Express Runtime

InfoCenter

Version 2 Release 1

IBM

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Chapter 1. Overview

Introduction to IBM Express Runtime

Solutions for customer requirements usually involve multiple products that work and share data together. In today's e-business environment, product requirements often include the Web, data storage, and an application server. IBM® Express Runtime offers a cohesive set of middleware components as a single offering, enabling hardware and software assets to work together. IBM Express Runtime provides the packaging and installation technology to create and deploy complete packages across multiple platforms.

Express Runtime can be used to quickly deploy IBM middleware to an end-user system. You can then install a solution so it integrates with the components. You might need to deploy the required middleware components and application to the end user as a single package. Express Runtime can greatly reduce the time, effort and complexity associated with installing and configuring middleware components.

Express Runtime provides tooling that helps you integrate applications with IBM middleware components into a cohesive solution, and deploy the solution to end users. The tooling that is provided with Express Runtime consists of the following tools:

- Express Runtime application development toolkit
- Express Runtime developer
- Deployment wizard
- Solution launcher
- Express Runtime console

Express Runtime application development toolkit
Use the Express Runtime application development toolkit to install development tools that you can use to help you create applications and solutions. The Express Runtime application development toolkit offers you a variety of tooling that you can use to make the most of your applications, and to get the most benefits from the IBM middleware components.

Express Runtime developer
The Express Runtime developer is an Eclipse-based plug-in that provides a standard platform for solution development. Express Runtime helps you offer a complete solution, including integrated installation and configuration. The Express Runtime developer features custom editors that help you to assemble solutions quickly and effectively.

Deployment wizard
The deployment wizard helps you deliver a solution to target computers. The deployment wizard offers an interface that helps you deploy a solution task-by-task.

Solution launcher
The solution launcher is a utility that helps you to start the deployment wizard and deploy a solution directly from a CD. The Express Runtime developer provides an export function that creates CD images in solution launcher format.

Express Runtime console
> The Express Runtime console helps you manage middleware components and provides a single, Web-based console for performing frequent administrative tasks.

What's new in IBM Express Runtime Version 2.1?

New features and functions:
- Support for Enterprise Java™ Beans (EJBs) as part of the ISV solution.
- Support for Java Messaging Services (JMS) as part of the ISV solution.
- Express Runtime console provides consolidated and remote administration of the middleware components.
- Rational® Application Developer license included for the ISV's application development use.
- Express Runtime application development toolkit provides middleware and development resources.

Usability Enhancements:
- Solution Development wizards added to replace editing of XML files
- Solution Deployment wizards added to simplify deployment of the solution
- Express Certified - meets the IBM standards for Express Architecture and Design

Middleware Components:

New versions of the following middleware:
- WebSphere® Application Server Express 6.0
- DB2® UDB Express 8.2
- IBM HTTP Server 6.0

Platforms:

IBM® i5/OS™ Version 5 Release 3 is the next generation of OS/400®. The information in this information center might refer to i5/OS™ or OS/400®.

Express Runtime audience

Express Runtime provides a comprehensive set of tools to develop and deliver a complete business solution to customers.

Customers of mid-sized companies can utilize the development and installation resources of software developers to build applications incorporating a middleware infrastructure, comprised of database and server software, into a single cohesive unit that can be easily deployed.

Express Runtime helps offer a complete and affordable solution to mid-sized companies by providing the following advantages:
- An affordable middleware infrastructure for customers to run their business applications.
- A framework that provides a complete business solution that is easily deployable in the customer environment.

Express Runtime middleware components

Express Runtime includes development and deployment tools, sample application wrappers and the following middleware components:

IBM WebSphere Application Server - Express
> IBM WebSphere Application Server - Express is a tool that you can use to develop, deploy, and manage both static and dynamic Web sites. Through the use of wizards and templates, IBM WebSphere Application Server - Express generates code, provides views of database information, and performs database updates. It also creates and uses Web services.

IBM DB2 Universal Database™ Express Edition for Windows® and Linux™ (OS/400 (i5/OS) database is embedded in the operating system)
> Designed for small and medium business needs, DB2 UDB Express Edition features self-tuning, self-managing, and self-configuring capabilities that increase reliability while reducing complexity and required skills.

IBM HTTP Server for Windows, Linux, and OS/400 (i5/OS)
> The foundation of any e-business application is the Web server. The IBM HTTP Server provides support for SSL secure connections, a fast response cache accelerator, and an administration server to administer and configure IHS servers.

IBM WebSphere HTTP Plug-in
> The IBM WebSphere HTTP plug-in provides a means of securely offering Web applications through a Web server. The IBM WebSphere HTTP Plug-in is featured as part of the IBM HTTP Server product for OS/400 (i5/OS)

The relationship between Express Runtime and the components

Express Runtime provides a complete solution that integrates configuration and installation. For example, you can design a solution to prompt the end-user to input a host name during the configuration process. Express Runtime then applies the data that the end-user enters to the application and the IBM middleware components appropriately. This reduces the time, effort, and complexity associated with installing and configuring a solution.

Express Runtime makes creating solutions a simple process. Select only the middleware required for a solution, thereby reducing the size of the solution. Tailor a solution to meet specific customer requirements. Whether only one or all of the middleware components is necessary, Express Runtime provides a single IBM product license and a single point of contact for service. Express Runtime also includes ready-to-use wrappers for the middleware components, and sample application wrappers that enable quick and easy installation of a complete solution that can include components on multiple platforms.

Express Runtime user roles

The following user roles are associated with Express Runtime:

Application developer
> The application developer creates the IBM Business Partner application. The application developer can use the application development tools provided by the Express Runtime tools installation.

Solution developer
> The solution developer builds solutions to integrate the installation and configuration of applications with selected middleware. The solution

developer should be familiar with Java and XML development. The solution developer edits sample application wrappers, creates new application wrappers, and assembles solutions to integrate the configuration and installation of applications and selected middleware.

Solution distributor
The solution distributor distributes solutions to customers using the Express Runtime deployment wizard. Alternatively, the solution distributor could be the end user who receives the solution on a set of CDs and uses the deployment wizard to deploy the solution to the target computers.

End user
The end user uses the deployment wizard to automate deployment. The deployment wizard helps deploy a solution to multiple target computers and run multiple operating systems.

Express Runtime business partner roadmap

This roadmap helps business partners determine what high-level topics apply in order to help him or her use IBM Express Runtime. A business partner might have the role of application developer, solution developer, solution distributor, or any combination of these.

Overview
Gives an overview of Express Runtime, the defined user roles, and other high-level information.

Business partner tutorial
Describes in general terms the tasks to install Express Runtime, use the Express Runtime developer to customize an existing solution, test the solution, and prepare the solution to deliver to the end user.

Installing
Instructs how to install Express Runtime to create a solution for your end user.

Cheat sheets
Aids with an interactive interface in completing common business partner tasks.

Planning
Presents decisions for you to make before creating a solution, such as determining the contents of your solution and licensing considerations.

Creating an application (optional, not for middleware-only solutions)
Describes what type of application files are needed to integrate your application with the IBM middleware components.

Testing applications (optional, not for middleware-only solutions)
Explains how to make sure your application works with the intended middleware.

Using the Express Runtime developer
Instructs how use the custom editor to create the wrapper files to set the solution configuration for your end user.

Deploying (optional, for testing purposes)
Describes how to use the deployment wizard to test how the end user will deploy your solution.

Maintaining (optional, if including the Express Runtime console in your solution)
Explains why you might want to deploy the Express Runtime console as part of your solution.

Express Runtime end user roadmap

This roadmap helps end users determine what high-level topics apply in order to help him or her use IBM Express Runtime.

Overview
Gives an overview of Express Runtime, the defined user roles, and other high-level information.

End user tutorial
Describes in general terms the tasks to deploy an Express Runtime solution from your business partner.

Deploying
Describes how to use the deployment wizard to deploy your supplied solution.

Express Runtime sizing guide

As you plan to install and use Express Runtime, use this guide to help you determine how much hard disk space you need. Determine which functions of the Express Runtime product you need, and use the table to determine how much space you need to install it. Two common scenarios are included so you have examples of how to size your installation. Remember that this guide does not reflect the amount of disk space you need to install the IBM middleware components or any third-party applications: those products contain sizing information in those products' documentation.

If you install Express Runtime for the purpose of deploying either a customized solution or only the IBM middleware, you use the solution launcher. The solution launcher installs files on the deploying computer, and removes them when you close the deployment wizard. In that case, this sizing guide helps you determine how much disk space you need for the deployment, but after deployment is complete, you regain the disk space.

General sizings

Table 1. Deployment Packages

Function	Sizing	Comments
Middleware for Windows	1.66 GB	Contains all middleware deployment packages for Windows
Middleware for Linux	1.76 GB	Contains all middleware deployment packages for Linux
Middleware for OS/400	836 MB	Contains all middleware deployment packages for OS/400
Middleware for Power Linux	1.75 GB	Contains all middleware deployment packages for Power Linux

Table 1. Deployment Packages (continued)

Function	Sizing	Comments
Total for all deployment packages	6.00 GB	

Table 2. Windows

Function	Sizing	Comments
All deployment packages	6.00 GB	See table above for breakdown of deployment packages by operating system
Express Runtime developer	2.2 GB	Includes the sample workspace
Deployment wizard	694 MB	Deployment wizard installation is required for all but "Middleware only" type of installation
IBM Installation Agent	131 MB	Only required for deployment to remote computer, installed on target computer(s)
Express Runtime console	677 MB	Only required for middleware component management, installed on target computer(s)

Table 3. Linux

Function	Sizing	Comments
All deployment packages	6.00 GB	See table above for breakdown of deployment packages by operating system
Express Runtime developer	2.0 GB	Includes the sample workspace
Deployment wizard	694 MB	Deployment wizard installation is required for all but "Middleware only" type of installation
IBM Installation Agent	135 MB	Only required for deployment to remote computer, installed on target computer(s)
Express Runtime console	695 MB	Only required for middleware component management, installed on target computer(s)

Table 4. Power on POWER

Function	Sizing	Comments
All deployment packages	6.00 GB	See table above for breakdown of deployment packages by operating system

Table 4. Power on POWER (continued)

Function	Sizing	Comments
Express Runtime developer	2.0 GB	Includes the sample workspace
Deployment wizard	1.16 GB	Deployment wizard installation is required for all but "Middleware only" type of installation
IBM Installation Agent	82 MB	Only required for deployment to remote computer, installed on target computer(s)
Express Runtime console	704 MB	Only required for middleware component management, installed on target computer(s)

Table 5. OS/400

Function	Sizing	Comments
IBM Installation Agent	16 MB	Only required for deployment to remote computer, installed on target computer

End user sizings

As the end user, you might want to install Express Runtime in order to deploy only the IBM middleware. This is how you should plan the computer resources you need. You need to plan additional space for when you deploy the middleware components. See the documentation for each middleware component to determine what resources you need when you deploy and install them.

Table 6. Windows

Function	Sizing	Comments
Middleware for Windows	778 MB	778MB of temporary space is required to deploy the middleware. If the user chooses to save the solution, then 6MB is left on the system.
Express Runtime console	677 MB	Only required for middleware component management, installed on target computer

Table 7. Linux

Function	Sizing	Comments
Middleware for Linux	784 MB	784MB of temporary space is required to deploy the middleware. If the user chooses to save the solution, then 8MB is left on the system.
Express Runtime console	695 MB	Only required for middleware component management, installed on target computer

Business partner sizings

As the business partner, you might want to install Express Runtime in order to create a solution for your end user that contains your application and IBM middleware components. This how you should plan the computer resources you need. You need to plan additional space for when you deploy the middleware components. See the documentation for each middleware component to determine what resources you need when you deploy and install them.

Table 8. Windows

Function	Sizing	Comments
All deployment packages	6.00 GB	See the table above for breakdown of deployment packages by operating system
Express Runtime developer	2.2 GB	Includes the sample workspace
Deployment wizard	694 MB	

Table 9. Linux

Function	Sizing	Comments
All deployment packages	5.98 GB	See table above for breakdown of deployment packages by operating system
Express Runtime developer	2.0 GB	Includes the sample workspace
Deployment wizard	694 MB	

Table 10. Linux on POWER

Function	Sizing	Comments
All deployment packages	5.98 GB	See table above for breakdown of deployment packages by operating system
Express Runtime developer	2.0 GB	Includes the sample workspace
Deployment wizard	1.16 GB	

Chapter 2. Tutorials

Accessing the Express Runtime cheat sheets

Tutorials are provided with Express Runtime in the form of cheat sheets to help you learn the process for performing common tasks. The tutorials use the Express Runtime interface, and help you to perform various tasks step-by-step. The following tutorials are available:

- Creating an application wrapper
- Adding an application wrapper to an existing solution
- Exporting and deploying the sample solution
- Deploying a solution using solution launcher

To access the tutorials, perform the following steps:

1. From the Express Runtime developer, select **Help > Cheat Sheets**.
2. From the Cheat Sheet selection dialog, select **Express Runtime**. Select the Cheat Sheet that you want to work with in the right pane of the dialog.
3. Click **OK**.

Express Runtime tutorial for IBM business partners

Welcome to the Express Runtime tutorial. Solution providers who plan to deploy applications bundled with IBM middleware components as complete business solutions can use this tutorial to understand the end-to-end process of working with Express Runtime. This tutorial provides information that helps solution providers understand the following concepts:

- The basic capabilities of Express Runtime
- Installing Express Runtime
- Customizing the default solution file
- Testing the solution
- Creating an installation image to provide to end users

To navigate to the various topics in this tutorial, click the corresponding link in the navigation pane on the left.

Introduction

Express Runtime provides a cohesive set of middleware components as a single offering, enabling hardware and software assets to work together to provide a well-defined total business solution. Express Runtime provides the packaging and installation technology to create and deploy complete packages across multiple platforms. The complete packages that you deploy with Express Runtime are referred to as *solutions*. A solution typically contains an ISV application that is bundled with one of more IBM middleware components. When you deploy a solution to an end user, only one installation is necessary to install the application, and all of the middleware that the application requires.

Express Runtime includes the following middleware components:

- WebSphere Application Server Express 6.0
- DB2 UDB Express 8.2

- IBM HTTP Server 6.0

In addition to the middleware components that Express Runtime provides, you can also deploy the Express Runtime console to end users. The Express Runtime console provides a single, Web-based utility for performing administrative tasks. By providing a consistent Web-based user interface, the Express Runtime console simplifies the experience of managing the IBM middleware.

Express Runtime system requirements

Operating system support

The following tables show which specific operating systems are supported for each basic platform type:

Windows

Operating System	Development or Deployment	Deployable as Target OS?
Windows XP Professional SP™ 2	both	No
Windows 2000 Server SP4	both	Yes
Windows 2000 Advanced Server SP4	both	Yes
Windows 2000 Professional SP3	both	Yes
Windows Server 2003, Standard Edition SP1	both	Yes
Windows Server 2003, Enterprise Edition SP1	both	Yes

Linux (Intel™ platforms only)

Operating System	Development or Deployment	Deployable as Target OS?
Red Flag Advanced Server 4.1	deployment only	Yes
Red Hat Enterprise Linux 3.0 WS/AS/ES	both	Yes
Red Hat Desktop 3.0	development only	No
SUSE LINUX Enterprise Server 8.0	both	Yes
SUSE LINUX Enterprise Server 9.0	both	Yes
SUSE LINUX Desktop 8.0	both	No
Novell Linux Desktop 9.0	both	No

Linux (IBM POWER5™ processor-based technology systems only)

Operating System	Development or Deployment	Deployable as Target OS?
Linux on POWER™ (using SUSE LINUX Enterprise Server 8.0, SUSE LINUX Enterprise Server 9.0, or Red Hat Enterprise Linux AS 3.0)	deployment only	Yes

OS/400

Operating System	Development or Deployment	Deployable as Target OS?
V5R2	neither	Yes

i5/OS[1]

Operating System	Development or Deployment	Deployable as Target OS?
V5R3	neither	Yes

Windows development requirements

- A minimum of 512 MB of memory; 1 GB recommended.
- At minimum, an Intel[(R)] Pentium[(R)] III class processor with a minimum clock speed of 600 MHz. A Pentium[®] IV class processor with a minimum clock speed of 1.2 GHz recommended.
- The following network support must be configured when deploying solutions to network-attached target computers:
  - TCP/IP
  - DNS
- A local area network (LAN) connection.
- An SVGA monitor with a minimum 1024 x 768 video resolution configured to display a minimum color depth of 256 colors.
- Internet Explorer 6.0 SP 1+ Web browser to view the online documentation and readme.
- Approximately 13 GB of disk space to install and run Express Runtime. Refer to the readme for complete disk space requirements.
- Administrative authority (required for product installation and uninstallation).
- Eclipse versions supported - based on the following:
  - IES - Eclipse Full SDK - 3.0
  - ecliplse.org - Eclipse SDK - 3.0

Linux development requirements

- A minimum of 512 MB of memory; 1 GB recommended.
- At minimum, an Intel[(R)] Pentium[(R)] III class processor with a minimum clock speed of 600 MHz. A Pentium IV class processor with a minimum clock speed of 1.2 GHz recommended.
- The following network support must be configured when deploying solutions to network-attached target computers:
  - TCP/IP
  - DNS
- A LAN connection.
- An SVGA monitor with a minimum 1024 x 768 video resolution configured to display a minimum color depth of 256 colors.
- Any Linux supported video card that supports the resolution requirements.
- Mozilla 1.4 Web browser to view online documentation and readme.

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1. The OS/400 operating system is known as the i5/OS operating system beginning with V5R3.

- Approximately 13 GB of disk space to install and run Express Runtime. Refer to the readme for complete disk space requirements.
- Administrative authority (required for product installation and uninstallation).
- Eclipse versions supported - based on the following:
  - IES - Eclipse Full SDK - 3.0
  - ecliplse.org - Eclipse SDK - 3.0

Linux on IBM POWER development requirements

- 2 GB of memory.
- A RS64-IV processor with a minimum clock speed of 600 MHz.
- The following network support must be configured when deploying solutions to network-attached target computers:
  - TCP/IP
  - DNS
- A LAN connection.
- An SVGA monitor with a minimum 1024 x 768 video resolution configured to display a minimum color depth of 256 colors.
- Any Linux supported video card that supports the resolution requirements.
- Mozilla 1.4 Web browser to view online documentation and readme.
- Approximately 85 MB of disk space to install and run Express Runtime. Refer to the readme for complete disk space requirements.
- Administrative authority (required for product installation and uninstallation).
- Eclipse versions supported - based on the following:
  - IES - Eclipse Full SDK - 3.0
  - ecliplse.org - Eclipse SDK - 3.0

OS/400 deployment requirements

- OS/400 V5R2 (5722SS1) or i5/OS V5R3 (5722SS1) -
- Host Servers (5722SS1, option 12) -
- QShell (5722SS1, option 30) -
- Java Developer Kit 1.4 (5722JV1, option 6) -
- Crypto Access Provider 128-bit (5722AC3) -
- The most recent WebSphere version 6 group and cumulative PTFs

Installing

You can install Express Runtime from either CD or a network location. When the installation of Express Runtime begins, the setup files unpack automatically. This can take anywhere from a few seconds to several minutes, depending on the system speed, the condition of the hard disk, and the disk access speed. Laptop computers with slower disk access can require several minutes to complete this process. You should notice disk and CPU activity during this process. Wait while the unpacking completes.

The launchpad panel starts automatically from the installation CD, or when you run the launchpad program from a network location. If it does not start automatically, you can start it by using the WindowsLaunchpad program on Windows or the LinuxLaunchpad program on Linux. By default, you can find these programs on installation medium in the *disk1* directory.

The launchpad panel provides controls for performing the following tasks:

- Installing Express Runtime
- Viewing the Express Runtime Readme
- Viewing the Express Runtime InfoCenter
- Viewing a product overview of Express Runtime

The following sample provides a step-by-step example of a typical Express Runtime installation:

1. From the launchpad, click **Install Express Runtime**.
2. A language selection panel is displayed. Select the language that you want to use for the installation of Express Runtime from the combo box. Click **OK**.
3. When the Welcome panel is displayed, Click **Next** to proceed with the installation.
4. The license agreement is displayed. To install Express Runtime, you must accept the terms of the license agreement. Read the license agreement and select the radio button next to **I accept the terms in the license agreement**. Click **Next**.
5. The installation location panel is displayed. Either accept the default destination or identify a new destination. You can either manually enter a directory or you can click **Browse** to navigate to a directory where you want to install Express Runtime. Additional subdirectories are created under the destination directory. Click **Next**.
6. The installation type panel is displayed. Select the type of installation that you want to be performed. Select from the following installation types:

   - Typical developer installation
   - Deployment wizard installation

   To learn more about the different types of installations, refer to the Express Runtime InfoCenter. Click **Next**.
7. The Eclipse development environment panel is displayed. You can accept the default to install Rational Web Developer as the Eclipse development environment that Express Runtime uses, or you can browse to select an Eclipse development environment that you have installed. If you select another Eclipse development environment, Rational Web Developer is not installed. Click **Next**.
8. The target middleware panel is displayed. Select all operating systems to which you plan to deploy solutions by selecting the appropriate checkboxes. Click **Next**.
9. You can watch the progress indicator of the installation of Express Runtime. When the installation completes, a panel is displayed that verifies that the installation has completed successfully. Click **Finish** to begin using Express Runtime.

Customize a solution

Express Runtime provides solutions for you to use to deploy IBM middleware to end users. Use the solutions provided with Express Runtime to customize for use with your applications. Express Runtime provides a development environment called the Express Runtime developer. You can use Express Runtime developer to create and build application and solution files, or to customize existing application and solution files. Use the specialized export function in the Express Runtime developer to export the deployable solutions that you develop.

Each solution contains one or more applications. Each application contains variables that you configure so that the application integrates seemlessly with IBM middleware on the end user's computer.

To customize a solution, you perform the following tasks:
- (Open Express Runtime developer)
- (Edit application variables)
- (Generate the solution file)

Open Express Runtime developer

Use Express Runtime developer to edit application and solution files. Express Runtime developer provides editors that help you to supply information that applications and solutions use when you deploy them to end users.

To open Express Runtime developer on Windows, select **Start > Programs > IBM Express Runtime > Express Runtime developer**.

To open solution devloper on Linux, select **Main Menu > IBM Express Runtime > Express Runtime developer**.

When you start Express Runtime developer, a welcome page is displayed that offeres you links to helpful resources. To work with Express Runtime developer, close the welcome page.

Express Runtime developer provides an Eclipse perspective that consists of the following views:
- Package explorer
- Navigator
- Properties
- Outline
- Tasks
- Console

The following list provides an overview of each of the Express Runtime developer views:

Package explorer
> Standard usage as with plain Java projects.

Navigator
> For viewing and operating on the contents of the bin output folder. Also helpful for viewing the non-Java resources in your projects.

Properties
> If the Eclipse platform includes a specialized XML editor such as the one available with the XML plugin in Rational Developer for the Web, then attribute information is displayed in the Properties view for an element selected in the XML editor's design page.

Outline
> Standard usage as with plain Java projects.

Tasks Standard usage as with plain Java projects.

Console

> Displays messages from solution and application generators. The Express Runtime developer console is not the same as the Express Runtime console.

When you open Express Runtime developer, you can customize applications and generate solutions that incorporate the changes you make. You can also use Express Runtime developer to test the deployment of solutions, and package them as solution launcher images that you can save on various types of distributable media to provide to end users.

Edit application variables

To customize a solution, you need to specify values for the variables that the middleware uses. The values that you provide represent things such as port numbers, user IDs, passwords, and other information that enables the middleware to integrate with bundled applications. If you do not provide values for the variables that the middleware components use, end users must provide this information after the installation process. By providing values for variables, you ensure that end users can use solutions without customization after the installation process.

To provide values for variables in Express Runtime developer, perform the following steps:

1. Close the Welcome page.
2. Click the Navigator tab to switch to the Navigator view of Express Runtime developer.
3. Expand the *src* folder. Expand the folder that has the name of the application project that you want to customize. Double-click the file with the .axml extension. The custom editor is displayed.
4. Click the Variables tab. The Application Variable Information panel is displayed.
5. All of the variables that the application uses are displayed in the Application Variables window. Select a variable to provide configuration information.
6. In the Variable Validation Configuration section of the Application Variable Information panel, provide values for the variable. The following three types of variables exist:

   String variable
   > This is the standard variable type used for data input.

   Password variable
   > Use password variables for data input that is displayed as ″*″ characters for security reasons.

   Boolean variable
   > Use boolean variables when requesting one of two possible value from the user.

7. Provide variable validation configuration information. Variable validation configuration information consists of the following values:

   Default Value
   > The default value is what is used by the application during installation. If you do not provide a default value, end users must providea value after the installation.

   Required
   > Select the Required checkbox if the variable is required.

Uppercase Only
> Select the Uppercase Only checkbox if only uppercase text is used.

Lowercase Only
> Select the Lowercase Only checkbox if only uppercase text is used.

Minimum Length
> Provide a minimum number of characters for the variable. This field accepts numeric input.

Maximum Length
> Provide a maximum number of characters for the variable. This field accepts numeric input.

Validation Rules
> For security purposes, optionally enter validation rules for variables.

8. Repeat the previous steps for every variable that you want to customize.
9. Save the application project.

For more information on adding new variables, refer to the Cheat Sheets provided with Express Runtime developer. To access the Cheat Sheets, select **Help > Cheat Sheets**.

Generate the solution file

Before the changes that you have made to an application file take effect, you must generate the solution that contains the application. When you generate a solution, all of the applications that are part of the solution are generated too.

To generate a solution, perform the following steps:

1. In the Navigation view of the Express Runtime developer, right-click the solution that you want to build. From the context menu, select **Generate Solution**.
2. View the status of the generation. First the applications generate, followed by the solution.
3. When the solution has been generated, a dialog is displayed that alerts that the generation is successful. Click **OK**.

When a solution has been successfully generated, you can test it in the deployment wizard. If you encountered errors during the generation of a solution, refer to the Express Runtime InfoCenter for more information.

To generate a deployment package, or generate or import an application or solution project without starting an Eclipse-based development environment, use the Eclipse generator batch files that are provided with Express Runtime. For more information using the Eclipse generator batch files, refer to the Express Runtime InfoCenter.

Testing deployment

When you have generated a solution, test it by deploying the solution to the local computer. Express Runtime features a deployment wizard that helps you deploy solutions to target computers. With the exception of localhost, all the target computers that you deploy a solution to using the deployment wizard must have the IBM Installation Agent installed and running. More information regarding the IBM Installation Agent is in the Express Runtime InfoCenter. To deploy a solution with the deployment wizard, you need to know the following information about each target computer:

- The operating system
- The fully-qualified hostname or IP address
- If it is not localhost, you need to know if it has the IBM Installation Agent installed and running.

When you test a solution in the deployment wizard, you deploy the middleware and applications to the target computers. Keep in mind that you are actually deploying code to target computers when you test a solution.

To test a solution in the deployment wizard, perform the following steps:

1. In the Navigator view of the Express Runtime developer, right-click the solution that you want to test in the deployment wizard. Select **Test in Deployment Wizard** from the context menu. The deployment wizard is displayed.
2. Read the Welcome panel of the deployment wizard. Click **Next**.
3. Select the tasks that you want to deploy by selecting the checkboxes that correspond with the tasks. Click **Next**.
4. Select the subtasks of the tasks that you want to deploy. Click Next. You need to repeat this step for each task that you selected in Step 3.When you finish, the specify targets panel is displayed.
5. In the Specify Targets panel, type localhost for the target. Click **Add**. Click **Next**. You need to repeat this step for each subtask that you selected for each task that you selected. When you finish, the configuration parameters panel is displayed.
6. Provide any configuration parameters that the deployment wizard prompts for. Configuration parameters are unique to specific tasks. Click **Next**. You need to repeat this step for each subtask that you selected for each task that you selected. When you finish, the summary panel is displayed
7. Review the summary information. Click **Deploy All**.The status panel is displayed.
8. When the status panel displays that the solution has been successfully deployed, the test is successful.

If you encounter errors during the deployment of the solution, you can debug the solution. For more information on debugging solutions, refer to the Express Runtime InfoCenter.

Exporting to a solution launcher image

The Express Runtime developer provides an export wizard that you can use for exporting your solution project to a solution launcher-ready image that can then be transferred to media for distribution. Before exporting a deployable solution, you must build the solution to create the binary solution file and build all of the necessary applications' deployment packages.

The solution launcher image is an easy way to distribute and deploy a solution. The solution you export to the solution launcher image can then be deployed through the deployment wizard. The deployment wizard is installed on the staging server through a graphical user interface similar to the one used for IBM Express Runtime. There is also the option to silently install the deployment wizard and silently deploy the solution contained in the solution launcher image. For more details on silent installation, see the Express Runtime Installation instructions.

Note: In order to silently install and deploy a solution launcher image, you must place the task file you want to use in the *tasks* directory of the solution.

The solution launcher image you export can display one or more license agreements as part of an installation. If you want to include licenses, place all the license files in the license directory of the solution project, in the appropriate language folder. If you have translated license files, place them in the other language folders. In order for the solution launcher to detect translated license files correctly, the filenames of the different translations should be the same, simply placed in different folders. In the following example, if the default language is English, the translated versions of license1.txt is displayed for Spanish and German machines, and the English version of license1.txt is displayed for all other languages. Additionally, the English version of license2.txt is displayed for all languages, since no translations were provided.

```
Solution/
 license/
  en/
   license1.txt
   license2.txt
  es/
   license1.txt
  de/
   license1.txt
```

The solution launcher image can also include a launchpad with links to a readme file and documentation for the solution. If you choose to include either a readme file or documentation, you must include the files in the solution. The readme file must be placed in the `readme` folder in the solution, and the documentation files must go in the `info` folder in the solution. The files must be placed in the appropriate language folder. Place any translated files in the appropriate language folders.

To export a deployable solution to a solution launcher image, complete the following steps:

1. From the left pane of the Express Runtime Developer, select the **Package Explorer** or the **Navigator** view.
2. Select the appropriate solution project.
3. Click **File > Export** from the main menu.
4. Select **Express Runtime solution launcher Image** from the list of available wizards.
5. Click **Next**.
6. Select the solution project that you want to export.
7. In the **Media size (MB)** field, enter the capacity, in MB, of the media that the solution launcher image will be distributed on. You can enter a value or select one from the list.
8. Use the **Include directory** field to include external files in the image. Enter the path, or click **Browse** to select the root directory of the files to include.
9. In the **Destination directory** field, enter a destination directory or **Browse** to an export destination directory.
10. Select the operating systems on which the solution launcher will run.
11. Enter the **Installation location** and **Temporary location** for each selected operating system. The installation uses the system TEMP directory by default. if the system TEMP directory is full, the installation used the directory you specify in the **Temporary** field.

12. Click **Next**.
13. In the **Vendor name** field, enter the vendor name that you want included in the solution launcher image.
14. In the **Vendor website** field, enter the vendor website that you want included in the solution launcher image.
15. Use the **Run installation silently** field, to include a task file in the image. A task file is required to install the solution launcher image silently. Use the **Task file** field to enter the path to the task file.
16. Click **Next**.
17. In the **Default language** field, select the default language for the image. The default language must be selected in the **Languages** list.
18. Click **Next**.
19. Use the **Install license files** options to specify the license files included with the image. If you select **Text/HTML files** as the license type, you must choose at least one file from the **Text/HTML files** field.
20. Click **Next**.
21. Use the **Install readme file** options to include a readme file in the image.
22. Use the **Install documentation files** options to include product documentation with the image.
23. Use the **Display Launchpad as part of solution launcher install** to include the launchpad and its options with the image.
24. Click **Finish**.

Note: If you include a readme file and product documentation, but do not include the launchpad or do not include a link to the documentation and readme file from the launchpad, you must provide another way for customers to access the readme file and product documentation. No shortcuts to the documentation or readme file are included in the solution launcher image.

Note: The deployment packages are located in the launcher CD in the bin\com\ibm\jsdt\webserver\tree folder and during installation and deployment are copied to the <install path> SolutionEnabler\com\ibm\jsdt\webserver\tree folder.

Deliver the solution to the end user

After you have exported a solution to a solution launcher image, copy the solution launcher image that resides in the **To directory** that you specified when you exported the solution to a distributable media, for example, one or more CDs.

Refer to the documentation distributed with the CD burning software that you use to copy the contents of this directory to on or more CDs. When an end user inserts the first distribution CD into his or her CD or DVD ROM drive, the solution launcher is displayed and provides instructions for the solution installation.

If you intend to deliver a solution to end users on a distributable media other then a CD, be sure to let end users know that they need to double-click the IRU_*os*Setup.exe, in the disk1 directory of the distributable media, where *os* is the target operating system.

Documentation for contained products

IBM Express Runtime

Installed on your system:
- **Windows:** Start > Programs > IBM Express Runtime 2.1 > Documentation > Express Runtime Documentation
- **RedHat Linux 8.0:** Extras > Other > IBM Express Runtime 2.1 > Documentation > Express Runtime Documentation
- **SUSE Linux 8.1:** Start > Programs > IBM Express Runtime 2.1 > Documentation > Express Runtime Documentation

DB2 UDB Express

On the Web: http://www.ibm.com/software/data/info/db2express/ (for **iSeries**™: http://www.ibm.com/servers/eserver/iseries/db2/)

After DB2 Express is installed you can access its documentation through menu shortcuts:
- **Windows:** Start > Programs > IBM DB2 > Information > Information Center
- **RedHat Linux 8.0:** Extras > Other > IBM DB2 > Information > Information Center
- **SUSE Linux 8.1:** Start > Programs > IBM DB2 > Information > Information Center

IBM HTTP Server

On the Web: http://www.ibm.com/software/webservers/httpservers/ (for **iSeries:** http://www.ibm.com/servers/eserver/iseries/software/http/)

After IBM HTTP Server is installed you can access its documentation through menu shortcuts:
- **Windows:** Start > Programs > IBM HTTP Server > Documentation
- **RedHat Linux 8.0:** Extras > Other > IBM HTTP Server > Documentation
- **SUSE Linux 8.1:** Start > Programs > IBM HTTP Server > Documentation

WebSphere Application Server - Express

On the Web: http://www.ibm.com/software/websphere/info/express/index.jsp (for **iSeries:** http://www.ibm.com/servers/eserver/iseries/software/webspher)

When WebSphere Application Server Express is installed you can access its documentation through menu shortcuts:
- **Windows:** Start > Programs > IBM WebSphere Application Server - Express 5.1 > FirstSteps, Readme, Getting Started
- **RedHat Linux 8.0:** Extras > Other > IBM WebSphere Application Server - Express 5.1 > FirstSteps, Readme, Getting Started
- **SUSE Linux 8.1:** Start > Programs > IBM WebSphere Application Server - Express 5.1 > FirstSteps, Readme, Getting Started

JACL: A TCL implementation in Java

On the Web:
http://www.usenix.org/publications/library/proceedings/tcl97/full_papers/lam/lam.pdf

Integrated Solutions Console

After the Integrated Solutions Console (ISC) is installed you can access its documentation through the user interface:
- **Windows:** Log on to ISC. Click the help icon at the top right corner of the screen.
- **RedHat Linux 8.0:** Log on to ISC. Click the help icon at the top right corner of the screen.
- **SUSE Linux 8.1:** Log on to ISC. Click the help icon at the top right corner of the screen.

Congratulations

You have now completed the IBM Express Runtime tutorial. For more information on IBM Express Runtime, refer to the IBM Express Runtime InfoCenter.

Express Runtime tutorial for end users

Welcome to the Express Runtime tutorial. End users who plan to install business solutions can use this tutorial to understand the end-to-end process of working with Express Runtime. This tutorial provides information that helps end users understand the following concepts:
- Installing solutions
- Testing solutions
- Using other information resources

To navigate to the various topics in this tutorial, click the corresponding link in the navigation pane on the left.

Introduction

Express Runtime provides a cohesive set of middleware components as a single offering, enabling hardware and software assets to work together to provide a well-defined total business solution. Express Runtime provides the packaging and installation technology to create and deploy complete packages across multiple platforms. The complete packages that you deploy with Express Runtime are referred to as solutions. A solution typically contains an ISV application that is bundled with one of more IBM middleware components. Only one installation is necessary to install the application, and all of the middleware that the application requires.

To install an Express Runtime solution, you work with an installation program that launches a wizard that helps you deploy the solution to one or more target computers. You provide specific information to the wizard so that the solutions you deploy integrate on the target computers seamlessly.

Express Runtime system requirements

Operating system support

The following tables show which specific operating systems are supported for each basic platform type:

Windows

Operating System	Development or Deployment	Deployable as Target OS?
Windows XP Professional SP 2	both	No
Windows 2000 Server SP4	both	Yes
Windows 2000 Advanced Server SP4	both	Yes
Windows 2000 Professional SP3	both	Yes
Windows Server 2003, Standard Edition SP1	both	Yes
Windows Server 2003, Enterprise Edition SP1	both	Yes

Linux (Intel platforms only)

Operating System	Development or Deployment	Deployable as Target OS?
Red Flag Advanced Server 4.1	deployment only	Yes
Red Hat Enterprise Linux 3.0 WS/AS/ES	both	Yes
Red Hat Desktop 3.0	development only	No
SUSE LINUX Enterprise Server 8.0	both	Yes
SUSE LINUX Enterprise Server 9.0	both	Yes
SUSE LINUX Desktop 8.0	both	No
Novell Linux Desktop 9.0	both	No

Linux (IBM POWER5 processor-based technology systems only)

Operating System	Development or Deployment	Deployable as Target OS?
Linux on POWER (using SUSE LINUX Enterprise Server 8.0, SUSE LINUX Enterprise Server 9.0, or Red Hat Enterprise Linux AS 3.0)	deployment only	Yes

OS/400

Operating System	Development or Deployment	Deployable as Target OS?
V5R2	neither	Yes

i5/OS[2]

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2. The OS/400 operating system is known as the i5/OS operating system beginning with V5R3.

Operating System	Development or Deployment	Deployable as Target OS?
V5R3	neither	Yes

Windows development requirements

- A minimum of 512 MB of memory; 1 GB recommended.
- At minimum, an Intel(R) Pentium(R) III class processor with a minimum clock speed of 600 MHz. A Pentium IV class processor with a minimum clock speed of 1.2 GHz recommended.
- The following network support must be configured when deploying solutions to network-attached target computers:
  - TCP/IP
  - DNS
- A local area network (LAN) connection.
- An SVGA monitor with a minimum 1024 x 768 video resolution configured to display a minimum color depth of 256 colors.
- Internet Explorer 6.0 SP 1+ Web browser to view the online documentation and readme.
- Approximately 13 GB of disk space to install and run Express Runtime. Refer to the readme for complete disk space requirements.
- Administrative authority (required for product installation and uninstallation).
- Eclipse versions supported - based on the following:
  - IES - Eclipse Full SDK - 3.0
  - ecliplse.org - Eclipse SDK - 3.0

Linux development requirements

- A minimum of 512 MB of memory; 1 GB recommended.
- At minimum, an Intel(R) Pentium(R) III class processor with a minimum clock speed of 600 MHz. A Pentium IV class processor with a minimum clock speed of 1.2 GHz recommended.
- The following network support must be configured when deploying solutions to network-attached target computers:
  - TCP/IP
  - DNS
- A LAN connection.
- An SVGA monitor with a minimum 1024 x 768 video resolution configured to display a minimum color depth of 256 colors.
- Any Linux supported video card that supports the resolution requirements.
- Mozilla 1.4 Web browser to view online documentation and readme.
- Approximately 13 GB of disk space to install and run Express Runtime. Refer to the readme for complete disk space requirements.
- Administrative authority (required for product installation and uninstallation).
- Eclipse versions supported - based on the following:
  - IES - Eclipse Full SDK - 3.0
  - ecliplse.org - Eclipse SDK - 3.0

Linux on IBM POWER development requirements

- 2 GB of memory.

- A RS64-IV processor with a minimum clock speed of 600 MHz.
- The following network support must be configured when deploying solutions to network-attached target computers:
  - TCP/IP
  - DNS
- A LAN connection.
- An SVGA monitor with a minimum 1024 x 768 video resolution configured to display a minimum color depth of 256 colors.
- Any Linux supported video card that supports the resolution requirements.
- Mozilla 1.4 Web browser to view online documentation and readme.
- Approximately 85 MB of disk space to install and run Express Runtime. Refer to the readme for complete disk space requirements.
- Administrative authority (required for product installation and uninstallation).
- Eclipse versions supported - based on the following:
  - IES - Eclipse Full SDK - 3.0
  - ecliplse.org - Eclipse SDK - 3.0

OS/400 deployment requirements
- OS/400 V5R2 (5722SS1) or i5/OS V5R3 (5722SS1) -
- Host Servers (5722SS1, option 12) -
- QShell (5722SS1, option 30) -
- Java Developer Kit 1.4 (5722JV1, option 6) -
- Crypto Access Provider 128-bit (5722AC3) -
- The most recent WebSphere version 6 group and cumulative PTFs

Installing

Express Runtime provides solutions to end users in the form of a single installation. This installation program provides a wizard for end users to install code that helps them deploy solutions to target computers that they specify. After you deploy a solution, the installation program uninstalls the wizard, so no legacy code is left behind on your computer. If you need to deploy a solution again, you run the installation program additional times.

The following sample provides a step-by-step example of a typical installation of an Express Runtime solution:

1. If you received a solution from a solution provider on one or more CDs, insert the first CD into the CD or DVD ROM drive. The installation program starts automatically. If you are installing a solution from a network location, other medium, or the installation program does not start automatically, go to the location where the installation program resides, and double click IRU_*Os*Setup.exe, where *Os* is the operating system of the computer where you are installing the solution.

2. A language selection panel is displayed. Select the language that you want to use for the installation of Express Runtime from the combo box. Click **OK**.

3. When the Welcome panel is displayed, Click **Next** to proceed with the installation.

4. The installation location panel is displayed. Either accept the default destination or identify a new destination. You can either manually enter a

directory or you can click Browse to navigate to a directory where you want to install Express Runtime. Additional subdirectories are created under the destination directory. Click **Next**.

5. The installation summary panel is displayed. Review the installation summary. Click **Next**.

6. You can watch the progress indicator of the installation of Express Runtime. When the installation completes, a panel is displayed that verifies that the installation has completed successfully. Click **Finish** to begin using Express Runtime.

After the installation completes, the deployment wizard is displayed. Use the deployment wizard to deploy the solution to one or more target computers. When compete a deployment and exit the deployment wizard, Express Runtime uninstalls.

Deploying

Express Runtime features a deployment wizard that helps you deploy solutions to target computers. With the exception of localhost, all the target computers that you deploy a solution to using the deployment wizard must have the IBM Installation Agent installed and running. More information regarding the IBM Installation Agent is in the Express Runtime InfoCenter.

To deploy a solution with the deployment wizard, you need to know the following information about each target computer:

- The operating system
- The fully-qualified hostname or IP address
- If it is not localhost, you need to know if it has the IBM Installation Agent installed and running.

To use the deployment wizard to deploy a solution, perform the following steps:

1. Read the Welcome panel of the deployment wizard. Click **Next**.

2. Select the tasks that you want to deploy by selecting the checkboxes that correspond with the tasks. Click **Next**.

3. Select the subtasks of the tasks that you want to deploy. Click **Next**. You need to repeat this step for each task that you selected in Step 2. When you finish, the Specify Targets panel is displayed.

4. In the Specify Targets panel, type localhost for the target. Click **Add**. Click **Next**. You need to repeat this step for each subtask that you selected for each task that you selected. When you finish, the configuration parameters panel is displayed.

5. Provide any configuration parameters that the deployment wizard prompts for. Configuration parameters are unique to specific tasks. Click **Next**. You need to repeat this step for each subtask that you selected for each task that you selected. When you finish, the summary panel is displayed.

6. Review the summary information. Click **Deploy All**. The status panel is displayed.

7. When the status panel displays that the solution has been successfully deployed, the test is successful.

If you encounter errors during the deployment of the solution, you can debug the solution. For more information on debugging solutions, refer to the Express Runtime InfoCenter.

If at any time you exit a deployment, Express Runtime uninstalls the deployment wizard. If you exit the deployment wizard before a solution is deployed, you need to install the solution again.

Testing the deployment

When the status panel of the deployment wizard displays that the solution has been successfully deployed, the test is successful. If you encounter errors during the deployment of the solution, you can debug the solution. For more information on debugging solutions, refer to the Express Runtime InfoCenter.

You can manually test the deployment of a solution, but starting the application that you have deployed on one of the target computers that you have deployed to.

Documentation for contained products

IBM Express Runtime

Installed on your system:
- **Windows:** Start > Programs > IBM Express Runtime 2.1 > Documentation > Express Runtime Documentation
- **RedHat Linux 8.0:** Extras > Other > IBM Express Runtime 2.1 > Documentation > Express Runtime Documentation
- **SUSE Linux 8.1:** Start > Programs > IBM Express Runtime 2.1 > Documentation > Express Runtime Documentation

DB2 UDB Express

On the Web: http://www.ibm.com/software/data/info/db2express/ (for **iSeries:** http://www.ibm.com/servers/eserver/iseries/db2/)

After DB2 Express is installed you can access its documentation through menu shortcuts:
- **Windows:** Start > Programs > IBM DB2 > Information > Information Center
- **RedHat Linux 8.0:** Extras > Other > IBM DB2 > Information > Information Center
- **SUSE Linux 8.1:** Start > Programs > IBM DB2 > Information > Information Center

IBM HTTP Server

On the Web: http://www.ibm.com/software/webservers/httpservers/ (for **iSeries:** http://www.ibm.com/servers/eserver/iseries/software/http/)

After IBM HTTP Server is installed you can access its documentation through menu shortcuts:
- **Windows:** Start > Programs > IBM HTTP Server > Documentation
- **RedHat Linux 8.0:** Extras > Other > IBM HTTP Server > Documentation
- **SUSE Linux 8.1:** Start > Programs > IBM HTTP Server > Documentation

WebSphere Application Server - Express

On the Web: http://www.ibm.com/software/websphere/info/express/index.jsp (for **iSeries:** http://www.ibm.com/servers/eserver/iseries/software/webspher)

When WebSphere Application Server Express is installed you can access its documentation through menu shortcuts:

- **Windows:** Start > Programs > IBM WebSphere Application Server - Express 5.1 > FirstSteps, Readme, Getting Started
- **RedHat Linux 8.0:** Extras > Other > IBM WebSphere Application Server - Express 5.1 > FirstSteps, Readme, Getting Started
- **SUSE Linux 8.1:** Start > Programs > IBM WebSphere Application Server - Express 5.1 > FirstSteps, Readme, Getting Started

JACL: A TCL implementation in Java

On the Web:
http://www.usenix.org/publications/library/proceedings/tcl97/full_papers/lam/lam.pdf

Integrated Solutions Console

After the Integrated Solutions Console (ISC) is installed you can access its documentation through the user interface:

- **Windows:** Log on to ISC. Click the help icon at the top right corner of the screen.
- **RedHat Linux 8.0:** Log on to ISC. Click the help icon at the top right corner of the screen.
- **SUSE Linux 8.1:** Log on to ISC. Click the help icon at the top right corner of the screen.

Congratulations

You have now completed the IBM Express Runtime tutorial. For more information on IBM Express Runtime, refer to the IBM Express Runtime InfoCenter.

Chapter 3. Installation

Express Runtime system requirements

Operating system support

The following tables show which specific operating systems are supported for each basic platform type:

Windows

Operating System	Development or Deployment	Deployable as Target OS?
Windows XP Professional SP 2	both	No
Windows 2000 Server SP4	both	Yes
Windows 2000 Advanced Server SP4	both	Yes
Windows 2000 Professional SP3	both	Yes
Windows Server 2003, Standard Edition SP1	both	Yes
Windows Server 2003, Enterprise Edition SP1	both	Yes

Linux (Intel platforms only)

Operating System	Development or Deployment	Deployable as Target OS?
Red Flag Advanced Server 4.1	deployment only	Yes
Red Hat Enterprise Linux 3.0 WS/AS/ES	both	Yes
Red Hat Desktop 3.0	development only	No
SUSE LINUX Enterprise Server 8.0	both	Yes
SUSE LINUX Enterprise Server 9.0	both	Yes
SUSE LINUX Desktop 8.0	both	No
Novell Linux Desktop 9.0	both	No

Linux (IBM POWER5 processor-based technology systems only)

Operating System	Development or Deployment	Deployable as Target OS?
Linux on POWER (using SUSE LINUX Enterprise Server 8.0, SUSE LINUX Enterprise Server 9.0, or Red Hat Enterprise Linux AS 3.0)	deployment only	Yes

OS/400

Operating System	Development or Deployment	Deployable as Target OS?
V5R2	neither	Yes

i5/OS[3]

Operating System	Development or Deployment	Deployable as Target OS?
V5R3	neither	Yes

Windows development requirements
- A minimum of 512 MB of memory; 1 GB recommended.
- At minimum, an Intel[(R)] Pentium[(R)] III class processor with a minimum clock speed of 600 MHz. A Pentium IV class processor with a minimum clock speed of 1.2 GHz recommended.
- The following network support must be configured when deploying solutions to network-attached target computers:
  - TCP/IP
  - DNS
- A local area network (LAN) connection.
- An SVGA monitor with a minimum 1024 x 768 video resolution configured to display a minimum color depth of 256 colors.
- Internet Explorer 6.0 SP 1+ Web browser to view the online documentation and readme.
- Approximately 13 GB of disk space to install and run Express Runtime. Refer to the readme for complete disk space requirements.
- Administrative authority (required for product installation and uninstallation).
- Eclipse versions supported - based on the following:
  - IES - Eclipse Full SDK - 3.0
  - ecliplse.org - Eclipse SDK - 3.0

Linux development requirements
- A minimum of 512 MB of memory; 1 GB recommended.
- At minimum, an Intel[(R)] Pentium[(R)] III class processor with a minimum clock speed of 600 MHz. A Pentium IV class processor with a minimum clock speed of 1.2 GHz recommended.
- The following network support must be configured when deploying solutions to network-attached target computers:
  - TCP/IP
  - DNS
- A LAN connection.
- An SVGA monitor with a minimum 1024 x 768 video resolution configured to display a minimum color depth of 256 colors.
- Any Linux supported video card that supports the resolution requirements.
- Mozilla 1.4 Web browser to view online documentation and readme.

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3. The OS/400 operating system is known as the i5/OS operating system beginning with V5R3.

- Approximately 13 GB of disk space to install and run Express Runtime. Refer to the readme for complete disk space requirements.
- Administrative authority (required for product installation and uninstallation).
- Eclipse versions supported - based on the following:
  - IES - Eclipse Full SDK - 3.0
  - ecliplse.org - Eclipse SDK - 3.0

Linux on IBM POWER development requirements
- 2 GB of memory.
- A RS64-IV processor with a minimum clock speed of 600 MHz.
- The following network support must be configured when deploying solutions to network-attached target computers:
  - TCP/IP
  - DNS
- A LAN connection.
- An SVGA monitor with a minimum 1024 x 768 video resolution configured to display a minimum color depth of 256 colors.
- Any Linux supported video card that supports the resolution requirements.
- Mozilla 1.4 Web browser to view online documentation and readme.
- Approximately 85 MB of disk space to install and run Express Runtime. Refer to the readme for complete disk space requirements.
- Administrative authority (required for product installation and uninstallation).
- Eclipse versions supported - based on the following:
  - IES - Eclipse Full SDK - 3.0
  - ecliplse.org - Eclipse SDK - 3.0

OS/400 deployment requirements
- OS/400 V5R2 (5722SS1) or i5/OS V5R3 (5722SS1) -
- Host Servers (5722SS1, option 12) -
- QShell (5722SS1, option 30) -
- Java Developer Kit 1.4 (5722JV1, option 6) -
- Crypto Access Provider 128-bit (5722AC3) -
- The most recent WebSphere version 6 group and cumulative PTFs

Installing from a CD or network location

When you start the installation process, the setup files are automatically unpacked. This can take anywhere from a few seconds to several minutes, depending on the speed of your system, the condition of your hard disk (how fragmented it is), and the speed of your disk access. Because laptop computers have slower disk access, they might require several minutes to complete this process. You can see disk and CPU activity during this process. Wait until the setup files are unpacked.

Please note that, if you are attempting to install the base product over an existing installation of Express Runtime with a higher version number, the installation must meet the following conditions:
- The higher version number must be due to the installation of a fix pack and not a more recent version of the base product.

- Your new base installation is installing only features not selected when you first installed the base product.

Note: Only users with administrative user access can install Express Runtime. Check that the logged-on user has administrative access to the system prior to running the installation.

Launchpad

On Windows computers, the launchpad starts automatically from the installation CD or DVD. If it does not start automatically, you can start it by using the WindowsLaunchpad.exe program on Windows. To initiate the launchpad on Linux computers, use the LinuxLaunchpad program. To initiate the launchpad program on Linux on POWER computers, use the LinuxPPCLaunchpad program. By default, you find the launchpad programs on the first CD or DVD in the installation media.

The launchpad dialog provides links for completing the following tasks:
- Installing Express Runtime
- Viewing the Express Runtime readme file
- Viewing a product overview of Express Runtime

Click a link on the launchpad to go to any of the preceding tasks, or click **Exit** to quit.

Select language

When you select either Install IBM Express Runtime from the launchpad, or double-click the launchpad program for the operating system you use from the installation directory of the installation CD or DVD, you are prompted to select a language.

Select the language that you want to use for the installation of Express Runtime and click **OK**.

The following languages are supported:
- English
- Spanish
- French
- German
- Italian
- Brazilian Portuguese
- Japanese
- Simplified Chinese
- Traditional Chinese
- Korean

Welcome

This dialog displays the name of the product to be installed: IBM Express Runtime product.

Read the dialog text and click **Next**.

Accept license agreement

To install Express Runtime, you must accept the terms of the license agreement.

1. In the License Agreement panel, read the license agreement information.
2. Select **I accept the terms in the license agreement** if you agree with it, and click **Next**. Otherwise, keep the selection **I do not accept the terms of the license agreement** (it is the default setting) and click **Cancel** to exit the installation.

Select standard or middleware only installation

Select whether you want to install the Express Runtime development environment, the deployment wizard, and the Express Runtime middleware, or the Express Runtime middleware only. If you select Middleware only, the installation of the middleware begins when you click **Next**. If you select to perform the standard installation of Express Runtime, you need to specify additional information.

Click **Next**.

Select installation location

The installation directory dialog prompts for a destination to install Express Runtime. This dialog is not displayed if you already have Express Runtime installed, for example, if you want to install components that you did not install originally.

Either accept the default destination or select a new destination. Additional subdirectories are created under the destination directory.

You can either manually enter a directory or click **Browse** to navigate to a directory where you want to install Express Runtime.

Click **Next**.

Select installation type

Select the type of installation that best meets your needs. There are three different types of installations:

- Typical installation
- Deployment only installation

Typical installation
> A typical installation installs all of the components of IBM Express Runtime, including the development tools, documentation, license, shortcuts, and runtime environments. This is the default type of installation. During a typical installation you can select the platforms to which you deploy middleware applications.

Deployment only installation
> A deployment-only installation installs only the components that are needed to create a staging server. This type of installation installs the deployment wizard component of Express Runtime. During a deployment-only installation, you can select the platforms to which you deploy middleware applications.

Select an installation type and click **Next**.

Select a platform for middleware applications

You can save space and installation time by installing only the middleware applications for the platforms that you target.

You can choose to install middleware applicationsfor the following platforms:

- Windows
- Linux
- OS/400 (i5/OS[4])
- Linux on POWER

Select the platforms on which to install middleware applications and click **Next**.

Select an Eclipse-based product

You can install the Express Runtime developer plug-in into an existing Eclipse-based product, or you can select to install IBM Rational Web Developer version 6.0.

Note: If you install the Express Runtime developer plug-in into an already installed Eclipse-based product, the product's default workspace opens when you start the program. You must manually change the workspace in your Eclipse-based product in order to work with the Express Runtime developer workspace.

Select the Eclipse-based product to use as your development environment and click **Next**.

Reconfigure Express Runtime developer

The Reconfigure Express Runtime developer dialog provides a way to quickly restore the Express Runtime developer back to a working state if the Eclipse plug-in is no longer installed. The option to reconfigure the Express Runtime developer is available in the following situations:

- The Eclipse plug-in was uninstalled and the Express Runtime installation process is restarted.
- The IBM Rational Web Developer installation failed.

When you reconfigure the Express Runtime developer, you do not need to reinstall the entire Express Runtime product.

Select to either reconfigure the Express Runtime developer or continue with the standard installation and click **Next**.

Review the installation summary

The summary dialog summarizes installation information such as the installation directory, the features to be installed, and the estimated total size of the features that you selected to install.

Review this installation summary before beginning the installation. To make changes, click **Back** to return to the previous dialogs and make any necessary changes.

Click **Next** to begin the installation.

---

4. The OS/400 operating system is known as the i5/OS operating system beginning with V5R3.

Monitor the installation progress

The Monitor installation progress dialog displays the status of the features of Express Runtime as they are installed.

The Express Runtime development environment is installed as part of the Express Runtime installation. You can follow the installation progress by monitoring the progress bar. Installing IBM Rational Web Developer adds significantly to the time that is needed for the installation process. Disk and CPU activity takes place during this process. When all of the features of Express Runtime are installed, a verification dialog is displayed.

Verify successful installation

The final installation dialog, Verify successful installation, indicates whether the installation was successful. Click **Finish** to exit the installation wizard. The First Steps dialog is displayed when the installation is finished.

To verify that the installation was successful, look for the following conditions:

- The IBM Installation Agent (IIA) is running as a system service (on Windows), a daemon (on Linux) or a background program (OS/400 or i5/OS[5]) on the target computer.
- The deployment wizard launches without any errors. For more on using the deployment wizard, see the Express Runtime Documentation available from the First Steps dialog.

To verify that the Express Runtime developer was successfully installed, open the Express Runtime developer and check that any existing projects imported without error and that a solution can be generated. For more on using the Express Runtime developer, see the Express Runtime Documentation available from the First Steps dialog.

Log files created during the product's installation also provide useful information about the installation process. Log files are created by the IBM Installation Agent and Express Runtime.

The log file associated with IBM Installation Agent can be found in the IIA/logs directory. The Express Runtime log file, IRU_Install.log, is found in the /opt/IBM/Runtime21/SolutionEnabler/logs/IRU_Install.log directory.

Troubleshoot installation problems

If you encounter errors during the installation process, or cannot complete an installation, complete the following tasks to identify the cause of the error or unsuccessful installation:

- Verify that the system where you are installing Express Runtime meets the hardware and software prerequisites for installation.
- View IRU_Install.log, which is located in \Program Files\IBM\Runtime21\SolutionEnabler\logs\. IRU_Install.log provides detailed information regarding the events of an installation.
- Record any messages that the Express Runtime installation program returns. Messages beginning with IRU008*xx* are related to the installation of Express Runtime.

---

5. The OS/400 operating system is known as the i5/OS operating system beginning with V5R3.

Note: Log messages are not logged for non-administrator users on Windows or Linux operating systems. You must have administrative access to install or uninstall IBM Express Runtime.

If you attempted a silent installation and do not see a log file generated, be sure that you have administrative privileges. Only users with administrative access can install IBM Express Runtime on Windows or Linux operating systems. During a silent installation, most errors are written to a log file; however, log messages cannot be logged for non-administrative users.

Use the First Steps dialog

The First Steps dialog provides links to documentation and functions to help familiarize you with the Express Runtime and its capabilities. The First Steps dialog starts automatically at the end of the installation process. You can also start the First Steps dialog from your computer's Start menu.

The First Steps dialog contains these links:

Readme file

Contains information, problem resolution, and procedures that were not available in the Express Runtime documentation when it was first published.

Getting Started

Contains documentation highlighting Express Runtime features and information roadmaps about various user roles.

Sample

Contains a sample designed to help a developer understand the development environment and how an application can be included in an integrated solution. There is also a demonstration of a deployment of an integrated solution.

These links are specific to the sample and are intended to be to learn about the functions and capabilities of Express Runtime. They are available only from First Steps dialog.

Express Runtime developer

Starts the Express Runtime developer tool and opens the full workspace provided with Express Runtime. This workspace contains all of the application and solution wrappers for the supported operating systems. The workspace is named `workspace` and is a separate workspace from the sample. Changes made in the sample workspace are not reflected in this workspace.

Deployment wizard

Starts the deployment wizard with no solution selected. Select **File > Open** to select a solution to be deployed.

Product Documentation

Starts the Express Runtime Help Environment.

Install Express Runtime silently

You can install IBM Express Runtime silently. Use the response file named IRU_setup.iss to set the installation options. You can use the same options that you would select during the interactive installation. The options are set in the response file. Start the silent installation using a command similar to:

```
WindowsSetup -options x:\yyy\...\IRU_setup.iss -silent
```

The WindowsSetup executable program and IRU_setup.iss response file are on disk1 of the IBM Express Runtime CDs. Use the LinuxSetup or LinuxPPCSetup executable programs for Linux platforms. The -options parameter must be the fully-qualified name of the IRU_setup.iss response file. The installation results are in the IRU_install.log in the specified installation directory.

Note: If you specify -silent in the response file by uncommenting the -silent line, do not specify -silent on the command line.

The following are the Express Runtime setup executable names:
- WindowsSetup.exe for Windows
- LinuxSetup for Linux
- LinuxPPCSetup for Linux on POWER

Installation results are not written to IRU_install.log if a user without administrator or root privileges performs a silent installation on the following operating systems:
- Microsoft® Windows 2000
- Windows XP
- Red Hat Enterprise Linux
- SUSE Linux (Intel platforms)

You can also deploy a solution file silently at installation time by editing the response file so that it calls a task file. For more on silently deploying, see the silent deployment topic in the Express Runtime InfoCenter.

Generate a response file

Response files are used to set the installation options for a silent installation. You can generate two types of response files automatically with Express Runtime.
- An *options record* is a response file containing values recorded during an installation or Express Runtime. This options record can be used to perform silent installations with identical options in the future.

  To create an options record, use a command similar to:

  ```
  WindowsSetup -options-record x:\yyy\...\IRU_setupRecord.iss
  ```
- An *options template* This is a sample response file. This file contains commonly used options, along with instructions for their use. You modify the file, specifying the values that you want to use for the installation. This template can then be saved and used to perform installations later.

  To create an options template, use a command similar to:

  ```
  WindowsSetup -options-template x:\yyy\...\IRU_setupTemplate.iss
  ```

Sample response file

Use the following sample response file to set the options for your installation. This file is named IRU_setup.iss and is located on disk1 of the IBM Express Runtime CDs.

```
##########################################################################
# SAMPLE RESPONSE FILE FOR SILENT IBM Express Runtime VERSION 2.1 INSTALLATION
#
# NOTE: No spaces are allowed before the options (-P, -W, -G)
#
##########################################################################


##########################################################################
```

```
                # Specify that the installation should run silently.
                #
                # NOTE: The following option is needed for successful silent installation.
                # Do not modify it. By doing so, you prevent the ability to choose a setup type
                # during installation.
                #

                -silent


                ##############################################################################
                # Provide an alternative installation destination.
                #
                # Default installation path for Windows: C:\Program Files\IBM
                # Default installation path for Linux: /opt/IBM
                #
                # To modify the default installation path, uncomment the line below and
                # insert a valid path for the location.  The following characters are
                # invalid characters for the shortcut folder name for Windows and Linux:
                #
                # Windows:  "   *   /  ;  <  >  ?  |
                # Linux: ! " # $ % & ' ( ) * , : ; < = > ? @ [ \ ] ^ ` { | } ~
                # and any native characters
                #
                #-P IBM_IRU.installLocation="C:\Program Files\IBM"


                ##############################################################################
                # Indicates the user's response to whether to replace a file that exists
                # on their system. The possible values are: "yesToAll", and "noToAll".
                # Note that this option is only available at installation.
                #

                -G replaceExistingResponse="yesToAll"


                ##############################################################################
                # Indicates the user's response to whether to replace a file if that
                # file is newer than the file being installed.
                # The possible values are: "yesToAll", and "noToAll".
                # Note that this option is only available at installation.
                #

                -G replaceNewerResponse="yesToAll"


                ##############################################################################
                # Indicates the user's response to whether to remove a file that has been
                # modified since it was last installed.
                # The possible values are: "yesToAll", and "noToAll".
                # Note that this option is only available at uninstallation.
                #

                -G removeModifiedResponse="yesToAll"


                ##############################################################################
                # NOTE: The following option is needed for successful feature selections.
                # Do not modify it.
                #

                -W setupTypes.active=false


                ##############################################################################
                #
                # The following part of the response file is divided into 3 sections for 3 different
```

```
# types of set up:
#
#  Typical Installation
#  Custom Installation
#  Deployment Wizard Only Installation
#
# Typical Installation is the default installation type. It installs the
# entire product.
#
# To select the Custom Installation, set "-W setupTypeAction.customDeveloperInstall=True".
# To select the Deployment Wizard Only Installation,
# set "-W setupTypeAction.deployerInstall=True".
#
# Only one of these options can be set to True. If more than one is set to True, the first
# option set to True is accepted and the remaining True values are ignored.
#
############################################################################
#
#   Typical Installation
#
# Install Express Runtime development tools and documentation. You can select
# the platforms to which you deploy middleware applications.
# Space required: 1 GB - 3.5 GB
#
# To enable the Typical Installation setup type, set the following option to True:
#

-W setupTypeAction.typicalDeveloperInstall=True

#
#
############################################################################
#
#   Custom Installation
#
# Install Express Runtime development tools and documentation. You can select
# the platforms to which you deploy middleware applications and the workspaces to
# install. This type of installation is recommended for advanced users.
# Space required: 0.8 GB - 3.5 GB
#
# To enable the Custom Installation setup type, set the following option to True:
#
#-W setupTypeAction.customDeveloperInstall=True
#
#
# The following is the feature selection associated with Custom Installation.
# Set the feature's active property to "True" to select a feature for installation.
# Set the feature's active property to "False" to prevent a feature from being installed.
#
#
# Express Runtime Middleware for Windows
#
#-P WinDPFeature.active=True
#
#
# Express Runtime Middleware for Linux
#
#-P LnxDPFeature.active=False
#
#
# Express Runtime Middleware for OS/400 (i5OS)
#
#-P OS400DPFeature.active=False
#
#
# Express Runtime developer Workspace Feature
#
```

```
#-P WorkspaceFeature.active=True
#
#
# Linux Sample Workspace Feature
# This feature is available for installation on Linux platforms only.
#
#-P LnxSampleWorkspaceFeature.active=False
#
#
# Windows Sample Workspace Feature.
# This feature is available for installation on Windows platforms only.
#
#-P WinSampleWorkspaceFeature.active=True
#
#
###############################################################################
#
#   Deployment Wizard Only Installation
#
# Install Express Runtime deployment tools and documentation. You can select
# the platforms to which you deploy middleware applications.
# Space required: 1 GB - 2.5 GB
#
# To enable the Deployment Wizard Only Installation setup type,
# set the following option to True:
#
#-W setupTypeAction.deployerInstall=True
#
#
# The following is the feature selection associated with Deployer Installation.
# Set the feature's active property to "True" to select a feature for installation.
# Set the feature's active property to "False" to prevent a feature from being installed.
#
#
# Express Runtime Middleware for Windows
#
#-P WinDPFeature.active=True
#
#
# Express Runtime Middleware for Linux
#
#-P LnxDPFeature.active=False
#
#
# Express Runtime Middleware for OS/400 (i5OS)
#
#-P OS400DPFeature.active=False
#
#
###############################################################################

###############################################################################
#
#   Eclipse Product Selection
#
# By default, Rational Web Developer 6.0 is installed during a Typical or
# Custom Installation. If you do not want to install Rational Web Developer, specify
# the eclipse folder location for an existing Eclipse 3.0 product to plug into.
#
# For example, if the location of the eclipse folder in your Eclipse environment
# is "C:\Program Files\eclipse" then you would specify the following:
#
#-W eclipseProductListings.eclipseDirectory="C:\Program Files\eclipse"


###############################################################################
# The following option is used when IBM Express Runtime is already
```

```
# installed with the Express Runtime developer feature, but the Eclipse development
# environment that it was installed into has been removed.
#
# To reconfigure the Express Runtime developer and restore it to a working state,
# uncomment the following line:
#
#-W userSelection.userSelection=1
#
# To perform a full installation, uncomment the following line instead:
#
#-W userSelection.userSelection=2
#
# See the "Eclipse Product Selection" section above to specify which Eclipse
# environment to plug into.
```

Uninstallation

An uninstallation executable program is provided with the Express Runtime product. The file is located in the \Runtime21_uninst directory. By running this program, the Express Runtime files are removed from the system, including Express Runtime and the Windows registry entries on Windows systems.

Directories and files that were installed as part of Express Runtime are removed unless the files have been added or modified after installation. Review these modified files to ensure that you want to delete them, and then manually delete the files and directories.

Deployed products are not uninstalled when Express Runtime is uninstalled. Deployed products must be uninstalled separately. See Uninstall Components for instructions.

Administrative authority

You must have administrative authority to install or uninstall Express Runtime. If you attempt to uninstall the product on Linux or Windows after having applied a fixpack, you may receive the error dialog titled: "InstallShield Wizard Panel" with the message "The java class is not found:run". This message occurs because you do not have Administrator authority. Log off the system and back on as a user with Administrator authority.

Uninstall Express Runtime

You must have administrative authority to uninstall Express Runtime. If you do not have administrative authority, errors will occur when you run the uninstallation and a log file may not be created. Check that the logged-on user has administrative authority before uninstalling Express Runtime.

To uninstall Express Runtime, complete the following steps:
1. Double-click uninstall.exe in <installation directory>\IBM\Runtime21_uninst on Windows computers, or <installation directory>\IBM\Runtime21\uninst on Linux computers.
2. Select a language for the uninstallation program from the dialog that is displayed. Click **OK**.
3. The uninstallation Welcome dialog is displayed. Click **Next**.
4. Verify the list of product features that are marked for uninstallation. Click **Next**.
5. Click **Finish** to close the uninstallation program.

Note: Some folders and files might not be automatically removed when Express Runtime is uninstalled. You can delete these folders and files manually.

If you encounter errors during uninstallation, you can view the IRU_Install.log, located in Runtime21\SolutionEnabler\logs,

Uninstall the deployed components

Deployed products are not uninstalled when Express Runtime is uninstalled. Deployed products must be uninstalled separately.

Uninstall the deployed component products as follows:

Remove the sample application
- Manually delete the sample files. The sample files are located in the directory that you specified at deployment time. Delete the files and remove the directory. The names specified in these instructions are the names set in the sample's properties file "DocMgmtSample.prop" and the sample's default configuration.
- Drop the database from DB2. This can use the DB2 Control Center or with the DB2 command **db2 drop database DOCMGTD7**.
- Remove the application from WebSphere Application Server. Using the Web administration console (for example, http://host:7090/admin):
  1. Select **Applications > Enterprise Applications**.
  2. Select the sample application.
  3. Click **Stop** to stop the application.
  4. Select the sample application.
  5. Click **Uninstall**.
  6. Save the configuration changes.
- Remove the J2C Authentication data entry
  1. Select **Resources > JDBC Providers**
  2. Set the scope to Node
  3. Click the provider named IRDB2Provider
  4. Under "Additional Properties" click **Data sources**
  5. Click the data source named DocMgmtEx
  6. Under "Related Items" click J2C authentication data entries
  7. Select **DB2AuthAlias**
  8. Click **Delete**
- Remove the JDBCProvider object from WebSphere Application Server. Using the Web Administration console (for example, http://host:7090/admin):
  1. Select **Resources > JDBC Providers**.
  2. Set the scope to Node.
  3. Select Select IRDB2Provider .
  4. Click **Delete**.
  5. Save the configuration changes.

Uninstall WebSphere Express for Windows and Linux platforms

Use the uninstallation executable program that is provided in the WASinstallDir/_uninst directory. This file starts an interactive uninstallation process.

Uninstall WebSphere Express for OS/400 (i5/OS)

Remove this program using the DLTLICPGM command for product 5722E51. Note that this does not delete any customer data such as application servers or deployed applications, but only removes the product libraries, directories, and files. If the product is reinstalled, all customer data remaining on the system is usable again.

Uninstall IBM HTTP Server for Windows and Linux

Use the uninstall.jar file provided in the <IHSinstallDir>/_uninst directory. A JRE is required to run this uninstallation. The IBM HTTP Server documentation instructs you to set your path to point to the Java product installed on your computer; however, IBM HTTP Server does not provide a JRE. You can use the JRE provided with the IBM Installation Agent or Express Runtime to perform the uninstallation. For example, **<IIAInstallDir>/IIAJRE/bin/java -jar <IHSInstallDir>/_uninst/uninstall.jar** starts the interactive uninstallation.

Uninstall IBM HTTP Server for iSeries

Remove the product using the following commands in order:
- ENDTCPSVR SERVER(*HTTP) HTTPSVR(*ALL)
- ALCOBJ OBJ((QHTTPSVR/QHTTPSVR *SBSD *EXCL)) WAIT(120)
- ENDSBS SBS(QHTTPSVR) OPTION(*IMMED)
- DLCOBJ OBJ((QHTTPSVR/QHTTPSVR *SBSD *EXCL))

After those commands have completed, then you can run DLTLICPGM LICPGM(5722DG1)

Uninstall WebSphere Express plug-in for IBM HTTP Server for Windows and Linux

Use the uninstallation executable program that is provided in the <plug-inInstallDir>/_uninst directory. If WebSphere Express and IBM HTTP Server are installed on the same system, the *<plug-inInstallDir>* is <IHSinstallDir>/Plugins . If WebSphere Express and IBM HTTP Server are installed on different systems, the plug-in is installed on the system with IBM HTTP Server, and the *<pluginInstallDir>* is IHSinstallDir/Plugins.

Uninstall WebSphere Express plug-in for IBM HTTP Server for iSeries

This plug-in is packaged and installed as part of the HTTP server product 5722DG1 for OS/400. Therefore, it is not separately uninstallable, but it is uninstalled with the HTTP server.

Uninstall DB2 UDB Express for Windows
1. Select **Start > Settings > Control Panel > Add or Remove Programs**.
2. Select **DB2 Universal Database Express Edition**.
3. Select **Change or Remove Programs**.

If you created databases, the DB2 instance is not deleted. You can manually delete any DB2 instances that were created. The default instance created at DB2 install time is <db2InstallDrive>:/DB2.

If the sample was installed and you are not deleting the DB2 instance, drop the sample database from DB2 before uninstalling DB2. See instructions for uninstalling the Sample Application.

Uninstall deployed components for DB2 UDB Express for Linux

1. In a Command Prompt window, switch to root user by entering the command**su**.
2. List all DB2 instances by entering the command**/opt/IBM/db2/V8.1/instance/db2ilist**.
3. Remove each DB2 by entering the command**/opt/IBM/db2/V8.1/instance/db2idrop** *<instancename>*.
4. Remove the DB2 administrative server by entering the commands**/opt/IBM/db2/V8.1/instance/dasdrop** and **/opt/IBM/db2/V8.1/instance/daslist**.
5. Enter the command**/opt/IBM/db2/V8.1/_uninst/db2_deinstall**.
6. Delete the DB2 admin user ID (db2admin by default) if you no longer need the user ID. Use the command **userdel -r** <db2admin user>.
7. Delete the DB2 instance user ID (db2inst by default) if you no longer need the user ID. Use the command **userdel -r** <db2inst user>.
8. Delete group for the DB2 admin user (db2admin by default) if the user was deleted. Use the command **groupdel** <db2admin group>.
9. Delete group for the DB2 instance user (db2inst by default) if the user was deleted. Use the command **groupdel** <db2inst group>.

If the sample was installed and you are not deleting the DB2 instance user ID, you should drop the sample database from DB2 before uninstalling DB2. Switch to the DB2 instance user and type **db2 drop database DOCMGTD7**.

DB2 UDB Express for OS/400 (i5/OS)

DB2 is an integral part of the database function imbedded in the OS/400 operating system. It cannot be uninstalled.

Notes® About Uninstalling the Component Products

The uninstallation process might not remove all of the files from the installation directories. Review these files to ensure you want to delete them, and then manually delete the files and remove the directories.

Refer to each product's documentation for more details about uninstalling the product.

Chapter 4. Planning

Defining a solution for deployment

Begin defining a solution by developing a high-level plan for the main aspects of the solution. You need to familiarize yourself with the deployment wizard graphical user interface provided by Express Runtime to ensure that the presentation is consistent with your vision. For an overview of the interface, refer to (Deploying your solution).

When defining your solution, you should consider how to address the following decisions:

- Choosing software applications
- Arranging the software applications into installation tasks
- Sharing between application variables
- Defining manual tasks for the solution
- Ordering the installation tasks and manual tasks
- Customizing the presentation of the deployment wizarda
- Licensing your solution
- Packaging your solution
- Providing user documentation
- Providing customer support

Selecting components for the solution

To create a complete solution, it is necessary to determine the Express Runtime middleware components to include with the applications. Specify the middleware components to be used in the solutions during the installation of Express Runtime. Only the component images of the middleware selected, or JAR files, are loaded onto the development computer. The deployer's computer functions as a staging server. When a solution is deployed to a target computer, the component installations are launched.

As an alternative, solutions can be deployed using CDs. In that situation, the solution is installed and launched locally.

Selecting components and applications for a solution

The Express Runtime components and software applications you develop (hereafter referred to as "applications") are the building blocks of solutions. You select the specific version and release of each component and application early in the planning process. In addition, consider any manual tasks, customized code, operating system commands, or application data that might be needed to complete the solution. To be deployed through Express Runtime's deployment wizard, all software applications and customized code must be able to start from the command line and run without user intervention.

Your solution might require components and applications that run on different operating systems. Express Runtime supports packaging a solution based on multiple operating systems.

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After you define the applications, identify any post-deployment configuration that you want to provide with the solution. Keep in mind that any required post-deployment configuration not performed by the solution must be completed by the user.

Beyond the individual component and application configuration, determine if there is any integration required between applications for the solution to work properly. Based on your knowledge of the components and your software applications, determine if this integration can be performed through application utilities or if you will have to provide customized integration code.

There are other things to consider when you choose software for the solution. After you determine all of the components and applications to include as part of the solution, decide the best order for deploying them. For example, if you have any customized integration code, it should be applied after the applications that it integrates are deployed. See (Planning your wrappers) for further information. If you choose an application or component that has different levels of encryption, that will affect the number of wrappers required. See (Packaging your solution) for further information.

Defining installation tasks

The main content of a solution are the installation tasks and the applications those installation tasks include.

Each installation task specifies one or more applications to be installed in that task, named by the file name of the binary application file. You must have access to the binary file for each application that you want to include. In addition, if an installation task contains more than one application, determine the order in which you want them to be installed within that task, and whether or not you want the solution deployment to continue if a particular application installation fails. All software applications that are deployed through the deployment wizard must be defined as part of an installation task.

Defining manual tasks

During the solution deployment, you might want to provide instructions for the user to manually complete before continuing with the next task. This is done using a manual task. Identify any such instructions required by the solution.

Ordering tasks

After the installation tasks and manual tasks have been defined, you must determine the order in which these tasks will be deployed. Some applications might need to be installed before another can be, or a manual task might need to be completed before the next installation task begins. For example, a task might determine if the solution deployment should continue if a component deployment fails.

Specifying shared application variables

You might have related applications in your solution that contain variables which should always hold the same value. For example, if one application contains a product, and another application contains a service pack for that product, you might want the installation paths for the two applications to be the same. To do this, you specify within the solution which variables should share values.

Determine which variables, if any, in your solution should share values.

Planning solution licensing

An important step in creating a solution is determining the kind of license that best suits the solution. Consult expert legal counsel for advice on your solution's licensing requirements. These requirements are based on the legal requirements of all components contained in your solution, including Express Runtime. The licensing you develop for your solution affects a solution in areas such as packaging, pricing and support. If license text is specified in the solution, the license text is displayed at deployment time. The user must select "Agree" for deployment to start.

Planning solution packaging

When planning for solution packaging, determine how to package the solution product media. Some solution packaging options supported by Express Runtime include repackaging the product media with any custom code as the solution media, or packaging the solution with custom code and no product media. The end-user must then obtain the media through other channels. You can also package prebuilt images of applications as part of a solution so the end-user does not have to create deployment packages during deployment.

Planning solution deployment

You might want to use the deployment wizard to deploy a solution without installing any of the Express Runtime components to a staging server. Express Runtime includes the solution launcher specifically for this scenario. The solution launcher starts the deployment wizard on a computer that acts as your staging server and removes all components of Express Runtime when deployment is complete.

You can customize the deployment wizard interface. You can define the titles, icons, the splash screen, and product information to reflect information about you as a solution provider. This helps you maintain consistent market branding in solution presentations.

When planning changes to the deployment wizard interface, be sure to consider the languages you want Express Runtime to support.

Creating and using wrappers

The Express Runtime developer gives you the framework to develop a complete solution for the end user, including integrated installation and configuration. A complete solution includes middleware components provided with Express Runtime and applications you create for the customer. The solution is contained in a wrapper, which contains individual application wrappers.

An *application wrapper* contains an XML file defining the application, several language-specific XML files for globalization purposes, and any scripts or Java programs necessary to begin and configure the installation of the application. A *solution wrapper* is made up of one or more of these application wrappers.

The Express Runtime developer offers a custom editor to help you create wrappers that enable each application to be part of a single solution.

Express Runtime provides sample application wrappers and the wrappers for the IBM middleware components that ship with the product. You can obtain wrappers to create a solution in several ways:

- Copy Express Runtime's sample application wrapper and edit the copy so that you can use it with your own application. You can also make modifications based on information contained in white papers posted on the Virtual Innovation Center at www.expressenablement.com.
- Create new application wrappers "from scratch."
- Use the IBM middleware component wrappers supplied in Express Runtime.

When the development of your application wrappers is complete, you can use the Express Runtime developer to prepare a solution for deployment. The Express Runtime developer assembles all the wrappers, including the middleware components and your applications, into deployable packages. These packages include JAR files that contain the application installation images, user program Java classes, and any script files necessary to install your solution. You then use the deployment wizard to deploy the solution.

Supplied sample solution wrappers

IBM Express Runtime ships with four sample solutions. You can modify these solutions using the Express Runtime developer and deploy them as needed using the deployment wizard. For information about modifying the solutions, see Modifying an existing solution wrapper.

The following list provides the names of the sample solutions and information about the components each solution contains. The solution ID is noted in parentheses next to the solution name. Click the solution name to learn more about deploying each solution.

- IBM Express Runtime 2.1 Middleware (IRU2_1MiddlewareAll.ser)

  This solution includes all of the Express Runtime middleware components for all supported platforms.
- IBM Express Runtime 2.1 Sample Solution (IRU2_1SampleSolution.ser)

  This solution includes all of the Express Runtime middleware components and the sample application for all supported platforms.
- IBM Express Runtime 2.1 Sample for Linux (IRU2_1SampleSolutionLnx.ser)

  This solution includes the Express Runtime middleware components and sample application for Linux platforms only.
- IBM Express Runtime 2.1 Sample for Windows (IRU2_1SampleSolutionWin.ser)

  This solution includes the Express Runtime middleware components and sample application for Windows platforms only.

Supplied application wrappers

When building your solution with the Express Runtime developer, you can create your own application wrappers or choose from the list of application wrappers included in Express Runtime. The following is a list of the application wrappers that are available. The unique application ID for each wrapper is listed in parentheses next to the name of the application.

- Sample application for Windows (IRU2_1SampleWin)
- Sample application for Linux (IRU2_1SampleLnx)
- Sample application for OS/400 (i5/OS) (IRU2_1SampleI5OS)
- IBM DB2 Universal Database Express Edition Version 8.2 for Windows (IRU2_1DB2Express8_2Win)
- IBM DB2 Universal Database Express Edition Version 8.2 for Linux (IRU2_1DB2Express8_2Lnx)

- IBM DB2 Universal Database Express Edition Version 8.2 for Linux on POWER (IRU2_1DB2Express8_2LnxOnPwr)
- IBM WebSphere Application Server-Express for Windows (IRU2_1WASExpress6_0Win)
- IBM WebSphere Application Server-Express for Linux (IRU2_1WASExpress6_0Lnx)
- IBM WebSphere Application Server-Express for Linux on POWER (IRU2_1WASExpress6_0LnxOnPwr)
- IBM WebSphere Application Server-Express for OS/400 (i5/OS) installation (IRU2_1WasExpress6_0I5OS)
- IBM WebSphere Application Server-Express for OS/400 (i5/OS) configuration (IRU2_1WASConfigI5OS)
- IBM HTTP Server 6.0 for Windows (IRU2_1IHS6_0Win)
- IBM HTTP Server 6.0 for Linux IRU2_1IHS6_0Lnx)
- IBM HTTP Server 6.0 for Linux on POWER (IRU2_1IHS6_0LnxOnPwr)
- IBM HTTP Server for OS/400 (i5/OS) installation, V5R2 (IRU2_1IHS520OS400)
- IBM HTTP Server for OS/400 (i5/OS) installation, V5R3 (IRU2_1IHS530I5OS)
- IBM HTTP Server for OS/400 (i5/OS) configuration (IRU2_1IHSConfigI5OS)
- IBM WebSphere HTTP Plugin for Windows (IRU2_1WASExpressHttpPlugin6_0Win)
- IBM WebSphere HTTP Plugin for Linux (IRU2_1WASExpressHttpPlugin6_0Lnx)
- IBM WebSphere HTTP Plugin for Linux on POWER (IRU2_1WASExpressHttpPlugin6_0LnxOnPwr)
- Integrated Solutions Console for Linux
- Integrated Solutions Console on Linux on POWER
- Integrated Solutions Console for Windows
- Console Management Extension for IBM DB2 Universal Database Express Edition Version 8.2 for Linux
- Console Management Extension for IBM DB2 Universal Database Express Edition Version 8.2 for Linux on POWER
- Console Management Extension for IBM DB2 Universal Database Express Edition Version 8.2 for Windows
- Console Management Extension for IBM HTTP Server for Linux
- Console Management Extension for IBM HTTP Server for Linux on POWER
- Console Management Extension for IBM HTTP Server for Windows
- Console Management Extension for WebSphere Application Server - Express for i5/OS
- Console Management Extension for WebSphere Application Server - Express for Linux
- Console Management Extension for WebSphere Application Server - Express for Linux on POWER
- Console Management Extension for WebSphere Application Server - Express for Windows

Planning an application wrapper

Applications are the building blocks of a solution file, and the application wrapper prepares them to be included in a solution file. When planning application wrappers, perform the following tasks:

- Choose a unique application ID.
- Gather general application information.
- Identify the operating systems the application supports.
- Decide the language translations you support.
- Determine the steps required to install the application and the steps required when the installation is complete. Consider how post-installation configuration can be automated or how you can instruct the user to complete required configuration steps using manual tasks.
  - Determine the steps to perform prior to installing the application. Consider checking for prerequisites or if the application is already installed. Identify conditions that would prevent a successful install. A Predeployment Checker user program is used to perform these checks prior to install. The Predeployment Checker is run before the install image for the application is sent to the target computer and unpacked. An Entry program can also be used to perform steps prior to installation. An Entry program is run after the install image is unpacked, therefore the Entry program has access to the install image.
  - Determine the steps required to install the application. A Main program is used to install the application.
  - Determine the steps required when the installation is complete. Consider how post-installation configuration can be automated. Automated post-install tasks can be performed in a Main or an Exit user program.
  - Identify the manual tasks the user must perform.
  - Identify any variables that you want to use.
  - Determine any other files needed to perform deployment.
  - Determine the files you put into the install image for the application.
- Identify the main program.
- Identify any variables that you want to use.
- Identify any other files needed to perform deployment.
- Determine if any user programs are needed.

Planning a solution wrapper

When you finish planning the application wrappers for the solution, you can plan the solution wrapper. Planning the solution wrapper is similar to planning application wrappers, but it introduces a different set of issues. As part of your planning, perform the following tasks:

- Select a unique solution ID.
- Gather general solution information.
- Identify the installation tasks and the applications included in each installation task.
- Identify sharing between application variables.
- Identify any manual tasks to include in the solution.
- Order the installation tasks and manual tasks in the solution.
- Decide which language translations to support.
- Determine whether to put the tasks into groups to help navigate through the components of a solution.

Chapter 5. Creating an application

Develop an EAR or WAR

You can use any application that can be saved as an EAR or WAR with Express Runtime.

EAR files

An Enterprise Archive file represents a J2EE application that can be deployed in an application server. EAR files are standard Java archive files and have the file extension .ear. An EAR file can consist of the following:

- One or more Web modules
- One or more EJB modules
- One or more application client modules
- Additional JAR files required by the application
- Any combination of the above

The modules that make up the EAR file are themselves packaged in archive files specific to their types--for example, a Web module contains Web archive files and an EJB module contains Java archive files. EAR files also contain a deployment descriptor (an XML file) that describes the contents of the application and contains instructions for the entire application, such as security settings to be used in the run-time environment.

When an EJB module or Web module is installed as a stand-alone application, it is automatically wrapped in an Enterprise Archive (EAR) file

WAR files

WAR file is the same format as a JAR file. However, you also need to create an eXtensible Markup Language (XML) deployment descriptor (WEB-INF/web.xml) file.

List resources that are used by EAR or WAR

In addition to having a project that is saved as an EAR or WAR file, you need to know the resources that are used by the application.

Resources is a collective term for the projects, folders, and files that are used in an application. The Navigator view in the Express Runtime developer workbench provides a hierarchical view of resources and helps you to open them for editing. Other tools are used to display and handle these resources differently.

The following are the three basic types of resources that exist in the Workbench:

Files Comparable to files as you see them in the file system.

Folders

Comparable to folders in a file system. In the Workbench, folders are contained in projects or other folders. Folders can contain files and other folders.

Projects
>Contain folders and files. Projects are used for builds, version management, sharing, and resource organization. Projects map to folders in the file system. When you create a project, you specify a location for it in the file system.

A project is either open or closed. When a project is closed, it cannot be changed in the Workbench. The resources of a closed project are not displayed in the Workbench, but the resources still reside on the local file system. Closed projects require less memory. Since they are not examined during builds, closing a project can improve build time.

When a project is open, the structure of the project can be changed and the contents are displayed in the workbench.

Chapter 6. Testing applications

Deploy a supplied middleware solution

Express Runtime features several middleware solutions that you can use to test the deployment wizard. It is a good practice to test the connections you have to target computers by deploying a supplied middleware solution prior to deploying a solution that you or a business partner develop. By successfully deploying a supplied middleware solution, you can determine that the deployment wizard is functioning correctly, and that the connections you have to the target computers are available.

Manually install an application

To test if an application can be successfully installed as part of a solution that is deployed using the deployment wizard, it is a good practice to manually install the application on a target computer. If you are using a predeployment checker as part of a solution, it is a good practice to test it prior to manually installing an application.

When you manually install an application, pay close attention to the configuration steps that you need to perform to complete the installation. Knowledge of the configuration steps is helpful for defining manual tasks that the end-user needs to perform.

If you can manually install an application successfully on a target machine, you can rule out errors in the applications installation program as something that could cause the unsuccessful deployment of a solution.

Run application

When an application has been successfully manually installed on a target computer, it is a good practice to run the application to ensure that it runs as intended. By running an application on a target computer, you can determine if the application functions as intended when you deliver it to the end user. If you can verify that an application runs as intended when it is successfully manually installed, you can rule out problems with the development of the application or its installation program when debugging the unsuccessful deployment of a solution.

Chapter 7. Using the Express Runtime developer

Environment setup

This section provides information about the set up and configuration of the Express Runtime developer.

Express Runtime developer perspective

Use the Express Runtime developer to edit application and solution files. The Express Runtime developer provides editors that help you to supply information that applications and solutions use when you deploy them to end users.

To open the Express Runtime developer on Windows, select **Start > Programs > IBM Express Runtime 2.1 > Express Runtime developer**.

To open the Express Runtime on Linux, select **Main Menu > IBM Express Runtime 2.1 > Express Runtime developer**.

When you start the Express Runtime developer, a welcome page is displayed that offers you links to helpful resources. To work with the Express Runtime developer, close the welcome page.

The Express Runtime developer provides an Eclipse perspective that consists of the following views:
- Package Explorer
- Navigator
- Properties
- Tasks
- Console
- Problems

The following list provides an overview of each of the Express Runtime developer views:

Package Explorer
> Standard usage as with plain Java projects.

Navigator
> For viewing and operating on the contents of the bin output folder. Also helpful for viewing the non-Java resources in your projects.

Properties
> If an element with additional attributes is selected in another view or in a specialized editor, the attribute information is displayed in the Properties view.

Tasks Standard usage as with plain Java projects.

Console
> Displays messages from solution and application generators. The Express Runtime developer console is not the same as the Express Runtime console.

Problems

If errors are detected while building Java programs, or while working with wrapper files, they are displayed in this view.

Eclipse preferences

The Eclipse environment offers the ability to modify some of its preferences.

Java Compiler preferences

The Express Runtime developer automatically modifies the setting that excludes certain types of resources from being copied to the output folder. This setting is available from Java | Compiler preferences, on the "Build Path" tab. The Express Runtime developer adds *.axml, and *.sxml, to the current setting. You can manually add other resource types to this filter setting.

Certain Eclipse-based products modify a standard Eclipse preference setting, causing a conflict with Express Runtime developer requirements. Open the Java | Compiler preference page, click the "Build Path" tab, and ensure the **Enable using exclusion patterns in source folders** checkbox is selected.

Workbench file association preferences

This setting is available from Workbench | File Associations. Use this preference setting to associate a file type with one or more editors. Associate file type *.xml with your preferred XML editor if the Eclipse-based product you use does not include an XML editor. To manually add workbench file associations, perform the following steps:

1. Select **Window | Preferences**.
2. Select **Workbench | File Associations**.
3. Click **Add** for File types. Enter the file type that you want to add.
4. Repeat step 3 to add additional file types.
5. Select the newly added file types. Click **Add** for Associated editors. Select an editor and Click **OK**.

Workbench editors preference

This section contains information regarding file encoding, as it relates to the XML wrapper translation files.

The following are recommendations for those who use Eclipse's integrated text editor to edit:

- Set the global text file encoding preference Workbench | Editors to "UTF-8".
- If an encoding other than UTF-8 is required, set the encoding on the individual file rather than using the global preference setting. To do this use the File | Properties | Info menu selection to set the encoding on an individual file.

If you set the global encoding preference to an alternate encoding, attempts to use the text editor could result in an error. Using UTF-16 as an example, the text editor window might display the following:

Character Encoding Problems

This file is unreadable using the "UTF-16" character encoding.

If you insert characters from an extended character set into a wrapper file

using the text editor, but have not set the text file encoding appropriately, you might encounter an error when you build your wrapper files. For example, if you inserted extended characters from the UTF-8 character set into a wrapper file, but you have not followed the above recommendation to change the global text file encoding to UTF-8, you can encounter one of the following problems:

Application wrapper build failure (console output)
> IRU06002: A Java exception occurred. (applicationBuilder.log) java.lang.Exception: java.io.UTFDataFormatException: Invalid byte x of y-byte UTF-8 sequence.

Solution wrapper build failure (error dialog popup)
> The solution failed to build. Reason: invalid byte x of y-byte UTF-8 sequence.

Express Runtime developer projects

An Express Runtime developer project is a construct based on the Eclipse Platform Integrated Development Environment. Structure and function follow standard Eclipse Platform guidelines.

Certain default resources are placed in the project to assist you, the Express Runtime developer. Also, certain tools, views, wizards, and menu selections are made available that are specific to solution development.

You can create two types of Express Runtime projects:
- An application project
- A solution project

An Express Runtime application project provides a specific project folder structure, populated with a basic application .axml file and an empty translation .xml file. Complete the application definition by specifying information in the application .axml file and adding resources, such as user programs, to the project.

An Express Runtime solution project provides a specific project folder structure, populated with a basic solution .sxml file and an empty translation .xml file. Complete the solution definition by specifying information and adding tasks to the solution, and adding resources, such as graphics, readme files, license files, and documentation to the project.

Application project structure

The application project must contain certain resources.

An application project contains a minimum of the following resources:
```
<PROJECT_ROOT>/
    externalSupportJars/
    src/<applicationID>
        userPrograms/  (empty - for Express Runtime developer use)
        <appWrapperFilename>.axml
        <appWrapperFilename>_<language>.xml (based on user input during project creation)
    bin/ (empty until a build is performed)
```

Often, an application requires a response file. It is recommended that you add such a resource in the application project's <applicationID> folder.

Solution project structure

A solution project contains, at a minimum, the following resources:

```
<PROJECT_ROOT>/
    externalSupportJars/
    src/
        graphics/ (empty - for Express Runtime developer use)
        <solWrapperFilename>.sxml
        <solWrapperFilename>_<language>.xml (based on user input during project creation)
    bin/ (empty until a build is performed)
    info/ (Solution documentation should be placed under this folder)
        /de/
        /en/
        /es/
        ...
    license/
        /de/
        /en/
        /es/
        ...
    readme/
        /de/
        /en/
        /es/
        ...
    tasks/ (task files for this solution should be placed in this folder)
```

Editors

Express Runtime contains the Express Runtime developer, which is an Eclipse-based plug-in that provides an integrated development environment for developing application and solution wrappers. With the Express Runtime developer you can organize your application and solution files in a standard Eclipse workbench project structure. The Express Runtime developer provides a graphical user interface to create and generate the wrappers into deployable binary files. For more information about Eclipse, visit (www.eclipse.org).

After you have developed a set of application wrappers, you can develop a solution wrapper to group a specific set of applications, along with the solution configuration. The application wrappers you develop can be included in multiple solutions.

After defining a solution wrapper, you use the Express Runtime developer to generate a binary solution file. The binary solution file is the input that you provide to the deployment wizard to perform the actual deployment of the solution.

Using the application editor

The application editor provides a way to create and edit application wrappers without having to hand-code the XML source. The editor contains the following pages:

General
Configure general information about the application, including supported translation languages and operating systems.

Programs
Add and edit user programs that run when you deploy the application.

Variables

Define variables that the end-user can configure from the deployment wizard.

Files   List the files that are needed to deploy this application.

Libraries

Include any external JAR files that your user programs need in their classpath.

Source

Helps you to edit the application wrapper XML source directly.

Creating an application wrapper

In the planning process for creating an application wrapper, identify the tasks necessary during implementation:

- Define the application ID.
- Define the general application information.
- Define the main deployment program, along with any other user programs needed.
- Define variables for any configuration parameters.
- Specify the names of all files required to run the application's user programs.

After the planning phase for the application wrapper, implementation can begin. To begin developing an application wrapper with the Express Runtime developer, click **Start > Programs > Express Runtime 2.1 > Express Runtime developer** on Windows, or **Main Menu >Express Runtime 2.1 > Express Runtime developer** on Linux.

When the application wrapper is created, the next step is to generate a binary application from the application wrapper.

Creating an application project: To create an Express Runtime application project, perform the following steps:

1. From the Express Runtime developer perspective, click **File > New > Application Project**
2. Type the project name. Click **Next**.
3. Type a version number and estimated installation time for the application.
4. Select the operating system and default language for the application. Click **Finish**.

The project includes the standard folder structure, including the externalSupportJars folders populated with all default resources. It also includes a basic application .axml file that is created in the src/<applicationID> folder.

Providing general application information: When a new application project is created, the application XML file is displayed in the application editor of Express Runtime developer. You can customize the application project by providing information to the editor. To start the editor, select **Start > Programs > IBM Express Runtime 2.1 > Express Runtime developer** on Windows, or **Main Menu > IBM Express Runtime 2.1 > Express Runtime developer** on Linux. In the Package Explorer view, you can create a new application project, or work with an existing application project. If you work with an existing application project, expand the project, and expand the src folder. Expand the package that you want to work with in the src folder, and double click the file with the .axml extension.

To provide general application information to the editor, perform the following steps:

1. Click the **General** tab.
2. The application name, application ID, version number, operating systems and default language provided during the project creation are displayed on this tab. An asterisk denotes a required field in the editor. The following information is optional:

   Provider name
   > The required display name for a resource provider. For example, *My Company*.

   Estimated installation time
   > Displays the estimated time that is required to install the appliation.

   License text
   > Contains the text for the application license. The license is displayed in the Application Properties License Acceptance window. If license text is also specified in the solution XML file, the application license text is not displayed.

   Deployment package protected
   > Used to prevent regeneration of the deployment package.

   Deployment package name
   > Determines the name of the deployment package .jar file. If nothing is specified, the application ID is used.

   Configuration instructions
   > Provides the text that is displayed in the application deployment parameters panel which describes, in general terms, what the user is to do. For example, "Provide the following information."

3. Save the application wrapper.

Configuring translation languages: Select the translation languages that you want to provide for the application wrapper. For every language that you select, you must provide an XML file that provides translated strings for that language. The following table shows the languages that you can select to use in an application wrapper, and the corresponding XML file names that you need to provide for each language that you use. The XML file name depends on the file name of the application wrapper. The following file names are based on an application wrapper file name of applicatio.axml

Table 11.

Language	XML file name
Brazilian Portuguese	application_brazilianportuguese.xml
English	application_english.xml
French	application_french.xml
German	application_german.xml
Italian	application_italian.xml
Japanese	application_japanese.xml
Korean	application_korean.xml
Simplified Chinese	application_simplifiedchinese.xml
Spanish	application_spanish.xml
Traditional Chinese	application_traditionalchinese.xml

To specify the languages you want to use for an application wrapper, perform the following steps:

1. Open the Express Runtime developer. Create a new application project, or open an existing application project.
2. Click the General tab of the application editor.
3. Select a default language for the application wrapper.
4. Select the checkboxes that correspond with the languages you want to use for the application wrapper.
5. For each language selected, create a corresponding XML file from the table above.

For more information about the behavior of wrapper translation, and the steps necessary to use the translation mechanism, refer to Enabling an application wrapper for globalization.

Configuring operating systems: You can specify the operating systems that the application runs on. Choose from the following operating systems:

- Linux
- Linux on POWER
- OS/400 (i5/OS)
- Windows

To select one or more operating systems that the application runs on, perform the following steps:

1. Open the Express Runtime developer. Create a new application project, or open an existing application wrapper.
2. Click the General tab of the application editor.
3. Select the checkboxes that correspond with the operating systems your application supports.

Click **Select All** to select all of the available operating systems, or click **Deselect all** to clear all the selections you have made.

If any of your application's user programs are custom programs, or InstallShield executables, it is likely that your application only supports one operating system.

Providing user programs information: User programs run during the application deployment to perform the main installation, and pre or post installation operations. User programs can be a Java program or a stand-alone executable or script. but they must be able to run silently. A main user program is required in an application wrapper. Other user programs such as a predeployment checker, entry program, and an exit program can be included in an application wrapper.

Predeployment checker

Before an entry, exit, or main program is run, the application's deployment package must be transferred to the target computer. A predeployment checker could ensure that the target computer met the following requirements:

- Adequate disk space is available on the target computer.
- System requirements are sufficient.

- There is no conflicting software.
- No previous version of the application exists.

A predeployment checker runs prior to the application entry, main and exit programs, and prior to the deployment package being transferred to the target computer.

When the predeployment checker exits, it returns one of the following return codes:

- **0** indicates that the application deployment should continue.
- **1** indicates that the application deployment should be skipped because the application is already installed or the application does not apply. The deployment wizard continues to the next application.
- **A negative value** indicates that the application cannot be deployed because of a fatal error, ending the deployment.

Entry program

Entry programs are typically used to perform pre-configuration or setup required before the main installation program runs.

Main program

The main user program is the installation program that is run on the target computer. Any type of installation program is acceptable as a main program, provided it can be invoked from a command-line and run silently.

Exit program

Exit programs are typically used for post-configuration or cleanup required following the product installation. Exit programs can also be used to determine if a main installation program installed successfully.

Note: The return code values for all predeployment checkers, entry, exit, and main programs running on Linux or OS/400 (i5/OS)[6] platforms must be between -128 and +127.

Basic user program configuration: Specify basic information about a user program by performing the following steps:

1. Open the Express Runtime developer. Create a new application project, or open an existing application project.
2. Click the Programs tab of the application editor.
3. Select an existing user program to edit, or click **Add** to add a new user program.
4. Select a program type. The following types of programs are available:

   Custom program
   > Use to run a custom script, executable or system command.

   InstallShield executable
   > Use to run an InstallShield installation.

---

6. The OS/400 operating system is known as the i5/OS operating system beginning with V5R3.

Java program

Use to run a Java program from a .class file.

5. Specify a program name. If you have already specified the files needed to run this user program, and you know the name of the program, type it directly into the **Program** field. Alternatively, you can use the Add User Program wizard to set the program.

Using the User Program wizard

To use the Add User Program wizard to add user programs, or configure existing user programs, perform the following steps:

1. Click **Add** beside the **User programs** field. The wizard is displayed and prompts you to select a type of user program that you want to add. Select a type of user program and click **Next**. If you are configuring an existing user program, select the user program in the **User programs** field, and click **Set** beside the **Program** field. Verify that the program type as displayed in the wizard is correct. Click **Next**.

2. Specify all of the files needed to run the user program. If the files for the user program are contained in the application project, specify them on the User Program Files page. If the files for the user program are contained in the software image, specify them on the Software Images Files page. Click **Next** to navigate to these pages.

3. A list of detected files (or classes in the case of Java programs) is provided on the last panel of the wizard. If the program you want this user program to run is not displayed in the list, ensure that you have added the program files (as explained in step 2) correctly.

Advanced user program configuration: Provide advanced configuration information for a user program by performing the following steps.

1. Open the Express Runtime developer. Create a new application project, or open an existing application wrapper.

2. Click the Programs tab of the application editor.

3. Select an existing user program, or click **Add** to add a new one.

4. Provide the following information:

Timeout

Specify a number of minutes for the program to complete. If this time limit is exceeded, the program times out, and the deployment wizard indicates failure. The default value is 90 minutes.

Wait for completion

Set by default, the user program is not interrupted until it has completed. If set to false, the success type for the user program must be "Assume Success". This option must be set as true for predeployment checkers.

Program reboots

Select to indicate that the user program reboots the target computer after it is finished running. If set to true, the success type for the user program must be "Assume Success".

Note: This option is not available for predeployment checkers.

Force reboot

Select to force an automatic reboot of the target computer on successful completion of the user program.

Environment variables

Specify any environment variables that you want set while the user program runs. You can override environment variables, or specify new ones to be defined. To add an environment variable Click **Add**. Provide a variable name and variable value. Click **Finish**.

Custom program options: Custom programs and Java programs allow additional options that are unique to these types of user programs, and are not required by other program types. You can use the following additional options:

Custom programs

Identify custom programs that use the shell interpreter of the operating system to run the program by selecting **System command** in the Custom program options section. For example, the command "ping" would be a system command since it is located in the system path, and not provided to the target computer by the application. If you provide a "ping" executable (by listing it either in the user program files list, or the software image files list), **System command** should not be checked.

Java program options: Custom programs and Java programs allow additional options that are unique to these types of user programs, and are not required by other program types. You can use the following additional options:

Java programs

Provide the classpath of any additional resources a Java program uses in the Java Program options section.

Specifying success type and log file search strings: The success type of a user program defines how the deployment wizard determines if it ran successfully. In the Success type section, select a success type and provide any additional required configuration. The following success types are available:

Check return code

Installation is considered successful if a return code of 0 is returned.

Check log file for string

Success is determined by searching the user program's log file for specific strings.

Assume success

Installation is always considered successful.

If you use the success type of **Search log file for string**, you can add a string that the Express Runtime developer searches for to evaluate if the program runs successfully. For example, you can establish a rule that if the log file that is generated by the program contains the word "exception", the program encountered an error when it ran.

To add a search string, perform the following steps:

1. Click **Add**. The Add Log File Search String dialog is displayed.
2. Provide a search sting, and select whether the presence of that search string indicates success or failure.
3. Click **Finish**.

To remove a search string, select the search string that you want to remove, and click **Remove**.

Specifying user program arguments: In the Program arguments section, click **Add** to add program arguments. Program arguments that are available depend on the way the user programs are configured. For example, if the application project does not use variables, variable values cannot be used as program arguments. The following types of arguments are available:

String argument
> Passes the provided string to the user program

Response file name
> Passes the fully-qualified path of the response file to the user program. The file name of the response file might be different then the original file name when it is created on the target computer. Always use the response file name argument type instead of entering the response file name directly as a string argument.

Log file name
> Passes the fully-qualified path of the log file to the user program.

Variable value
> Passes the value of an application variable to the user program.

Select the radio button that corresponds to the type of argument that you use in the Add Arguments dialog. Click **Next**. Provide the string, response file, log file or variable, and click **Finish**.

By default, arguments are passed to the user program individually. In some cases, multiple arguments need to be grouped together. For example, if a user program needs a single argument in the form

-installLocation=<PATH>

where <PATH> is the desired location, the application uses a variable so the end user can change the installation path. You can pass two arguments to the user program, a string argument (-installLocation=) and a variable value argument that provides the value of the application's installation path.

To combine two arguments into a single argument, perform the following steps:
1. Right-click the first argument.
2. Select Properties from the context menu. The properties dialog is displayed.
3. Set the **Concatenate With Next Argument** property to true
4. Click **OK**.

User controlled messages: Express Runtime users need the capability of controlling the messages and icons that appear in the messages table of the deployment wizard. Express Runtime provides an API that facilitates the posting of a user-defined message associated with one of the following four icons
- success
- information
- warning
- failure

Note: You cannot use user controlled messages if a solution from a release earlier then Express Runtime, Version 2.1 is used in the deployment wizard.

The wrapper developer creates the message within the user program. All substitutions and translations are performed prior to calling the support framework API.

Sending a message between a user program and the IBM Installation Agent is accomplished by storing the message in serialized message object file. The Express Runtime Support Framework generates the serialized file. The serialized file name is formed from an ISO time stamp with a ".ser" extension. The serialized file is placed in the logs directory and will be deleted when the logs directory is cleaned up. Leaving the serialized file in the logs directory facilitates debugging. The User Program creates a message with a call to SupportHelper. All displayed messages are logged in the Deployer log ("IRU_DeploymentWizard.log").

When an attempt to send a message fails, consult the log files on both the IBM Installation Agent and the deployment wizard. Most often, the error is logged in the IBM Installation Agent log. Further debugging may be accomplished by running the IBM Installation Agent with the "-leaveFiles" option. See the IBM Installation Agent documentation on how to run the IBM Installation Agent with options. When the leave files option is specified, the "logs" directory is not removed at the conclusion of the install. The logs directory will include ".ser" serialized files for each attempted message post. The support framework produces the serialized file name from a collapsed time stamp (no spaces, dashes, or colons) appended with an integer value. For example, the following is the name of a serialized file for a message that was posted on March 11, 2004 at 1:55:58 PM, it was the second message posted for this install session so the suffix is "2": 200403111355582.ser.

When attempting to discern the cause of a message posting problem, you should consult the logs directory for the existence of the appropriate serialized message files. If the file is present, the support framework created a message and attempted to send it. In this case, you should consult the IBM Installation Agent log file should be consulted for stack traces of exceptions that may have been thrown by the deployment wizard. If the file is not there, you should consult the IBM Installation Agent trace log file for evidence of an incorrect invocation. If the log files do not have error information and a corresponding serialized file does exist the problem likely occurred on the source system by the deployment wizard and the logs on that computer should be checked for additional information.

User controlled messages API:

Put your short description here; used for first paragraph and abstract.

The following example shows an informational message in a user program:

```
setMessage("HelloWorld!");  // Create the message
getHelper().log(this);  // Log the message to the file
getHelper().postInformationMessageToDeployerUI(this);
// Display the message on the deployment wizard
```

To obtain a translated message from a resource bundle invoke the following API shown in the following example. In this example, the directory "testsuite" resides in the "unpacked" directory of the target computer. "Unpacked" is the working directory for user programs. The resource bundles with the name, "TestSuiteMessagesNls", reside in the testsuite directory and have a package testsuite qualifier at the beginning of their source files.

```
setLocale(getHelper().getDeployerLocale(this));
setMessageResourcePath("testsuite.TestSuiteMessagesNls");
```

To post a translated error message with no substitution parameters, invoke the following API as shown in the following example:

```
setKey("Group_User_Create_Failed");
setMessageSubstitutionString(null);
setMessage(getHelper().getTranslatedMessage(this));
getHelper().postErrorMessageToDeployerUI(this);
```

To post a translated warning message with one substitution parameter, invoke the following API as shown in the following example:

```
setKey("Missing_Prerequisite");
setMessageSubstitutionString("Tivoli Storage Manager");
setMessage(getHelper().getTranslatedMessage(this));
getHelper().postWarningMessageToDeployerUI(this);
```

To post a translated message with more than one substitution parameter, invoke the API shown in the following example (note the comma delimiter between the two substitution parameters):

```
setKey("Install_Conflict");
setMessageSubstitutionString("HelloWorld, WebSphere Commerce Analyzer");
setMessage(getHelper().getTranslatedMessage(this));
getHelper().postWarningMessageToDeployerUI(this);
```

Support Base API

The following methods from the SupportBase class are used to set the message information.

Table 12.

Method name	Description	Signature
setMessage	Sets the message directly.	`public void setMessage (String data)`
setMessageResourcePath	Identifies the location of the message resources files. Used in combination with setKey to set the information to look up a translated message.	`public void setMessageResourcePath (String path)`
setKey	Identifies the key used to look up a translated message. Used in combination with setMessageResourcePath to set the information to look up a translated message.	`public void setKey (String data)`
setMessageSubstituionString	Used to set the values of the parameters in the message. Values sent to the setMessageSubstitutionString method are separated by commas.	`public void setMessageSubstitutionString (String subs)`
setMessageSubstitutionArray	Used to set the values of the parameters in the message. Each element in the array passed to setMessageSubstitutionStringArray is associated with one parameter in the message.	`public void setMessageSubstitutionStringArray (String[] subArray)`

Support Helper API

The following methods from the SupportHelper class are used to set the message information.

Table 13.

Method name	Description	Signature
getDeployerLocale	Used to retrieve the appropriate translated message based on the values set in the SupportBase class instance.	`public Locale getDeployerLocale (SupportBase s)`
getTranslatedMessage	Used to retrieve the appropriate translated message based on the values set in the SupportBase class instance.	`public String getTranslatedMessage (SupportBase s)`
postErrorMessage ToDeployerUI	Posts the message that was set in the SupportBase class instance with the error icon to the detailed messages panel of the deployment wizard.	`public void postErrorMessageToDeployerUI (SupportBase s)`
postInformationMessage ToDeployerUI	Posts the message that was set in the SupportBase class instance with the information icon to the detailed messages panel of the deployment wizard.	`public void postInformationMessageToDeployerUI (SupportBase s)`
postSuccessMessage ToDeployerUI	Posts the message that was set in the SupportBase class instance with the success icon to the detailed messages panel of the deployment wizard.	`public void postSuccessMessageToDeployerUI (SupportBase s)`
postWarningMessage ToDeployerUI	Posts the message that was set in the SupportBase class instance with the warning icon to the detailed messages panel of the deployment wizard.	`public void postWarningMessageToDeployerUI (SupportBase s)`
postErrorMessage ToDeployerMainUI	Does what the method of the same name without "Main" in it does, except it also shows the message on the main deployment wizard status panel.	`public void postErrorMessageToDeployerMainUI (SupportBase s)`
postInformationMessage ToDeployerMainUI	Does what the method of the same name without "Main" in it does, except it also shows the message on the main deployment wizard status panel.	`public void postInformationMessageToDeployerMainUI (SupportBase s)`

Table 13. (continued)

Method name	Description	Signature
postSuccessMessage ToDeployerMainUI	Does what the method of the same name without "Main" in it does, except it also shows the message on the main deployment wizard status panel.	`public void postSuccessMessageToDeployerMainUI (SupportBase s)`
postWarningMessage ToDeployerMainUI	Does what the method of the same name without "Main" in it does, except it also shows the message on the main deployment wizard status panel.	`public void postWarningMessageToDeployerMainUI (SupportBase s)`

Providing application variable information: Define variables to display configuration parameters to the end user during deployment.

Specifying the variable type: Define variables to display the deployment parameters to the user at deployment. The variables are displayed in the deployment wizard's configuration parameters panel. There are three types of variables:

String variable
>   This is the standard variable type used for data input. It is displayed as a text field on the deployment wizard interface.

Password variable
>   This is used for data input but masks the entered value for security reasons. It is displayed as an asterisk-masked text field on the deployment wizard interface.

Boolean variable
>   This can be used when a true or false value is requested from the user. It is displayed as **Yes** and **No** radio buttons on the deployment wizard interface.

To add a variable, perform the following steps:

1. Click the **Variables** tab.
2. In the Application Variables section, click **Add**.
3. From the Add Variable dialog, select one of the following types of variable:
   * Boolean variable
   * Password variable
   * String variable
4. Provide a variable name and description. Click **Finish**.

Adding label and help text to an application variable: After a variable is added, you can add or change basic configuration information by performing the following steps:

1. Click the Variables tab.
2. In the Application Variables section, select the variable you want to change. When you select the variable, notice that the fields on the right populate with the variable's information.
3. In the Basic Variable Configuration section, change any of the following fields:

Label text

> This field specifies the text that labels an input field on a task's application customization parameters panel in the deployment wizard.

Help text

> This optional field specifies help text for the variable. Help text is displayed in a tooltip that is shown when hovering the mouse over an input field, or when Ctrl + F1 is pressed while the cursor is in an input field.

Type
> Choose whether this variable is a "Typical Variable" or an "Advanced Variable". In the deployment wizard interface, typical variables are displayed on a separate tab than advanced variables. Expose commonly changed variables (such as installation locations) as typical variables, and rarely changed variables (such as port numbers) as advanced variables. Additionally, assign acceptable default values to advanced variables so the end user is not required to change any value on the advanced configuration tab in the deployment wizard to deploy a solution.

Creating variable associations: After you complete the basic configuration of a variable, configure the variable associations. Variable associations make the variable values available to the user programs by including these values in response files or properties files.

To pass the value of a variable to a user program as an argument, see User Program arguments.

To configure variable associations, perform the following steps:

1. In the Variable Associations Configuration section, click **Add**.
2. In the Add Association dialog, select the type of association that you want to add. You can create the following types of associations:

   CID response file association
   > The Configuration, Installation, and Distribution response file format supported by DB2 applications.

   ISMP response file association
   > The response file format for InstallShield MultiPlatform Edition installations.

   ISS response file association
   > The response file format for InstallShield installations.

   Properties association
   > Standard properties file format. Java-based user programs can access the value of a variable through this type of association, using the support framework.

3. Click **Next**
4. Provide the information needed to insert the value of the variable into the file type specified:
   - CID response file association
     - Choose which response file to insert the value of the variable into.
     - Choose the keyword to store the value of the variable under. If the keyword exists in the response file, the value of the variable is substituted for the existing value. Otherwise, the keyword is created at the end of the response file.

- ISMP response file association
  - Choose which response file to insert the value of the variable into.
  - Choose the property key and the property key type to store the value of the variable under. If the property key and the property key type exist in the response file, the value of the variable is substituted for the existing value. Otherwise, the property key and the property key type are created at the end of the response file.
- ISS response file association
  - Choose which response file to insert the value of the variable into.
  - Choose the response file section to store the value of the variable under. If the section type exists in the response file, the value of the variable is substituted for the existing value. Otherwise, the section is created at the end of the response file.
  - Choose the keyword to store the value of the variable under. If the keyword exists in the response file, the value of the variable is substituted for the existing value. Otherwise, the keyword is created at the end of the specified section.

5. Click **Finish**.
6. If the variable you are adding an association to is a boolean variable, you must configure the valueIfTrue and valueIfFalse properties of the association. Because the end user can only choose yes or no while configuring a boolean variable, the application developer must specify the values to be inserted into the properties or response file. To specify these values right-click the variable association, select Properties, then edit the valueIfTrue and valueIfFalse properties.

Creating validation configurations for variables: If you want to restrict the values that end users can enter for variables, or provide a default value for the variable, you can do so in the Variable Validation Configuration section.

To provide validation information for application variables, perform the following steps:
1. From the left pane of the Express Runtime developer, select the **Package Explorer** view.
2. Select the appropriate application project file.
3. Open the src/ directory and open the *.axml file.
4. Select the **Variables** tab in the application editor.
5. To add or modify validation information for a variable, select the variable in the left pane.
6. In the right pane, you can specify the following information:

   Default value
   Specify the default value for a variable. Any variable specified here must comply with any other validation restrictions placed on this variable.

   Required
   If selected, required indicates that a value must be entered for this variable. If no default value is provided, the end user needs to enter a value before deploying the application.

   Make uppercase
   If selected, transforms any value entered for the variable to be uppercase only.

Make lowercase

If selected, transforms any value entered for the variable to be lowercase only.

Minimum length

Specifies the minimum number of characters allowed for the value of the variable.

Maximum length

Specifies the maximum number of characters allowed for the value of the variable.

Validation rules

If the restrictions offered by the other controls in the validation section are not comprehensive enough, you can place very specific restrictions on the value of the variable by creating validation rules for variables. Validation rules are created to describe either valid or invalid variable values. To specify values that must be part of the value of the variable, create a valid validation rule. To specify values that are not allowed to be part of the value of a variable, create an invalid validation rule. You can specify one of the following pieces of information for each validation rule:

Complete string

a sequence of characters that either must match or is not allowed to match the complete variable value

Partial string

a sequence of characters that either must match or is not allowed to match a sequence of characters in the variable value

Prefix a sequence of characters that either must occur or is not allowed to occur at the beginning of the variable value

Suffix a sequence of characters that either must occur or is not allowed to occur at the end of the variable value

Specific characters

a list of characters, where sequence does not matter, that either must occur or is not allowed to occur in the variable value

Range of values

a minimum and maximum numerical value that represents either a valid or invalid range of values for the variable

7. Save the application project.

Providing application file information: An application wrapper must list all of the files that need to be transferred to a target computer to run the user programs and application successfully during a deployment.

The files that are required can be divided into two categories:

User program files

User program files are typically small files necessary to run user programs. They must be located in the application project. These files are placed in the user program package, which is transferred to the target computer at the beginning of an application deployment. Any files needed to run your application's predeployment checker must be specified in the user program files list.

Software image files

This group of files typically includes the files necessary to run the main application installation. These files are placed in the deployment package, which is transferred to the target computer after the application's predeployment checker determines whether or not the deployment should proceed.

After you determine what files are needed by your application, and which category they should be placed in, perform the following steps to add the files to the application wrapper:

1. Click the **Files** tab.
2. Specify a source directory for your software image files by clicking the link in the Software Image Files section. Browse to the root folder used for the source directory and click **OK**.
3. Click **Add** in the Software Image Files section to add software image files. Select the folders and files to add, or click **Add root directory** to include all the folders and files under the source directory. Click **Finish**.
4. Repeat step 3 for the user program files section.
5. Save the application project.

Providing required libraries information: If an application's user programs require any external JAR files to run, you can specify them on the libraries tab of the application editor. To add external JAR files, perform the following steps:

1. Click the **Libraries** Tab.
2. Click **Add**.
3. Browse for the JAR files that are required by the user programs.
4. Click **Open**.
5. Save the application project.

Any external JAR files are automatically added to the classpath of any Java user programs.

The JAR files necessary to use the support framework are automatically included, and do not need to be added to the external JAR files list.

Enabling an application wrapper for globalization

There are many strings in application and solution wrappers that are displayed to end users in the deployment wizard interface. These strings can be specified directly in the wrapper files, or they can be placed in translatable XML files. To enable translation for an application or solution wrapper, perform the following steps:

1. Decide which translation languages your application or solution will support, and create the necessary translatable XML files, as described in the topic Translation Language Configuration
2. Populate the default-language XML file with all the translatable strings for the wrapper, giving each string a meaningful key name. If you have already created a wrapper, you can copy the translatable strings from your wrapper into the default-language XML file. Keys must consist of alphanumeric characters only (no white-space), and must begin with a letter. The following example shows what a default-language XML file for a simple solution might look like.

```
<?xml version="1.0" ?>
<SolutionID>
    <solutionTitle>Solution Title</solutionTitle>
    <task1Details>Details for task #1</task1Details>
    <task1Description>Description for task #1</task1Description>
</SolutionID>
```

3. Using the application or solution editor, replace all the translatable strings with references to their keys in the default-language XML file.

   If using the GUI editor, simply enter the key name, prefixed with a percent sign (%).

   Following the example, the solution title field would be set to: %solutionTitle

   If editing the XML source directly, use the translatedKey attribute. Following the example, the <title> element in the solution wrapper would be specified as:

   <title translatedKey="solutionTitle" />

4. Place the translations of the strings in the default-language XML file in the appropriate language XML files. This step can be performed separately, if translations are not immediately available. If a string does not exist for a particular translation language, the string from the default-language XML file is used.

5. Generate the application or solution wrapper. Any missing translatable strings are detected, and the appropriate error messages are displayed in the console.

Modifying an existing application wrapper

You can modify an existing application wrapper. When you modify an existing application wrapper, you use the application editor to replace values with ones that are appropriate for a new application wrapper.

To modify an existing application wrapper, perform the following steps:

1. Select an existing application project in the Navigator view and press **Ctrl + C** to copy the application wrapper.

2. Press **Ctrl + V** to paste the application project in the Navigator view.

3. Specify a new name for the duplicate application project in the Copy project dialog.

4. Click **OK**.

5. Expand the application project in the Navigator view.

6. Expand the src folder.

7. Double-click the file with the .axml extension. The application editor opens.

8. Select the **General** tab of the application editor.

9. Specify a new ID for the application project.

10. Use the application editor to add, edit or remove tasks, applications, or configuration information for the application project.

11. Save the application project.

Using the solution editor

The solution editor provides a way to create and edit solution wrappers without having to hand-code the XML source. The editor contains the following pages:

General
> Configure general information about the solution, including supported translation languages.

Tasks Add and edit tasks and applications that run when you deploy the solution.

Validation
Helps you define validation information for shared variables.

Source
Helps you to edit the solution wrapper XML source directly.

Creating a solution wrapper

You can use Express Runtime to package an application or applications into a solution. This is done with an .sxml file that references existing applications and provides additional configuration information. This .sxml file is called a solution wrapper.

Creating a solution project: To create an Express Runtime solution project, perform the following steps:

1. From the Express Runtime perspective, click **File > New > Solution Project**.
2. Type a project name. Click **Next**.
3. Type a solution ID and a solution title.
4. Select the default language for the solution.
5. Click **Finish**.

The project includes the standard folder structure, populated with all default resources. It also includes a basic solution .sxml file in the src folder.

Providing general solution information: When a new solution project is created, the solution XML file is displayed in the solution editor of Express Runtime developer. You can customize the solution project by providing information to the editor. To start the editor, select **Start > Programs > IBM Express Runtime 2.1 > Express Runtime developer** on Windows, or **Main Menu > IBM Express Runtime 2.1 > Express Runtime developer** on Linux. In the Package Explorer view, you can create a new solution project, or work with an existing solution project. If you work with an existing solution project, expand the project, and expand the src folder. Expand the package that you want to work with in the src folder, and double click the file with the .sxml extension.

To enter or edit the general solution information, perform the following steps:

1. From the left pane of the Express Runtime developer, select the **Package Explorer** view.
2. Select the appropriate solution project file.
3. Open the src/ directory and open the *.sxml file.
4. Select the **General** tab in the right pane of the Express Runtime developer.
5. Enter or modify the following information for the basic solution configuration. Fields designated with an asterisk (*) are required. All other fields are optional.

    ID Enter an ID for the solution. This ID must begin with an alphabetic character, be less than 200 characters in length, and consist only of alphanumeric characters, underscores, hyphens, and periods.

    Title Enter a descriptive title for the solution. This title is displayed in the title bar of the deployment wizard main window and in the Product Information window.

    Version
    Enter the version number of the solution.

Icon   Select an image file to be displayed next to the title of the solution.

Splash screen image
Select an image file to use in the splash screen for the solution. The image is displayed when the solution is opened in the deployment wizard.

About screen image
Select an image file to use in the About screen for the solution.

About screen text
Provide legal information about the solution in an accessible format.

Welcome screen image
Select an image file to use in the welcome screen for the solution.

Welcome screen title
Enter a title for the welcome screen.

Welcome screen text
Enter text to be displayed on the welcome screen for the solution.

Task group selection prompt
Enter text to be displayed at the top of the task selection panel in the deployment wizard.

License prompt
Enter text to display on the license agreement dialog.

License text
Enter the text of the solution license agreement. The license agreement is displayed when a deployment to a target computer is started. If license text is specified here, license text from the application is not displayed.

Default solution language
Select the default language for the solution from the drop down list.

Translated languages
Select each language into which the solution is to be translated.

6. Specify any advanced solution configuration in the bottom of the right pane. Advanced configuration information can include the following:

Deployment package path
Enter a location for the deployment packages.

Maximum number of target connections
Enter the maximum number of target computers that can be connected simultaneously with the staging server. The valid range is 1 to 100 target computers.

Maximum number of data connections
Enter the maximum number of active data connections that a staging server can have at one time. The valid range is 1 to 100 data connections.

Data port
Specify the TCP/IP port number the deployment wizard uses to send data such as deployment packages to target computers. If this port number is not available, specify a different port number between 0 to 65535. Note that ports 1 to 1023 are usually reserved for use by other programs such as FTP and Telnet.

Communication port

Specify the TCP/IP port number the deployment wizard uses to communicate with the target computers. If this port number is not available, specify a different port number between 0 to 65535. Note that ports 1 to 1023 are usually reserved for use by other programs such as FTP and Telnet.

7. Save the solution wrapper.

Providing solution tasks information: A solution defines a list of tasks which are performed at deployment time. There are two types of tasks that can be defined in a solution.

Manual tasks

Manual tasks display instructions that you can customize during deployment of the solution, and wait for the user to indicate the instructions have been followed. For example, a manual task might instruct the end user to copy a script generated on one system during installation to another system and run that script.

Install tasks

Install tasks consist of an application or set of applications to be deployed to one or more target computers. All of the applications in an install task are deployed to all of the target computers the end user specifies for the task. For each install task, you can specify whether it can be deployed to one or multiple target computers. For example, you might want to have a database client application installed to several target computers, and a Web application server and portal server installed to a different target computer. Each of these would be a separate install task, with the database client application task allowed to target multiple computers, and the Web application server and portal server task only allowed to target a single computer. If a solution contains install tasks that are not required for all customers or in all situations, you can specify the tasks as optional so that the customer can decide whether to deploy them or not. All target computers specified in an install task must have the same operating system.

Similar tasks (both install tasks and manual tasks) can be grouped into task groups, if desired. For example, one solution could have three sets of install tasks, each configured for a different target computer operating system. These install tasks could be placed into three task groups, allowing the user to easily select and configure install tasks for a particular operating system. If all of the tasks in a task group are optional, the task group becomes optional.

Adding task groups to a solution: A task group is used to group related tasks. The deployment wizard presents the end user with a list of all the task groups in the solution. Users select the tasks to deploy.

To add a task group to a solution, follow these steps:

1. From the left pane of the Express Runtime developer, select the **Package Explorer** view.
2. Select the appropriate solution project file.
3. Open the src/ directory and open the *.sxml file.
4. Select the **Tasks** tab in the right pane of solution editor.
5. Click **Add**.
6. Select **Task group**. Click **Next**.

7. Enter a **Task group title**.
8. Enter a **Task group prompt.** This prompt is displayed on the task selection panel in the deployment wizard.
9. Click **Finish**.

Use the Properties view to specify optional information about the task group. Right-click a task group in the editor and choose **Properties** from the context menu. Specify information for the following optional attributes in the corresponding Value field:

taskGroupDetails
> Any text specified is displayed along with the task group title on the task group selection panel in the deployment wizard.

Adding install tasks to a solution: Install tasks can be parts of a parent task group.

An install task consists of a set of applications that are deployed to a target computer or a group of target computers.

To add an install task to a solution, perform the following steps:
1. From the left pane of the Express Runtime developer, select the **Package Explorer** view.
2. Select the appropriate solution project file.
3. Open the src/ directory and open the *.sxml file.
4. Select the **Tasks** tab in the solution editor.
5. In the Solution tasks section, click **Add**.
6. Select **Install task**.
7. Click **Next**.
8. Select a **Parent task group** (if applicable).
9. Enter a **Task description**.
10. Select an **Operating system** for the task.

> **Note:** If you want to add an application to the new install task immediately, select the check box to automatically **Launch the "Add Application" wizard after adding this task** checkbox.

11. Click **Finish**.

Use the Properties view to specify optional information about the install task. Right-click the task in the editor and choose Properties from the context menu. Specify information for the following optional attributes:

addLocalHost
> Set to true to initialize the install task with localhost as the target.

isOptional
> Set to true to make the selected task optional.

> > **Note:** If the isOptional attribute is set to false, selectedByDefault is returned as **true**.

oneTargetDeployment
> Set to true to restrict deployment of the selected task to only one computer.

selectedByDefault

Set to true to deploy the selected task by default

taskDetails

Enter a text description to display a brief description of the task on the task selection panel of the deployment wizard.

Adding applications to install tasks: To deploy an application using the deployment wizard, you must first add the application to an install task in a solution. To add an application to an install task, perform the following steps:

1. From the left pane of the Express Runtime developer, select the **Package Explorer** view.
2. Select the appropriate solution project file.
3. Open the src/ directory and open the *.sxml file.
4. Select the **Tasks** tab in the solution editor.
5. In the solution tasks section, click **Add**.
6. Select **Application**. Click **Next**.
7. Select the install task you want to add applications to.
8. From the list of compatible applications, select the applications you want to add.
9. Click **Finish**.

Use the Properties view to enter optional information about the application. Right-click the application in the editor and select Properties from the context menu. Specify information for the following optional attributes:

stopDeploymentOnFail

Set to true to stop solution deployment if the installation of this particular application fails on a target computer.

Adding response file variables for middleware applications: Each middleware image that is available for installation with Express Runtime is typically installed using the deployment wizard. An application wrapper defines information about a software image such as the necessary parameter configuration, files needed, and installation location. By default, the middleware application wrappers provided by Express Runtime are configured to specify parameter values for only the parameters typically used during an installation. Since the application wrappers are only defined for "typical" variables, advanced variables do not appear in the deployment wizard. In some cases, advanced technical users might find a need for configuring parameters that are not displayed in the deployment wizard. Using Express Runtime, you can easily add these advanced parameters to your application wrapper at deployment time.

To add response file variables for middleware applications, perform the following steps:

1. In the Package Explorer, open the appropriate application wrapper folder by double clicking the folder icon.
2. Inside the application folder, open the src folder.
3. Inside the src folder, double click on the package – the package name matches the name of the application wrapper.
4. Inside the package, double click the file application.axml.
5. Click the **Variables** tab.

6. To add an advanced variable, click **Add** beside the Application Variables list box.

7. Select a variable type from the drop down. The variable type determines how the variable is displayed in the deployment wizard.

   - Boolean variables are displayed as two radio buttons. Typically Boolean variables are used for specifying items that have a maximum of two possible values. For example, True and False or Yes and No.

   - Password variables are displayed as text fields where the value entered by the user is filled with the '*' character. This variable type should be used when privacy of the information is important. For example, password fields.

   - String variables are displayed as text fields where the value entered by the user is readable as plain text.

8. Enter a variable name and variable description. Click **Finish**.

9. Select your new variable in the Application Variables list box. To the right of the list box, locate the Variable Associations Configuration list box. Click **Add** to the right of the Variable Associations Configuration list box.

10. Select the appropriate association type for your variable and click **Next**.

11. Click **Finish**.

12. Select the association you created by clicking the association in the Variable Associations Configuration list box.

13. Save the application project.

Reusing Express Runtime applications: When building your solution with the Express Runtime developer, you can create your own application wrappers or choose from the list of application wrappers included in Express Runtime. The following application wrappers are available:

- IBM DB2 Universal Database Express Edition Version 8.2 for Windows
- IBM DB2 Universal Database Express Edition Version 8.2 for Linux
- IBM DB2 Universal Database Express Edition Version 8.2 for Linux on POWER
- IBM WebSphere Application Server-Express for Windows
- IBM WebSphere Application Server-Express for Linux
- IBM WebSphere Application Server-Express for Linux on POWER
- IBM WebSphere Application Server-Express for OS/400 (i5/OS)
- IBM HTTP Server 6.0 for Windows
- IBM HTTP Server 6.0 for Linux
- IBM HTTP Server 6.0 for Linux on POWER
- IBM HTTP Server for OS/400 (i5/OS)
- IBM HTTP Server for OS/400 (i5/OS) configuration
- IBM WebSphere HTTP Plugin for Windows
- IBM WebSphere HTTP Plugin for Linux
- IBM WebSphere HTTP Plugin for Linux on POWER
- Integrated Solutions Console for Linux
- Integrated Solutions Console on Linux on POWER
- Integrated Solutions Console for Windows
- Console Management Extension for IBM DB2 Universal Database Express Edition Version 8.2 for Linux
- Console Management Extension for IBM DB2 Universal Database Express Edition Version 8.2 for Linux on POWER

- Console Management Extension for IBM DB2 Universal Database Express Edition Version 8.2 for Windows
- Console Management Extension for IBM HTTP Server for Linux
- Console Management Extension for IBM HTTP Server for Linux on POWER
- Console Management Extension for IBM HTTP Server for Windows
- Console Management Extension for WebSphere Application Server - Express for i5/OS
- Console management extension for IBM WebSphere Application Server - Express for Linux
- Console management extension for IBM WebSphere Application Server - Express for Linux on IBM POWER
- Console Management Extension for WebSphere Application Server - Express for Windows
- Sample application for Linux
- Sample Application for OS/400 (i5/OS)
- Sample application for Windows

IBM DB2 Universal Database Express Edition Version 8.2 for Linux: Include this middleware component in your solution to deploy IBM DB2 Universal Database Express Edition 8.2 to computers running Linux.

Application ID: IRU2_1DB2Express8_2Lnx

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 14. Exposed variables

Field	Explanation	Default value	Validation
Destination Directory	The directory where you want to install the application files.		
DB2 administrator user name	*Required.* The administrator user name is used to connect to DB2.	db2admin	• Valid characters: hyphen (-), underscore (_), period (.), A - Z, a - z, 0 - 9 • Invalid prefix: IBM, SQL, SYS, numeric characters, period (.), or comma (,) • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, SELECT, DROP, INSERT, WHERE

Table 14. Exposed variables (continued)

Field	Explanation	Default value	Validation
DB2 administrator group name	*Required.* The primary group to which the administrator belongs.	db2admin	• Valid characters: hyphen (-), underscore (_), period (.), at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9 • Invalid prefix: numeric characters, period (.), or comma (,)
DB2 administrator password	*Required.* The password for the administrator. It is used to connect to DB2.		• Valid characters: at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9
DB2 administrator home directory	*Required.* This is the home directory of the DB2 administrator.	/home/db2admin	• Must start with a forward slash (/)
DB2 instance owner user name	*Required.* This instance owner user name is used to work with the DB2 instance.	db2inst	• Valid characters: hyphen (-), underscore (_), period (.), at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9 • Invalid prefix: IBM, SQL, SYS, numeric characters, comma (,), or period (.) • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, SELECT, DROP, INSERT, WHERE • Length cannot exceed 128 characters

Table 14. Exposed variables (continued)

Field	Explanation	Default value	Validation
DB2 instance owner group name	*Required.* The primary group to which the instance owner belongs.	db2inst	• Valid characters: hyphen (-), underscore (_), period (.), at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9 • Cannot begin with numeric characters, period (.), or comma (,) • Length cannot exceed 128 characters
DB2 instance owner password	*Required.* The password for the instance owner used to work with the DB2 instance.		• Valid characters: hyphen (-), underscore (_), , at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9
DB2 instance owner home directory	*Required.* The DB2 instance owner's home directory.	/home/db2inst	• Must start with a forward slash(/).
DB2 fenced user name	*Optional.Conditional.* The fenced user can run fenced user-defined functions and stored procedures. **Note:** This is a conditional variable. If you enter a value in any of the fenced user fields, you must include values for all of the fenced user fields.		• Valid characters: hyphen (-), underscore (_), period (.), A - Z, a - z, 0 - 9 • Invalid prefix: IBM, SQL, SYS, numeric characters, comma (,), or period (.) • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, SELECT, DROP, INSERT, WHERE
DB2 fenced user group name	*Optional.Conditional.* This is the primary group to which the fenced user belongs. **Note:** This is a conditional variable. If you enter a value in any of the fenced user fields, you must include values for all of the fenced user fields.	db2inst	• Valid characters: hyphen (-), underscore (_), period (.), at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9 • Cannot begin with a numeric character, a comma (,), or a period (.)

Table 14. Exposed variables (continued)

Field	Explanation	Default value	Validation
DB2 fenced user password	*Optional.Conditional.* The password for the fenced user used to isolate fenced user-defined functions and stored procedures. **Note:** This is a conditional variable. If you enter a value in any of the fenced user fields, you must include values for all of the fenced user fields.		• Valid characters: at symbol (@), dollar sign ($), number sign (#), period (.), A - Z, a - z, 0 - 9
DB2 fenced user home directory	*Optional.Conditional.* The fenced user's home directory. **Note:** This is a conditional variable. If you enter a value in any of the fenced user fields, you must include values for all of the fenced user fields.	/home/db2inst	• Must start with a forward slash(/).
DB2 instance administrative contact name	*Required.*The name of the DB2 instance administrator user to receive e-mail notifications regarding the DB2 instance.	db2admin	• Valid characters: hyphen (-), underscore (_), period (.), A - Z, a - z, 0 - 9 • Invalid prefix: IBM, SQL, SYS, numeric characters, comma (,), or period (.) • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, SELECT, DROP, INSERT, WHERE
DB2 instance administrative contact email address	*Required.* The e-mail address of the user to receive e-mail notifications regarding the DB2 instance. If the DB2 instance administrative contact name is specified, this field must have a value.		• Valid characters: hyphen (-), underscore (_), period (.), at symbol (@), A - Z, a - z, 0 - 9 • Invalid prefix: numeric characters, comma (,), or period (.)

Table 14. Exposed variables (continued)

Field	Explanation	Default value	Validation
DB2 instance administrative contact email address is for pager	Set this option to `true` if the text of the e-mail notifications should be formatted for a pager.		
SMTP Server Name	The name of the SMTP server used to send e-mail notifications regarding this instance.		
DB2 service name	*Required.* The DB2 service name as registered in the services file for TCP/IP.	db2cdb2inst1	• Valid characters: hyphen (-), underscore (_), period (.), A - Z, a - z, 0 - 9 • Invalid prefix: numeric characters, comma (,), period (.) or at symbol (@)
DB2 service port number	*Required.* The DB2 service port as registered in the services file for TCP/IP.	50001	Valid range is from 1 to 65535
Include Brazilian Portuguese	Set to `true` to include language support for Brazilian Portuguese in addition to other languages specified. English language support is always installed.	False	
Include Simplified Chinese	Set to `true` to include language support for Simplified Chinese in addition to other languages specified. English language support is always installed.	False	
Include German	Set to `true` to include language support for Germa nin addition to other languages specified. English language support is always installed.	False	

Table 14. Exposed variables (continued)

Field	Explanation	Default value	Validation
Include French	Set to true to include language support for French in addition to other languages specified. English language support is always installed.	False	
Include Spanish	Set to true to include language support for Spanish in addition to other languages specified. English language support is always installed.	False	
Include Italian	Set to true to include language support for Italian in addition to other languages specified. English language support is always installed.	False	
Include Japanese	Set to true to include language support for Japanese in addition to other languages specified. English language support is always installed.	False	
Include Korean	Set to true to include language support for Korean in addition to other languages specified. English language support is always installed.	False	
Include Traditional Chinese	Set to true to include language support for Traditional Chinese in addition to other languages specified. English language support is always installed.	False	
Include Polish	Set to true to include language support for Polish in addition to other languages specified. English language support is always installed.	False	

Table 14. Exposed variables (continued)

Field	Explanation	Default value	Validation
Include Russian	Set to `true` to include language support for Russian in addition to other languages specified. English language support is always installed.	False	
Include Czechoslovakian	Set to `true` to include language support for Czechoslovakian in addition to other languages specified. English language support is always installed.	False	

IBM DB2 Universal Database Express Edition Version 8.2 for Linux on POWER:
Include this middleware component in your solution to deploy IBM DB2 Universal Database Express Edition 8.2 to computers running Linux on POWER.

Application ID: IRU2_1DB2Express8_2LnxOnPwr

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 15. Exposed variables

Field	Explanation	Default value	Validation requirements
DB2 administrator user name	*Required.* The user name of the administrator connecting to DB2.	db2admin	• Valid characters: hyphen (-), underscore (_), period (.), A - Z, a - z, 0 - 9 • Invalid prefix: IBM, SQL, SYS, numeric characters, period (.), or comma (,) • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, SELECT, DROP, INSERT, WHERE

Table 15. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
DB2 administrator group name	*Required.* The primary group to which the administrator belongs.	db2admin	• Valid characters: hyphen (-), underscore (_), at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9 • Invalid prefix: numeric characters, period (.), or comma (,)
DB2 administrator password	*Required.* The password for the administrator connecting to DB2.		• Valid characters: at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9
DB2 administrator home directory	*Required.* The administrator's home directory.	/home/db2admin	• Valid characters: back slash (/), hyphen (-), underscore (_), period (.), A - Z, a - z, 0 - 9 • Must start with a forward slash (/)
DB2 instance owner user name	*Required.* User name used to work with the particular DB2 instance.	db2inst	• Valid characters: hyphen (-), underscore (_), period (.), at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9 • Invalid prefix: IBM, SQL, SYS, numeric characters, comma (,), or period (.) • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, SELECT, DROP, INSERT, WHERE • Length cannot exceed 128 characters

Table 15. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
DB2 instance owner group name	*Required.* The primary group to which the instance owner belongs.	db2inst	• Valid characters: hyphen (-), underscore (_), period (.), at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9 • Cannot begin with numeric characters, period (.), or comma (,) • Length cannot exceed 128 characters
DB2 instance owner password	*Required.* The password for the DB2 instance owner user.		• Valid characters: underscore (_), , at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9
DB2 instance owner home directory	*Required.* The instance owner's home directory.	/home/db2inst	• Valid characters: back slash (/), hyphen (-), underscore (_), period (.), A - Z, a - z, 0 - 9
DB2 fenced user name	*Optional.Conditional.* The fenced user can run fenced user-defined functions and stored procedures. **Note:** This is a conditional variable. If you enter a value in any of the fenced user fields, you must include values for all of the fenced user fields.		• Valid characters: hyphen (-), underscore (_), period (.), A - Z, a - z, 0 - 9 • Invalid prefix: IBM, SQL, SYS, numeric characters, comma (,), or period (.) • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, SELECT, DROP, INSERT, WHERE

Table 15. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
DB2 fenced user group name	*Optional.Conditional.* This is the primary group to which the fenced user belongs. **Note:** This is a conditional variable. If you enter a value in any of the fenced user fields, you must include values for all of the fenced user fields.	db2inst	• Valid characters: hyphen (-), underscore (_), period (.), at symbol (@), dollar sign ($), number sign (#), A - Z, a - z, 0 - 9 • Cannot begin with a numeric character, a comma (,), or a period (.)
DB2 fenced user password	*Optional.* The password for the fenced user used to isolate fenced user-defined functions and stored procedures.		• Valid characters: @ # $. a b c d e f g h i j k l m n o p q r s t u v w x y z 0 1 2 3 4 5 6 7 8 9
DB2 fenced user home directory	*Optional.Conditional.* The fenced user's home directory. **Note:** This is a conditional variable. If you enter a value in any of the fenced user fields, you must include values for all of the fenced user fields.	/home/db2inst	• Valid characters: hyphen (-), underscore (_), period (.), back slash (/), a - z, A - Z, 0 - 9
DB2 instance administrative contact name	*Required.* The name of the DB2 instance administrator user to receive e-mail notifications regarding the DB2 instance.	db2admin	• Valid characters: hyphen (-), underscore (_), period (.), A - Z, a - z, 0 - 9 • Invalid prefix: IBM, SQL, SYS, numeric characters, comma (,), or period (.) • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, SELECT, DROP, INSERT, WHERE

Table 15. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
DB2 instance administrative contact email address	*Required.* The e-mail address of the user to receive e-mail notifications regarding the DB2 instance.		• Valid characters: hyphen (-), underscore (_), period (.), at symbol (@), A - Z, a - z, 0 - 9 • Invalid prefix: numeric characters, comma (,), or period (.)
DB2 instance administrative contact email address is for pager	Set this option to `true` if the text of the e-mail notifications should be formatted for a pager.		
SMTP Server Name	The name of the SMTP server used to send e-mail notifications regarding this instance.		
DB2 service name	*Required.* The DB2 service name as registered in the services file for TCP/IP.	db2cdb2inst1	• Valid characters: hyphen (-), underscore (_), period (.), A - Z, a - z, 0 - 9 • Invalid prefix: numeric characters, comma (,), period (.) or at symbol (@)
DB2 service port number	*Required.* The DB2 service port as registered in the services file for TCP/IP.	50001	Valid range is from 1 to 65535
Include Brazilian Portuguese	Set to `true` to include language support for Brazilian Portuguese. English language support is always installed.	False	
Include Simplified Chinese	Set to `true` to include language support for Simplified Chinese. English language support is always installed.	False	
Include German	Set to `true` to include language support for German. English language support is always installed.	False	

Table 15. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Include French	Set to true to include language support for French. English language support is always installed.	False	
Include Spanish	Set to true to include language support for Spanish. English language support is always installed.	False	
Include Italian	Set to true to include language support for Italian. English language support is always installed.	False	
Include Japanese	Set to true to include language support for Japanese. English language support is always installed.	False	
Include Korean	Set to true to include language support for Korean. English language support is always installed.	False	
Include Traditional Chinese	Set to true to include language support for Traditional Chinese. English language support is always installed.	False	
Include Polish	Set to true to include language support for Polish. English language support is always installed.	False	
Include Russian	Set to true to include language support for Russian. English language support is always installed.	False	
Include Czechoslovakian	Set to true to include language support for Czechoslovakian. English language support is always installed.	False	

IBM DB2 Universal Database Express Edition Version 8.2 for Windows: Include this middleware component in your solution to deploy IBM DB2 Universal Database Express Edition 8.2 to computers running Windows.

Application ID: IRU2_1DB2Express8_2Win

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 16. Exposed variables

Field	Explanation	Default value	Validation requirements
Target Directory	*Required.* The directory where you want the application files installed.	c:\Program Files\IBM\SQLLIB	• Must start with an alphabetic character and colon (:) forward slash (\) • Invalid characters: asterisk (*), question mark (?), quotation marks ("), semicolon (;) pipe character (|), tilde (~) less than symbol (<), greater than symbol (>)
Include Brazilian Portuguese	Set to true to include language support for Brazilian Portuguese. English language support is always installed.	False	
Include Simplified Chinese	Set to true to include language support for Simplified Chinese. English language support is always installed.	False	
Include German	Set to true to include language support for German. English language support is always installed.	False	
Include French	Set to true to include language support for French. English language support is always installed.	False	
Include Spanish	Set to true to include language support for Spanish. English language support is always installed.	False	
Include Italian	Set to true to include language support for Italian. English language support is always installed.	False	

Table 16. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Include Japanese	Set to true to include language support for Japanese. English language support is always installed.	False	
Include Korean	Set to true to include language support for Korean. English language support is always installed.	False	
Include Traditional Chinese	Set to true to include language support for Traditional Chinese. English language support is always installed.	False	
Include Danish	Set to true to include language support for Danish. English language support is always installed.	False	
Include Finnish	Set to true to include language support for Finnish. English language support is always installed.	False	
Include Norwegian	Set to true to include language support for Norwegian. English language support is always installed.	False	
Include Polish	Set to true to include language support for Polish. English language support is always installed.	False	
Include Russian	Set to true to include language support for Russian. English language support is always installed.	False	
Include Swedish	Set to true to include language support for Swedish. English language support is always installed.	False	

Table 16. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
DB2 Administrator User ID	*Required.* The user ID used to connect to DB2 as the administrator.		• Valid characters: underscore (_), A - Z, a - z, 0 - 9, at symbol (@), dollar sign ($), number sign (#) • Length cannot exceed 30 characters • Invalid prefix: IBM, SQL, SYS, numeric characters, underscore (_) • Invalid suffix: $ • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, and SQL-reserved words
DB2 Administrator Password	*Required.* The password for the administrator connecting to DB2.		• Must be between 6 and 14 characters in length.
Create Start menu shortcuts?	If set to `true`, Start menu shortcuts are created for various DB2 functions.		
Add features to installed version	If set to `true`, you can add features to an existing installation of DB2 UDB Express Version 8.2 on the target computer.		

IBM HTTP Server 6.0 for Linux: Include this middleware component in your solution to deploy IBM HTTP Server 6.0 to computers running Linux.

Application ID: IRU2_1IHS6_0Lnx

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 17. Exposed variables

Field	Explanation	Default value	Validation requirements
IBM HTTP Destination Directory	*Required.* The directory where you want to install IBM HTTP Server.	/opt/IBMIHS	Must be root drive plus at least one character.

Table 17. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
HTTP Port	*Required.* The network port the server listens to.	80	Numeric. Valid range is from 0 to 65535.
Admin Server Port	*Required.* The network port on that the Admin Server listens to.	8008	Numeric. Valid range is from 0 to 65535.
Enable product re-install	If set to `true`, an installation over an existing installation is acceptable.	False	

IBM HTTP Server 6.0 for Linux on POWER: Include this middleware component in your solution to deploy IBM HTTP Server 6.0 to computers running Linux on POWER.

Application ID: IRU2_1IHS6_0LnxOnPwr

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 18. Exposed variables

Field	Explanation	Default value	Validation requirements
IBM HTTP Destination Directory	*Required.* The directory where you want to install IBM HTTP Server.	/opt/IBMIHS	Must be root drive plus at least one character.
HTTP Port	*Required.* The network port the server listens to.	80	Numeric. Valid range is from 0 to 65535.
Admin Server Port	*Required.* The network port on that the Admin Server listens to.	8008	Numeric. Valid range is from 0 to 65535.
Enable product re-install	If set to `true`, an installation over an existing installation is acceptable.	False	

IBM HTTP Server 6.0 for OS/400 (i5/OS): Include this middleware component in your solution to deploy IBM HTTP Server (IHS) 6.0 to computers running OS/400 or i5/OS.

There are three wrappers for IHS. There are two different installation wrappers. The installation wrapper you select is determined by the version of the operating system to which you are deploying IHS. Select the wrapper with application ID **IRU2_1IHS520I5OS** to install IHS to computers running OS/400 Version 5 Release 2. Select the wrapper with application ID **IRU2_1IHS530I5OS** to install IHS to

computers running i5/OS Version 5 Release 3. The additional wrapper, with application ID **IRU2_1IHSConfigI5OS**is used for the configuration of an IHS server.

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the fields in the following table, which are included in the configuration wrapper. There are no variables exposed by the installation wrappers.

Table 19. Exposed variables

Field	Explanation	Default value	Validation requirements
HTTP Server Name	*Required.* The name of the HTTP server you are configuring.	IRHTTP	• Must be from 1 to 10 characters in length. • Must start with: A - Z, a - z, dollar sign ($), pound sign (#) or at symbol (@) • Remaining characters must be: A - Z, a - z, 0 - 9, dollar sign ($), pound sign (#) or at symbol (@)
HTTP Server Port	*Required.* The network port on which the server listens.	80	Numeric. Valid range is from 1 to 65535.
Application server name	*Required.* A unique name for the application server.	IRAppSvr	• Length cannot exceed 100 characters. • Cannot start with a numeric (0 - 9) character. • Valid characters: A - Z, a - z, 0 - 9, hyphen (-), underscore (_), period (.)

IBM HTTP Server 6.0 for Windows: Include this middleware component in your solution to deploy IBM HTTP Server (IHS) 6.0 to computers running Windows.

Application ID: IRU2_1IHS6_0LnxOnPwr

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 20. Exposed variables

Field	Explanation	Default value	Validation requirements
IBM HTTP Destination Directory	*Required.* Where you want the IBM HTTP Server installed.	C:\Program Files\IBM HTTP Server	Must start with drive letter followed by a colon (:), forward slash (\), and then at least one character.
HTTP Port	*Required.* The default port used by the IBM HTTP Server.	80	Numeric. Valid range is from 1 to 65535.
Logon as Local System	Set to `true` to run the IHS service as Local System.	True	

Table 20. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Windows Service User ID	*Conditional.* The user ID to run IHS as a Windows service.		• Must be between 1 and 20 characters in length. • Invalid characters: *+,/:;<=>?[\]| • Not required if Logon as Local System is set to true.
Windows Service User Password	*Conditional.* The password for the user ID used to run IHS as a Windows service.		• Length cannot exceed 14 characters • Valid characters: at symbol (@), dollar sign ($), number sign (#), underscore (_), a - z, A - Z, 0 - 9 • Not required if Logon as Local System is set to true.
Admin Server Port	*Required.* The network port that the Admin Server listens to.	8008	Numeric. Valid range is from 1 to 65535.
Enable product re-install	Set to true to allow the installation of IHS over an existing installation.	False	

IBM WebSphere HTTP Plugin Version 6.0 for Linux: Select this middleware component to deploy IBM WebSphere HTTP Plugin Version 6.0 to computers running Linux platforms.

Application ID:IRU2_1WASExpressHttpPlugin6_0Lnx

Note:

If you include this wrapper in your solution, you must also include the wrapper for IBM HTTP Server Version 6.0 for Linux (application ID IRU2_1IHS6_0Lnx).

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 21. Exposed variables

Field	Explanation	Default value	Validation requirements
WebSphere Application Server - Express Host Name (if remote)	*Optional.* Host name or TCP/IP address of the WebSphere Application Server - Express if it is on a system remote from the plug-in. If not specified, the primary host name of the local system is used.		• Must not start or end with a hyphen (-) • Valid characters: A - Z; a - z; 0 - 9; hyphen (-), period (.)

Table 21. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Installation location of WebSphere Application Server - Express Version 6	*Optional*. Configures the plug-in to use a local WebSphere Application Server in this installation directory. This field is only used when multiple WebSphere Application Servers are installed on a local system for a local installation.		• Must not start or end with a hyphen (-) • Valid characters: A - Z; a - z; 0 - 9; hyphen (-), period (.)
Installation location of the IBM HTTP Server	*Required*. The fully-qualified path to the installation directory of the IBM HTTP Server.	/opt/IBMIHS	• Must not start or end with a hyphen (-) • Valid characters: A - Z; a - z; 0 - 9; hyphen (-), period (.)
HTTP Port	*Required*. The port that the IBM HTTP Server listens to.	80	Numeric. Valid range is from 1 to 65535.

IBM WebSphere HTTP Plugin Version 6.0 for Linux on POWER: Select this middleware component to deploy IBM WebSphere HTTP Plugin Version 6.0 to computers running Linux on POWER.

Application ID: IRU2_1WASExpressHttpPlugin6_0LnxOnPwr

Note:

If you include this wrapper in your solution, you must also include the wrapper for IBM HTTP Server Version 6.0 for Linux on POWER (application ID IRU2_1IHS6_0LnxOnPwr).

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 22. Exposed variables

Field	Explanation	Default value	Validation requirements
WebSphere Application Server - Express Host Name (if remote)	*Optional*. Host name or TCP/IP address of the WebSphere Application Server - Express if it is on a system remote from the plug-in. If not specified, the primary host name of the local system is used.		• Must not start or end with a hyphen (-) • Valid characters: A - Z; a - z; 0 - 9; hyphen (-), period (.)

Table 22. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Installation location of WebSphere Application Server - Express Version 6	*Optional.* Configures the plug-in to use a local WebSphere Application Server in this installation directory. This field is only used when multiple WebSphere Application Servers are installed on a local system for a local installation.		• Valid prefix: forward slash (/) • Valid characters: A - Z; a - z; 0 - 9; hyphen (-), period (.)
Installation location of the IBM HTTP Server	*Required.* The fully-qualified path to the installation directory of the IBM HTTP Server.	/opt/IBMIHS	• Must not start or end with a hyphen (-) • Valid characters: A - Z; a - z; 0 - 9; hyphen (-), period (.)
HTTP Port	*Required.* The port that the IBM HTTP Server listens to.	80	Numeric. Valid range is from 1 to 65535.

IBM WebSphere HTTP Plugin Version 6.0 for Windows: Select this middleware component to deploy IBM WebSphere HTTP Plugin Version 6.0 to computers running Windows platforms.

Note:

If you include this wrapper in your solution, you must also include the wrapper for IBM HTTP Server Version 6.0 for Windows.

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 23. Exposed variables

Field	Explanation	Default value	Validation requirements
WebSphere Application Server - Express Host Name (if remote)	*Optional.* Host name or TCP/IP address of the WebSphere Application Server - Express if it is on a system remote from the plug-in. If not specified, the primary host name of the local system is used.		• Must not start or end with a hyphen (-) • Invalid characters: asterisk (*), question mark (?), double quotes ("), pipe (|), back slash (/)
HTTP Port	*Required.* The port that the IBM HTTP Server listens to.	80	Numeric. Valid range is from 1 to 65535.

Table 23. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Installation location of the IBM HTTP Server	*Optional*. The installation location of the IBM HTTP Server.	c:\Program Files\IBM HTTP Server	• Must start with drive letter and colon (:), forward slash (\) • Invalid characters: asterisk (*), question mark (?), double quotes (″), pipe (|), back slash (/)
Installation location of WebSphere Application Server - Express Version 6	*Optional*. Configures the plug-in to use a local WebSphere Application Server in this installation directory. This field is only used when multiple WebSphere Application Servers are installed on a local system for a local installation.	c:\Program Files\IBM\WebSphere	• Must start with drive letter and colon (:), forward slash (\) • Invalid characters: asterisk (*), question mark (?), double quotes (″), pipe (|), back slash (/)

IBM WebSphere Application Server - Express Version 6.0 for Linux: Include this middleware component in your solution to deploy WebSphere Application Server Express Version 6.0 to computers running Linux.

Application ID: IRU2_1WASExpress6_0Lnx

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 24. Exposed variables

Field	Explanation	Default value	Validation requirements
Installation directory	*Required*. The fully qualified path name to the directory where you want to install WebSphere Application Server - Express.	/opt/IBM/WebSphere/AppServer	• Must start with back slash (/) plus at least one alphabetic character. • Invalid characters: asterisk (*), question mark (?), double quotes (″), pipe (|), period (.)

Table 24. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Do not install if required ports are busy	Set to True to cancel the installation of WebSphere Application Server - Express if any of the ports listed in the following fields are busy.	True	
HTTP Transport Port	*Required.* A transport is the request queue between a WebSphere Application Server plug-in for Web servers and a Web container in which the Web modules of an application reside. When a user at a Web browser requests an application, the request is passed to the Web server, then sent along the transport to the Web container.	9080	Numeric. Valid range is from 1 to 65535.
Administrative console port	*Required.* The port where used by the administrative console for administering the Application Server.	9060	Numeric. Valid range is from 1 to 65535.
HTTPs Transport Port	The WebSphere Application Server Web container processes HTTPS requests through this port.	9443	Numeric. Valid range is from 1 to 65535.
Secure Administrative console port	*Required.* If you have security turned on, this is the port at which WebSphere Application Server - Express listens for the HTTPS requests for the administrative console to administer your application server.	9043	Numeric. Valid range is from 1 to 65535.

Table 24. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Bootstrap Port	*Required* This is the port used to create an initial context for a Java Naming and Directory Interface (JNDI) lookup. References to Enterprise JavaBean (EJB) homes and other artifacts such as data sources are bound to the WebSphere name space. You can obtain these objects through the JNDI interface, but JNDI operations cannot be performed without an initial context.	2809	Numeric. Valid range is from 1 to 65535.
SOAP Connector Port	This is the port number for Java Management Extensions (JMX) connectors. JMX connectors communicate with WebSphere Application Server when you invoke a scripting process.	8880	Numeric. Valid range is from 1 to 65535.
SAS SSL ServerAuth Port	Inbound port for SSL Secure Authentication Service.	9401	Numeric. Valid range is from 1 to 65535.
CSIV2 ServerAuth Listener Port	Inbound port for Common Secure Interoperability Specification, Version 2.	9403	Numeric. Valid range is from 1 to 65535.
CSIV2 MultiAuth Listener Port	Inbound port for Common Secure Interoperability Specification, Version 2.	9402	Numeric. Valid range is from 1 to 65535.

Table 24. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
ORB Listener Port	The Object Request Broker (ORB) on WebSphere Application Server uses a listener port for Remote Method Invocation over the Internet Inter-ORB Protocol (RMI/IIOP) communications, which is selected dynamically during run time. If you are using a firewall, you must specify a static port for the ORB listener and open that port on the firewall so that communication can pass through the specified port.	9100	Numeric. Valid range is from 1 to 65535.
High Availability manager communication port	*Required.*	9353	Numeric. Valid range is from 1 to 65535.
Service Integration port	*Required.*	7276	Numeric. Valid range is from 1 to 65535.
Service Integration secure port	*Required.*	7286	Numeric. Valid range is from 1 to 65535.
Service Integration MQ interoperability port	*Optional.*	5558	Numeric. Valid range is from 1 to 65535.
Service Integration MQ interoperability secure port	*Required.*	5578	Numeric. Valid range is from 1 to 65535.

IBM WebSphere Application Server - Express Version 6.0 for Linux on POWER: Include this middleware component in your solution to deploy WebSphere Application Server Express Version 6.0 to computers running Linux on POWER.

Application ID: IRU2_1WASExpress6_0LnxOnPwr

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 25. Exposed variables

Field	Explanation	Default value	Validation requirements
Installation directory	*Required*. The fully qualified path name to the directory where you want to install WebSphere Application Server - Express.	/opt/IBM/WebSphere /AppServer	• Must start with back slash (\) plus at least one alphabetic character. • Invalid characters: asterisk (*), question mark (?), double quotes ("), pipe (|), period (.)
Do not install if required ports are busy	Set to True to cancel the installation of WebSphere Application Server - Express if any of the ports listed in the following fields are busy.	True	
HTTP Transport Port	*Required*. A transport is the request queue between a WebSphere Application Server plug-in for Web servers and a Web container in which the Web modules of an application reside. When a user at a Web browser requests an application, the request is passed to the Web server, then sent along the transport to the Web container.	9080	Numeric. Valid range is from 1 to 65535.
Administrative console port	*Required*. The port where used by the administrative console for administering the Application Server.	9060	Numeric. Valid range is from 1 to 65535.
HTTPs Transport Port	The WebSphere Application Server Web container processes HTTPS requests through this port.	9443	Numeric. Valid range is from 1 to 65535.

Table 25. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Secure administrative console port	*Required*. If you have security turned on, this is the port at which WebSphere Application Server - Express listens for the HTTPS requests for the administrative console to administer your application server.	9043	Numeric. Valid range is from 1 to 65535.
Bootstrap Port	*Required* This is the port used to create an initial context for a Java Naming and Directory Interface (JNDI) lookup. References to Enterprise JavaBean (EJB) homes and other artifacts such as data sources are bound to the WebSphere name space. You can obtain these objects through the JNDI interface, but JNDI operations cannot be performed without an initial context.	2809	Numeric. Valid range is from 1 to 65535.
SOAP Connector Port	This is the port number for Java Management Extensions (JMX) connectors. JMX connectors communicate with WebSphere Application Server when you invoke a scripting process.	8880	Numeric. Valid range is from 1 to 65535.
SAS SSL ServerAuth Port	Inbound port for SSL Secure Authentication Service.	9401	Numeric. Valid range is from 1 to 65535.
CSIV2 ServerAuth Listener Port	Inbound port for Common Secure Interoperability Specification, Version 2.	9403	Numeric. Valid range is from 1 to 65535.

Table 25. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
CSIV2 MultiAuth Listener Port	Inbound port for Common Secure Interoperability Specification, Version 2.	9402	Numeric. Valid range is from 1 to 65535.
ORB Listener Port	The Object Request Broker (ORB) on WebSphere Application Server uses a listener port for Remote Method Invocation over the Internet Inter-ORB Protocol (RMI/IIOP) communications, which is selected dynamically during run time. If you are using a firewall, you must specify a static port for the ORB listener and open that port on the firewall so that communication can pass through the specified port.	9100	Numeric. Valid range is from 1 to 65535.
High Availability manager communication port	*Required*.	9353	Numeric. Valid range is from 1 to 65535.
Service Integration port	*Required*.	7276	Numeric. Valid range is from 1 to 65535.
Service Integration secure port	*Required*.	7286	Numeric. Valid range is from 1 to 65535.
Service Integration MQ interoperability port	*Optional*.	5558	Numeric. Valid range is from 1 to 65535.
Service Integration MQ interoperability secure port	*Required*.	5578	Numeric. Valid range is from 1 to 65535.

IBM WebSphere Application Server - Express Version 6.0 for OS/400 (i5/OS): Include this middleware component in your solution to deploy WebSphere Application Server Express Version 6.0 to computers running OS/400 (i5/OS) There are two wrappers available for deployment. The first is used for the installation of WebSphere Application Server - Express. The application ID for the installation wrapper is **IRU2_1WASExpress6_0I5OS** . The second wrapper is used for the configuration of a WebSphere server. The application ID for the configuration wrapper is **IRU2_1WASConfigI5OS**.

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the fields in the following

table, which are included in the configuration wrapper. There are no variables exposed by the installation wrapper.

Table 26. Exposed variables

Field	Explanation	Default value	Validation requirements
Application Server starting port	*Required*. WebSphere Application Server - Express requires a block of 15 consecutive ports to perform internal services. Specify the first port number in the range. For example, if 3001 is entered, then ports 3001 through 3015 are configured for this purpose.	3001	Numeric. Valid range is from 1 to 65535.
HTTP Server Port	*Required*. The default port used by the IBM HTTP Server.	80	Numeric. Valid range is from 1 to 65535.
Application server name	*Required*. A unique name for the application server.	IRAppSvr	• Length cannot exceed 100 characters. • Cannot start with a numeric (0 - 9) character. • Valid characters: A - Z, a - z, 0 - 9, hyphen (-), underscore (_), period (.)

IBM WebSphere Application Server - Express Version 6.0 for Windows: Include this middleware component in your solution to deploy WebSphere Application Server Express Version 6.0 to computers running Windows.

Application ID: IRU2_1WASExpress6_0Win

Depending on your selection and configuration of other middleware components, you might need to provide values for some or all of the following fields:

Table 27. Exposed variables

Field	Explanation	Default value	Validation requirements
Installation directory	*Required.* The fully qualified path name to the directory where you want to install IBM WebSphere Application Server - Express.	C:\Program Files \IBM\WebSphere \AppServer	• Must start with drive letter and colon (:), forward slash (\) • Invalid characters: asterisk (*), question mark (?), double quotes ("), pipe (│), back slash (/)
HTTP Transport Port	*Required.* A transport is the request queue between a WebSphere Application Server plug-in for Web servers and a Web container in which the Web modules of an application reside. When a user at a Web browser requests an application, the request is passed to the Web server, then sent along the transport to the Web container.	9080	Numeric. Valid range is from 1 to 65535.
Administrative console port	*Required.* The port where you find the administrative console application to administer the IBM WebSphere Application server.	9060	Numeric. Valid range is from 1 to 65535.
HTTPs Transport Port	The WebSphere Application Server Web container processes HTTPS requests through this port.	9443	Numeric. Valid range is from 1 to 65535.
Secure administrative console port	*Required.* If you have security turned on, this is the port at which WebSphere Application Server - Express listens for the HTTPs requests for the administrative console to administer your application server.	9043	Numeric. Valid range is from 1 to 65535.

Table 27. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Bootstrap port	*Required* This is the port number used to create an initial context for a Java Naming and Directory Interface (JNDI) lookup. References to Enterprise JavaBean (EJB) homes and other artifacts such as data sources are bound to the WebSphere name space. You can obtain these objects through the JNDI interface, but JNDI operations cannot be performed without an initial context.	2809	Numeric. Valid range is from 1 to 65535.
SOAP Connector Port	This is the port number for Java Management Extensions (JMX) connectors. JMX connectors communicate with WebSphere Application Server when you invoke a scripting process.	8880	Numeric. Valid range is from 1 to 65535.
SAS SSL ServerAuth Port	Inbound Port for SSL Secure Authentication Service.	9401	Numeric. Valid range is from 1 to 65535.
CSIV2 MultiAuth Listener Port	Inbound port for Common Secure Interoperability Specification, Version 2.	9403	Numeric. Valid range is from 1 to 65535.
CSIV2 ServerAuth Listener Port	Inbound port for Common Secure Interoperability Specification, Version 2.	9402	Numeric. Valid range is from 1 to 65535.

Table 27. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
ORB Listener Port	The Object Request Broker (ORB) on WebSphere Application Server uses a listener port for Remote Method Invocation over the Internet Inter-ORB Protocol (RMI/IIOP) communications, which is selected dynamically during run time. If you are using a firewall, you must specify a static port for the ORB listener and open that port on the firewall so that communication can pass through the specified port.	9100	Numeric. Valid range is from 1 to 65535.
High Availability manager communication port	*Required*.	9353	Numeric. Valid range is from 1 to 65535.
Service Integration Port	*Required*. Applications use this port to connect to the JMS Server. The DIRECT port is for nonpersistent, nontransactional, and nondurable subscriptions only.	5559	Numeric. Valid range is from 1 to 65535.
Service Integration MQ Interoperability Port	*Required*. Applications use this port to connect to the JMS Server. The QUEUED port is for full-function JMS publish and subscribe support.	5558	Numeric. Valid range is from 1 to 65535.
Startup type of the service	Specify how to start the server service.	automatic	Legal values are: • `automatic`: server starts when the computer starts. • `manual`: server starts when the user clicks **Start** on the Windows services panel. • `disabled`: does not start server

Table 27. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Abort install if required ports are busy	If any of the TCP/IP port numbers above is busy, the installation succeeds, but the application server fails to start. Set to **No** to force installation.		

Integrated Solutions Console for Linux: You can use this application wrapper to install the Integrated Solutions Console and associated management portlets on target computers running the Linux operating system.

Application ID: IRU2_1ConsoleLnx

You must provide values for all of the following fields:

Field	Explanation	Default value	Validation requirements
Installation Location	*Required.* The directory where you want to install the application.	c:\Program Files\IBM	• Must start with a letter, colon (:), and forward slash (\) • Must not contain *?";|~<>
Host Name	*Required.*The fully qualified host name of the target computer.		
HTTP Port	*Required.*The port number that Integrated Solutions Console uses. The port number must be a port that is not being used by another process on the computer. After installing Integrated Solutions Console, include this port number in the URL for opening the console. That URL is the protocol name, plus the fully qualified host name, plus the port, plus ibm/console. An example is: http://myhost.com :8421/ibm/console.	8421	Port number 1 - 65535

Field	Explanation	Default value	Validation requirements
Bootstrap/RMI Port	*Required.*The Java Remote Method Invocation (RMI) bootstrap port that Integrated Solutions Console uses.	8424	Port number 1 - 65535
HTTPS Port	*Required.*The port that Integrated Solutions Console uses for the secure HTTP (HTTPS) transport.	8422	Port number 1 - 65535
SOAP Port	*Required.*The port that Integrated Solutions Console uses for the Simple Object Access Protocol (SOAP) transport.	8425	Port number 1 - 65535
Unused HTTP	*Required.*The port number that the application server uses for the HTTP transport. The HTTP transport is a request queue between the application server and the HTTP server (Web server). This value must not conflict with existing port assignments on the computer.	8426	Port number 1 - 65535
Unused HTTPS Port	*Required.*The port number that the application server uses for the secure HTTP (HTTPS) transport. This value must not conflict with existing port assignments on the computer.	8427	Port number 1 - 65535
Unused Bootstrap/RMI Port	*Required.*The address for the bootstrap function and the port number for the Java Remote Method Invocation (RMI) connector in the application server. This value must not conflict with existing port assignments on the computer.	8428	Port number 1 - 65535

Field	Explanation	Default value	Validation requirements
Unused SOAP Port	*Required.*The address for the Simple Object Access Protocol (SOAP) connector in the application server. This value must not conflict with existing port assignments on the computer.	8429	Port number 1 - 65535
Eclipse Port	*Required.*The port that the Eclipse technology-based help system uses to receive requests for help files. This value must not conflict with existing port assignments on the computer.	8423	Port number 1 - 65535
Administrator ID	*Required.*The administrator user ID for the console.		• Must be at least 3 characters, but no more than 60 characters • Can contain only lowercase a-z (case ignored), period (.), hyphen (-), and underscore (_).
Password	*Required.* The administrator password for the console.		• Must be at least 3 characters, but no more than 60 characters • Can contain only lowercase a-z (case ignored), period (.), hyphen (-), and underscore (_).
Console plugin for WebSphere Application Server - Express	*Required.*Specify whether to install the Cconsole plug-in for IBM WebSphere Application Server - Express.	True	Boolean
Console plugin for DB2 UDB Express	*Required.*Specify whether to install the console plug-in for IBM DB2 Universal Database Express Edition.	True	Boolean
Console plugin for IBM HTTP Server	*Required.*Specify whether to install the console plug-in for IBM HTTP Server.	True	Boolean

Integrated Solutions Console for Linux on IBM POWER: You can use this application wrapper to install the Integrated Solutions Console and associated management portlets on target computers running Linux on IBM POWER.

Application ID: IRU2_1ConsoleLnxOnPwr

You must provide values for all of the following fields:

Table 28. Exposed variables

Field	Explanation	Default value	Validation requirements
Installation Location	*Required.* The directory where you want to install the application.	c:\Program Files\IBM	• Must start with a letter, colon (:), and forward slash (\) • Must not contain *?";|~<>
Host Name	*Required.*The fully qualified host name of the target computer.		
HTTP Port	*Required.*The port number that Integrated Solutions Console uses. The port number must be a port that is not being used by another process on the computer. After installing Integrated Solutions Console, include this port number in the URL for opening the console. That URL is the protocol name, plus the fully qualified host name, plus the port, plus ibm/console. An example is: http://myhost.com :8421/ibm/console.	8421	Port number 1 - 65535
Bootstrap/RMI Port	*Required.*The Java Remote Method Invocation (RMI) bootstrap port that Integrated Solutions Console uses.	8424	Port number 1 - 65535
HTTPS Port	*Required.*The port that Integrated Solutions Console uses for the secure HTTP (HTTPS) transport.	8422	Port number 1 - 65535

Table 28. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
SOAP Port	*Required.*The port that Integrated Solutions Console uses for the Simple Object Access Protocol (SOAP) transport.	8425	Port number 1 - 65535
Unused HTTP	*Required.*The port number that the application server uses for the HTTP transport. The HTTP transport is a request queue between the application server and the HTTP server (Web server). This value must not conflict with existing port assignments on the computer.	8426	Port number 1 - 65535
Unused HTTPS Port	*Required.*The port number that the application server uses for the secure HTTP (HTTPS) transport. This value must not conflict with existing port assignments on the computer.	8427	Port number 1 - 65535
Unused Bootstrap/RMI Port	*Required.*The address for the bootstrap function and the port number for the Java Remote Method Invocation (RMI) connector in the application server. This value must not conflict with existing port assignments on the computer.	8428	Port number 1 - 65535
Unused SOAP Port	*Required.*The address for the Simple Object Access Protocol (SOAP) connector in the application server. This value must not conflict with existing port assignments on the computer.	8429	Port number 1 - 65535

Table 28. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Eclipse Port	*Required.*The port that the Eclipse technology-based help system uses to receive requests for help files. This value must not conflict with existing port assignments on the computer.	8423	Port number 1 - 65535
Administrator ID	*Required.*The administrator user ID for the console.		• Must be at least 3 characters, but no more than 60 characters • Can contain only a-z (case ignored), period (.), hyphen (-), and underscore (_).
Password	*Required.* The administrator password for the console.		• Must be at least 3 characters, but no more than 60 characters • Can contain only a-z (case ignored), period (.), hyphen (-), and underscore (_).
Console plugin for WebSphere Application Server - Express	*Required.*Specify whether to install the console plug-in for IBM WebSphere Application Server - Express.	True	Boolean
Console plugin for DB2 UDB Express	*Required.*Specify whether to install the console plug-in for IBM DB2 Universal Database Express Edition.	True	Boolean
Console plugin for IBM HTTP Server	*Required.*Specify whether to install the console plug-in for IBM HTTP Server.	True	Boolean

Integrated Solutions Console for Microsoft Windows: You can use this application wrapper to install the Integrated Solutions Console and associated management portlets over a network on target computers running the Microsoft Windows operating system.

Application ID: IRU2_1ConsoleWin

You must provide values for all of the following fields:

Field	Explanation	Default value	Validation requirements
Installation Location	*Required.* The directory where you want to install the application.	c:\Program Files\IBM	• Must start with a letter, colon (:), and forward slash (\) • Must not contain *?";|~<>
Host Name	*Required.*The fully qualified host name of the target computer.		
HTTP Port	*Required.*The port number that Integrated Solutions Console uses. The port number must be a port that is not being used by another process on the computer. After installing the Integrated Solutions Console, include this port number in the URL for opening the console. That URL is the protocol name, plus the fully qualified host name, plus the port, plus ibm/console. An example is: http://myhost.com :8421/ibm/console.	8421	Port number 1 - 65535
Bootstrap/RMI Port	*Required.*The Java Remote Method Invocation (RMI) bootstrap port that Integrated Solutions Console uses.	8424	Port number 1 - 65535
HTTPS Port	*Required.*The port that Integrated Solutions Console uses for the secure HTTP (HTTPS) transport.	8422	Port number 1 - 65535
SOAP Port	*Required.*The port that Integrated Solutions Console uses for the Simple Object Access Protocol (SOAP) transport.	8425	Port number 1 - 65535

Field	Explanation	Default value	Validation requirements
Unused HTTP	*Required.*The port number that the application server uses for the HTTP transport. The HTTP transport is a request queue between the application server and the HTTP server (Web server). This value must not conflict with existing port assignments on the computer.	8426	Port number 1 - 65535
Unused HTTPS Port	*Required.*The port number that the application server uses for the secure HTTP (HTTPS) transport. This value must not conflict with existing port assignments on the computer.	8427	Port number 1 - 65535
Unused Bootstrap/RMI Port	*Required.*The address for the bootstrap function and the port number for the Java Remote Method Invocation (RMI) connector in the application server. This value must not conflict with existing port assignments on the computer.	8428	Port number 1 - 65535
Unused SOAP Port	*Required.*The address for the Simple Object Access Protocol (SOAP) connector in the application server. This value must not conflict with existing port assignments on the computer.	8429	Port number 1 - 65535
Eclipse Port	*Required.*The port that the Eclipse technology-based help system uses to receive requests for help files. This value must not conflict with existing port assignments on the computer.	8423	Port number 1 - 65535

Field	Explanation	Default value	Validation requirements
Administrator ID	*Required.*The administrator user ID for the console.		• Must be 3 - 60 characters • May contain only lowercase a-z, uppercase A-Z, period (.), hyphen (-), and underscore (_).
Password	*Required.* The administrator password for the console.		• Must be 3 - 60 characters • May contain only lowercase a-z, uppercase A-Z, period (.), hyphen (-), and underscore (_).
Console plugin for WebSphere Application Server - Express	*Required.*Specify whether to install the Console plug-in for IBM WebSphere Application Server - Express.	True	Boolean
Console plugin for DB2 UDB Express	*Required.*Specify whether to install the Console plug-in for IBM DB2 Universal Database Express Edition.	True	Boolean
Console plugin for IBM HTTP Server	*Required.*Specify whether to install the Console plug-in for IBM HTTP Server.	True	Boolean

Console management extension for IBM DB2 Universal Database Express Edition Version 8.2 for Linux: Use this wrapper to install the console's management extension for IBM DB2 Universal Database Express Edition Version 8.2 on a target computer running the Linux operating system.

Application ID: IRU2_1DB2MgmtExt8_2Lnx

Depending on your selection and configuration, you might need to provide values for some or all of the following fields:

Field	Explanation	Default value	Validation requirements
Console Extensions Directory	*Required.* The directory where the console extensions are installed. If the console extension are already installed on this computer, that location is used.	/opt/IBM	• Can contain a-z (either case) and integers 0-9, underscore (_), period (.) • Must not contain / \ * ? " < >

Field	Explanation	Default value	Validation requirements
SOAP Port	*Required.* The Simple Object Access Protocol (SOAP) port used by the embedded WebSphere Application Server and the DB2 management extension.	8888	Port number 1 - 65535
Bootstrap port	*Required.* The port used by the embedded IBM WebSphere Application Server.	2817	Port number 1 - 65535
HTTP Port	*Required.* The HTTP Transport port used by the embedded WebSphere Application Server.	9088	1 - 65535
HTTPS Port	*Optional.* The HTTPS Transport port used by the embedded WebSphere Application Server.	9451	Port number 1 - 65535
User Name	*Required.* The user name required for administering the embedded WebSphere Application Server.	Administrator	• Must be 1 - 20 characters. • Must not contain * + , / : ; < = > ? [\ ] |
Password	*Required.* The password required for administering the embedded WebSphere Application Server.	password	• Can be 1 - 14 characters • Can contain lowercase a-z, integers 0-9, @ # $ _
Console Agent User Name	*Required.* The user name for Console Agent.	Administrator	• Must be 1 - 20 characters • Must not contain * + , / : ; < = > ? [\ ] |
Console Agent Password	*Required.* The password for the Console Agent user name.	password	• Can be 1 - 14 characters • Can contain lowercase a-z, integers 0-9, @ # $ _
Console Agent Port	*Required.* The communication port used by Console Agent.	7044	Port number 1 - 65535

Field	Explanation	Default value	Validation requirements
Console Agent Service install run level	*Required.* The run level for Console Agent Service.	3, 5	A string containing integers 1 - 5 and commas.
Overwrite previously installed management extensions	*Required.* Specify whether to enable reinstallation if the management extension is already installed on the target computer.	false	Boolean

Console management extension for IBM DB2 Universal Database Express Edition Version 8.2 for Linux on IBM POWER: Use this wrapper to install the console's management extension for IBM DB2 Universal Database Express Edition Version 8.2 on a target computer running Linux on IBM POWER.

Application ID: IRU2_1DB2MgmtExt8_2LnxOnPwr

Depending on your selection and configuration, you might need to provide values for some or all of the following fields:

Field	Explanation	Default value	Validation requirements
Console Extensions Directory	*Required.*The directory where the console extensions are installed. If the console extension are already installed on this computer, that location is used.	/opt/IBM/IRExt	• Can contain a-z (either case) and integers 0-9, underscore (_), period (.) • Must not contain / \ * ? ″ < >
Bootstrap Port	*Required.* The Java Remote Method Invocation (RMI) bootstrap port used by the embedded IBM WebSphere Application Server.	2817	Port number 1 - 65535
SOAP Port	*Required.* The Simple Object Access Protocol (SOAP) port used by the embedded WebSphere Application Server and the DB2 management extension.	8888	Port number 1 - 65535
HTTP Port	*Required.* The HTTP Transport port used by the embedded WebSphere Application Server.	9088	Port number 1 - 65535

Field	Explanation	Default value	Validation requirements
HTTPS Port	*Optional.* The HTTPS Transport port used by the embedded WebSphere Application Server.	9451	Port number 1 - 65535
User Name	*Required.* The user name used for administering the embedded WebSphere Application Server.	Administrator	• Must be 1 - 20 characters. • Must not contain * + , / : ; < = > ? [\ ] |
Password	*Required.* The password for the user name for administering the embedded WebSphere Application Server.	password	• Can be 1 - 14 characters • Can contain lowercase a-z, integers 0-9, @ # $ _
Console Agent User Name	*Required.* The user name used for Console Agent. If no user name is specified, the embedded WebSphere Application Server user name is used.	Administrator	• Must be 1 - 20 characters • Must not contain * + , / : ; < = > ? [\ ] |
Console Agent Password	*Required.* The password for the user name for Console Agent. If no password is specified, the embedded WebSphere Application Server password is used.	password	• Can be 1 - 14 characters • Can contain lowercase a-z, integers 0-9, @ # $ _
Console Agent Port	*Required.* The communication port used by Console Agent.	7044	Port number 1 - 65535
Console Agent Service install run level	*Required.* The run level for Console Agent Service.	3, 5	A string containing integers 1 - 5 and commas.
Reinstall flag	*Required.* Specify whether to enable reinstallation if the management extension is already installed on the target computer.	false	Boolean

Console management extension for IBM DB2 Universal Database Express Edition Version 8.2 for Microsoft Windows: Use this wrapper to install the console's management extension for IBM DB2 Universal Database Express Edition Version 8.2 on a target computer running the Microsoft Windows operating system.

Application ID: IRU2_1DB2ExpressMgmtExt8_2Win

Depending on your selection and configuration, you might need to provide values for some or all of the following fields:

Field	Explanation	Default value	Validation requirements
Management Extension hostname	*Required.* The fully qualified host name of the server on which the management extension is run.	localhost	• Can contain lowercase a-z, integers 0-9, underscore (_), period (.) • Must not contain hyphen (-)
DB2 Management Extension Installation Location	*Required.* The fully qualified path name for the directory where the DB2 management extension is installed.	c:\Program Files\IBM	• Can contain a-z (either case) and integers 0-9, underscore (_), period (.) • Must not contain / \ * ? " < >
BootStrap Port	*Required.* The Java Remote Method Invocation (RMI) bootstrap port to be used by the embedded IBM WebSphere Application Server.	2817	Port number 1 - 65535
SOAP Port	*Required.* The Simple Object Access Protocol (SOAP) port to be used by the embedded IBM WebSphere Application Server and the DB2 management extension.	8888	Port number 1 - 65535
HTTP Port	*Required.* The HTTP Transport port to be used by the embedded WebSphere Application Server.	9088	Port number 1 - 65535
HTTPS Port	*Optional.* The HTTPS Transport port to be used by the embedded WebSphere Application Server.	9451	Port number 1 - 65535

Field	Explanation	Default value	Validation requirements
Embedded WebSphere Username	*Required.* The user name required for administering the embedded WebSphere Application Server.	Administrator	• Must be 1 - 20 characters. • Must not contain * + , / : ; < = > ? [\ ] |
Embedded WebSphere Password	*Required.* The password required for administering the embedded WebSphere Application Server.	password	• Can be 1 - 14 characters • Can contain lowercase a-z, integers 0-9, @ # $ _
Console Agent Service Username	*Optional.* The user name for installing Console Agent Service. If no password is specified, the embedded WebSphere Application Server user name is used.	Administrator	• Must be 1 - 20 characters • Must not contain * + , / : ; < = > ? [\ ] |
Console Agent Service Password	*Optional.* The password for installing Console Agent Service. If no password is specified, the embedded WebSphere Application Server password is used.	password	• Can be 1 - 14 characters • Can contain lowercase a-z, integers 0-9, @ # $ _
Console Agent Port	*Required.* The communication port to be used by Console Agent.	7044	Port number 1 - 65535
Reinstall flag	*Required.* Specify whether to enable reinstallation if the management extension is already installed on the target computer.	false	Boolean

Console management extension for IBM HTTP Server for Linux: Use this wrapper to install the console's management extension for IBM HTTP Server on a target computer running the Linux operating system.

Application ID: IRU2_1IHSMgmtExt6_0Lnx

Depending on your selection and configuration, you might need to provide values for some or all of the following fields:

Field	Explanation	Default value	Validation requirements
Management Extension Target Directory	*Required.* The location that the management extension will be installed into if a management extension home directory has not already been installed. If a management extension has already been installed the existing directory is used.	c:\Program Files\IBM /opt/IBM	• Must start with a letter, colon (:), and forward slash (\) • Must not contain *?";|.
HTTP Server Directory	*Required.* The location of the IBM HTTP Server	c:\Program Files\IBM HTTP Server /opt/IBMHTTPServer	• Must start with a letter, colon (:), and forward slash (\) • Must not contain *?";|.
Console Agent Service Username	*Required.* The user name for the installation of Console Agent.		• Must be 1 - 20 characters • Must not contain * + , / : ; < = > ? [\ ]
Console Agent Service Password	*Required.* Password for the installation of Console Agent.		• Must be 1 - 14 characters • Can contain only lowercase a-z, integers 0-9, @ # $ _
Console Agent Port	*Required.*The communication port to be used by Console Agent.	7044	Port number 1 - 65535
Console Agent run level	*Required.* The run level for the Console Agent Service installation.	3, 5	A string containing integers 1 - 5 and commas.
Overwrite previously installed management extensions	*Required.* Specify whether to enable reinstallation if the management extension is already installed on the target computer.	false	Boolean

Console management extension for IBM HTTP Server for Linux on IBM POWER: Use this wrapper to install the console's management extension for IBM HTTP Server on a target computer running Linux on IBM POWER.

Application ID: IRU2_1IHSMgmtExt6_0LnxOnPwr

Depending on your selection and configuration, you might need to provide values for some or all of the following fields:

Field	Explanation	Default value	Validation requirements
Management Extension Target Directory	*Required.* The location that the management extension will be installed into if a management extension home directory has not already been installed. If a management extension has already been installed the existing directory is used.	c:\Program Files\IBM /opt/IBM	• Must start with a letter, colon (:), and forward slash (\) • Must not contain *?";|.
HTTP Server Directory	*Required.* The location of the IBM HTTP Server	c:\Program Files\IBM HTTP Server /opt/IBMIHS	• Must start with a letter, colon (:), and forward slash (\) • Must not contain *?";|.
Console Agent Service Username	*Required.*The user name for the installation of Console Agent.		• Must be 1 - 20 characters • Must not contain * + , / : ; < = > ? [\ ]
Console Agent Service Password	*Required.* The password for the installation of Console Agent.		• Must be 1 - 14 characters • Can contain only lowercase a-z, integers 0-9, @ # $ _
Console Agent Port	*Required.*The communication port to be used by Console Agent.	7044	Port numbers 1 - 65535
Console Agent run level	*Required.* The run level for the Console Agent Service installation.	3, 5	A string containing integers 1 - 5 and commas.
Overwrite previously installed management extensions	*Required.* Specify whether to enable re-installation if the management extension is already installed on the target computer.	false	Boolean

Console management extension for IBM HTTP Server for Microsoft Windows: Use this wrapper to install the console's management extension for IBM HTTP Server on a target computer running the Microsoft Windows operating system.

Application ID: IRU2_1IHSMgmtExt6_0Win

Depending on your selection and configuration, you might need to provide values for some or all of the following fields:

Field	Explanation	Default value	Validation requirements
Management Extension Target Directory	*Required.* The location that the management extension is installed into if a management extension home directory has not already been installed. If a management extension has already been installed the existing directory is used.	c:\Program Files\IBM	• Must start with a letter, colon (:), and forward slash (\) • Must not contain *?";|.
HTTP Server Directory	*Required.* The location of the IBM HTTP Server	c:\Program Files\IBM HTTP Server	• Must start with a letter, colon (:), and forward slash (\) • Must not contain *?";|.
HTTP Configuration Directory	*Required.* The configuration directory for the instance of the IBM HTTP Server to be managed	C:\Program Files \IBM HTTP Server \conf /opt/IBMHTTPServer /conf	• Must start with a letter, colon (:), and forward slash (\) • Must not contain *?";|.
Fully-Qualified Hostname	*Required.* The fully qualified hostname of the server on which the management extension will run.	localhost	• Must not start or end with a hyphen (-) • Must not contain *?";| /
Console Agent Service Username	*Required.*The user name for the installation of Console Agent Service.	LocalSystem	• Must be 1 - 20 characters • Must not contain * + , / : ; < = > ? [\ ]
Console Agent Service Password	*Required.* The password for the installation of Console Agent.		• Must be 1 - 14 characters • Can contain only lowercase a-z, integers 0-9, @ # $ _
Console Agent Port	*Required.*The communication port to be used by Console Agent.	7044	Port numbers 1 - 65535

Field	Explanation	Default value	Validation requirements
Overwrite previously installed management extensions	*Required.* Specify whether to enable reinstallation if the management extension is already installed on the target computer.	false	Boolean

Console management extension for IBM WebSphere Application Server - Express for IBM i5/OS: Use this wrapper to install the console's management extension for IBM WebSphere Application Server - Express on a target computer running the IBM i5/OS operating system.

Application ID: IRU2_1WASMgmtExt6_0I5OS

Console management extension for IBM WebSphere Application Server - Express for Linux: Use this wrapper to install the console's management extension for IBM WebSphere Application Server - Express on a target computer running the Linux operating system.

Application ID: IRU2_1WASExpressMgmtExt6_0Lnx

Depending on your selection and configuration, you might need to provide values for some or all of the following fields:

Field	Explanation	Default value	Validation requirements
WebSphere Management Extension Installation Location	*Required.* The fully qualified path name to the directory where you want to install the WebSphere Application Server - Express management extension. If the management extension is already installed, that directory will be used.	c:\Program Files\IBM	Must not contain /
Target WebSphere Location	*Required.* The fully qualified path name to the directory of the WebSphere Application Server to be administered.	C:\Program Files \IBM\WebSphere \AppServer	Must not contain /
WebSphere Username	*Optional.* The user name required for administering the WebSphere Application Server.		• Must be 1 - 20 characters • Must not contain / * + , : ; ? | < = > [\]

Field	Explanation	Default value	Validation requirements
WebSphere Password	*Optional.* The password required for administering the WebSphere Application Server		• Must be no more than 14 characters • Can contain only lowercase characters a-z, numbers 0 to 9 @ # $ and _
Console Agent Port	*Required.* The communication port to be used by Console Agent. If Console Agent is already installed, this value is ignored.	7044	Port number 1 - 65535
Enable Reinstall	Specify whether to enable reinstallation if the management extension is already installed on the target computer.	false	Boolean
Console Agent Runlevels	*Required.* The run level that Console Agent will run under.		A string containing integers 1 - 5 and commas.

Console management extension for IBM WebSphere Application Server - Express for Linux on IBM POWER: Use this wrapper to install the console's management extension for IBM WebSphere Application Server - Express on a target computer running Linux on IBM POWER.

Application ID: IRU2_1WASExpressMgmtExt6_0LnxOnPwr

Depending on your selection and configuration, you might need to provide values for some or all of the following fields:

Field	Explanation	Default value	Validation requirements
WebSphere Management Extension Installation Location	*Required.* The fully qualified path name to the directory where you want to install the WebSphere Application Server - Express management extension. If the management extension is already installed, that directory will be used.	c:\Program Files\IBM	Must not contain /

Field	Explanation	Default value	Validation requirements
Target WebSphere Location	*Required.* The fully qualified path name to the directory of the WebSphere Application Server to be administered.	C:\Program Files \IBM\WebSphere \AppServer	Must not contain /
WebSphere Username	*Optional.* The user name required for administering the WebSphere Application Server.		• Must be 1 - 20 characters • Must not contain / * + , : ; ? | < = > [\]
WebSphere Password	*Optional.* The password required for administering the WebSphere Application Server		• Must be no more than 14 characters • Can contain only lowercase characters a-z, numbers 0 to 9 @ # $ and _
Console Agent Port	*Required.* The communication port to be used by Console Agent. If Console Agent is already installed, this value is ignored.	7044	Port number 1 - 65535
Enable Reinstall	Specify whether to enable reinstallation if the management extension is already installed on the target computer.	false	Boolean
Console Agent Runlevels	*Required.* The run level that Console Agent will run under.		A string containing integers 1 - 5 and commas.

Console management extension for IBM WebSphere Application Server - Express for Microsoft Windows: Use this wrapper to install the console's management extension for IBM WebSphere Application Server - Express on a target computer running the Microsoft Windows operating system.

Application ID: IRU2_1WASMgmtExt6_0Win

Depending on your selection and configuration, you might need to provide values for some or all of the following fields:

Field	Explanation	Default value	Validation requirements
WebSphere Management Extension Installation Location	*Required.* The fully qualified path name to the directory where you want to install the WebSphere Application Server - Express management extension. If the management extension is already installed, that directory will be used.	c:\Program Files\IBM	• Must start with a letter, colon (:), and forward slash (\). • Must not contain / * ? " | < > \\
Target WebSphere Location	*Required.* The fully qualified path name to the directory of the WebSphere Application Server to be administered.	C:\Program Files \IBM\WebSphere \AppServer	• Must start with a letter, colon (:), and forward slash (\). • Must not contain / * ? " | < > \\
WebSphere Username	The user name required for administering the WebSphere Application Server.		• Must be 1 - 20 characters • Must not contain / * + : ; ? " | < = > [\]
WebSphere Password	The password required for administering the WebSphere Application Server		• Must be no more than 14 characters • Can contain only lowercase characters a-z, numbers 0 to 9, @, #, $, and _
Console Agent Service Username	*Required.* The user name for the installation of Console Agent Service. If the Console Agent is already installed, this value is ignored.	"LocalSystem"	• Must be 1 - 20 characters • Must not contain / * + : ; ? " | < = > [\]
Console Agent Service Password	*Conditional.*Password for the installation of Console Agent Service. If the Console Agent Service user name is *LocalSystem*, this password is not required. If Console Agent is already installed, this value is ignored.		• Must be no more than 14 characters • Can contain only lowercase characters a-z, numbers 0 to 9, @, #, $, and _

Field	Explanation	Default value	Validation requirements
Console Agent Port	*Required.* The communication port to be used by Console Agent. If Console Agent is already installed, this value is ignored.	7044	Port number 1 - 65535
Enable Reinstall	Specify whether to enable reinstallation if the management extension is already installed on the target computer.	false	Boolean

Sample application for Linux: Use this application wrapper to deploy the sample application to computers running Linux. You can also edit this wrapper using Express Runtime developer to create a wrapper for deploying your custom applications to computers running Linux.

Application ID: IRU2_1SampleLnx

Table 29. Exposed variables

Field	Explanation	Default value	Validation requirements
Document Directory	*Required.* The directory where the application documents are installed.	/opt/IBM /RuntimeDocs	• Must start with backslash (/)
Database Name	*Required.* The name of the database to be created and used by this application.	DOCMGTD7	• Must 1 to 8 characters in length.. • Must begin with an alphabetic character, at symbol (@), number sign (#), or dollar sign ($) • Valid characters: A - Z, a - z, 0 - 9, dollar sign ($), number sign (#), at symbol (@). underscore (_)

Table 29. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
DB2 instance owner user name	*Required.* The DB2 instance owner user ID used to connect to DB2.	db2inst	• Valid characters: A - Z, a - z, 0 - 9, dollar sign ($), number sign (#), at symbol (@), or underscore (_) • Must be from 2 to 30 characters in length. • Invalid prefix: IBM, SQL, SYS, underscore (_) • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, and SQL-reserved words
DB2 instance owner password	*Required.* The password for the DB2 instance user ID.		• Valid characters: A - Z, a - z, 0 - 9, dollar sign ($), number sign (#), at symbol (@), or underscore (_). • Must be from 6 to 127 characters in length.

Sample Application for OS/400 (i5/OS): Use this application wrapper to deploy the sample application to computers running OS/400 (i5/OS). You can also edit this wrapper using Express Runtime developer to create a wrapper for deploying your custom applications to computers running OS/400 (i5/OS).

Application ID: IRU2_1SampleI5OS

Table 30. Exposed variables

Field	Explanation	Default value	Validation requirements
Document Directory	*Required.* The directory where the application documents are installed.	/opt/IBM /RuntimeDoc	• Must start with a forward slash (/) • Valid characters: A - Z, a - z, 0 - 9, hyphen (-), underscore (_), period (.)

Table 30. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
Database Name	The name of the database that is created and used by this application. If the database already exists, it is to be dropped.		
DB2 Administrator User ID	*Required.* The administrator user ID used to connect to DB2.	db2inst	• Must begin with an alphabetic character. • Valid characters: A - Z, a - z, 0 - 9, dollar sign ($), pound sign (#), or at symbol (@). • Must be from 2 to 10 characters in length. • Invalid prefix: IBM, SQL, SYS, numeric characters, underscore (_) • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, and SQL-reserved words
DB2 Administrator Password	*Conditional.* The password used with the administrator user ID specified to connect to DB2.		• Valid characters: A - Z, a - z, 0 - 9, dollar sign ($), pound sign (#), at symbol (@), or underscore (_). • Must be from 2 to 10 characters in length.
HTTP Server Name	Specify the name of the IBM HTTP Server.		• Must start with an alphabetic character. • Must be from 1 to 10 characters in length.
Application server name	Specify a unique name for the application server.		

Sample application for Windows: Use this application wrapper to deploy the sample application to computers running Windows. You can also edit this wrapper using Express Runtime developer to create a wrapper for deploying your custom applications to computers running Windows.

Application ID: IRU2_1SampleWin

Table 31. Exposed variables

Field	Explanation	Default value	Validation requirements
Document Directory	*Required*. The directory where the application documents are installed.	C:\RuntimeDocs	• Must start with drive letter, colon (:), then forward slash (\) • Invalid characters: asterisk (*), question mark (?), quotation marks ("), pipe (¦), backslash (/), semicolon (;), tilde (~), brackets ([]), less than or greater than symbols (< >)
Database Name	*Required*. The name of the database used by this application.	DOCMGTD7	• Must 1 to 8 characters in length.. • Must begin with an alphabetic character, at symbol (@), number sign (#), or dollar sign ($) • Valid characters: A - Z, a - z, 0 - 9, dollar sign ($), number sign (#), at symbol (@). underscore (_)
DB2 Administrator User ID	*Required*. The administrator ID used to connect to DB2.	db2inst	• Valid characters: A - Z, a - z, 0 - 9, dollar sign ($), number sign (#), at symbol (@), or underscore (_) • Must be from 2 to 30 characters in length. • Invalid prefix: IBM, SQL, SYS, underscore (_) • Invalid values: ADMINS, GUESTS, USERS, PUBLIC, LOCAL, and SQL-reserved words

Table 31. Exposed variables (continued)

Field	Explanation	Default value	Validation requirements
DB2 Administrator Password	*Required*. The password used with the DB2 Administrator User ID specified to connect to DB2..		• Valid characters: A - Z, a - z, 0 - 9, dollar sign ($), number sign (#), at symbol (@), or underscore (_). • Must be from 6 to 127 characters in length.

Changing the appearance of a variable: All of the variables defined within an application are displayed as editable fields on the configuration parameters panel in the deployment wizard. When an application is added to a solution, variables within the application can be hidden or made read-only for a particular configuration parameters panel.

To change the appearance of variables, perform the following steps:

1. From the left pane of the Express Runtime developer, select the Navigator view.
2. Expand the appropriate solution project.
3. Expand the src/ directory and open the *.sxml file
4. Click the Tasks tab in the solution editor.
5. In the Solution Tasks section, expand the install task and select the application that contains variables you want to change.
6. In the Overridden Application Variables section, click **Add** to select the variables to change.

   Notes:

   a. If the variables you want to change are already listed, skip to step 9
   b. If all variables defined in the application are already listed, skip to step 9

7. In the Override Application Variables wizard, select the variables you want to change from the checklist. Click **Next**.

   Note: If the application project is not available in the workspace, no list of variables is provided. Instead, you must enter the name of the variable you want to change.

8. For each variable selected in step 7, you are presented with a wizard page that helps you change the appearance of a variable. Choose the appearance from the list, then click **Next** or **Finish** for each variable. While on this panel you can share the value of the variable with other applications, or modify the default value of the variable. The following options are available for the appearance of a variable:

   Editable
   This is the default type of variable.

   Read-only
   Makes the variable read-only, but still visible in the deployment wizard. Read-only variables must have valid default values, since the end-user cannot change their value.

Hidden

> Hides the variable in the Deployment Wizard. Hidden variables must have valid default values, since the end-user cannot change their value.

9. To change the appearance of a variable that is already in the Overridden Application Variables list, right-click on the variable, choose Properties, then set the following read-only and hidden properties as desired:

   - hidden
   - readonly
   - sharedAs
   - value

Sharing variables between applications: Sometimes, applications need to access the variable values of another application in the same solution. An example would be a solution which contained DB2 and a DB2 fix pack, in which the fix pack would need to have access to the main DB2 installation location. The solution editor provides a way to "link" or "share" variables between applications. Doing so ensures that any value entered for one application's variable are stored in any other variables that are shared with it.

Note: After sharing variables between applications, you might want to configure validation for shared variables.

To share variables between applications, perform the following steps:

1. From the left pane of the Express Runtime developer, select the Navigator view.
2. Expand the appropriate solution project.
3. Expand the src/ directory and open the *.sxml file
4. Click the Tasks tab in the solution editor.
5. In the Solution Tasks section, expand the install task and select the application that contains variables that you want to share.
6. In the Overridden Application Variables section, click **Add** to select the variables to share.

   Note: If the variables you want to share are already listed, skip to step 9.

7. In the Override Application Variables wizard, select the variables you want to share from the checklist. Click **Next**.

   Note: If the application project is not available in the workspace, no list of variables is provided. Instead, you must enter the name of the variable you want to share.

8. For each variable selected in step 7, you will be presented with a wizard page which allows you to specify how that variable is shared.

   a. In the Behavior drop down, select Share the value with other variables.

   b. If you have already shared variables from other applications in the solution, the sharedAs names of those variables are listed in the Shared as drop down. Select one of the existing sharedAs names from the list in order to link this value with all other variables with the same sharedAs name. If this is the first application whose variables you are sharing, or you want to share this value with variables that are not listed yet, then type in a unique name to share this variable as. While on this panel you can also change the appearance of this variable. Once you have finished configuring the variable, click **Next** or **Finish**.

9. To share a variable which is already in the Overridden Application Variables list, right-click on the variable, choose Properties, then set the sharedAs property as desired.
   - hidden
   - readonly
   - sharedAs
   - value

Modifying the default value of a variable: Applications can provide default values for any variables they define. Sometimes, it is necessary to set or override those default values at the solution level, as in the following cases:

- If a solution changes the appearance of a variable to make it hidden or read only, and the variable does not have a valid default value, then the solution must provide a valid default.
- If a solution includes applications that, if deployed with their default values, would not work correctly (for example, the default installation locations would conflict), the solution must override the necessary default values of the variables.

To change the default value of an application variable, perform the following steps:
1. From the left pane of the Express Runtime developer, select the Navigator view.
2. Expand the appropriate solution project.
3. Expand the src/ directory and open the *.sxml file
4. Click the Tasks tab in the solution editor.
5. In the Solution Tasks section, expand the install task and select the application that contains variables you want to change.
6. In the Overridden Application Variables section, click **Add** to select the variables to change.

   Notes:

      a. If the variables you want to change are already listed, skip to step 9
      b. If all variables defined in the application are already listed, skip to step 9
7. In the Override Application Variables wizard, select the variables you want to change from the checklist. Click **Next**.
8. For each variable selected in step 7, you are presented with a wizard page that helps you to change the default value of that variable. In the Behavior drop down, select Modify the default value, then enter the new default value in the Default value text field. While on this panel you can also change the appearance of this variable. Once you have finished setting the default value, click **Next** or **Finish**.
9. To change the default value of a variable that is already in the Overridden Application Variables list, right-click on the variable, choose Properties, then set the following read-only and hidden properties as desired:
   - hidden
   - readonly
   - sharedAs
   - value

Adding manual tasks to a solution: A manual task is an instruction that is displayed during the deployment of the solution. The user must complete the manual task

before continuing with the solution deployment. For example, a manual task might instruct the user to verify that the user ID specified has the appropriate administrative authority.

To add a manual task to the solution, perform the following steps:
1. From the left pane of the Express Runtime developer, select the **Package Explorer** view.
2. Select the appropriate solution project file.
3. Open the src/ directory and open the *.sxml file.
4. Select the **Tasks** tab in the solution editor.
5. In the solution section, Click **Add**.
6. Select **Manual task**. Click **Next**.
7. Select a **Parent task group** (if applicable).
8. Enter a **Task description**.
9. Provide a brief description of the task and the instructions needed to complete it in the **Task instructions** field.
10. Click **Finish**.

Use the Properties view to specify optional information about the manual task. Right-click the task in the editor and choose Properties from the context menu. Specify information for the following optional attributes

isOptional
> Set to true to make the selected task optional.

selectedByDefault
> Set to true to deploy the selected task by default.
>
> > **Note:** If the `isOptional` attribute is set to false, `selectedByDefault` is returned as **true**.

taskDetails
> Enter a text description to display a brief description of the task on the task selection panel of the deployment wizard.

Reordering tasks within a solution: To reorder tasks in a solution, perform the following steps:
1. From the left pane of the Express Runtime developer, select the **Package Explorer** view.
2. Select the appropriate solution project file.
3. Open the src/ directory and open the *.sxml file.
4. Select the **Tasks** tab in the right pane of the Express Runtime developer.
5. Select the task you want to move.
6. Click **Up** to place the task earlier in the solution, or **Down** to place it later in the solution.

You can also drag and drop tasks from one group to another in the Navigator and Package Explorer views of the Express Runtime solution editor.

Providing variables validation information: To provide validation information for solution variables, perform the following steps:
1. From the left pane of the Express Runtime developer, select the **Package Explorer** view.

2. Select the appropriate solution project file.
3. Open the src/ directory and open the *.sxml file.
4. Select the **Validation** tab in the solution editor.
5. If there are shared solution variables to add to the validation list, select the variable in the left pane of the window and click **Add**.
6. If there are shared solution variables to delete from the validation list, select the variable in the left pane of the window and click **Remove**.
7. To add or modify validation information for a variable, select the variable in the left pane.
8. In the right pane, you can specify the following information:

Required
> Specify that the variable is required.

Default value
> You can enter a default value for the variable.

Make uppercase
> Specify that any value entered for the variable should be made uppercase.

Make lowercase
> Specify that any value entered for the variable should be made lowercase.

Minimum length
> Enter a minimum character length for the variable.

Maximum length
> Enter a maximum character length for the variable.

Validation rules
> If the restrictions offered by the other controls in the validation section are not comprehensive enough, you can place very specific restrictions on the value of the variable by creating validation rules for variables. Validation rules are created to describe either valid or invalid variable values. To specify values that must be part of the value of the variable, create a valid validation rule. To specify values that are not allowed to be part of the value of a variable, create an invalid validation rule. You can specify one of the following pieces of information for each validation rule:

> **Complete string**
> > a sequence of characters that either must match or is not allowed to match the complete variable value

> **Partial string**
> > a sequence of characters that either must match or is not allowed to match a sequence of characters in the variable value

> **Prefix** a sequence of characters that either must occur or is not allowed to occur at the beginning of the variable value

> **Suffix** a sequence of characters that either must occur or is not allowed to occur at the end of the variable value

> **Specific characters**
> > a list of characters, where sequence does not matter, that either must occur or is not allowed to occur in the variable value

Range of values
　　　　a minimum and maximum numerical value that represents
　　　　either a valid or invalid range of values for the variable

9. Save the solution.

Enabling a solution for globalization

There are many strings in application and solution wrappers that are displayed to end users in the deployment wizard interface. These strings can be specified directly in the wrapper files, or they can be placed in translatable XML files. To enable translation for an application or solution wrapper, perform the following steps:

1. Decide which translation languages your application or solution will support, and create the necessary translatable XML files, as described in the topic Translation Language Configuration

2. Populate the default-language XML file with all the translatable strings for the wrapper, giving each string a meaningful key name. If you have already created a wrapper, you can copy the translatable strings from your wrapper into the default-language XML file. Keys must consist of alphanumeric characters only (no white-space), and must begin with a letter. The following example shows what a default-language XML file for a simple solution might look like.

```
<?xml version="1.0" ?>
<SolutionID>
    <solutionTitle>Solution Title</solutionTitle>
    <task1Details>Details for task #1</task1Details>
    <task1Description>Description for task #1</task1Description>
</SolutionID>
```

3. Using the application or solution editor, replace all the translatable strings with references to their keys in the default-language XML file.

   If using the GUI editor, simply enter the key name, prefixed with a percent sign (%).

   Following the example, the solution title field would be set to: `%solutionTitle`

   If editing the XML source directly, use the `translatedKey` attribute. Following the example, the `<title>` element in the solution wrapper would be specified as:

   `<title translatedKey="solutionTitle" />`

4. Place the translations of the strings in the default-language XML file in the appropriate language XML files. This step can be performed separately, if translations are not immediately available. If a string does not exist for a particular translation language, the string from the default-language XML file is used.

5. Generate the application or solution wrapper. Any missing translatable strings are detected, and the appropriate error messages are displayed in the console.

Modifying an existing solution wrapper

You can modify an existing solution wrapper as an alternative to creating a new solution. When you modify an existing solution wrapper, you use the solution editor to replace values with ones that are appropriate for a new solution wrapper. This is a good approach if you want to add your application to one of the provided solutions. You can change the title, splash screen image, welcome screen image, and other items on the general tab so this shows as your branded solution.

To modify an existing solution wrapper, perform the following steps:

1. Select an existing solution project in the Navigator view and press **Ctrl + C** to copy the solution wrapper.
2. Press **Ctrl + V** to paste the solution project in the Navigator view.
3. Specify a new name for the duplicate solution project in the Copy project dialog.
4. Click **OK**.
5. Expand the solution project in the Navigator view.
6. Expand the src folder.
7. Double-click the file with the .sxml extension. The solution editor opens.
8. Select the **General** tab of the solution editor.
9. Specify a new ID for the solution project.
10. Use the solution editor to add, edit or remove tasks, applications, or configuration information for the solution project.
11. Save the solution project.

IBM Express Runtime 2.1 Middleware: This solution helps you to deploy all of the Express Runtime middleware and the Express Runtime console to any of the platforms supported by Express Runtime. The solution includes the following components:

- WebSphere Application Server - Express 6.0
- DB2 UDB Express 8.2
- IBM HTTP Server 6.0
- Express Runtime console

To deploy the IBM Express Runtime 2.1 Middleware, perform the following steps:
1. Open the deployment wizard.
2. Select **File > Open**.
3. Select IRU2_1MiddlewareAll.ser and click **Open**.
4. Review the informational text to confirm that you selected the proper solution and click **Next**.
5. The Select Task window opens. Select the middleware you want to deploy and click **Next**.
6. Select the platforms to which you want to deploy each middleware component and click **Next**.
7. Specify the host name or IP address for each target computer you want the middleware deployed to. Click **Add** after you enter each address. You must provide this information for each operating system to which you are deploying. In addition, if you selected to deploy the Express Runtime console, you must provide target information separately for each operating system to which the console is deployed.

   Note: The IBM Installation Agent must be running on all target systems other than localhost before you can deploy the solution.
   When you are finished adding targets, click **Next**.
8. Provide the required configuration information for each platform selected for deployment. You must provide this information for each middleware component and for the Express Runtime console. Fields marked with an asterisk (*) are required. To review validation requirements for each field, refer to the specific application wrapper topic for each of the components. These topics are found in the Reusing Express Runtime applications section of the Express Runtime 2.1 InfoCenter.

Note: Some variable values are shared between applications. For example, the value for the location of the IHS installation directory is shared between the IBM HTTP Server and the WebSphere Express Plugin for IBM HTTP Server applications. If, in the process of configuring this solution for deployment you change the value in one location, it is automatically changed in the other location. For more information on shared variables, see "Specifying shared application variables" on page 46 and "Sharing variables between applications" on page 138.

9. The Summary Panel for the solution opens. This panel provides information about the tasks you are about to deploy and includes an estimated time that each task should take. To make corrections to tasks before deploying, click **Back**. To deploy an individual task, click the **Deploy task** button associated with it. To deploy all tasks as configured, click **Deploy all**.

10. The Deployment Status window opens and provides status information in percent completed and estimated time remaining. The window also displays the time and date that you initiated the deployment, as well as a brief description of each task being deployed. To review information in more detail, click **Detailed messages** or **Master log**.

    If you want to cancel the deployment, click **Stop Deployment**. You must click **Yes** on the resulting dialog box to confirm cancellation of the deployment.

IBM Express Runtime 2.1 Sample Solution: This solution helps you to deploy all of the Express Runtime middleware, the Express Runtime console, and the sample application to any of the platforms supported by Express Runtime. The solution includes the following components:

- WebSphere Application Server - Express 6.0
- DB2 UDB Express 8.2
- IBM HTTP Server 6.0
- WebSphere Express Plugin for IBM HTTP Server 6.0
- Express Runtime Document Publishing Manager

  Note: Express Runtime Publishing Document Manager is the sample application.
- Express Runtime console

To deploy the IBM Express Runtime 2.1 Sample for Linux, perform the following steps:

1. Open the deployment wizard.
2. Select **File > Open**.
3. Select IRU2_1SampleSolution.ser and click **Open**.
4. Review the informational text to confirm that you selected the proper solution and click **Next**.
5. The Select Task window opens. Select the tasks you want to deploy and click **Next**.
6. The Sample Application window opens. Select the platforms to which you want to deploy the middleware components and the sample application and click **Next**.
7. Select the platforms to which you want to deploy the Express Runtime console and click **Next**.
8. Specify the host name or IP address for each target computer you want the sample application and middleware deployed to. Click **Add** after you enter each address. You must provide this information for each operating system to

which you are deploying. In addition, if you selected to deploy the Express Runtime console, you must provide target information separately for each operating system to which the console is deployed.

> **Note:** The IBM Installation Agent must be running on all target systems other than localhost before you can deploy the solution.

When you are finished adding targets, click **Next**.

9. Provide the required configuration information for each platform selected for deployment. You must provide this information for each middleware component, sample application, and Express Runtime console deployment. Fields marked with an asterisk (*) are required. To review validation requirements for each field, refer to the specific application wrapper topic for each of the components. These topics are found in the Reusing Express Runtime applications section of the Express Runtime 2.1 InfoCenter.

> **Note:** Some variable values are shared between applications. For example, the value for the location of the IHS installation directory is shared between the IBM HTTP Server and the WebSphere Express Plugin for IBM HTTP Server applications. If, in the process of configuring this solution for deployment you change the value in one location, it is automatically changed in the other location. For more information on shared variables, see "Specifying shared application variables" on page 46 and "Sharing variables between applications" on page 138.

10. The Summary Panel for the solution opens. This panel provides information about the tasks you are about to deploy and includes an estimated time that each task should take. To make corrections to tasks before deploying, click **Back**. To deploy an individual task, click the **Deploy task** button associated with it. To deploy all tasks as configured, click **Deploy all**.

11. The Deployment Status window opens and provides status information in percent completed and estimated time remaining. The window also displays the time and date that you initiated the deployment, as well as a brief description of each task being deployed. To review information in more detail, click **Detailed messages** or **Master log**.

If you want to cancel the deployment, click **Stop Deployment**. You must click **Yes** on the resulting dialog box to confirm cancellation of the deployment.

IBM Express Runtime 2.1 Sample for Linux: This solution helps you to deploy all of the Express Runtime middleware and the sample application to a computer running a Linux platform. This sample is located in the sample workspace in the Linux development environment. It contains a single install task that demonstrates how to include your application in a solution and how to automate the configuration required for your application. You can work with this solution by selecting Develop Sample Solution or Deploy Sample Solution in the Express Runtime First Steps panel. The solution includes the following components:

- WebSphere Application Server - Express 6.0
- DB2 UDB Express 8.2
- IBM HTTP Server 6.0
- WebSphere Express Plugin for IBM HTTP Server 6.0
- Express Runtime Document Publishing Manager

> **Note:** Express Runtime Publishing Document Manager is the sample application.

To deploy the IBM Express Runtime 2.1 Sample for Linux, perform the following steps:

1. Open the deployment wizard.
2. Select **File > Open**.
3. Select IRU2_1SampleSolutionLnx.ser and click **Open**.
4. Review the informational text to confirm that you selected the proper solution and click **Next**.
5. The Select Task window opens. As there is only one task in the solution, it is preselected for you. Click **Next**.
6. Specify the host name or IP address for each target computer you want the sample application deployed to. Click **Add** after you enter each address.

   Note: All targets specified must be running a Linux operating system. In addition, the IBM Installation Agent must be running on all target systems other than localhost before you can deploy the solution.
   When you are finished adding targets, click **Next**.
7. Provide the required configuration information for each component. Fields marked with an asterisk (*) are required. To review validation requirements for each field, refer to the specific application wrapper topic for each of the components. These topics are found in the Reusing Express Runtime applications section of the Express Runtime 2.1 InfoCenter.

   Note: Some variable values are shared between applications. For example, the value for the location of the IHS installation directory is shared between the IBM HTTP Server and the WebSphere Express Plugin for IBM HTTP Server applications. If, in the process of configuring this solution for deployment you change the value in one location, it is automatically changed in the other location. For more information on shared variables, see "Specifying shared application variables" on page 46 and "Sharing variables between applications" on page 138.
8. The Summary Panel for the solution opens. This panel provides information about the task you are about to deploy and includes an estimated time that the deployment should take. To make corrections to the task before deploying, click **Back**. To deploy the task, click **Deploy all**.
9. The Deployment Status window opens and provides status information in percent completed and estimated time remaining. The window also displays the time and date that you initiated the deployment, as well as a brief description of each task being deployed. To review information in more detail, click **Detailed messages** or **Master log**.

   If you want to cancel the deployment, click **Stop Deployment**. You must click **Yes** on the resulting dialog box to confirm cancellation of the deployment.

IBM Express Runtime 2.1 Sample for Windows: This solution helps you to deploy all of the Express Runtime middleware and the sample application to a computer running a Windows platform. This sample is located in the sample workspace in the Windows development environment. It contains a single install task that demonstrates how to include your application in a solution and how to automate the configuration required for your application. You can work with this solution by selecting Develop Sample Solution or Deploy Sample Solution in the Express Runtime First Steps panel. The solution includes the following components:

- WebSphere Application Server - Express 6.0
- DB2 UDB Express 8.2

- IBM HTTP Server 6.0
- WebSphere Express Plugin for IBM HTTP Server 6.0
- Express Runtime Document Publishing Manager

  Note: Express Runtime Publishing Document Manager is the sample application.

To deploy the IBM Express Runtime 2.1 Sample for Windows, perform the following steps:

1. Open the deployment wizard.
2. Select **File > Open**.
3. Select IRU2_1SampleSolutionWin.ser and click **Open**.
4. Review the informational text to confirm that you selected the proper solution and click **Next**.
5. The Select Task window opens. As there is only one task in the solution, it is preselected for you. Click **Next**.
6. Specify the host name or IP address for each target computer you want the sample application deployed to. Click **Add** after you enter each address.

   Note: All targets specified must be running a Windows operating system. In addition, the IBM Installation Agent must be running on all target systems other than localhost before you can deploy the solution.
   When you are finished adding targets, click **Next**.
7. Provide the required configuration information for each component. Fields marked with an asterisk (*) are required. To review validation requirements for each field, refer to the specific application wrapper topic for each of the components. These topics are found in the Reusing Express Runtime applications section of the Express Runtime 2.1 InfoCenter.

   Note: Some variable values are shared between applications. For example, the value for the location of the IHS installation directory is shared between the IBM HTTP Server and the WebSphere Express Plugin for IBM HTTP Server applications. If, in the process of configuring this solution for deployment you change the value in one location, it is automatically changed in the other location. For more information on shared variables, see "Specifying shared application variables" on page 46 and "Sharing variables between applications" on page 138.
8. The Summary Panel for the solution opens. This panel provides information about the task you are about to deploy and includes an estimated time that the deployment should take. To make corrections to the task before deploying, click **Back**. To deploy the task, click **Deploy all**.
9. The Deployment Status window opens and provides status information in percent completed and estimated time remaining. The window also displays the time and date that you initiated the deployment, as well as a brief description of each task being deployed. To review information in more detail, click **Detailed messages** or **Master log**.

   If you want to cancel the deployment, click **Stop Deployment**. You must click **Yes** on the resulting dialog box to confirm cancellation of the deployment.

Testing a solution in the deployment wizard

Testing a solution in the deployment wizard helps you to see how a solution is displayed to an end user, and to perform the following tasks:

- Verify the solution's presentation.
- Verify the behavior of the applications that are a part of the solution.
- Review the deployment on the target computer.
- Debug the user programs for an application as they run on a target computer.

To test a solution in the deployment wizard, perform the following steps:

1. From the left pane of the Express Runtime developer, select the **Package Explorer** view.
2. Select the appropriate solution project.
3. Select **Project > Test in Deployment Wizard**.
4. Configure the solution and deploy it.

When you deploy a solution in the deployment wizard, the applications are installed on the target computers. Keep in mind that you are actually deploying code to target computers just as an end user would.

Debugging a solution during deployment

You can debug Java user programs in the Express Runtime developer while you deploy them to local and remote Windows or Linux computers using the deployment wizard.

To debug a Java user program during deployment, perform the following steps:

1. Start Express Runtime developer on the staging server. Ensure the application project containing the Java user program is open in the Express Runtime developer workspace.
2. Open the Java user program source file you want to debug, and insert a breakpoint where you want to pause during execution.
3. Start the deployment wizard by selecting a solution that contains the application you want to debug. Right-click the solution, and select **Test in deployment wizard** from the context menu.
4. Deploy the Java user program to a local or remote Linux or Windows computer.

If you set a breakpoint on a line that is executed, you have the option to switch to the debug perspective. Click **Yes**. You can debug the user program as you would a normal Java program.

Troubleshooting debugging

If a message is displayed stating that debugging cannot be enabled because port 1099 is in use when you start the Deployment Wizard from the Express Runtime developer, you must free port 1099. When you free port 1099, restart the Deployment Wizard from the Express Runtime developer to debug user programs. The IBM Installation Agent uses port 1099. You cannot simultaneously debug user programs and run the Installation Agent on the same computer.

If your user program does not suspend execution during deployment, enabling debugging, verify that the following conditions exist:

- You set a breakpoint in the correct Java file, and on a line that is executed.
- There is an application project in the Express Runtime developer workspace for the user program you want to deploy.
- A Linux or Windows computer is the deployment target.
- The type of the user program is Java.
- There is no firewall between the server and agent, or if there is, that port 1099 is open.
- Port 1099 is not in use by any other applications on the server.

If a message is displayed during deployment stating that the debugger cannot connect, ensure that there is no firewall between the server and agent, or if there is, that port 8000-8004 is open.

Generators

You can generate solution and application wrappers contained in solution and application projects using menu selections from the context menu on the Navigator or Package Explorer views, or from the Project menu. Deployment packages can also be generated from these menu selections.

Application generator

Generate application .ser files from application projects using the application generator.

Invoking the application generator

You can start the application generator in the following ways:
- Right-click an application project or an application .axml resource and choose **Generate Application**.
- Select the application project or an application .axml resource and choose **Project > Generate Application**.
- Right-click within an application editor and choose **Generate Application**.

When you select Create Deployment Package for an application wrapper, the Express Runtime developer package generator is invoked using the binary application file as input.

Application generator output

The appliction generator produces one or more binary application files having an extension of .ser. A binary application file is created for each operating system specified in the application wrapper and these files are stored in the project under the `bin/<application_ID>` folder.

The log file for the application generators is stored in the `bin/<application_ID>/log` folder and is named applicationBuilder.log.

Solution generator

You can generate a solution .ser file from a solution project using the solution generation.

When you generate a solution, the following actions occur:

1. The Express Runtime developer examines the solution XML file to determine what application wrappers are included in the solution.
2. The application generator is invoked against each application wrapper referenced in the solution wrapper. If the application wrapper is up-to-date, this step is skipped.
3. When all required application wrappers have been generated, the solution generator is invoked against the solution wrapper. The solution generation step is skipped if the solution wrapper and all of its referenced application wrappers are up-to-date.
4. Finally, the user programs package generator is invoked for each application wrapper, creating packages containing all user programs as specified in the application XML file. If the required user program packages already exist and are up-to-date, this step is skipped.

The user programs package generator requires that your user programs be located in the bin folder of the project containing the corresponding application wrapper. If application wrappers specify user programs that are defined in non-Express Runtime developer projects (or even outside of the Eclipse workspace environment), the generator cannot locate them. Be sure to import all required user programs (including any other resources they need, such as message bundles) as described in Importing external resources.

Deployment packages are not created as part of a solution generation, and must be created separately.

Invoking the solution generator

You can start the solution generator in the following ways:
- Right-click the solution project or the solution .sxml file and choose **Generate Solution** from the context menu.
- Select the solution project or the solution .sxml file and choose **Project > Generate Solution**.
- Right-click within the solution editor and choose **Generate Solution**.

Solution generator output

The solution generator creates one binary solution file with a .ser extension. This file is stored in the root bin folder of the solution project.

The log file for the solution generator is stored in the bin/log folder and is named solutionBuilder.log.

Deployment package generator

Generate deployment packages from application projects using the deployment package generator.

Invoking the deployment package generator

You can start the deployment package generator in the following ways:
- Right-click an application project or an application .axml resource and choose **Generate Deployment Package**.
- Select the application project or an application .axml resource and choose **Project > Generate Deployment Package**.

- Right-click within an application editor and choose **Generate Deployment Package**.

When you select Create Deployment Package for an application wrapper, the Express Runtime developer package generator is invoked using the binary application file as output.

Before you create a deployment package for an application, the application's software image root must be set. To set a software image root, perform the following steps:

1. From the left pane of the Express Runtime developer, select the Navigator view.
2. Expand the appropriate application project.
3. Expand the src/ directory and open the *.axml file
4. Click the Files tab in the application editor.
5. In the Software Image Files section, make sure the source directory is set.
6. If the source directory is not set, or set incorrectly, click the link and browse to the location of the software image files.

Deployment package generator output

The deployment package generator creates a deployment package JAR file. This package contains the software image files pointed to by the software image root specified for an application wrapper. This package is not stored within the application wrapper's project. Instead, it is placed in the `IRU_common_resources` project, which is intended to be a repository for common resources that multiple projects might need to access. Express Runtime developer creates the IRU_common_resources project as needed. The package is placed in the mediaJars folder of this project.

The deployment package builder's log file is stored in the `bin/<application_ID>/log` folder and is named `softwareImageDeploymentPkgBuilder.log`.

Headless operation

To generate a deployment package, or generate or import an application or solution project without starting an Eclipse-based development environment, use the headless operation script files that are provided with Express Runtime. These files are located in the Express Runtime installation directory, in the Solution Enabler folder. To use the headless operation files, invoke them with the required parameters provided in the corresponding help topic.

The following files are provided:

IRU_ApplicationGenerator.bat (Windows) / IRU_ApplicationGenerator (Linux)
Use this file to generate an application project without starting the Eclipse development environment.

IRU_DeploymentPackageGenerator.bat (Windows) / IRU_DeploymentPackageGenerator (Linux)
Use this file to generate a deployment package without starting the Eclipse development environment.

IRU_ImportProject.bat (Windows) / IRU_ImportProject (Linux)
Use this file to import a project into a predefined workspace without starting the Eclipse development environment.

Note: You can only import projects that exist in the workspace in the file system.

IRU_SolutionGenerator.bat (Windows) / IRU_SolutionGenerator (Linux)
Use this file to generate a solution project without starting the Eclipse development environment.

IRU_ExportProject.bat (Windows) / IRU_ExportProject (Linux)
Use this file to export a solution project without starting the Eclipse development environment.

The information required to invoke the headless operation files is provided in the corresponding help topic for each file.

Project import

Use the headless project import script to import an application or solution project into the Express Runtime developer. Invoke the headless project import script by running it from the command line with the following arguments:

- data [workspace path]
The path of the workspace that contains the project that is to be imported. This path can be either a full path, for example ″C:\ProgramFiles\IBM\Runtime\SolutionEnabler\workspace″, or a path that is relative to the working directory, for example, ″..\workspace″.

-project [project name]
The name of the application or solution project.

Application generation

Use the headless application generation script to generate an application project without starting the Express Runtime developer. Invoke the headless application generation script by running it from the command line with the following arguments:

-data [workspace path]
The path of the workspace that contains the application project that is to be generated. This path can be either a full path, for example ″C:\ProgramFiles\IBM\Runtime\SolutionEnabler\workspace″, or a path that is relative to the working directory, for example, ″..\workspace″.

-project [project name]
The name of the application package to generate.

-replace
Use this option to replace any previously generated versions of the application .ser file.

Solution generation

Use the headless solution generation script to generate a solution project without starting the Express Runtime developer. Invoke the headless solution generation script by running it from the command line with the following arguments:

-data [workspace path]
The path of the workspace that contains the solution project that is to be generated. This path can be either a full path, for example ″C:\ProgramFiles\IBM\Runtime\SolutionEnabler\workspace″, or a path that is relative to the working directory, for example, ″..\workspace″.

-project [project name]
>   The name of the solution project.

-replace
>   Use this option to replace any previously generated versions of the
>   solution .ser file or user program packages.

Deployment package creation

Use the headless deployment package creation script to create a deployment
package without starting the Express Runtime developer. Invoke the headless
deployment package creation script by running it from the command line with the
following arguments:

-data [workspace path]
>   The path of the workspace that contains the application project that is to
>   have its deployment package generated. This path can be either a full path,
>   for example
>   "C:\ProgramFiles\IBM\Runtime\SolutionEnabler\workspace", or a path
>   that is relative to the working directory, for example, "..\workspace".

-project [project name]
>   The name of the application project.

-replace
>   Use this option to replace any previously generated versions of the
>   deployment packages.

Solution launcher image export

Use the headless solution launcher image export script to export a solution
launcher image without starting the Express Runtime developer. Invoke the
headless solution launcher image export script by running it from the command
line with the following arguments:

-data [PATH]
>   Workspace location containing the solution to export

-solutionProject [PROJECT]
>   Solution project to export

-mediaSize [SIZE]
>   Target media size (in megabytes)

-destinationDirectory [PATH]
>   Destination directory

-replace
>   Overwrite existing files in destination directory

-includeDirectory [PATH]
>   Directory to include files from

-includeWindows
>   Include the Solution Launcher for Windows

-windowsInstallLocation [PATH]
>   Install location for Windows

-windowsTempLocation [PATH]
>   Temporary drive for Windows

-includeLinux
>   Include the Solution Launcher for Linux

-linuxInstallLocation [PATH]
Install location for Linux

-linuxTempLocation [PATH]
Temporary location for Linux

-includeLinuxOnPOWER
Include the Solution Launcher for LinuxOnPOWER

-linuxOnPOWERInstallLocation [PATH]
Install location for LinuxOnPOWER

-linuxOnPOWERTempLocation [PATH]
Temporary location for LinuxOnPOWER

-silent
Run the Solution Launcher install and deployment silently

-taskFile [FILE]
Task file filename, located in the tasks folder of the solution.

-vendorName [NAME]
Vendor name to display during install

-vendorWebsite [WEBSITE]
Vendor website to display during install

-defaultLanguage [LANGUAGE]
Default language to use for license files, readme files, and documentation
files. Valid languages are zh_CN,zh_TW,en,fr,de,it,ja,ko,pt_BR,es

-languages [LANGUAGE1;LANGUAGE2]
List of languages to generate LaunchPad properties files for. Valid
languages are zh_CN,zh_TW,en,fr,de,it,ja,ko,pt_BR,es

-includeLicense
Include license files

-licenseType [TYPE]
License files type. Either LICR or TEXT/HTML

-licenseFiles [FILE1;FILE2]
License files to display if type is TEXT/HTML

-licenseEncodings [LOCALE=ENCODING;LOCALE=ENCODING]
Optional list of encodings to use to display licenses. Defaults to UTF-8.
Valid locales are zh_CN,zh_TW,en,fr,de,it,ja,ko,pt_BR,es,cs,pl,tr

Note: When you provide encodings, delineate then with ; on Windows
computers, and : on Linux computers.

-readmeFile [FILE]
File name of the readme file

-docFile [FILE]
File name of the documentation file

-includeLaunchpad
Include LaunchPad files

-launchpadReadme
Include a link to the readme file on the LaunchPad

-launchpadDoc
Include a link to the documentation file on the LaunchPad

-launchpadBackground [FILE]
Fully-qualified background image file name

-launchpadIcon [FILE]
Fully-qualified icon image file name

Importing

You can import application and solution projects into the Express Runtime developer workspace, or import resources into existing Express Runtime application and solution projects.

Importing existing application and solution projects

You can move or copy an application or solution project from one Eclipse workspace to another, while retaining original resource property values.

The Express Runtime developer's import wizard works in conjunction with the export wizard. When you select a project contents directory that contains an application or solution project, it will automatically create that project in your Eclipse workbench. It will also initialize all resource properties with the original values from the source workspace. The project is ready to use, just as it was in the source workspace.

This wizard works similarly to the standard Eclipse wizard for importing existing projects into the workspace. Like the standard Eclipse wizard, the Express Runtime developer's import wizard does not move or copy the files from the project contents directory.

If you prefer to have your imported project's files physically reside under the target workspace folder, then you must ensure that the project to be imported is placed there prior to the import.

If you want to import arbitrary resources from the file system, you must use the standard Eclipse file system import wizard.

Importing files into an application and solution project

You can import files and folders into existing application and solution projects.

To import files and folders into existing application and solution projects, perform the following steps:

1. Right click the project that you want to import files or folders into in the Navigator view.
2. Select **Import** from the context menu.
3. Select **File System**, then click **Next**.
4. In the From directory field, type or browse to select the directory containing the files that you want to import. The Filter Types button can be used to filter the types of files that will be imported.
5. The **Into folder** field should already be filled in with the name of the project.
6. In the Options area, options are given to:
   - Overwrite existing resources without warning
   - Create complete folder structure or Create selected folders only
7. Click **Finish**.

Exporting

You can export files and folders from the Express Runtime developer either by:

- dragging and dropping to the file system, or copying and pasting to the file system
- using the Eclipse Export wizard.

To use the operating system's file system explorer to export a copy of a folder or file from the Express Runtime developer to the file system, perform the following steps:

1. Drag the files or folders from the Navigator view to the file system explorer.
2. Hold down the Ctrl key while dragging to ensure the file is copied.
3. You can also export by selecting the file in the Navigator and choosing **Edit > Copy**, then pasting it in the file system explorer.

To use the Eclipse Export wizard to export files or folders to the file system, perform the following steps:

1. Right-click the project that you want to export in the Navigator view.
2. Select **Export** from the context menu. The Eclipse Export wizard is displayed.
3. In the Export wizard, select **File system**.
4. Click **Next**.

To export an application or solution project's source files, use the standard Eclipse file system export wizard (**File > Export File System**).

Exporting solution projects for the deployment wizard

A solution project has two distinct characteristics. One characteristic is that of a solution definition consisting of various source files (such as XML wrappers and Java files). The other characteristic is the deployable parts of a solution (such as user programs packages and the solution .ser file) that are generated when you build the solution.

The Express Runtime developer provides a wizard to export deployable solution parts. To invoke the export wizard, select a solution project in the Navigator or Package Explorer view and right-click it to display the context menu.

- Select **Export > Express Runtime Solution**.
- Select the solution to export
- Enter the destination directory

When this export wizard is run, the binary solution file is exported to the selected directory. The user program packages and deployment packages are exported to the installation location of the deployment wizard.

Exporting to a solution launcher image

The Express Runtime developer provides an export wizard that you can use for exporting your solution project to a solution launcher-ready image that can then be transferred to media for distribution. Before exporting a deployable solution, you must build the solution to create the binary solution file and build all of the necessary applications' deployment packages.

The solution launcher image is an easy way to distribute and deploy a solution. The solution you export to the solution launcher image can then be deployed

through the deployment wizard. The deployment wizard is installed on the staging server through a graphical user interface similar to the one used for IBM Express Runtime. There is also the option to silently install the deployment wizard and silently deploy the solution contained in the solution launcher image. For more details on silent installation, see the Express Runtime Installation instructions.

Note: In order to silently install and deploy a solution launcher image, you must place the task file you want to use in the *tasks* directory of the solution.

The solution launcher image you export can display one or more license agreements as part of an installation. If you want to include licenses, place all the license files in the license directory of the solution project, in the appropriate language folder. If you have translated license files, place them in the other language folders. In order for the solution launcher to detect translated license files correctly, the filenames of the different translations should be the same, simply placed in different folders. In the following example, if the default language is English, the translated versions of license1.txt is displayed for Spanish and German machines, and the English version of license1.txt is displayed for all other languages. Additionally, the English version of license2.txt is displayed for all languages, since no translations were provided.

```
Solution/
 license/
  en/
   license1.txt
   license2.txt
  es/
   license1.txt
  de/
   license1.txt
```

The solution launcher image can also include a launchpad with links to a readme file and documentation for the solution. If you choose to include either a readme file or documentation, you must include the files in the solution. The readme file must be placed in the readme folder in the solution, and the documentation files must go in the info folder in the solution. The files must be placed in the appropriate language folder. Place any translated files in the appropriate language folders.

To export a deployable solution to a solution launcher image, complete the following steps:

1. From the left pane of the Express Runtime Developer, select the **Package Explorer** or the **Navigator** view.
2. Select the appropriate solution project.
3. Click **File > Export** from the main menu.
4. Select **Express Runtime solution launcher Image** from the list of available wizards.
5. Click **Next**.
6. Select the solution project that you want to export.
7. In the **Media size (MB)** field, enter the capacity, in MB, of the media that the solution launcher image will be distributed on. You can enter a value or select one from the list.
8. Use the **Include directory** field to include external files in the image. Enter the path, or click **Browse** to select the root directory of the files to include.
9. In the **Destination directory** field, enter a destination directory or **Browse** to an export destination directory.

10. Select the operating systems on which the solution launcher will run.

11. Enter the **Installation location** and **Temporary location** for each selected operating system. The installation uses the system TEMP directory by default. if the system TEMP directory is full, the installation used the directory you specify in the **Temporary** field.

12. Click **Next**.

13. In the **Vendor name** field, enter the vendor name that you want included in the solution launcher image.

14. In the **Vendor website** field, enter the vendor website that you want included in the solution launcher image.

15. Use the **Run installation silently** field, to include a task file in the image. A task file is required to install the solution launcher image silently. Use the **Task file** field to enter the path to the task file.

16. Click **Next**.

17. In the **Default language** field, select the default language for the image. The default language must be selected in the **Languages** list.

18. Click **Next**.

19. Use the **Install license files** options to specify the license files included with the image. If you select **Text/HTML files** as the license type, you must choose at least one file from the **Text/HTML files** field.

20. Click **Next**.

21. Use the **Install readme file** options to include a readme file in the image.

22. Use the **Install documentation files** options to include product documentation with the image.

23. Use the **Display Launchpad as part of solution launcher install** to include the launchpad and its options with the image.

24. Click **Finish**.

Note: If you include a readme file and product documentation, but do not include the launchpad or do not include a link to the documentation and readme file from the launchpad, you must provide another way for customers to access the readme file and product documentation. No shortcuts to the documentation or readme file are included in the solution launcher image.

Note: The deployment packages are located in the launcher CD in the bin\com\ibm\jsdt\webserver\tree folder and during installation and deployment are copied to the <install path> SolutionEnabler\com\ibm\jsdt\webserver\tree folder.

Silent installation of a solution launcher image

You can perform a silent installation of the solutions provided by Express Runtime as solution launcher images by modifying IRU_install.iss. By default this response file resides in the installation root directory.

To modify IRU_install.iss, perform the following steps:

1. Open IRU_install.iss in a text editor.

2. Uncomment the -silent option.

3. Uncomment the Task file name option.

4. Save IRU_install.iss.

When you have modified IRU_install.iss, you can modify the task file. A task file is an .xml file that stores information about the tasks that are part of a solution, and

target computers that each task in a solution is deployed to. By default, the task file is named *solution name*_Task.xml where *solution name* corresponds to the name of the solution that the task file is associated with. By modifying the task file, you can specify tasks to deploy, target computers, and other information, such as the password that is used by the IBM Installation Agent so that you can silently deploy to remote computers.

To modify the task file, perform the following steps:

1. Open the task file in a text editor.
2. If you are deploying to remote computers locate the `createkey` element. Modify the `phrase` attribute to match the password of the IBM Installation Agent that is running on the computers you want to deploy to. If you are deploying locally, you don't need to provide a value for this attribute.
3. For each task that is part of a solution, modify the task file to specify target computers that the task is deployed to, the applications that are deployed to the target computer, and configuration parameters for the application.
4. Save the task file.

When you have modified the response and task files, you can initiate a silent installation.

To initiate a silent installation, perform the following steps:

1. Copy the contents of the disk1 folder, and the bin subdirectory of all folders for disk2 and above from the output folder where the solution launcher image resides, to the computer that you are deploying from.
2. Navigate to the disk1 folder, and double-click the launchpad executable for the operating system you use. Installation progresses without any panels being displayed to the user.
3. View log files to confirm a successful installation. The log files are in the location that is specified in the User files default location section of IRU_install.iss.

Chapter 8. Deploying

Using the deployment wizard

The deployment wizard provides a simple graphical user interface for deploying a solution.

The deployment wizard helps you deploy a solution (.ser file) to target computers that you specify.

The deployment wizard is displayed as a set of steps. Navigate the steps of the deployment wizard by completing them in order and clicking **Back** and **Next** to switch to the previous or subsequent step.

Open a solution to begin the deployment process. To open a solution, perform the following steps:

1. Open the deployment wizard:
   - From Windows: Select **Start > Programs > Express Runtime 2.1 > Start Deployment Wizard**.
   - From Linux: Select **Main Menu > Express Runtime 2.1 > Start Deployment Wizard**.
2. Click **File > Open**.
3. Click the solution with the .ser file extension that you want to deploy and click **Open**. The deployment wizard Welcome dialog is displayed.
4. Click **Next**.

Note: If you are deploying from a solution launcher image, such as the Express Runtime application development toolkit, the default solution will automatically open in the deployment wizard.

Selecting tasks to deploy

The deployment wizard provides a list of all of the tasks that are part of the solution. A task is a set of actions that are performed together. Select any combination of tasks listed in the wizard for deployment to one or more target computers.

To select tasks for deployment, perform the following steps:

1. Select at least one task from the list that is displayed in the deployment wizard, by selecting the corresponding check box.
2. Click **Next**.
3. Tasks might contain one or more sets of subtasks. Select at least one subtask for each task.
4. Click **Next**.

Define target computers

Define one or more target computers for each task that you select for deployment. You can define up to 100 target computers. To define a target computer, the fully-qualified domain name or the IP address of that computer is required. A fully-qualified domain name includes all higher level domain names up to the top-level domain name.

Use the following guidelines to ensure the correct format of a domain name:
- An alphanumeric text string up to 24 characters in length, containing any of the letters A-Z, digits between 0-9, and the - and . characters.
- The first character must be an alphabetical.
- You can use upper and lowercase letters.
- The last character cannot be a minus sign or a period.
- Only use periods to delimit components of a domain name.
- Do not use blank or space characters.

Use the following guidelines to ensure the correct format for an IP Address:
- A 32-bit numeric address written containing four numbers.
- Each of these four numbers can range from 0 to 255.
- Each of the four numbers is separated by periods.

To define a target computer, perform the following steps:
1. In the target field, type the fully-qualified domain name, or the IP address of the target computer.
2. Click **Add**.
3. Repeat steps one and two for all additional target computers.
4. Click **Test Connections** to verify the deployment wizard can connect to the specified target computers. The Target Computer Data window is displayed and shows the status for each target computer. If the deployment wizard cannot connect to a target computer, verify that the fully-qualified domain name or IP address is correct. If this information is correct, contact the computer owner to determine if the target computer is running and connected to a network.
5. Click **Next**.

Configuring deployment parameters

The deployment parameters dialog contains the deployment parameters for an application associated with a selected task. Use deployment parameters to configure an installation during deployment. Examples of deployment parameters include user IDs, passwords, and target directories.

In many cases, the deployment parameters can have default values. You can use or modify the default values. The values are shared with all target computers associated with a task.

Complete all the fields on the deployment parameters dialog denoted with an asterisk. Provide deployment parameters for every task in the solution selected for deployment, and click **Next**.

Modify parameters listed on the **Typical** tab only. The parameters on the **Advanced** tab are for advanced users only. Do not modify advanced parameters unless you understand the potential results of changing the parameter.

Deploying tasks to target computers

The summary dialog of the deployment wizard displays a summary of the tasks that have been selected to deploy and the target computers selected for deployment. An estimate of the time to install each task is provided, along with the summary of the task. This dialog also shows the status of the last attempted deployment for each task.

There are two methods for deploying tasks. Click **Deploy Task** to deploy each task individually. Click **Deploy All** to deploy all of the tasks that are displayed on the summary dialog sequentially.

If the files required for deployment span more than one disk or cannot be located, the Deployment Packages Needed dialog prompts you for the correct location of each of the deployment packages JAR files that do not exist in the default directory. You must enter the proper path for each required file before deployment can begin. A dialog prompts you for each file directory needed to complete the deployment.

Viewing deployment status

The status dialog of the deployment wizard provides detailed information on the deployment process. It contains deployment status and messages that explain the reason for any errors that occurred during deployment. To view a list of all the messages that are displayed during deployment, click **Detailed Messages**. Detailed messages provides the name of the solution, time, and the target computer for the deployment of each solution.

To view a log of the tasks that were performed during deployment, click **Master Log**. The Master log provides a list of every action that occurred as part of deployment. You might need to refer to this information when debugging unsuccessful deployments.

Deployment logging options

You can use specific logging options in the deployment wizard to generate log files that provide information that is useful to have when resolving problems that you might encounter during deployment. You can enable logging to provide diagnostic information that is related to the Express Runtime support framework, the deployment wizard, or both. The logging capability of Express Runtime records Express Runtime support framework diagnostic information and the deployment wizard diagnostic information in separate log files. You can specify the name that you want to use for each log file, and the maximum amount of space that each log file can physically occupy.

Logging diagnostic information is CPU intensive, and therefore slows system performance. Use diagnostic logging only when it is necessary for troubleshooting a deployment.

To use deployment logging, perform the following steps:
1. From the deployment wizard select **Edit > Preferences**.

2. From the Deployment Preference dialog, click **Diagnostic Trace**.
3. In the Diagnostic Trace dialog, select the checkbox that corresponds to the type of diagnostic information you want logged. You can select Express Runtime support framework information, deployment wizard information, or both.
4. Provide a name for the file to which diagnostic information is recorded.
5. Provide a value for the maximum amount of space that each log file can physically occupy.
6. From the Diagnostic Trace dialog, click **OK**.
7. From the Deployment Preference dialog, click **OK**.

The log files that the deployment wizard generates are saved in the following locations:

- *Installation_Directory*/SolutionEnabler/logs/
- *Installation_Directory*/IIA/logs/

You can also use deployment diagnostic logging when you start the deployment wizard from the command line.

To use deployment diagnostic logging when you start the deployment wizard from the command line, you can apply the following arguments:

- **-enableSolutionDeployerTrace** - Enables the deployment wizard diagnostic logging.
- **-solutionDeployerTraceFile** - Sets the name of the deployment wizard log file.
- **-maxSolutionDeployerTraceFileSize** - Sets the maximum size of the deployment wizard log file.
- **-enableSupportFrameworkTrace** - Enables the support framework diagnostic logging.
- **-supportFrameworkTraceFile** - Sets the name of the support framework log file.
- **-maxSupportFrameworkTraceFileSize** - Sets the maximum size of the support framework log file.

The following command provides an example of a command line invocation of a solution that uses all of the available arguments to perform diagnostic values:

```
DJTJRE\bin\java -jar DJT_ibmnsit.jar -enableSolutionDeployerTrace
-solutionDeployerTraceFile myTrace.log -maxSolutionDeployerTraceFileSize 10
-enableSupportFrameworkTrace -supportFrameworkTraceFile mySupportTrace.log
-maxSupportFrameworkTraceFileSize 2
```

Deployment wizard preferences

Use the deployment wizard preferences to specify default settings that the deployment wizard uses, configure logging options, and specify display settings.

Path

The deployment package path is the location where all the deployment package files are stored. By default, the deployment package path is:
<installation_directory>\Runtime21\SolutionEnabler\com\ibm\jsdt\webserver\tree
.

Communication ports

Select the data and communication port numbers that you want the deployment wizard to use. If you specify a 0 for either the data or communication port, the deployment wizard automatically determines an unused port to use. Specify the maximum number of connections that can be used by both the communication and the data ports.

Troubleshooting

You can use specific logging options in the deployment wizard to generate log files that provide information that is useful to have when resolving problems that you might encounter during deployment. You can enable logging to provide diagnostic information that is related to the Express Runtime support framework, the deployment wizard, or both. The logging capability of Express Runtime records Express Runtime support framework diagnostic information and the deployment wizard diagnostic information in separate log files. You can specify the name that you want to use for each log file, and the maximum amount of space that each log file can physically occupy.

Logging diagnostic information is CPU intensive, and therefore slows system performance. Use diagnostic logging only when it is necessary for troubleshooting a deployment.

Display settings

Click display settings to toggle between the default deployment wizard, and the display settings of your computer. You can change the display settings to those of your computer to enable more accessible viewing.

Target Computer Data panel

The Target Computer Data panel displays information for all target computers associated with a task, and indicates whether the deployment wizard can connect to the target computer. A green check mark to the left of the *Target* column indicates the deployment wizard can connect to the IBM Installation Agent on the target computer. A black question mark to the left of the *Target* column indicates that the deployment wizard is collecting data or was unable to determine the operating system of the target computer because the target computer is running a down-level version of the Installation Agent. A red circle with an *X* to the left of the *Target* column indicates the deployment wizard cannot connect to the Installation Agent on the target computer. Possible reasons for failure to connect include:

* The computer does not exist on the network.
* The computer is not running the IBM Installation Agent.

See the *Details* column for more information on the target computer's status.

Chapter 9. Maintaining

Using the Express Runtime console

The Express Runtime console provides the following functions:

- An Integrated Solutions Console for managing the Express Runtime middleware (WebSphere Application Server - Express, DB2 UDB Express, and HTTP Server)
- A single, Web-based console for performing frequent administrative tasks
- Simplification of the user experience by scoping tasks to the individual's role and providing a consistent user interface and a location for all middleware installation

You can use the Express Runtime console to perform the following tasks:

- Manage multiple instances of WebSphere Application Server - Express, DB2 UDB Express, and IBM HTTP Server on Windows, Linux, and iSeries platforms.
- Check the status of, and start and stop Application Servers, HTTP Servers, and DB2 databases.
- Configure log settings and view logs.
- Check server status and database health.
- Perform a one step database backup.
- Modify WebSphere Application Server configuration settings.
- Filter tasks according to the role you perform.

To learn more about the Express Runtime console, consult the Console for Express Runtime documentation.

Chapter 10. Reference

Troubleshooting

The topics in this category provide information and procedures that help you diagnose problems.

Viewing product version information

To properly troubleshoot and report problems, you might need specific product version information. The way you access this information depends on the particular issue and portion of the product that you are using.

To access this information for Express Runtime products follow these steps:

Express Runtime
> Click **Start > Programs > Express Runtime 2.1 > About**.

Express Runtime developer
> From within Express Runtime developer, click **Help > About Express Runtime developer**. Click the icon at the far right of the dialog to view both version and build information.

Deployment wizard
> From within the deployment wizard, select **Help > About**. The window displays the build ID for the deployment wizard and JVM version information.

Problem analysis and reporting

Express Runtime creates several log files. You can use these log files to determine the cause of a problem. These files contain information that you might need to supply to the IBM Support Center if there is a problem with the Express Runtime product itself. There are three distinct phases during which Express Runtime can generate these logs: during installation, during development, and during deployment of Express Runtime.

The Express Runtime logs directory is located in the installation root directory and contains all of the logs, including those created during installation. Logs that are generated at deployment time are placed in the /deployment/logs directory on the target computer.

Diagnosing a problem

In many cases, you might wait until an error happens two or three times before actually taking the time to diagnose it. When you decide to diagnose a system problem, follow these steps:

- When the problem occurs, collect the symptom data and determine what type of problem it is.
- Once you determine the type of problem, determine if the problem is a product problem or a user problem.
- Build a search argument from the data collected.
- Report the problem to IBM. Provide the search argument that you built to determine if the problem has already been reported.

The following topics help you understand what information to gather in order to diagnose the problem.

Selecting the proper form to submit to the Virtual Innovation Center

Below is a sample of the types of information that should be included by request or report type.

Your first selection is one of the most important. It indicates the type of submission you want to make. There are three forms to choose from:

- **Participant Issue**

  Participation Issue forms can be submitted to reflect problems or issues in your interaction with the Virtual Innovation Center Community site. These types of issues vary from problems accessing educational material to accessing resources.

  Information for this type of report includes component, browser and version, error number and message (if applicable), and the specific problem you are experiencing.

- **Product Issue**

  Product Issue forms can be submitted for either Express Runtime, IBM WebSphere Application Server - Express or DB2 Universal Database (UDB)-Express. These reports indicate specific problems with the product that are considered to be a suspected defect (for example, the product is not performing to specifications).

  Information for this type of report includes error number and message, product component (for example, for WebSphere Application Server - Express, the problem might exist in the development environment or the deployment environment), and steps required to re-create the problem.

- **Request for Porting Assistance**

  The Request for Porting Assistance form is only available to companies and participants that have requested such assistance, and have been approved by IBM. The ability to access this feature is part of the registration process.

  The Request for Porting Assistance form provides advanced help is provided to companies utilizing the product code to develop or port applications. Information for this type of request includes product, component, company project, and the specific assistance that is required.

Types of information to gather before submitting a problem to the Virtual Innovation Center

In order to efficiently and quickly resolve problems, provide as much information as possible to the IBM Virtual Innovation Center team. This includes providing steps for recreating the problem, as well as explanations of errors, lack of action you experienced, or unexpected actions that occurred.

Fill out the form

The information that you provide forms the basis of the resolution process for your submission and must be as accurate and complete as possible.

- **Product** The product for which you are submitting the problem or request. Depending on the type of form, the choices vary. For Participant Issues, the type of system is the product.
- **Version** The version of the product. The version choices change to represent the proper list when you select a product.

- **Component** The component of the product currently selected. The choices for component change to represent the proper list when you select a product.
- **Browser** The Web browser that you were using when the problem occurred.

  Hint: This information is important, especially for Participation Issues, because some errors only occur when using certain browsers but function properly in others.
- **Browser version** The version of the Web browser. The choices change to represent the proper list when you make your browser selection.
- **Operating System** The type of operating system you are using. Knowing the operating system assists in the process of recreating the problem. Ensure that you also include any service pack revisions or upgrades applied to your operating system.
- **Recreatable** The determination whether the problem that you are experiencing is recreatable. In other words, does the problem occur each time you attempt a certain action, or did it occur a single time. Report issues that are recurring, recreatable problems.

  If the problem seems to have gone away or fixed itself, do not submit it as an issue. Report sporadic issues through the e-Tutors. You can also use e-mail, which is available in the Virtual Innovation Center Site, under the Help Options or e-Support features.
- **Error Number** The error number that is displayed when the error occurs. For example, when you navigate to a page and get a 'Page cannot be displayed' message, you also see 'HTTP 404' displayed either at the top or bottom of the page.
- **Error Message** The error message that is displayed. If the message is too large to include within the field, paste the message into a text or document file. Then upload it to the IBM Virtual Innovation Center team. See the file attachment fields at the bottom of the data entry panel.
- **Steps to recreate** The steps that were followed when the problem occurred. If there isn't enough room to document the steps within the size of the entry field, paste the message into a text or document file. Then upload it to the IBM Virtual Innovation Center team. See the file attachment fields at the bottom of the data entry panel.
- **Unexpected actions** The events that resulted in a significantly unusual occurrence, for example, a link that previously brought you to one location now brings you to a completely different location, or no longer works.
- **Other Information** Any additional information that is relevant in order for IBM to help resolve the problem. If the information that you need to include exceeds the size of the entry field, paste the message into a text or document file. Then upload it to the IBM Virtual Innovation Center team. See the file attachment fields at the bottom of the data entry panel.
- **File Attachment/Uploading Files** Fields that allow you to attach any necessary files to your report submission.

  Tip: Before attaching any files, use a Zone Information Protocol (ZIP) compression utility to compress all of your files into one *.zip file. Click **Browse** to select your *.zip file. Once selected, click **Submit**.

Support for end-user customer defects

The IBM Support Center offers service during normal business hours. Two methods of reporting Express Runtime Eend-user customer defects are:
- Contact IBM software support at (http://www.ibm.com/software/support)

- Contact your local IBM Support Center by telephone, using the number that was provided to you in the original "Welcome" letter you received after completing the original equipment manufacturer (OEM)/ISV Agreement process for the IBM Express Runtime software product.

When contacting the IBM Support Center, you will be asked to provide the following information:
- IBM Customer Nnumber
- Telephone number and caller name
- Company name
- The name of product for which you need support (for example, the IBM Express Runtime product). Although Express Runtime includes WebSphere(R) Express, DB2(R) UDB Express and other components, specify the initial problem report with Express Runtime as the product.

Before Contacting the IBM Support Center

Take the following steps before you contact the IBM Support Center. Gather information about the problem, and have it on hand when you discuss the problem with the IBM Support Center.

The following checklist can help you identify the problem.
1. **Define the problem:** Use the Problem Resolution Work Sheet to help you identify the problem and communicate the specifics about the problem to the IBM Support Center.
2. **Gather background information**

   To effectively and efficiently solve a problem, provide all of the relevant information about the problem. Being able to answer the following questions can help in resolving your software problem:
3. **Gather relevant diagnostic information:** It is often necessary that the IBM Support Center analyzes specific diagnostic information, such as storage dumps, traces, and so on, in order to resolve the problem. Gathering this information is often the most critical step in resolving the problem. Product-specific diagnostic documentation can be very helpful in identifying what information is typically required to resolve problems. If you are unsure about what documentation might be of use, The IBM Support Center is available to provide you assistance and guidance.
4. **Reporting the software problem:** IBM does not warrant that products are defect free; however IBM endeavors to fix them to work as designed.

   Tasks you might need to complete to provide information include:
   - Capturing documentation at the time of a failure
   - Applying a trap or trace code to your system
   - Formatting the output from the trap or trace
   - Sending documentation or trace information, in hardcopy or soft copy, to the IBM Support Center.

   Occasionally, you might be asked to remove installed fixes in the process of isolating problems. Fixing a problem might mean the installation of a later release of the software, because some fixes cannot be retrofitted into earlier code.

   Be aware of your responsibilities when working with the IBM Support Center, as stated in your OEM/ISV Agreement. If you do not have the required skill or

cannot complete the diagnostic tasks, you can engage a service provider (for an additional fee) such as IBM Global Services (IGS) to assist you.

Problem Identification Worksheet

Complete this form before calling the IBM Support Center. This form helps you identify problems and assists the IBM Support Center in finding solutions.

- System information
  - What is the failing product?
  - What is the version number and the release number?
  - What machine model, operating system, and version are you running?
- Problem Description
  - What are the expected results?
  - What statement or command is specified?
  - What are the exact symptoms and syntax?
  - What is happening? What is the message text and error number?
  - Is anyone else experiencing the problem?
  - Is this the first time this operation has been attempted?
  - Is this the first time this problem has occurred?
- Environment
  - When did this activity work last?
  - What has changed since the activity last worked?
  - __ Hardware type/model __ Application
  - __ Operating system/version __ Level of usage
  - __ New product version/release __ Maintenance applied
- If the problem does not occur every time, under what conditions does the problem occur?
- Is there any other software running on the system that might conflict with this product?
- Problem Isolation
  - Identify the specific feature of the software causing the problem.
  - Can you reproduce the problem? If so, provide a reproducible test case or instructions on how to reproduce the error condition

Problem analysis and problem identification tutorial education

The Problem Determination Mastery Self-Study Series is a tutorial that is designed for the following groups:
- Users that support applications in a database environment
- Users that develop applications in a database environment
- Users of WebSphere Application Server products.

The complimentary tutorial teaches you the following skills:
- To identify product issues
- To isolate product issues
- To resolve product issues

With these skills you can reduce the time it takes to resolve a problem, as well as reduce your dependence on the IBM Support Center. Currently a mastery examination is available for DB2 Universal Database(C) and WebSphere Application Server.

- DB2 UDB Tutorial - (http://www.ibm.com/software/data/support/pdm/)
- WebSphere Application Server Tutorial - (http://www-3.ibm.com/software/webservers/appserv/express/support/pdt.html)

Installation log files

The Express Runtime installation is actually broken into two installation phases:

- The first phase of the installation process installs the Launchpad, which contains a link to install the rest of Express Runtime.
- The second phase of the installation process is called from the WindowsSetup program on Windows or the LinuxSetup program on Linux. You can call these programs directly.

The Launchpad dialog starts automatically on Windows computers when you load the installation CD. If it does not start automatically, you can start it by using the WindowsLaunchpad program on Windows or the LinuxLaunchpad program on Linux. Once the installation CD loads, the First Steps dialog starts.

Both phases of the installation process create logs. These logs are merged into a single file, IRU_Setup.log, which is contained in the /logs directory. The installation generally completes successfully, however, if an error does occur during installation, you can consult this log file.

If either the Launchpad or the First Steps dialog encounters an error, these dialogs also create log files as shown in Table 1:

Table 32. Launchpad and First Steps log files

Log File Name	Location	Description
IRU_FirstSteps.log	<IRU install dir>\Runtime21\SolutionEnabler\logs	Contains errors or exceptions encountered by the First Steps dialog.
IRU_Install.log	/opt/IBM/Runtime21/SolutionEnabler/logs	Contains errors or exceptions encountered by the installation.

Note: Log messages are not logged for non-administrator users on Windows or Linux operating systems. You must have administrative access to install or uninstall IBM Express Runtime.

If you attempted a silent installation and do not see a log file generated, be sure that you have administrative privileges. Only users with administrative access can install IBM Express Runtime on Windows or Linux operating systems. During a silent installation, most errors are written to a log file; however, log messages cannot be logged for non-administrative users.

Development log files

With Express Runtime installed, use the Express Runtime development environment to create and build your application wrappers and your solution wrappers. The Express Runtime development environment, in turn, uses three tools to build a solution:

- The application generator compiles the application wrapper and builds manifest files.
- The solution generator compiles the solution wrapper.
- The deployment package generator creates the user JAR files.

Each of the above tools also creates a log file. The tools place these log files, listed in table 2, into the workspace associated with the Express Runtime developer workbench. The location of the application generator log is dependent on whether you are building an application or a solution:

Table 33. Log files created at development time.

Log file name	Location	Description
applicationBuilder.log	When you are building an application: `<application project>\bin\ <application id>\log`	The application generator writes status and error information to this log file as it creates the application .ser file. In addition, Extensible Markup Language (XML) parser information about the application wrapper is written to this file.
solutionBuilder.log	When you are building a solution: `<solution project>\bin \log`	The solution generator writes status and error information to this log file as it creates the solution .ser file.
deploymentPackageBuilder.log	`<solution project>\bin \<application id>\log` or `<application project>\bin\<application id>\log`	The deployment package generator writes status and error information to this log file as it creates the user .jar file.

Manifest files are useful for making certain that the correct files are included in the JAR user files and the media JAR files. The manifest files, MANIFEST.MF and USERPROGRAMS.MF, are located in the Eclipse workspace under the application project. For example, <workspace location>\<application id>\bin\<application id>default.

You can only view the manifest files when you specify the debug option in the application wrapper. To specify this option, add **debug="true"** to the <application> element of the application wrapper. For example, the following XML fragment shows how to enable the debug option for the IRU_IHS1_3_28Win application wrapper:

```
<iru:application
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:iru="http://www.ibm.com/xmlns/prod/iru/application"
  xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/application
  ../../schemas/DJT_application.xsd"
  debug="true"
  id="IRU_IHS1_3_28Win">
```

Deployment log files

There are several types of files that can aid your debugging effort during the deployment phase:

- Log files
- User program and media files
- Response files
- Property file

In general, the location of these files depends on whether the deployment is remote or local.

Performing the deployment

To perform a remote deployment, use the IBM Installation Agent (IIA) and the deployment wizard, which are both Express Runtime tools. The Installation Agent must be running on the target computers and the deployment wizard must be running on the source computer (also called the staging server).

To perform a deployment on a local computer, you only need to use the deployment wizard.

Keeping temporary deployment files

Some of the files that are used during deployment are temporary files. If you want to prevent Express Runtime from deleting temporary files after a deployment, you must use the command line option -leavefiles. This option is prebuilt in a batch file on Windows platforms (IRU_DebugInstallationAgent.bat) and a script file on Linux platforms (IRU_DebugInstallationAgent.sh).

Keeping temporary deployment files on Windows platforms

To prevent Express Runtime from deleting temporary files after a deployment, perform these steps:

1. Stop the IBM Installation Agent service if it is running.
2. Start the IBM Installation Agent again using the IRU_DebugInstallationAgent.bat file.
3. Start the deployment wizard with the -leavefiles option, using the following command:

   `./IRU_TaskInvocation -task deployer -leavefiles`

Keeping temporary deployment files on Linux platforms

To prevent Express Runtime from deleting temporary files after a deployment, perform these steps:

1. Stop the IBM Installation Agent if it is running, using the following command:

   `./IRU_iia_stop-agent`

2. Start the IBM Installation Agent again using
   IRU_DebugInstallationAgent.sh.script.
3. Start the deployment wizard with the `-leavefiles` option, using the following
   command:

   `./IRU_TaskInvocation -task deployer -leavefiles`

Keeping temporary deployment files on OS/400 (i5/OS)

To prevent Express Runtime from deleting temporary files after a deployment,
perform these steps:

1. Stop the IBM Installation Agent, using the following command:

   `IRU_iia_stop-agent`

2. Start the IBM Installation Agent again, using the following command:

   `IRU_iia_start-agent -leavefiles`

By specifying the `-leavefiles` command line option, Express Runtime does not
delete the media and user files after deploying an application. Instead, Express
Runtime leaves them in the unpacked directory. These files can be useful for
ensuring that Express Runtime transferred the user and media JAR files to the
target computer correctly. For remote and local deployments, the unpacked
directory is located in <IRU install drive>\iru. If there is already a directory withf
this name on the target computer, a numerical suffix is added to create a unique
name for the unpacked directory (for example, <IRU install dir>\iru1).

To determine what values were specified for those configuration parameters that
have `fileAssociations` XML entries associated with them, examine the contents of
response files. The names are controlled by the application wrappers.

Similarly, to determine what values were specified for those configuration
parameters that have `propertiesAssociations` XML entries associated with them,
you can examine the contents of the property file, ibmnsi.properties. To find the
response files and the property files, look in the following directories:

- For remote deployments, these files are located in the <IIA install dir>\IIA\logs
- For local deployments, these files are located in the <IRU install
  dir>\Runtime21\SolutionEnabler\logs

Deployment logs

During deployment, there are four types of log files:

Express Runtime
> The file is named `IRU_DeploymentWizard.log`.
>
> The file is located in <IRU install dir>\Runtime21 \SolutionEnabler\logs.
>
> This log file contains messages and exceptions that are stored on the
> staging server (for both local deployment and remote deployment).

Installation Agent
> The file is named `IRU_IIATrace.log`.
>
> The file is located in <IRU install dir>\Runtime21 \SolutionEnabler\logs if
> you are performing a local deployment.
>
> The file is located in <IIA install dir>\IIA\logs if you are performing a
> remote deployment.

This log file allows you to add print instructions to your user programs, which can aid you when debugging a problem. Data that you write to either the System.out or System.err file is displayed in this log. In addition, exceptions that occur while a user program is running also is displayed in this log.

NSI The file is named `ibmnsi.log`.

The file is located in <IRU install dir>\Runtime21\SolutionEnabler\deployment\logs if you are performing a local deployment.

The file is located in <IIA install dir>\IIA\logs if you are performing a remote deployment.

This log file can be used for debugging user programs. It contains the command line call of the most recent user program. You can run this command string from a command prompt to start the user program directly without having to go through the deployment wizard. In this way, you can run your user program with all of the scaffolding that would be there if your user program had been started by the normal process.

Application
Different types of user programs each create a log file.

The file is located in <IRU install dir>\Runtime21\SolutionEnabler\deployment\logs if you are performing a local deployment.

The file is located in <IIA install dir>\IIA\deployment\logs if you are performing a remote deployment.

The creation of application logs is controlled by the application wrapper and the user programs.

Each of the different types of user programs can create a log file, if desired. The `logFile` attribute in the application wrapper controls the name of the log file. This attribute can be displayed in each of the following XML elements:

- `<preDeploymentChecker>`
- `<entryProgram>`
- `<mainProgram>`
- `<exitProgram>`

These log files are controlled by user programs. Using these logs, you can gauge the progress of your programs. You determine what data should be logged in the application logs.

Recommendation: Consider data such as logging exceptions, return codes, parameters, calls, progress, and so on, in order to determine what information should be logged to allow you to debug errors.

IBM Express Runtime Web site

You can use IBM Express Runtime technical education, enablement, and predeployment within the overall IBM PartnerWorld(R) Web site ((http://www.ibm.com/partnerworld)). The PartnerWorld® home page provides links to a variety of information and resources depending on your needs. To access the full complement of resources, join the IBM PartnerWorld for Developers and IBM PartnerWorld for Software programs. These programs offer a broad range of benefits to partners working with the IBM Express Runtime software product.

A key part of Express Runtime is provided through the Virtual Innovation Center ((http://www.ibm.com/partnerworld/vic)). The Virtual Innovation Center provides complementary resources that enable mid-market companies and businesses to build technical, sales, and product skills using Express Runtime, as well as the IBM Express products (for example , IBM WebSphere Application Server (R) Express, Database 2(TM) UDB Express), and other IBM software.

Benefits of the Virtual Innovation Center

By using the Virtual Innovation Center, you receive benefits that include:
- Early assistance in building your applications on IBM software
- Code for development and training purposes at no charge
- Complimentary online IBM education courses
- Access to online technical support using e-mail or chat tools
- Access to online sales and marketing materials

Virtual Innovation Center Topics

The following list of topics can help you start to understand, plan, and build technical, sales, and product skills. It can guide you through information in the Virtual Innovation Center for Integration Runtime, IBM Express products and other IBM Software:
- Education with mentoring
  - Technical Education
  - Marketing Sales
- Support
  - Self-service approach
  - FAQ's
  - White papers
  - Hints, tips, and tricks
  - Topical forums and discussion groups
  - Telephone support, help, and marketing
  - Online support available
  - Mentoring and relationship management
  - Additional porting assistance for qualified customers
  - Express solutions
  - Pre and post sales support

Messages

This chapter lists the messages generated by the deployment wizard, the IBM Installation Agent, and their respective installation programs. You can use the information in this chapter to identify and resolve an error using the appropriate recovery action. You can also use this information to understand where messages are generated and logged.

The user responses for several messages suggest that you print the log file before calling your solution provider. Some log files are displayed in the deployment wizard messages detail window during an active session. Log files are typically returned in the language of the target computer. When using the deployment wizard, some log files might not be readable if the language of the log file is not

supported by the operating system on the staging server. Similarly, some log files might not be readable if the language of the log file is not supported by the operating system on the target computer.

Message identifiers consist of a 3-character message prefix followed by a five-digit message number. Tokens, such as {0}, {1}, and so on, are used in many messages. These tokens represent computer names, application names, files names, or directory names. The appropriate value is substituted for the token when the message is displayed.

IRU00000 messages

IRU00000 messages

IRU00000
Explanation:

The command issued during deployment. : The following command was issued: {0}

User response:

This is an informational message. No action is required.

IRU00001

Exception occurred issuing command. Exception: {0}

Explanation:

The command failed due to the listed exception.

User response:

This is an informational message. No action is required.

IRU00002

There are no files defined for this software.

Explanation:

There are no files defined for this software in the application wrapper.

User response:

Contact your solution provider.

IRU00003

The path specified does not contain the files necessary to create this deployment package.

Explanation:

If you copied the solution components to a network drive, you might not have maintained the directory structure of the original install image. The file structure of

the install image must be maintained when copying files to a local area network (LAN) or other location.

User response:

If the files were copied to a LAN, ensure that the file structure is the same as the original install image. You should also try the deployment from the original image.

If the problem persists, contact your solution provider.

IRU00004

`The directory specified is not valid.`

Explanation:

The directory cannot be accessed.

User response:

Verify that the directory that you specified actually exists. If the problem persists, contact your solution provider.

IRU00005

`The process of creating a deployment package completed successfully.`

Explanation:

The deployment wizard successfully created the package for the application.

User response:

For information only. No action required.

IRU00006

`An error occurred processing the command {0}.`

Explanation:

The deployment wizard encountered an internal error on the staging server.

User response:

Restart the deployment wizard. If the problem persists, contact your solution provider.

IRU00007

`The solution file {0} does not exist.`

Explanation:

You must give a binary solution file name as a parameter for the `-solutionFileName` option when starting the deployment wizard.

User response:

Enter the binary solution file name, for example, *mysolution*.ser.

IRU00008

```
The file {0} was not found in either of the following search paths: {1} or
{2}.
```

Explanation:

A file required to create the deployment package was not found.

User response:

Unless you specified it differently, the default log file is
IRU_DeploymentWizard.log and is located in the directory where Express Runtime
is installed. The log file indicates which file was not found. Make sure that the
specified file exists and retry the create step.

IRU00009

```
The process of creating a deployment package was cancelled.
```

Explanation:

The process of creating a deployment package did not complete because of user
intervention.

User response:

For information only. No action required.

IRU00010

```
The software image root was not specified.
```

Explanation:

A software image root must be specified before the deployment package creation
can proceed. There is no default available.

User response:

Enter the software image root.

IRU00011

```
The deployment package could not be created in the deployment package path
for the following reason: {0}.
```

Explanation:

There was a problem creating the deployment package.

User response:

Ensure that the directories specified in the file list for your application wrapper exist and that the image root (either `softwareImageRoot` or `userProgramsRoot`) specified locates those directories correctly. If the problem persists, contact your solution provider.

IRU00012

`The deployment package path is not valid.`

Explanation:

The specified directory cannot be found. There are several possible reasons:
- The directory was never created.
- The directory was deleted.
- The directory resides on a drive that the staging server cannot currently access (for example, an unmapped network drive).

User response:

Specify a valid deployment package path.

IRU00013

`A communication socket was created on port {0}.`

Explanation:

The communication port was created successfully.

User response:

For information only. No action required.

IRU00014

`Failed creating file {0}`

Explanation:

The file could not be created.

User response:

Refer to message IRU00013 for the reason the file could not be created.

IRU00015

`Port {0} is not available.`

Explanation:

The port specified on the preferences panel is already in use.

User response:

Specify a different port.

IRU00016

```
The IBM Installation Agent must run with {0} special authority to perform
an install.
```

Explanation:

The special authority, listed in the message, is required to perform the necessary install actions.

User response:

Stop the IBM Installation Agent and restart it from a user ID with the correct authority.

IRU00017

```
The log file for this application does not exist.
```

Explanation:

There was a problem creating the log file.

User response:

Ensure that the file is valid and is not set as read-only.

IRU00018

```
{0} is an invalid file name or write access is denied.
```

Explanation:

The specified file name is not valid or you do not have write access.

User response:

Ensure that the specified file name is valid and that you have write access to the file.

IRU00019

```
Group PTF {0} level {1} for product {2} applied successfully.
```

Explanation:

The group PTF was successfully applied to the system.

User response:

This is an informational message. No action is required.

IRU00020

`Both phrases are required.`

Explanation:

Both the key value and confirm value are required to create security keys.

User response:

Enter both the key value and confirm value again.

IRU00021

`The two phrases do not match.`

Explanation:

The confirm value for the security key does not match the key value.

User response:

Enter the key value and confirm value again.

IRU00023

`If you exit now, the current deployment will end. Do you want to exit the`
`deployment wizard now?`

Explanation:

You requested to close the deployment wizard while it is deploying applications. If you exit now, the deployment will not be completed.

User response:

Select Yes to end the deployment and close the deployment wizard. Select No to continue the deployment.

IRU00025

`Stopping now will abnormally end the deployment on a target computer. Are`
`you sure you want to stop now?`

Explanation:

You requested to stop the deployment process on the staging server while it is deploying applications on a target computer. If you stop the process now, the deployment on the target computer will not be complete and will end abnormally.

User response:

Select OK if you want to stop the deployment.

IRU00028

```
You must restart the deployment wizard for the port number changes to take
effect.
```

Explanation:

Changes will not take effect until you close and restart the deployment wizard.

User response:

If you want the port number changes to take effect immediately, restart the deployment wizard now.

IRU00029

```
You cannot add more than 100 computers to each task.
```

Explanation:

You are trying to add more computers to a task than permitted. Only 100 computers can be included in each task.

User response:

To deploy this task to more than 100 target computers, you will need to deploy the task more than once, modifying the target host name list for each deployment.

IRU00034

```
The specified target computer, {0}, is already included in the list.
```

Explanation:

The target computer is already specified in the list, either by the name indicated, or by an alias.

User response:

Specify a different target computer.

IRU00035

```
The icon label you entered is not valid.
```

Explanation:

The icon label that you entered for a computer ID is not valid.

User response:

Enter a valid icon label.

IRU00036

```
You did not enter information for a required field.
```

Explanation:

All required fields must contain information before you can continue to the next step.

User response:

Enter the required information in all fields marked with an asterisk (*).

IRU00039

```
You cannot view or edit the deployment parameters for this software.
```

Explanation:

No deployment parameters are required for the software.

User response:

For information only. No action required.

IRU00044

```
A host name must begin with an alphabetic character (A-Z). An IP address
must begin with a numeric character (0-9).
```

Explanation:

Host names can be specified as either a name or IP address.

User response:

Enter a valid host name or IP address.

IRU00045

```
A host name cannot end with a period (.).
```

Explanation:

Host names can be specified as either a name or IP address.

User response:

Enter a valid host name.

IRU00046

```
A host name cannot end with a dash (-).
```

Explanation:

Host names can be specified as either a name or IP address.

User response:

Enter a valid host name.

IRU00048

A host name can consist only of alphanumeric characters (A-Z, 0-9), a dash (-), or a period (.).

Explanation:

Host names can be specified as either a name or IP address.

User response:

Enter a valid host name.

IRU00049

A period (.) can only be used as a delimiter in a host name.

Explanation:

A period can only be used in a host name when you specify an IP address. An example of a valid IP address is: 3.65.255.0

User response:

Enter a valid host name.

IRU00050

An IP address must be entered as 4 numbers separated by periods (.).

Explanation:

The IP address that you entered is not valid. An example of a valid IP address is: 3.65.255.0

User response:

Enter a valid IP address.

IRU00051

Each number in an IP address must be between 0 and 255, inclusive.

Explanation:

The IP address that you entered is not valid. An example of a valid IP address is: 3.65.255.0

User response:

Enter a valid IP address.

IRU00052

An IP address can contain only numeric characters (0-9) and use periods (.) as delimiters.

Explanation:

The IP address that you entered is not valid. An example of a valid IP address is: 3.65.255.0

User response:

Enter a valid IP address.

IRU00053

```
The number of tokens provided did not match the number expected for
resource bundle {0} with key {1}. The expected number of tokens is {2}.
```

Explanation:

An internal error prevented the message from being displayed.

User response:

Contact your solution provider.

IRU00054

```
The resource bundle {0} with key {1} is not valid in the abstraction
object.
```

Explanation:

An internal error prevented the message from being displayed.

User response:

Contact your solution provider.

IRU00055

```
The key {1} you provided is not valid for the resource bundle {0}.
```

Explanation:

An internal error prevented the message from being displayed.

User response:

Contact your solution provider.

IRU00056

```
The resource bundle name {0} is not valid.
```

Explanation:

An internal error prevented the message from being displayed.

User response:

Contact your solution provider.

IRU00057

`Token abstractions are missing for a message in resource bundle {0} with key {1}. The missing tokens are {2}.`

Explanation:

An internal error prevented the message from being displayed.

User response:

Contact your solution provider.

IRU00058

`There are currently no software packages available for this operating system and language. Do you want to continue?`

Explanation:

There are currently no software packages available for this operating system and language.

User response:

Determine whether there's another language that you can use that is available for the software package.

IRU00059

`No software packages are available for this combination of operating system and language.`

Explanation:

No software packages are available for this combination of operating system and language.

User response:

Ensure you specified the correct operating system. Determine whether there's another language that you can use that is available for the software package.

IRU00060

`Failed to re-establish communication with the staging server.`

Explanation:

The staging server that initiated the deployment has been restarted or is no longer network accessible.

User response:

Restart the staging server to reestablish the communication with the IBM Installation Agent.

IRU00061

Communication with the staging server successfully re-established.

Explanation:

The IBM Installation Agent has restarted and reestablished a connection to an existing deployment.

User response:

For information only. No action required.

IRU00062

The target computer will restart during the {0} deployment. You will be notified once the target computer is restarted.

Explanation:

The deployment requires the target computer to be restarted.

User response:

For information only. No action required.

IRU00063

The target computer has restarted.

Explanation:

The deployment required the target computer to be restarted.

User response:

For information only. No action required.

IRU00066

Another process modified the original solution. Do you want to overwrite those changes?

Explanation:

The currently loaded solution was modified by another application.

User response:

Select Yes to overwrite the other changes, or select No to keep the other changes. You can also use the SaveAs option to avoid losing your changes and not overwriting the other changes.

IRU00067

The solution has changed. Do you want to save the changes?

Explanation:

You made changes that affected the solution file.

User response:

Select Yes to save these changes. Select No to discard them.

IRU00068

A file with the same name already exists. Do you want to overwrite that file?

Explanation:

A file with the same name already exists.

User response:

Select Yes to overwrite the existing file. Otherwise, select No .

IRU00069

The file name you specified is not valid.

Explanation:

The specified file name is not valid.

User response:

Check the file name to be sure it does not include special characters.

IRU00070

The file {0} cannot be saved in a read-only directory. You must select another location to save to.

Explanation:

The specified file is located in a read-only directory, and therefore cannot be saved to that directory.

User response:

Choose the File->Save As menu option and select another directory in which to save the file.

IRU00071

The solution file {0} exists in a read-only location. The Solution Deployer will not be able to save any changes made to the solution. To save your changes, open the solution file from another location.

Explanation:

The solution file exists in a read-only location. The solution deployer cannot save any changes made to the solution.

User response:

To save your changes, open the solution file from another location.

IRU00072

```
Do you want to exit the deployment wizard?
```

Explanation:

You asked to exit the deployment wizard.

User response:

This is an informational message. No action is required.

IRU00073

```
Exiting the solution launcher causes the deployment wizard to be
uninstalled. Do you want to continue?
```

Explanation:

You asked to exit the solution launcher without completing the installation of the deployment wizard.

User response:

Be sure you want to exit the solution launcher.

IRU00087

```
Help could not be loaded; the help set {0} was not found.
```

Explanation:

The deployment wizard help panels could not be loaded.

User response:

Contact your solution provider.

IRU00088

```
The help set was not found.
```

Explanation:

The deployment wizard help panels could not be loaded.

User response:

Contact your solution provider.

IRU00089

`The file {0} could not be loaded.`

Explanation:

The specified file either could not be found or it contained an error within the file.

User response:

Ensure that the file exists and is a valid file.

IRU00090

`The invocation option -{0} is not valid.`

Explanation:

The specified invocation option is not valid for the task invoked.

User response:

Specify a valid invocation option. To see all of the valid options for this task, use the -? option.

IRU00091

`The invocation option -{0} requires {1} arguments and {2} arguments were provided.`

Explanation:

The specified invocation option requires a different number of arguments than you provided.

User response:

Provide the correct number of arguments.

IRU00092

`A dash (-) must precede each invocation option.`

Explanation:

You did not include the required dash (-) before the invocation option.

User response:

Enter the invocation option again.

IRU00093

`The invocation option -{0} is required.`

Explanation:

You must include the specified invocation option for the task.

User response:

Enter the invocation option again.

IRU00094

`A dash (-) is not a valid invocation option.`

Explanation:

You did not include the name of the invocation option, only the dash.

User response:

Enter the invocation option again using all required options.

IRU00095

`The invocation option -{0} requires {1} arguments and only 1 argument was`
`provided.`

Explanation:

The specified invocation option requires a different number of arguments than you provided.

User response:

Enter the invocation option again using the full name of the invocation option.

IRU00096

`The argument {0} is not valid for option -{1}.`

Explanation:

You cannot use the specified argument with this invocation option.

User response:

Enter the invocation option again.

IRU00097

`See log file {0} for more details.`

Explanation:

The specified log file contains the details of the situation.

User response:

Check the log file for information.

IRU00098

`Either the -phrase or -display option must be used, but not both.`

Explanation:

You must use one of the two options, but not both of them.

User response:

Choose the option that you want to use, and enter the invocation option again.

IRU00099

`The deployment parameters are not configured for task {0}.`

Explanation:

You cannot install the software for the specified task until deployment parameters are configured.

User response:

Configure the software before you try to install it.

IRU00100

`Not all deployment packages for task {0} have been created.`

Explanation:

Not all deployment packages for task have been created.

User response:

IRU00101

`The install task {0} does not exist for the solution {1}.`

Explanation:

You entered a task number that does not exist in the solution specified.

User response:

Enter a valid task name.

IRU00103

`There is no software for task {0}.`

Explanation:

There are currently no software applications defined for the specified task.

User response:

For information only. No action required.

IRU00104

```
The deployment package {0} could not be created.
```

Explanation:

The specified deployment package could not be created.

User response:

Ensure that the required files are present. Also, check the log files for any further error messages.

IRU00105

```
An error occurred processing file set.
```

Explanation:

An error occurred accessing a file.

User response:

Ensure that the directory where the Application generator is invoked has free space and is not write protected.

IRU00108

```
The deployment package path {0} does not exist.
```

Explanation:

You specified a path that does not currently exist.

User response:

Verify that the path that you specified is correct.

IRU00109

```
The solution file {0} does not support the {1} language.
```

Explanation:

You specified a language that is not supported in the solution.

User response:

Either create a new solution to include the language for the software, or change the
language of the software.

IRU00110

`The software {0} does not support the {1} language.`

Explanation:

You specified a software application that does not support the solution language.

User response:

Either create a new solution to include the language for the software, or change the
language of the software.

IRU00111

`The solution {0} could not be opened.`

Explanation:

The specified binary solution file could not be accessed. It could be corrupted or it
might not exist with the name that you entered.

User response:

Ensure that the specified name is spelled correctly and that the file resides in the
correct location. If you still have problems, contact your solution provider.

IRU00112

`The solution {0} is invalid.`

Explanation:

The path specified for the deployment packages is not valid.

User response:

Ensure that the specified path exists and points to a writable directory.

IRU00113

`The software {0} does not support the {1} operating system.`

Explanation:

You specified a software application that does not support the solution operating
system.

User response:

Either create a new solution to include the operating system for the software, or
change the operating system of the software.

IRU00114

```
All task groups must contain at least one task.
```

Explanation:

The task group is empty

User response:

Include at least one task in the group.

IRU00115

```
You do not have write access to the deployment package path {0}.
```

Explanation:

The path specified for deployment packages must be writeable.

User response:

Specify a writeable deployment package path to store the deployment packages.

IRU00116

```
The deployment package path {0} is read-only, so the deployment package(s)
can not be removed.
```

Explanation:

The deployment package cannot be deleted because it is located in a path with read-only access.

User response:

Specify a writable deployment package path to store the deployment packages.

IRU00117

```
The saved deployment package path is invalid. The default path {0} has been
restored.
```

Explanation:

An invalid build images path was specified, or no build images path was specified. A default path will be used.

User response:

No action required. However, if a specific build images path is desired, ensure that the path specified exists.

IRU00118

```
The deployment wizard version {0} detected agent version {1} which is not
compatible.
```

Explanation:

The computer that you have targeted is running an agent version that is not compatible with the version of the deployment wizard that you are using.

User response:

Ensure that the computer that you want to deploy software on has a version of the agent that is compatible with the version of the deployment wizard that you are using.

IRU00119

```
WARNING: The log file is larger than 2MB. Only the most recent 2MB of log
information is displayed below. Please see IRU_IIA.log for more details.
```

Explanation:

The log file is too large to display through the deployment wizard interface.

User response:

For information only. No action required.

IRU00120

```
Specify the {0} attribute or the {1} attribute, or both attributes, when
you invoke the task {2}.
```

Explanation:

At least one of the two options must be called when invoking this task.

User response:

Invoke the task again, calling at least one of the specified options.

IRU00121

```
The invocation option -{0} will not be used.
```

Explanation:

You specified an unnecessary invocation on the command line, which will not be used by the generator.

User response:

For information only. No action required.

IRU00122

```
Jar file {0} created successfully.
```

Explanation:

The JAR file specified was successfully created.

User response:

For information only. No action required.

IRU00123

```
The user {0} does not have {1} authority. You must have {1} authority to
perform any tasks.
```

Explanation:

The current user does not have the proper permissions to run the agent.

User response:

Login as a user with the proper authority and try again.

IRU00125

```
The files required to assemble {0} ({1}) can not be found in the path {2}.
```

Explanation:

The task cannot be built because the path that was specified was incorrect.

User response:

Specify the correct path.

IRU00126

```
The files required to assemble one or more deployment packages can not be
found in the path {0}.
```

Explanation:

The files required to assemble one or more deployment packages can not be found
in the path.

User response:

Specify the correct path.

IRU00127

```
Your user ID {0} either does not belong to the local Administrators group
or does not have the privileges assigned to that group. To perform the
desired task, you must either belong to the local Administrators group or
you must have the privileges assigned to that group.
```

Explanation:

The user ID that was specified either does not belong to the local administrators
group or does not have the privileges assigned to that group.

User response:

To perform the task, the user ID must either belong to the local administrators group or you must assign the correct privileges to the group to which the ID belongs.

IRU00128

A problem occurred starting the help system.

Explanation:

A problem occurred starting the help system.

User response:

IRU00301

The data port configured for the deployment wizard is not available.

Explanation:

The port specified for data communications is already being used.

User response:

Select a different port.

IRU00302

The value {0} exceeds the range {1} - {2}.

Explanation:

The value that you specified is outside of the valid range.

User response:

Specify a valid value within the range {1} - {2}.

IRU00303

The deployment wizard is configured to use port number {0} as its communication port. That port is already being used by another process.

Explanation:

The specified port number for the communication port is already being used.

User response:

Specify a different communication port number.

IRU00304

The communication port {0} is already assigned.

Explanation:

The communication port that you specified in the preferences is being used by another process.

User response:

Modify the user communication port setting to a port not in use.

IRU00308

```
Are you sure you want to exit? No changes will be saved.
```

Explanation:

The user is attempting to exit the deployment wizard during a deployment.

User response:

For information only. No action required.

IRU00824

```
The base Express Runtime product is not installed on this system.
```

Explanation:

The fix cannot be applied because the base Express Runtime product is not installed.

User response:

Install the base Express Runtime product and try installing the fix again.

IRU00826

```
This fix does not apply to the installed version of the base Integrated
Runtime product.
```

Explanation:

The version of the Express Runtime product that you have installed is not compatible with the fix you are trying to install.

User response:

Obtain the correct fix for your version of the base Express Runtime product.

IRU00829

```
The same or higher level of Express Runtime fix pack is already installed.
Click Cancel to exit the installation.
```

Explanation:

The fix cannot be applied because it or a higher version is installed.

User response:

For information only. No action required.

IRU00831

```
The following user data files are updated by this fix pack: {1} These files
are also backed up individually in their original location for quick
access.
```

Explanation:

Any user data files updated by this fix pack are listed.

User response:

For information only. No action required.

IRU00832

```
An error occurred while backing up these files: {0}. If you want to
continue you may manually back up these files, though this action is not
required.
```

Explanation:

Errors occurred while backing up a set of the files.

User response:

Manually back up the files listed.

IRU00833

```
An error occurred while backing up these files: {0}. If you want to
continue you may manually back up these files, though this action is not
required. Note: You are not able to roll back this fix pack because of this
error. Any previous rollbacks are removed.
```

Explanation:

Errors occurred while backing up all the files. If you want to continue installing the fix pack, then you will be unable to roll it back. If you have any other fix packs installed, then you will be unable to roll them back either.

User response:

Manually back up the files listed before completing the rollback.

IRU00834

```
The following files can not be rolled back because a backup error occurred
during the fix pack install: {0}. If you want to continue, you may manually
restore these files if you backed them up as suggested during the fix pack
install.
```

Explanation:

The following files can not be rolled back because a backup error occurred during the fix pack install: {0}. If you want to continue, you may manually restore these files if you backed them up as suggested during the fix pack installation.

User response:

Manually restore the files listed before continuing.

IRU00835

```
An error occurred while rolling back the fix pack. Contact support.
```

Explanation:

An error occurred during the rollback.

User response:

Contact support.

IRU00836

```
This rollback installation restores the product to the previous level, {0}.
Click Next to continue to the rollback, or click Cancel to stop the
rollback.
```

Explanation:

If you continue, your system is restored to the previous level.

User response:

For information only. No action required.

IRU00837

```
The rollback is complete.
```

Explanation:

For information only.

User response:

No action required.

IRU00838

```
You modified the following user data files since the fix pack installation.
Select the files you want to back up into a new file {0} located in the
Runtime directory. For the files that you do not select in the following
list, your changes will be lost.
```

Explanation:

These files have been modified since applying the fix pack. The files you select will be backed up before the rollback is applied.

User response:

Select the files you want to back up.

IRU00839

```
The file {0} was not found.
```

Explanation:

The rollback cannot continue because the backup file is not found.

User response:

Contact support.

IRU00840

```
The file {0} cannot be found and cannot be renamed.
```

Explanation:

The file could not be found before applying the fix pack; therefore, it was not renamed in the directory.

User response:

For information only. No action required.

IRU00841

```
The file {0} is renamed to {2} and is found in directory {1}.
```

Explanation:

This file has been renamed correctly.

User response:

For information only. No action required.

IRU00842

```
The file {0} cannot be renamed. The file might be open or corrupted, or the
directory might be unwriteable.
```

Explanation:

This file could not be renamed because it is open, corrupted, or unwriteable.

User response:

Locate the file from the zip file located in the Backup folder.

IRU00843

```
Information required for file {0} cannot be located. You can continue with
the installation of this fix pack; however, you may not be able to roll
back this fix pack or any previous fix packs installed on the system.
```

Explanation:

There is a problem locating information from the Rollback.properties file. The problem might be that the file does not exist or the file is corrupted. This file is used to perform a successful backup of any previous fix packs.

User response:

If you want to continue installing the fix pack, you run the risk of not being able to roll back the fix.

IRU00844

```
Information required for file {0} cannot be located; therefore, you cannot
roll back the fix pack. Contact support.
```

Explanation:

There appears to be a problem locating information from the file Rollback.properties. The problem might be that the file does not exist or the file is corrupted. This file is used to perform the rollback.

User response:

Contact support.

IRU02000 messages

IRU02000 messages

IRU02000

```
The first character of the drive notation must be an alphabetic character
(A-Z).
```

Explanation:

An incorrect drive notation was specified.

User response:

Specify the drive with an alphabetic character.

IRU02001

```
The second character of the drive notation must be a colon (:).
```

Explanation:

The drive notation was specified incorrectly.

User response:

Specify the drive using an alphabetic character, followed immediately by a colon.

IRU02002

The third character of the drive notation must be a backslash (\\).

Explanation:

The third character of the drive notation must be two backslashes (\\).

User response:

Include a backslash as the third character when you specify the drive notation.

IRU02003

The character {0} is not allowed.

Explanation:

User response:

IRU02004

Specify the drive and folder name, for example, c:\\Software.

Explanation:

A folder name was not specified after the drive notation.

User response:

Specify a folder name when you specify the drive.

IRU02005

The drive and path you specified contains too many characters.

Explanation:

More than 100 characters were specified for the drive, and path.

User response:

Ensure the combination of the drive and the path that you specify does not exceed 100 characters.

IRU02006

The entry {0} is not valid for {1}.

Explanation:

The value that you entered for the field {1} is not a valid value.

User response:

Enter a valid value in the field.

IRU02007

```
A required value for {0} was not found.
```

Explanation:

No value was entered for the required field {0}.

User response:

Enter a valid value for the required field.

IRU02008

```
The prefix {0} is not valid for {1}.
```

Explanation:

The value that you entered contains a substring that is not allowed.

User response:

Edit your entry to remove the invalid substring.

IRU02009

```
A required prefix for {0} was not found.
```

Explanation:

The value that you entered must begin with a specific prefix.

User response:

Enter a valid prefix and the remainder of the value for this field. See the online help for configuration.

IRU02010

```
The suffix {0} is not valid for {1}.
```

Explanation:

The value that you entered must end with a specific suffix.

User response:

Enter a value that ends with a valid suffix.

IRU02011

```
A required suffix for {0} was not found.
```

Explanation:

The value that you entered must end with a specific suffix.

User response:

Enter the value for this field and end it with a valid suffix. See the online help for configuration.

IRU02012

```
The substring {0} is not valid for {1}.
```

Explanation:

The value that you entered contains a substring that is not allowed.

User response:

Edit your entry to remove the invalid substring.

IRU02013

```
A required substring for {0} was not found.
```

Explanation:

The value that you entered must contain a specific substring for {0}.

User response:

Enter a valid value that includes the required substring.

IRU02014

```
The character {0} is not valid for {1}.
```

Explanation:

The value that you entered contains an invalid character: {0}.

User response:

Enter the value without the invalid character.

IRU02015

```
A required character for {0} was not found.
```

Explanation:

The value that you entered must contain a specific character.

User response:

Enter a valid value that includes the required character.

IRU02016

The entry for {2} is outside of the range {0} to {1}.

Explanation:

The value must be within the range {0} to {1}.

User response:

Enter a value within the specified range.

IRU02017

The entry for {2} is within the range {0} to {1}.

Explanation:

The value cannot be within the range {0} to {1}.

User response:

Enter a value outside of the specified range.

IRU02018

The selection is not valid.

Explanation:

The item selected is not valid.

User response:

Select a different item.

IRU02019

The maximum length is {0} characters.

Explanation:

The value entered exceeds the maximum length of {0}.

User response:

Enter no more than {0} characters.

IRU02020

The minimum length is {0} characters.

Explanation:

The value entered is fewer than the minimum length of {0}.

User response:

Enter at least {0} characters.

IRU02021

```
The fields do not match.
```

Explanation:

The confirm value for the password does not match.

User response:

Enter the password and confirm value again.

IRU02022

```
The solution file, {0}, does not exist or cannot be written to.
```

Explanation:

The specified file could not be found or is not writeable.

User response:

Ensure that the specified file exists and is writeable.

IRU02023

```
Incompatible variable types are attempting to share variable \"{0}\".
```

Explanation:

User response:

IRU02024

```
The following applications must be configured before this task will be
deployable: {0}. Would you like to run the deployment wizard to configure
them now?
```

Explanation:

A task cannot be deployed until all of the applications are configured.

User response:

Run the deployment wizard and configure the applications or abort the
deployment of the task.

IRU02025

```
One or more of the configuration parameters contain invalid values. Each
invalid parameter is marked with a red X. Correct the errors, and continue.
```

Explanation:

One or more of the configuration parameters contain values that are not valid. Each nonvalid parameter is marked with a red X.

User response:

Correct the errors, and continue.

IRU03000 messages

IRU03000 messages

IRU03000

```
The deployment was successful for {0}.
```

Explanation:

The software deployed successfully on the target computer.

User response:

For information only. No action required.

IRU03001

```
The deployment failed for {0}.
```

Explanation:

The software failed to deploy on the target computer.

User response:

Analyze the log file associated with the failed deployment to determine the source of the error. Try to correct the error and then try the deployment again. If the problem persists, print the log file and contact your solution provider.

IRU03002

```
The deployment wizard timed out waiting for {0} to complete deployment.
```

Explanation:

The deployment of the application exceeded the maximum timeout allowed by the staging server.

User response:

If there is an active connection and the target computer is operating normally, restart the IBM Installation Agent on the target computer and the deployment

wizard on the staging server. Try the deployment again.

If the problem persists, print the log file and contact your solution provider.

IRU03003

```
The deployment wizard could not establish a network connection with
computer {0}.
```

Explanation:

The deployment wizard could not establish a network connection with the target computer. This error could occur because the IBM Installation Agent is not installed or running on the target computer or because the computer is not currently online, powered on, or connected to the network. This error could also be encountered if the deployment wizard was terminated while deploying applications to the target computer.

User response:

Check the target computer to see if the agent is installed and running. If there is an active connection and the target computer is operating normally, restart the IBM Installation Agent on the target computer and the deployment wizard on the staging server. Try the installation again.

If the problem persists, print the log file and contact your solution provider.

IRU03004

```
The key phrases on the staging server and the target computer {0} do not
match.
```

Explanation:

The key phrases must be identical on the staging server and all target computers. The key phrase for the IBM Installation Agent on the specified target computer does not currently match that of the staging server.

User response:

Generate a new key phrase on the target computer to match that of the staging server.

IRU03005

```
There was a problem when comparing the keys on the server and client.
```

Explanation:

Before the IBM Installation Agent will accept an installation from the staging server, it verifies that there are matching security keys on both the target computer and the staging server.

User response:

Ensure the following:
- There are matching security keys on the target computer and the staging server.
- There is sufficient authority to write to the target computer.
- There is enough space on the target computer.

If the problem persists, print the log file and contact your solution provider.

IRU03006

`An error occurred on computer {0}.`

Explanation:

The deployment wizard encountered an internal error on the specified target computer.

User response:

Contact your solution provider.

IRU03007

`The deployment process was terminated.`

Explanation:

The deployment process was terminated from either the staging server or the target computer.

User response:

For information only. No action required.

IRU03008

`All RPMs are already installed.`

Explanation:

All files associated with the application are already installed.

User response:

For information only. No action required.

IRU03009

`RPM {0} is already installed.`

Explanation:

The RPM package is already installed.

User response:

For information only. No action required.

IRU03010

```
The deployment for RPM {0} is starting.
```

Explanation:

Deployment is in progress for the specified RPM package.

User response:

For information only. No action required.

IRU03011

```
The host name of the target computer cannot be resolved by the Domain Name
Server.
```

Explanation:

The host name identified for the target computer is either not correct or the Domain Name Server is down.

User response:

Verify that the host name is correct and that the <domain name> server is up and running.

IRU03012

```
The deployment wizard cannot connect to the IBM Installation Agent on the
target computer.
```

Explanation:

The deployment wizard is unable to connect to the target computer. The IBM Installation Agent might not be started or installed.

User response:

Verify that the agent is installed and running on the target computer.

IRU03013

```
The connection to computer {0} was lost.
```

Explanation:

The network connection to the target computer was lost.

User response:

Verify that both the staging server and the target computer can communicate with the network.

IRU03014

`The deployment failed.`

Explanation:

Deployment of the application did not complete successfully.

User response:

See the deployment log file for details of the problem.

IRU03015

`A data socket was created on port {0}.`

Explanation:

The data communications port was created on the specified port.

User response:

For information only. No action required.

IRU03016

`The deployment wizard is configured to use port number {0} as its data`
`port. That port is already being used by another process.`

Explanation:

You are trying to use the same port for two programs. This is not allowed by the operating system. One possible way you received this error is if you started the deployment wizard twice from the same solution only a few seconds apart. The deployment wizard in the background might seem locked; this is because the second instance of the deployment wizard starting caused an error.

User response:

Close the second instance of the deployment wizard. Or, if you need two Deployers running simultaneously, change the value for the data port and the second instance of the deployment wizard, and save the new solution with a different file name using the File -> SaveAs menu function.

IRU03017

`An internal programming error occurred.`

Explanation:

An unknown internal programming error occurred.

User response:

Contact your solution provider.

IRU03018

`The task deployment is complete.`

Explanation:

The selected task deployment has completed for this target computer.

User response:

For information only. No action required.

IRU03019

`The task deployment failed.`

Explanation:

One or more of the selected solution applications in the task failed to deploy.

User response:

Analyze the log file associated with the failed deployment to determine the source of the error. Try to correct the error and then try the deployment again. If the problem persists, print the log file and contact your solution provider.

IRU03020

`The operating system of the target computer does not match the operating system of the task.`

Explanation:

The operating system defined for this task is not the same as the operating system of the target computer.

User response:

Delete this target host name from the task.

IRU03021

`The target computer could not obtain the software from the staging server.`

Explanation:

The target computer could not obtain the necessary files from the staging server. There might be problems with the network, or there might not be enough free disk space on the target computer to receive the files.

User response:

If there is an active network connection and the target computer is operating normally, restart the IBM Installation Agent on the target computer and the deployment wizard on the staging server. Try the installation again.

Ensure that there is enough free disk space available on the target computer and try the installation again.

IRU03022

```
Deployment is in progress for {0}.
```

Explanation:

The deployment wizard has started the deployment process for the specified software.

User response:

For information only. No action required.

IRU03023

```
Deployment of {0} did not take place.
```

Explanation:

The specified application is already installed on the target computer.

User response:

The solution provider has determined that the specified application should not be installed on the target computer. This typically occurs if the application is already installed on the target computer or is not compatible with the target computer.

IRU03024

```
{0} is not an executable file.
```

Explanation:

The deployment wizard could not execute the specified command because the files associated with the software installation did not have the correct permission attributes.

User response:

Contact your solution provider.

IRU03025

```
An error occurred while unpacking the deployment package for {0}.
```

Explanation:

The deployment wizard encountered an internal error on the target computer while unpacking the deployment package for the application.

User response:

There are a number of possible reasons for this problem. Most likely, you do not have enough space on your IBM Installation Agent working directory, which is the

install location. If this is not the cause of your problem, contact your solution provider.

IRU03026

`The target computer cannot find the deployment package {0}.`

Explanation:

The deployment wizard cannot find the specified file. This file is necessary for the software installation.

User response:

Restart the deployment wizard on the staging server and IBM Installation Agent on the target computer and then start the installation again. If the problem persists, print the log file and contact your solution provider.

IRU03027

`The target computer cannot obtain the deployment package {0}.`

Explanation:

The deployment wizard encountered a network error while trying to obtain the specified file. This file is necessary for the software installation.

User response:

If there is an active connection and the target computer is operating normally, restart the IBM Installation Agent on the target computer and the deployment wizard on the staging server. Try the installation again.

If the problem persists, print the log file and contact your solution provider.

IRU03028

`The expected operating system for the target computer is {0}.`

Explanation:

Based on the task configuration, the deployment wizard expected the operating system for the computer to be the value represented by the token {0}.

User response:

For information only. No action required.

IRU03029

`The operating system of the target computer is {0}.`

Explanation:

The operating system of the target computer is {0}.

User response:

For information only. No action required.

IRU03030

`The target computer cannot obtain custom application configuration information.`

Explanation:

The target computer cannot obtain custom application configuration information.

User response:

IRU03031

`Required files could not be received or unpacked on the target computer: {0}`

Explanation:

There is insufficient room on a target computer to either receive or unpack required files.

User response:

Ensure that the target computer meets the perquisites.

IRU03032

`Deployment in progress for {0}.`

Explanation:

The deployment wizard has started the deployment process for the application.

User response:

For information only. No action required.

IRU03033

`Deployment failed for {0}.`

Explanation:

The specified application failed to deploy on the target computer.

User response:

Analyze the log file associated with the failed deployment to determine the source of the error. Try to correct the error and then retry the deployment. If the problem persists, print the log file and contact your solution provider.

IRU03034

```
{0} is already installed on the target computer.
```

Explanation:

The specified application is already installed on the target computer.

User response:

For information only. No action required.

IRU03035

```
The prerequisite {0} is not installed on the target computer.
```

Explanation:

The specified prerequisite is missing.

User response:

Install the missing prerequisite or contact your solution provider.

IRU03036

```
The required port {0} is not available.
```

Explanation:

The specified port number is currently in use by another application.

User response:

Move the application using the port to another port number and repeat the deployment.

IRU03037

```
The deployment wizard could not read file {0}.
```

Explanation:

This error occurs on the target machine when the deployment wizard is unable to read the specified file. There are several reasons this could occur. Common causes are that the file specified does not exist, or the user does not have read access to the destination.

User response:

Try the deployment again. If the problem persists, print the log file and contact your solution provider.

IRU03038

```
The deployment wizard could not update file {0}.
```

Explanation:

This error occurs on the target machine when the deployment wizard is unable to update the specified file. There are several reasons this could occur. Common causes are that the file specified does not exist, or the user does not have write access to the destination.

User response:

Try the deployment again. If the problem persists, print the log file and contact your solution provider.

IRU03039

```
The deployment wizard could not create user or group.
```

Explanation:

The deployment wizard was not able to create the user or group on the target computer.

User response:

Consult the solution provider documentation. If you are still unable to resolve the problem, contact your solution provider.

IRU03040

```
There is not enough free disk space available on {0} for installation.
```

Explanation:

The specified target directory does not have enough free space available to install this application.

User response:

Ensure that there is enough free disk space available on the drive or mount point specified and try the installation again.

IRU03041

```
The deployment wizard cannot write to path {0}.
```

Explanation:

The deployment wizard is unable to save information to the specified directory.

User response:

Ensure that the target directory is not read-only.

IRU03042

```
{0} could not be installed because {1} is already installed.
```

Explanation:

The application that you are trying to install already exists on the target computer.

User response:

For information only. No action required.

IRU03043

```
{0} requires Windows NT Service Pack {1} or higher.
```

Explanation:

The deployment wizard cannot install the specified application on the target computer because it requires Windows NT® Service Pack {1} or higher.

User response:

Upgrade the service pack on the Windows NT operating system and start the deployment again.

IRU03044

```
The Windows NT Service Pack is {0}.
```

Explanation:

The Service Pack level for the Windows NT operating system is the value represented by the token {0}.

User response:

For information only. No action required.

IRU03045

```
The deployment wizard was not able to obtain the Windows NT Service Pack
number.
```

Explanation:

The deployment wizard was unable to obtain the Windows NT service pack level from the registry.

User response:

For information only. No action required.

IRU03046

```
{0} is not installed.
```

Explanation:

The specified application is not installed on the target computer.

User response:

For information only. No action required.

IRU03047

`The Windows 2000 Service Pack is {0}.`

Explanation:

The Service Pack level for the Windows 2000 operating system is the value represented by the token {0}.

User response:

For information only. No action required.

IRU03048

`{0} requires Windows 2000 Service Pack {1} or higher.`

Explanation:

The product represented by token {0} requires Windows 2000 Service Pack level {1} or higher.

User response:

Upgrade the Windows 2000 Service Pack level and try the deployment again.

IRU03049

`The deployment wizard cannot determine the version of the Windows 2000 Service Pack installed on the target computer.`

Explanation:

The Service Pack level for the Windows 2000 operating system cannot be determined by the deployment wizard.

User response:

For information only. No action required.

IRU03050

`Successfully updated file {0}.`

Explanation:

The specified file was updated.

User response:

For information only. No action required.

IRU03051

`The specified user ID {0} and password were created successfully.`

Explanation:

The user ID and password were created.

User response:

For information only. No action required.

IRU03052

`The specified user ID {0} and password already exist on the target machine.`

Explanation:

The user ID and password already exist.

User response:

For information only. No action required.

IRU03053

`The {0} file was successfully copied to the {1} location.`

Explanation:

The specified file was copied successfully.

User response:

For information only. No action required.

IRU03054

`The {0} file could not be copied to the {1} location.`

Explanation:

The specified file was not copied.

User response:

For information only. No action required.

IRU03055

`Incorrect invocation.`

Explanation:

The invocation command entered was not valid.

User response:

Enter a valid invocation. Contact your solution provider for details.

IRU03056

`The password for user {0} is not valid.`

Explanation:

The password entered is not valid for the specified user.

User response:

Enter the valid password.

IRU03057

`There is no security key defined on the staging server.`

Explanation:

Before the IBM Installation Agent will accept an installation from the staging server, it verifies that there are matching security keys on both the target computer and the staging server. There was no security key found for the staging server.

User response:

Create a matching security key on the staging server and try the deployment again. If the problem persists, print the log file and contact your solution provider.

IRU03058

`Internet Explorer 6.0 is not installed.`

Explanation:

Internet Explorer 6.0 must be installed on the target computer.

User response:

View the log files associated with this message for a course of action or contact your solution provider.

IRU03059

`A minimum of {0} version {1} is required.`

Explanation:

You must have the application and version specified installed on the target computer.

User response:

Install the required version of the specified application or contact your solution provider.

IRU03060

Invalid Configuration File.

Explanation:

User response:

IRU03061

The deployment failed for {0}: {1}

Explanation:

The user program specified by {0} could not be executed for the reason specified in {1}.

User response:

Ensure that your user program name and location are correct. If the problem persists, contact your solution provider.

IRU03063

You are not ready to deploy. Please go back and ensure all previous steps have been completed

Explanation:

You are not ready to deploy the task.

User response:

Ensure that you have completed all previous steps before deploying the task.

IRU03064

The IBM Installation Agent on the target computer is not responding. The deployment was terminated.

Explanation:

The IBM Installation Agent on the target computer has been stopped or was never started. The deployment must terminate.

User response:

Restart the agent on the target computer, or reboot the target computer, and attempt the deployment again.

IRU03065

Security keys do not exist on the target computer {0}

Explanation:

The security keys do not exist on the target computer. Either they were never created, or they were deleted because of multiple failed authentication attempts on the IBM Installation Agent.

User response:

Create the security keys on the target computer using the Key Manager utility.

IRU03066

```
{0} is already installed on the target computer.
```

Explanation:

The specified application is already installed on the target computer.

User response:

For information only. No action required.

IRU03070

```
Required files could not be received or unpacked on the target computer:
{0}
```

Explanation:

The required files could not be received or unpacked on the target computer.

User response:

IRU03071

```
The .ser file you selected is invalid.
```

Explanation:

You see this message when you open either an application.ser file, or some other file that ends in .ser. Also, this message is displayed when you attempt to open a non-PPA solution with a PPA version of the deployment wizard..

User response:

Ensure that the .ser file you select to open in the deployment wizard is valid.

IRU04000 messages

IRU04000 messages

IRU04001

```
The software size must be greater than 0 and cannot contain decimal values.
```

Explanation:

The software size must be greater than 0 and cannot contain decimal values.

User response:

Specify a valid software size.

IRU04002

`The root directory you specified does not exist.`

Explanation:

The root directory you specified does not exist.

User response:

Specify a valid root directory.

IRU04004

`{0} is not a valid file.`

Explanation:

The specified file is not valid.

User response:

Specify a valid file name.

IRU04005

`The specified deployment package name is already in use by the {0} custom software.`

Explanation:

The specified deployment package name is already in use by the custom software.

User response:

Specify a unique name for the deployment package.

IRU04007

`If you choose logfile as the response method, all input fields are required.`

Explanation:

If you choose logfile as the response method, all input fields are required.

User response:

Either specify values for all input fields or choose a response method other than logfile.

IRU04009

`The custom software was not added because an error occurred.`

Explanation:

The custom software was not added because an error occurred.

User response:

Provide the message output to the IBM Support Center representative.

IRU04010

`The configuration being opened contains the following custom software whose resources are not available: {0}. Do you want to remove the custom software from your configuration?`

Explanation:

The configuration being opened contains the following custom software whose resources are not available.

User response:

IRU04011

`There was an error loading the following custom software: {0}.`

Explanation:

There was an error loading the specified custom software.

User response:

Contact your solution provider.

IRU04013

`The file name field cannot be empty.`

Explanation:

This is an error message that is displayed on the Diagnostic Trace Settings panel when the user tries to enter an empty trace file name.

User response:

Provide a name in the Name field.

IRU04014

```
The {0} cannot contain a {1}
```

Explanation:

This is used as an error message that is displayed on the Diagnostic Trace Settings panel or the command line when the user enters an invalid character for a file name. {0} is the file and {1} is the invalid character.

User response:

The file name contains an invalid character. Do not use special characters in file names.

IRU04015

```
{0} is an invalid file size.
```

Explanation:

This message is displayed in the command line when the user enters a non-integer maximum file size for either trace file.

User response:

Use a whole number for a file size.

IRU04016

```
The trace log has exceeded its maximum size. No additional trace
information will be logged.
```

Explanation:

This message is logged when either trace file exceeds its set maxiumum size.

User response:

Enter a larger maximum file size for the trace log and deploy the solution again.

IRU04017

```
The number of arguments specified is not valid.
```

Explanation:

The number of arguments specified is not valid.

User response:

Specify the correct number of arguments.

IRU04018

```
The value specified for the solution {0} is not valid.
```

Explanation:

The value specified for the solution is not valid.

User response:

Specify a valid value for the solution.

IRU04019

The value specified for the target solution {0} is not valid.

Explanation:

The value specified for the target solution is not valid.

User response:

Specify a valid value for the target solution.

IRU04020

The value specified for the configuration file {0} is not valid.

Explanation:

The value specified for the configuration file is not valid.

User response:

Specify a valid value for the configuration file.

IRU04021

An unexpected error occurred during migration.

Explanation:

An unexpected error occurred during migration.

User response:

Contact your solution provider.

IRU04022

The value specified for the configuration key {0} is not valid.

Explanation:

The value specified for the configuration key is not valid.

User response:

Specify a valid value for the configuration key.

IRU04023

```
The configuration file format is not valid.
```

Explanation:

The configuration file format is not valid.

User response:

Specify a valid configuration file format.

IRU04024

```
The group {0} was not migrated because the operating system {1} is not
supported in the target solution.
```

Explanation:

The group was not migrated because the operating system is not supported in the target solution.

User response:

Contact your solution provider.

IRU04025

```
The group {0} was not migrated because the language {1} is not supported in
the target solution.
```

Explanation:

The group was not migrated because the language is not supported in the target solution.

User response:

Choose another language to migrate the target solution. If the problem persists, Contact your solution provider.

IRU04026

```
The product {0} was not migrated for the group {1} because it is not
supported in the target solution.
```

Explanation:

The product was not migrated for the group because it is not supported in the target solution.

User response:

Contact your solution provider.

IRU04027

The product {0} was not migrated for the computer {1} because it is not supported in the target solution.

Explanation:

The product was not migrated because it is not supported in the target solution.

User response:

Contact your solution provider.

IRU04028

An error occurred setting the SBSSolution flag.

Explanation:

An error occurred setting the SBSSolution flag.

User response:

Contact your solution provider.

IRU04029

The group {0} contains the following computers: {1}.

Explanation:

The group contains the computers in the message.

User response:

This is an informational message. No action is required.

IRU05000 messages

This chapter lists the messages generated by the console. You can use the information in this chapter to identify and resolve an error using the appropriate recovery action. You can also use this information to understand where messages are generated and logged.

The user responses for several messages suggest that you print the log file before calling your service provider.

Message identifiers consist of a three-character message prefix followed by a five-digit message number. Tokens, such as {0}, {1}, and so on, are used in many messages. These tokens represent computer names, application names, files names, or directory names. The appropriate value is substituted for the token when the message is displayed.

IRU05000

Failed: Incorrect user ID or password

Explanation:

An authentication failed due to either incorrect user ID or password.

User response:

Enter the correct user ID and password.

IRU05001

`Failed: Select a resource before clicking Edit or Test connection.`

Explanation:

A resource was not selected on which to perform the function.

User response:

Select a resource and relaunch the task.

IRU05002

`Failed: Select only one resource before clicking Edit.`

Explanation:

Multiple instances were selected to edit simultaneously.

User response:

Select one resource at a time.

IRU05003

`Specify a server.`

Explanation:

A valid server was not specified in order to perform the task.

User Response:

Provide a valid server.

IRU05004

`Specify a port.`

Explanation:

A valid port number was not specified in order to perform the task.

User response:

Provide a valid port number.

IRU05005

`Specify a console agent port.`

Explanation:

A valid console agent port number was not specified in order to perform the task.

User response:

Provide a valid console agent port.

IRU05006

`Could not connect to server.`

Explanation:

The Express Runtime console could not connect to specified server.

User response:

Check the error logs and the troubleshooting section of the Express Runtime Information Center to find more details on how to resolve this problem.

IRU05007

`The requested function is not available for this resource.`

Explanation:

You cannot perform this task using the selected resource.

User response:

Choose an appropriate task for the selected resource.

IRU05008

`The specified component node is null.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05009

`Select at least one component from the table.`

Explanation:

No component was selected from the table to perform the task.

User response:

Select at least one component in the table for the task.

IRU05010

`Provide a title before clicking Add.`

Explanation:

A title was not provided.

User response:

Provide a title before clicking **add**.

IRU05011

`The requested action was canceled by the user.`

Explanation:

The task was canceled before it could be completed.

User response:

Run the task again.

IRU05012

`Could not connect to the console agent.`

Explanation:

The Express Runtime console could not connect to the console agent.

User response:

Consult the troubleshooting section of the Express Runtime console Information Center to get details on how to solve this problem.

IRU05013

`Could not find any instances for component {0}.`

Explanation:

The Express Runtime console could not find any instances for the specified component.

User response:

Consult the troubleshooting section in the Express Runtime Information Center for details to solve this problem.

IRU05014

One or more thresholds were modified to ensure consistency.

Explanation:

The Express Runtime console had to modify one or more thresholds to maintain consistency.

User response:

This is an informational message. No action is necessary.

IRU05016

The specified title, {0}, already exists. Select a different title.

Explanation:

A title was selected that already exists.

User response:

Select a new title.

IRU05017

The certificate verification for the following server, {0}, at agent port, {1}, failed.

Explanation:

The certificate was not accepted by the server.

User response:

Ensure that you have updated your certificate.

IRU05019

The user has been locked out of the agent.

Explanation:

An attempt was made to log in to the console agent too many times. As a security measure, the agent has locked the user out for a specified amount of time.

User response:

Consult the troubleshooting section of the Express Runtime Information Center to find more information on how to solve this problem.

IRU05020

One or more components were deleted while you were working with this group.

Explanation:

One of the components in a component group you are actively working with has been removed.

User response:

Close the task and reopen it; the revised component list will not include the component that caused the error.

IRU05021

```
The specified server information, {0}, already exists. Please verify your
server information.
```

Explanation:

You have specified a server which is already defined.

User response:

Specify a different server and perform the operation again.

IRU05022

```
Error reading {0} from {1}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05023

```
Failed: User ID does not have sufficient authority to perform the requested
operation.
```

Explanation:

You are not authorized to perform the operation.

User response:

Log on with the proper authorization and perform the operation.

IRU05024

```
Could not connect to the following server, {0} at agent port, {1}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05030

`Method entry`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05031

`Method exit`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05032

`An exception has occurred: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05033

`Error creating/invoking UserTaskManager.`

Explanation:

There was an error launching the portlet.

User response:

Provide the message output to the IBM Support Center representative.

IRU05034

`Cannot set portlet help URL link because one of the following is null:`
`server is {0}; helpport is {1}; path to file is {2}.`

Explanation:

There was an error creating the help link for the portlet.

User response:

Provide the message output to the IBM Support Center representative.

IRU05035

```
Help URL is null; cannot append more detailed message.
```

Explanation:

There was an error while creating the More Details link. The detailed message cannot be appended to the help file.

User response:

Provide the message output to the IBM Support Center representative.

IRU05036

```
Context: {0}
```

Explanation:

There was a problem working with the context.

User response:

Provide the message output to the IBM Support Center representative.

IRU05037

```
Error handling: {0}
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05040

```
Error restarting adapter: {0}
```

Explanation:

There was an error while reloading a portlet.

User response:

Provide the message output to the IBM Support Center representative.

IRU05041

`User ID is null.`

Explanation:

There was an error while retrieving the application adapter for the portlet.

User response:

Provide the message output to the IBM Support Center representative.

IRU05042

`Error launching page`

Explanation:

A request to launch a missing or nonvalid page was processed.

User response:

Provide the message output to the IBM Support Center representative.

IRU05043

`Error closing page`

Explanation:

There was an error while trying to close a page.

User response:

Provide the message output to the IBM Support Center representative.

IRU05044

`Error sending message`

Explanation:

There was an error while trying to send a queued message request to a portlet.

User response:

Provide the message output to the IBM Support Center representative.

IRU05045

`An error occurred while trying to read configuration data.`

Explanation:

There was an error while attempting to work with Java preferences.

User response:

Provide the message output to the IBM Support Center representative.

IRU05046

An error occurred while trying to create a component.

Explanation:

An error occurred while trying to create a component.

User response:

Provide the message output to the IBM Support Center representative.

IRU05047

A component with an unknown type was passed: component name = {0}; component type = {1}.

Explanation:

A component other than a Web server, an application server, or a database is being used.

User response:

Provide the message output to the IBM Support Center representative.

IRU05049

Attempted to edit with a null key value.

Explanation:

There is a problem with the selected item and it can not be edited.

User response:

Provide the message output to the IBM Support Center representative.

IRU05050

Invalid argument: {0}

Explanation:

An nonvalid argument was passed to a method.

User response:

Provide the message output to the IBM Support Center representative.

IRU05051

Unexpected value, {0}, received for the following object: {1}.

Explanation:

An incorrect trace value was parsed from the console agent properties.

User response:

Check the console agent properties file to ensure the trace value is set properly.

IRU05100

```
Missing a value for the following key: {0}; cannot execute command.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05101

```
The directory name provided ({0}) is not a proper directory.
```

Explanation:

The Express Console agent can not access the specified remote directory. This problem occurs most commonly because the console agent has been configured incorrectly. The task can not be completed.

User response:

Some configuration errors can be corrected by reinstalling the management extension that is related to the task you are running. For example, if you are accessing the **Servers->HTTP Servers->Details** dialog, this error message occurs, and reinstalling the HTTP management extension might correct the problem. In other cases, contact the IBM Support Center.

IRU05102

```
Unable to retrieve contents of the following directory: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05103

```
Incorrect password
```

Explanation:

A valid user ID and password combination are needed for this administration task.

User response:

Use the following table to determine what type of user ID and password combination is needed:

Table 34.

Management extension	Operating system	User ID and password type
IBM HTTP Server	All windows platforms	Any valid operating system user ID and password with administration authority
IBM HTTP Server	All Linux platforms	Any valid operating system user ID and password with root authority
IBM HTTP Server	OS/400	Any valid operating system user ID and password that has *IOSYSCFG authority
WebSphere Application Server – Express	All windows platforms	The user ID and password used to secure the WebSphere Application Server – Express server
WebSphere Application Server – Express	All Linux platforms	The user ID and password used to secure the WebSphere Application Server – Express server
WebSphere Application Server – Express	OS/400	Any valid operating system user ID and password that has *IOSYSCFG and *ALLOBJ authority
DB2 UDB Express	All windows platforms	Any valid DB2 admin user ID and password
DB2 UDB Express	All Linux platforms	Any valid DB2 admin user ID and password
DB2 UDB Express	OS/400	Any valid operating system user ID and password that has DB2 admin authority

IRU05104

`Could not retrieve the correct logger in order to set the trace levels.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05105

`Could not read the Windows registry.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05106

```
Unsupported callback type
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05107

```
Error retrieving CPU usage.
```

Explanation:

The console agent has encountered an error while monitoring the CPU usage of one or more of the Express Runtime software components . The system health indicator and associated performance graphs are available.

User response:

Provide the message output to the IBM Support Center representative.

IRU05108

```
Starting the console agent server.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05109

```
Stopping the Console Agent Server.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05110

```
Remote client {0} has been added to the warning list.
```

Explanation:

A remote user tried to access the console agent, but the access failed. This occurs most commonly because an incorrect user ID or password was given. This error can also occur if an incomplete or partial request was received.

User response:

Usually this error occurs because a user has forgotten a user ID and password combination. However, if multiple failed attempts from the same remote user continue to occur, this could be an attempt to break into the system. If you believe that there is an attempted breakin, contact your security representative.

IRU05111

```
Remote client {0} has been exiled due to too many consecutive warnings. The
client will be unable to access the server for 1 hour.
```

Explanation:

A remote user has repeatedly failed to enter the correct user ID and password combination. Most likely, this error occurred because someone is trying to break into the system by guessing user ID and password pairs. To aid in the prevention of this hacking technique, the remote user will automatically be locked out of the system for one hour.

User response:

Take appropriate steps to determine the origin of the erroneous requests. You should also take necessary steps to protect or shutdown the server until the cause of erroneous requests can be resolved.

IRU05112

```
Remote client {0} has accessed the server. The remote client was previously
exiled from the server.
```

Explanation:

This message can occur after a user has been locked out of the system (exiled) for some period of time. The original login problem was resolved and the remote user then logged in with the correct user ID and password. This message can also occur if the hacking technique of guessing user ID and password pairs is left unchecked and the hacker eventually guessed the correct user ID and password combination.

User response:

Inspect the security logs on the target system and investigate the cause of the problem.

IRU05113

```
Remote client {0} attempted to access the server. The remote client is
exiled from the server.
```

Explanation:

A remote user has repeatedly failed to enter the correct user ID and password combination. Most likely, this error occurred because someone is trying to hack into the system by guessing user ID and password pairs. To aid in the prevention of this hacking technique, the remote user has been automatically locked out of the system for one hour. Duning the lockout period, the user is continuing to attempt to access the server but the request is being ignored.

User response:

Take appropriate steps to determine the origin of the erroneous requests. Also take necessary steps to protect or shutdown the server until the cause of erroneous requests can be resolved.

IRU05114

```
Remote client {0} issued an unknown server command. This command did not
originate from the IBM Express Runtime console.
```

Explanation:

Erroneous or poorly formatted requests to the console agent are ignored, and most likely did not originate from the IBM Express Runtime console. Repeated requests can be a sign of an attempt to hack into the system.

User response:

Take appropriate steps to determine the origin of the erroneous requests.

IRU05115

```
User {0} on remote client {1} accessed IBM HTTP Server instance {2} by
browsing folder: {3}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05116

```
User {0} on remote client {1} accessed IBM HTTP Server instance {2} by
viewing log file: {3}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05117

User {0} on remote client {1} accessed IBM HTTP Server instance {2} by changing the log settings.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05118

User {0} on remote client {1} accessed IBM HTTP Server instance {2} by issuing the command: {3}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05119

User {0} on remote client {1} accessed IBM HTTP Server instance {2} by querying the state of the server.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05120

User {0} on remote client {1} accessed WebSphere Application Server instance {2} by issuing the command: {3}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05121

```
User {0} on remote client {1} accessed WebSphere Application Server
instance {2} by querying the state of the server.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05122

```
User {0} on remote client {1} queried traceLevel settings.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05123

```
User {0} on remote client {1} set traceLevel settings.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05124

```
User has been locked out of the system.
```

Explanation:

A remote user has repeatedly failed to enter the correct user ID and password combination. Most likely, this error occurred because someone is trying to hack into the system by guessing user ID and password pairs. To aid in the prevention of this hacking technique, the remote user will automatically be locked out of the system for one hour.

User response:

Take appropriate steps to determine the origin of the erroneous requests. You should also take necessary steps to protect or shutdown the server until the cause of erroneous requests can be resolved.

IRU05125

```
Could not find server instance.
```

Explanation:

The instance of the IBM HTTP Server that you are attempting to administer cannot be found. Most likely this error occurred due to an incorrect console agent configuration or an incorrect installation of the IBM HTTP Server.

User response:

If the problem persists, reinstall the HTTP management extension, or reinstall the IBM HTTP Server. If the problem persists, contact the IBM Support Center.

IRU05126

```
Invalid Port: {0}
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05127

```
Could not find the Apache service name for configuration file {0}.
```

Explanation:

The console agent can only start and stop instances of IBM HTTP Server that are configured as a Windows service. There was not a Windows service entry corresponding to the requested IBM HTTP Server instance.

User response:

Configure the IBM HTTP Server instance to be a Windows Service. See IBM HTTP Server documentation.

IRU05128

```
IBM HTTP Server instance {0} could not be found.
```

Explanation:

The instance of the IBM HTTP Server you are attempting to administer cannot be found. Most likely this error occurred due to an incorrect console agent configuration or an incorrect installation of the IBM HTTP Server.

User response:

You might need to reinstall the HTTP management extension, or reinstall the IBM HTTP Server. If the problem persists, contact the IBM Support Center.

IRU05129

`The page you requested is not supported.`

Explanation:

The console agent does not support the request made by the Express Runtime console.

User response:

No action is required; the function is not supported by this operating system.

IRU05130

`The specified WebSphere Application Server port ({0}) could not be found.`

Explanation:

To administer the WebSphere Application Server, the administrative console port must be specified. The default port is 9080, but can be changed during installation.

User response:

Ensure that the port number that was entered corresponds to the administrative console port. To change the port click **Add / remove servers**. Select the server name from the server list and click **Edit**. Type in the new administrative console port number and click **Apply**. You can test the new value by clicking **Test connection**.

IRU05131

`The console agent is not configured to manage WebSphere Application Servers.`

Explanation:

The console agent is not configured to manage WebSphere Application Server – Express servers.

User response:

If WebSphere Application Server – Express is installed on this system and you want to manage the system, install the WebSphere Application Server – Express management extensions.

IRU05132

`The console agent is not configured to manage IBM HTTP Server instances.`

Explanation:

The console agent is not configured to manage IBM HTTP Server instances.

User response:

If the IBM HTTP Server is installed on this system and you want to manage the server, install the IBM HTTP Server management extensions.

IRU05140

```
New server listener created: server IP address={0} server port={1}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05141

```
Cannot find file: {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05142

```
Added new command: {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05143

```
Entered the ServiceMain() method.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05144

```
Start server control signal detected.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05145

```
Server started successfully.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05146

```
Server is shutting down.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05147

```
Server did not start successfully.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05148

```
Stop server control signal detected.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05149

```
Checking server PID: exists={0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05150

```
Server listener stopped.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05151

```
New remote connection detected and created. Starting new thread for
connection.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05152

```
Request body: <start>{0}<end>
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05153

```
Response body: <start>{0}<end>
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05154

Request header: <start>{0}<end>

Explanation:

This is an informational message.

User response:

No action is required.

IRU05155

Request header key={0} value={1}

Explanation:

This is an informational message.

User response:

No action is required.

IRU05156

Response header: <start>{0}<end>

Explanation:

This is an informational message.

User response:

No action is required.

IRU05157

Found command in request URI: {0}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05158

Found keys in request: {0}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05159

```
Starting execution of command: {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05160

```
Type of OS: {0}
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05161

```
Mapping virtual name: {0} to configuration file: {1}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05162

```
Loading configuration file: {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05163

No server instance found. Setting to default instance: {0}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05164

Cookies for execute command: {0}

Explanation:

This is an informational message.

User response:

No action is required.

IRU05165

Keys for execute command: {0}

Explanation:

This is an informational message.

User response:

No action is required.

IRU05166

Found serivceName mapping for configuration file: {0} to service: {1}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05167

About to execute command: <start>{0}<end>.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05168

Output of command: <start>{0}<end>

Explanation:

This is an informational message.

User response:

No action is required.

IRU05169

Found HTTP Service for serviceName: {0}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05170

Arguments for the service are: {0}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05171

Adding service mapping for confFile: {0} to serviceName {1}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05172

Looking for process ID for server instance: {0} at {1}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU05173

```
Looking for log file at {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05174

```
Verifying log file {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05175

```
Client locale: {0}
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05176

```
User is set to: {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05177

```
No persistent agents declared.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05178

```
Stopping persistent agent: {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05179

```
Configuration file {0} failed verification. It will not be added to the
list of available servers.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05180

```
Server Started on {0}, port: {1}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05181

```
Pluggable authentication module error: {0}
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05182

```
Error while decoding URL: {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05183

```
Unable to keep up with polling interval: {0} ms.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05184

```
Invalid process ID: {0}
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05185

```
Error getting children for process ID: {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05200

```
Server data entered is not incorrect: server= {0} port={1} agent port={2}.
```

Explanation:

You entered incorrect data for either the WebSphere Application Server – Express server host name, the WebSphere Application Server – Express console port, or the console agent port, while trying to configure the server.

User response:

The user should verify the data entered in the Add/remove portlet is correct. The fields should not be left blank.

IRU05201

```
Could not find portlet instance data; returning default URL: portlet
instance ID:{0} user ID:{1} user key: {2}.
```

Explanation:

The necessary information needed to build the URL for the Websphere Application Systems console task is missing. The default URL will be used.

User response:

Provide the message output to your service representative.

IRU05202

```
No task was defined; using a default URL.
```

Explanation:

The specific Websphere Application Server console task data is not defined. The task URL cannot be built without the data; the default URL is being used.

User response:

Provide the message output to the IBM Support Center representative.

IRU05203

```
The current user is already in the hash table.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05204

```
The current user is not in the hash table; creating a new one.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU05205

`No portal user defined; cannot continue.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05206

`Unable to log out from server {0}.`

Explanation:

The logout request to the specified Websphere Application Server was not successful. There is chance that user was not completely logged out of the server. The user may have a login conflict on the next login to the server.

User response:

Check the error logs and the trouble shooting section for more details. Provide the message output to the IBM Support Center representative.

IRU05207

`Could log out since an exception ocurred: {0}. The URL for logout was {1}.`

Explanation:

The logout request to the Websphere Application Server server threw an exception. There is chance that user was not completely logged out of the server. The user may have a login conflict on the next login to the server.

User response:

Check the error logs and the trouble shooting section for more details. Provide the message output to the IBM Support Center representative.

IRU05208

`User key is null; could not log out.`

Explanation:

The necessary user information needed for the logout request for a Websphere Application Server is missing. The user was not logged out of the server. The user may have a login conflict on the next login to the server.

User response:

Check the error logs and the trouble shooting section for more details. Provide the message output to the IBM Support Center representative.

IRU05209

```
Server is null; did not attempt to log out.
```

Explanation:

The necessary server information needed for the logout request for a Websphere Application Server is missing. The user was not logged out of the server. The user may have a login conflict on the next login to the server.

User response:

Check the error logs and the trouble shooting section for more details. Provide the message output to the IBM Support Center representative.

IRU05210

```
Could not log out since user {0} does not exist in list.
```

Explanation:

The Express Runtime console's Websphere Application Server management extension could not log out the specified user, since the user was not found in the list. The user may have a login conflict on the next login to the server.

User response:

Check the error logs and the troubleshooting section for more details. Provide the message output to the IBM Support Center representative.

IRU05211

```
Could not log out since userkey was missing.
```

Explanation:

The Express Runtime console's Websphere Application Server management extension could not log out the user, since the data needed to determine the user is missing. The user may have a login conflict on the next login to the server.

User response:

Check the error logs and the trouble shooting section for more details. Provide the message output to the IBM Support Center representative.

IRU05212

```
Exception occurred while cleaning out workspace.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05213

`Could not connect to server, since the port provided is not a HTTP port.`

Explanation:

The connection to the server could not be established, since the Websphere Application Server administrative port provided is not a valid HTTP port. Most likely the port provided is the HTTPS port.

User response:

Ensure that the administrative port provided is a valid HTTP port. If it is not, modify the configuration for the server. Check the troubleshooting section for more details, including how to determine the administrative HTTP port.

IRU05214

`Could not connect to server because of unexpected return code: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05215

`Exception occured during redirect. The message is: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05230

`Server={0}, port={1}`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05231

The list of visited servers is: {0}. The list size is {1}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05232

The active state is {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05233

The parameter list from the portlet XML is {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05234

Trying to log out from server {0}, using this URL: {1}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05235

Adding a close request for the following page: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05236

Does the user need to be prompted for a profile conflict: {0}?

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05237

Do we have a profile conflict: {0}?

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05238

Was the instance removed sucessfully: {0}?

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05239

Trying to remove the following instance: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05240

The parameter list, after parsing, is: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05260

```
The referrer value from {1} is {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05261

```
The session ID is {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05262

```
The request URL is {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05263

```
Name={0}, value={1}
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05264

Information in the task data is: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05265

The session is already invalidated; cannot log out. The following exception occured: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05266

The action command is: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05267

The login action was successful.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05268

The action going forward is: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05269

Treating request as a new task launched from Integrated Solutions Console.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05270

The redirect URL is the new value with WebSphere Application Server
parameters: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05271

Found existing key {0}, with value: {1}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05272

Treating request as a refresh from Integrated Solutions Console.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05273

The user mapped to session list is: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05274

The application server user from session is: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05275

The workspace is: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05276

Changes not found; clearing workspace.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05277

Changes found; not clearing workspace.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05278

No matches found in the hash table to track portlets.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05279

The referrer matches with a value in the hash; the matching key is {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05280

The stored task data for the key, {0}, is: {1}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05281

Treating request as normal processing and continuing to save the drill-down information.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05282

Treating request as a redirect URL.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05283

`The unique portlet key/ID is {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05284

`The full URL to store is {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05285

`The session is not associated with Integrated Solutions Console.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05286

`Adding user key {0} to the user mapped to session list.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05287

`The value of the previous task key is: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05288

```
Starting filter {0} processing.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05289

```
Finishing filter {0} processing.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05290

```
The session has been invalidated.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05291

```
The state of the session according to the server is: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05292

`The session ID to state list is: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05300

`Base administration page is {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05301

`Error in processing the DOM: {0}`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05302

`Node name: {0}`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05303

`In prompt user - Panel={0} UTM={1}`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05305

```
The SSL certificate dialog is about to be displayed to the user. The dialog
will be nonmodal.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05306

```
The SSL certificate dialog has been displayed to the user. The dialog is
nonmodal.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05307

```
The SSL certificate dialog is about to be displayed to the user. The dialog
will be modal.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05308

```
The SSL certificate dialog has been displayed to the user. The dialog was
modal.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05309

`SSL certificate was accepted.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05310

`SSL certificate was not accepted.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05311

`The command is null.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05312

`The following command is {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05313

`There are no error messages to display.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05314

`Displaying the following messages: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05315

`There are no items to remove.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05316

`The number of items to remove is {0}. The items are {1}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05317

`Removing context from hash, since the selected context was set to null.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05318

`Sending message with the following context: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05319

```
Retrieving the following context for the hash: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05320

```
The URL is {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05321

```
Did not find the last selected context; looking for a persistent context.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05322

```
Found the following persistent context: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05323

The help URL is {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05324

Returning since no change found in context list.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05325

Could not find context in list.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05326

Context is null or empty.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05327

TrustManager={0} Size={1}

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05328

```
Received an Integrated Solutions Console save context action. Saving the
context.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05329

```
Sending the context as the message.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05330

```
The action was handled by sendContextAsMessage. It is returning without
calling super.actionPerformed.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05332

```
Object {0} has a null value.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05333

```
The action {0} is being passed to the superclass for handling.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05334

```
Key={0} Value={1}
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05335

```
The read line is: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05336

```
Adding cookie: key={0}, value={1}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05337

```
String buffer is: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05338

`Setting cookies [{0}].`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05339

`Opening connection: sUrl={0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05340

`Working with key {0} value {1} pair.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05341

`Did not find a message; returning false.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05342

`Removing the message from context.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05343

`Returning since persistedContext = {0} or userName = {1}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05344

`Object {0} is either null, empty, has a size of 0, or has nothing left to iterate through.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05345

`Sending the new context to {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05346

`Creating credentials with session ID(uo) {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05347

`Found user ID {0} for resource {1}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05348

Deleting the credentials for the following resource: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05349

Creating the following credential slot ID: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05350

Updating the following credential slot id: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05351

Retrieving the credentials with resource {0} and session ID {1}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05352

`Attempting to start a server.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05353

`Attempting to stop a server.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05354

`IBM Express Runtime, Version {0} build:{1} component:{2}`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05355

`Attempting to use multi-threaded certificate check.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05356

`UserTaskManager is null or could not be found.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05357

```
Starting isAlive() for: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05358

```
The result for isAlive() is: {0} = {1}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05406

```
The selected IBM HTTP Server instance is : {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05407

```
The IBM HTTP Server instance list is null.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05408

```
New node created with ID: {0} and display name: {1}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05409

```
The selected tree node is: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05410

```
The status for IBM HTTP Server {0} is {1}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05411

```
The console agent URL is : {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05412

```
The process ID value of the IBM HTTP Server being administered is: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05413

The fully qualified PID value of IBM HTTP Server being administered is:
{0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05414

The log settings level is: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05415

The host name lookup status is: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05416

The cookie status tracking is : {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05417

The root node is: {0}.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05418

```
The node is : {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05419

```
The string to be parsed is : {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05420

```
The node value is : {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05421

```
Attributes: [ {0} ]
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05422

```
The children of the node are {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05800

`Error getting dispatcher or service request.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05801

`Null value found for asyncBackup.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05802

`Null value found for resultsUtm.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05803

`Authentication failed for {0}.`

Explanation:

This message indicates that there was a failure in authentication.

User response:

Ensure that the correct authentication credentials are entered and try again.

IRU05804

`Login attempt to {0} by {1}.`

Explanation:

This message contains security audit information.

User response:

No action is required.

IRU05805

`Get database list for server {0}; the instance is {1}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05806

`Could not retrieve the list of databases.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05807

`AppAdapter or UTM is null; cannot refresh.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05808

`Method getDirectory - getDirectoryList failed.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05809

`Method getName returned null for {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05810

`Error parsing time {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05811

`Failed to load JDBC driver.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05812

`JDBC connection requires valid database remote name: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05813

`JDBC connection URL:`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05814

```
JDBC driver metadata:
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05815

```
Failed to establish JDBC connection: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05816

```
JDBC connection was closed successfuly.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05817

```
Failed to close JDBC connection.
```

Explanation:

This message contains information for use by service.

User response:

Provide the message output to your service representative.

IRU05818

`Failed to retrieve AdminClient: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05819

`Failed to invoke MBean: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05820

`Failed to find MBean: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05821

`Failed to retrieve user message for SQL code: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05822

`DASFileSystemService failed during the DAS API call: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05823

`Catalog`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05824

`Database catalog requires a valid context file: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05825

`Current catalog entries: {0}`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05826

`Database key not found: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05827

`DB2Alert requires valid arguments: ID, timestamp.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05828

```
Failed JDBC call: {0}
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05829

```
Failed to recover DB2 port: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05830

```
DB2Database requires valid arguments: alias, name, hostname, instanceName,
db2portNumber, jmxPortNumber, and version.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05831

```
DB2Database requires valid DB2 port: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05832

`DB2Database requires valid argument: jmxPortNumber: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05833

`Failed DAS execution SQL code check: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05834

`Instance db2start command failed and returned {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05835

`Instance db2start command succeeded and returned {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05836

`Instance db2stop command failed and returned {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05837

```
Instance db2stop command succeeded and returned {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05838

```
Instance ATTACH command failed and returned {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05839

```
Instance ATTACH command succeeded and returned {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05840

```
Database not available due to: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05841

```
Implemented in the connector through a call to TableUDF: SNAPSHOT_DATABASE.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05842

```
Database backup requires valid: instanceName, dbName, userID, passwd, path.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05843

```
Failed to set up success code sets: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05844

```
DAS execution failed and backup script returned {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05845

```
Database backup command failed and returned {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05846

`Database backup succeeded and returned {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05847

`Admin command failed and returned {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05848

`Admin command failed unexpectedly: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05849

`Asynchronous command to be executed in less than {0} seconds.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05850

`Command execution did not finish after {0} seconds.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05851

```
Command execution failed.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05852

```
Command execution failed unexpectedly.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05853

```
Failed to retrieve DATABASES from DB2 Server: [{0}] with error code: [{1}]
due to SQL error: [{2}].
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05854

```
Failed to retrieve database configuration: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05855

```
Retrieved [{0}] from [{1}] discovered databases on host: [{2}].
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05856

```
Failed to retrieve databases for TCPIP node: [{0}] from DB2 Server: [{1}]
with error code: {2}] - SQL error: [{3}].
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05857

```
DB2 node found: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05858

```
Stored procedure call: {0}
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05859

```
SQLCAMessage SP execution failed with error code {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05860

```
Failed to retrieve error message.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05861

```
Failed during the SP call: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05862

```
DB2 udfStmt: {0}
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05863

```
Failed during the UDF call: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05864

```
Retrieved: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05865

```
Failed to build query: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05866

```
Failed to query MBeanServer: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05867

```
Failed to find MBeanServer for: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05868

```
Failed to contact JMX on port {0}: {1}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05869

```
Failed to contact JMX on port {0}/{1}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05870

```
Instance (node) state: {0}
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05871

```
DB2 management services initialization
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05872

```
Retrieve DB2 Services configuration file.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05873

```
Failed to load configuration file: [{0}] due to: {1}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05874

```
Failed to access configuration file [{0}] due to: {1}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05875

```
Erroneous DB2 services configuration: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05876

```
Logger configuration type: {0}
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05877

```
Initialized DB2 common trace: [{0}].
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05878

```
Failed to open/write trace file: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05879

```
Failed to initialize DB2 common trace: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05880

```
Asynchronous execution response delay: {0} seconds
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05881

```
DB2 management services registered: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05882

```
Failed to register [{0}] due to: {1}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05883

```
Attempting to load [db2srvapi] shared library.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05884

```
Failed to load [db2srvapi] shared library: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05885

```
Successfuly loaded [db2srvapi] shared library.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05886

```
Error code is expected to be an integer: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05887

```
DB2ServiceDispatcher requires a valid context: {0}.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05888

`Found in catalog database: {0}`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05889

`User response: {0}`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05890

`Failed to retrieve platform; unsupported type: {0}.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05891

`DB2Database requires valid arguments: locale, dbAlias, userID, passwd.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU05900

`User ID={0}, remote host name={1}, action=initialize portlet {2}`

Explanation:

This is a security audit log message. It occurs when a portlet is loaded.

User response:

No action is required.

IRU05901

```
User ID={0}, action=close portlet {1}
```

Explanation:

This is a security audit log message. It occurs when a portlet is closed.

User response:

No action is required.

IRU05903

```
Integrated Solutions Console user {0} failed to log on to server {1} using
the Web server user ID {2}.
```

Explanation:

This is a security audit log message. It occurs when a user in the Integrated Solutions Console attempted to administer a Web server with invalid credentials.

User response:

No action is required.

IRU05904

```
Integrated Solutions Console user {0} has changed configuration on Web
server {1} using Web user ID {2}.
```

Explanation:

This is a security audit log message. It occurs when the configuration for a Web server is changed.

User response:

No action is required.

IRU05907

```
Integrated Solutions Console user {0} failed to log in to server {1} with
console agent user ID {2}.
```

Explanation:

This is a security audit log message. It occurs when a user tries to connect to the console agent to work with configuration settings with invalid credentials.

User response:

No action is required.

IRU05908

`User {0} has issued a {1} command on {2}: {3}.`

Explanation:

This is a security audit log message. It occurs when a user starts or stops a DB2 database.

User response:

No action is required.

IRU05909

`User {0} has issued a Backup command on {1}: {2}.`

Explanation:

This is a security audit log message. It occurs when a user issues the backup command for a DB2 database.

User response:

No action is required.

IRU06000 messages

IRU06000 messages

IRU06001

`The program was not started correctly.`

Explanation:

The program could not be started using the invocation command you provided.

User response:

Enter a valid invocation command.

IRU06002

`A Java exception occurred.`

Explanation:

An internal program error occurred while building the binary file.

User response:

Contact your solution provider.

IRU06003

`A SAX exception occurred.`

Explanation:

A SAX parsing error occurred while building the binary file.

User response:

Contact your solution provider.

IRU06004

```
An empty stack exception occurred: Invalid XML file.
```

Explanation:

An internal program error occurred while building the binary file.

User response:

Contact your solution provider.

IRU06005

```
An error occurred when invoking method {0} for class {1}.
```

Explanation:

An internal program error occurred while building the binary file.

User response:

Contact your solution provider.

IRU06006

```
An error occurred when accessing the constructor.
```

Explanation:

An internal program error occurred while building the binary file.

User response:

Contact your solution provider.

IRU06007

```
The factory handler could not be started.
```

Explanation:

An internal program error occurred while building the binary file.

User response:

Contact your solution provider.

IRU06008

`The manifest file for locale {0} could not be loaded.`

Explanation:

An internal program error occurred while building the binary file.

User response:

Contact your solution provider.

IRU06009

`The binary application file {1} could not be created from the application wrapper {0}.`

Explanation:

The binary application file was not successfully created.

User response:

Check the log file for error details. Contact your solution provider.

IRU06010

`The response file template was not added.`

Explanation:

The response file specified in the application wrapper was not found.

User response:

Ensure that the file specified exists.

IRU06011

`The {0} key in the {1} bundle cannot be found.`

Explanation:

The string resource that you specified was not found.

User response:

Ensure that the specified key exists in the specified resource bundle.

IRU06012

`The install size specified is not valid.`

Explanation:

The value specified for the install size must be a positive integer.

User response:

Ensure that the install size value is a positive integer.

IRU06013

`The variable was not added.`

Explanation:

A specified variable could not be added to the solution.

User response:

Check the log file for details. Ensure that the variable specified is not a duplicate.

IRU06014

`The binary application file was not created.`

Explanation:

The binary application file could not be created.

User response:

Check the log file for error details. Contact your solution provider.

IRU06015

`The binary application file {1} was created from the application wrapper {0}.`

Explanation:

The binary application file was successfully created.

User response:

For information only. No action required.

IRU06016

`The schema validation could not be enabled.`

Explanation:

The SAX parser could not be enabled for schema validation.

User response:

Ensure that the reference to the schema in your XML wrapper is correct. Also ensure that the schema exists where you specified.

IRU06017

`The XML document is ready to be processed.`

Explanation:

The SAX parsing process is starting.

User response:

For information only. No action required.

IRU06018

`The binary file {0} was successfully created.`

Explanation:

The binary file was successfully created from the XML wrapper.

User response:

For information only. No action required.

IRU06020

`The XML document is being processed.`

Explanation:

The parser detected the beginning of your XML wrapper.

User response:

For information only. No action required.

IRU06021

`The XML document finished processing.`

Explanation:

The parser detected the end of your XML wrapper.

User response:

For information only. No action required.

IRU06022

`The fileset {0} for the language {1} was not found.`

Explanation:

A language was specified for which no files are associated.

User response:

Ensure that your solution wrapper specifies a file set for each language.

IRU06023

`The language {0} is not supported.`

Explanation:

A language was specified that is not currently supported by Express Runtime.

User response:

Ensure that your solution wrapper specifies only supported languages.

IRU06024

`The manifest file {0} could not be created.`

Explanation:

An internal program error occurred while creating the binary solution file.

User response:

Contact your solution provider.

IRU06025

`A SAX warning occurred at {0} : {1}`

Explanation:

The SAX parser encountered a warning level problem.

User response:

Check your solution wrapper for syntax errors at the line and column indicated.

IRU06026

`A SAX error occurred at {0} : {1}`

Explanation:

The SAX parser encountered an error level problem.

User response:

Check your solution and application wrappers for syntax errors at the line and column indicated.

IRU06027

`A SAX fatal error occurred at {0} : {1}`

Explanation:

The SAX parser encountered a fatal level problem.

User response:

Check your solution wrapper for syntax errors at the line and column indicated.

IRU06028

```
{0} is not a valid operating system.
```

Explanation:

An operating system was specified that is not currently supported by Express Runtime.

User response:

Ensure that your solution wrapper specifies only supported operating systems.

IRU06030

```
Software {0} could not be added to the solution.
```

Explanation:

An internal program error occurred while building the binary file.

User response:

Contact your solution provider.

IRU06031

```
The XML tag <{0}> in {1} could not be translated.
```

Explanation:

A translatedKey attribute specified a value that was not found in the translated file.

User response:

Ensure that the value for {0} exists in the translated file {1}.

IRU06036

```
The Solution generator is reading the binary application file {0}.
```

Explanation:

The application is being included in the solution.

User response:

For information only. No action required.

IRU06037

```
The contents of the binary application file {0} are not valid.
```

Explanation:

An internal program error occurred while creating the binary file.

User response:

Contact your solution provider.

IRU06038

File {0} is not a valid binary application file.

Explanation:

The class for the application being added to the solution is not valid.

User response:

See the log file for details on the invalid class. Contact your solution provider.

IRU06040

The data "{0}" specified for element {1} is not valid.

Explanation:

The value specified for the input validation is not correct.

User response:

Specify valid data for the input validation.

IRU06041

The external JAR {0} was not found.

Explanation:

The file specified as the external JAR was not found.

User response:

Ensure that the specified file exists.

IRU06042

The value specified for the external JAR {0} is not a .jar file.

Explanation:

The file specified as the external JAR does not have a file type of .jar.

User response:

Specify a file that is a Java .jar file.

IRU06043

```
The entry program was already used in the solution. {0}
```

Explanation:

The entry program was already used in the solution.

User response:

This is an informational message. No action is required.

IRU06044

```
The entry program could not be added to the solution.
```

Explanation:

The entry program could not be added to the solution.

User response:

IRU06045

```
The exit program was already used in the solution. {0}
```

Explanation:

The exit program was already used in the solution.

User response:

Specify another exit program.

IRU06046

```
The exit program could not be added to the solution.
```

Explanation:

The exit program could not be added to the solution.

User response:

IRU06047

```
Default data "{0}" for the shared variable {1} was removed.
```

Explanation:

Shared variables cannot have default data specified.

User response:

Ensure that default data is not specified for the variable.

IRU06048

`The file {0} was not found.`

Explanation:

The file specified could not be found.

User response:

Ensure that the file name specified is correct, and verify that the file exists.

IRU06049

`The software {0} could not be added to the solution.`

Explanation:

The specified software could not be added to the solution.

User response:

See the log file for details. Contact your solution provider.

IRU06050

`The software {0} could not be added to the solution because the solution does not exist.`

Explanation:

The solution that you specified does not exist.

User response:

Ensure that the file name specified for the solution is correct.

IRU06051

`The value of the timeout attribute for the entry program must be greater than 0.`

Explanation:

The value for the timeout attribute is not valid. It must be a positive integer.

User response:

Specify a valid timeout value.

IRU06052

`The value of the timeout attribute for the main program must be greater than 0.`

Explanation:

The value for the timeout attribute is invalid. It must be a positive integer.

User response:

Specify a valid timeout value.

IRU06053

```
The value of the timeout attribute for the exit program must be greater
than 0.
```

Explanation:

The value for the timeout attribute is invalid. It must be a positive integer.

User response:

Specify a valid timeout value.

IRU06054

```
Software {0} cannot be specified as a prerequisite because it does not
exist.
```

Explanation:

The specified software cannot be specified as a prerequisite because it does not exist.

User response:

Specify valid software.

IRU06055

```
Software {0} cannot be specified as a consumer because it does not exist.
```

Explanation:

The specified software cannot be specified as a consumer because it does not exist.

User response:

Specify valid software.

IRU06056

```
Software {0} cannot be specified as a provider because it does not exist.
```

Explanation:

The specified software cannot be specified as a provider because it does not exist.

User response:

Specify valid software.

IRU06057

```
Application {0} cannot be specified as a conflict because it does not
exist.
```

Explanation:

The specified application cannot be specified as a conflict because it does not exist.

User response:

Specify a valid application.

IRU06058

```
A default translation language must be specified.
```

Explanation:

One of the languages specified must be set as the default.

User response:

Use the `default` attribute on the `translationLanguages` element to specify the default translation language you want.

IRU06059

```
Multiple default translation languages are not allowed.
```

Explanation:

You can specify only one language as the default translation language.

User response:

Ensure that the `default` attribute on the `translationLanguages` element occurs only once and contains only one language.

IRU06061

```
The element {0} specifies the translatedKey attribute but also contains
element data. You cannot include both.
```

Explanation:

An element cannot specify data and the `translatedKey` attribute at the same time.

User response:

Remove either the element data or the `translatedKey` attribute.

IRU06062

```
A logMessage element with the type attribute {0} is required.
```

Explanation:

Both types, error and success, are required when defining a `logMessage`. You included one, but not the other.

User response:

Ensure that both error and success are specified.

IRU06069

```
{0} is required for program type {1}.
```

Explanation:

The specified element or attribute must be included when the program type is {1}.

User response:

Update the XML file to include the required element or attribute.

IRU06070

```
{0} is a duplicate host name in group {1}.
```

Explanation:

There is a duplicate host name in the specified group.

User response:

Specify a valid host name.

IRU06071

```
{0} is a duplicate computer name in group {1}.
```

Explanation:

A duplicate computer name was specified in the group.

User response:

Specify a unique computer name.

IRU06072

```
Media file list was not specified for language {0}. At least one media
fileset should be specified for each language.
```

Explanation:

A media file list was not specified for a language.

User response:

Specify at least one media fileset for each language.

IRU06073

```
Software {0} does not exist in group {1}.
```

Explanation:

The specified software does not exist in the group.

User response:

Specify a valid software name in the specified group.

IRU06074

```
Software {0} already exists on computer {1}.
```

Explanation:

The software already exists on the computer.

User response:

This is an informational message. No action is required.

IRU06075

```
The software {0} does not exist in the solution for this operating system
and language.
```

Explanation:

The software does not exist in the solution for this operating system and language.

User response:

Specify the correct software for this operating system and language.

IRU06076

```
The variable name {0} is not valid for software {1}.
```

Explanation:

The variable name is not valid for this software.

User response:

Specify a valid variable name for the software.

IRU06077

```
Input {0} is not valid for variable {1}.
```

Explanation:

The input that was specified is not valid for the variable.

User response:

Specify valid input.

IRU06078

```
The operating system {0} is not supported by Express Runtime.
```

Explanation:

You are attempting to install Express Runtime to an unsupported operating system.

User response:

Check the product documentation for a list of operating systems supported by Express Runtime.

IRU06079

```
{0} is a duplicate group name.
```

Explanation:

A duplicate group name was specified.

User response:

Specify a valid group name.

IRU06080

```
Software {0} already exists in group {1}
```

Explanation:

The specified software already exists in the group.

User response:

This is an informational message. No action is required.

IRU06086

```
A programName attribute cannot be specified when the programType attribute
value is "rpm".
```

Explanation:

The programName attribute is not valid for an RPM program type.

User response:

Delete the programName attribute or change the programType attribute.

IRU06088

`All group name attributes must be at least 1 character in length.`

Explanation:

All group name attributes must be at least 1 character in length.

User response:

Specify valid group name attributes that are at least 1 character in length.

IRU06089

`The operating system {1} is not supported by the solution {0}.`

Explanation:

You specified an operating system that is not defined for the given solution.

User response:

Specify a valid operating system for the solution.

IRU06090

`The language {0} is not supported by Express Runtime.`

Explanation:

A language was specified that is not currently supported by Express Runtime.

User response:

Ensure that your XML wrapper specifies only supported languages.

IRU06091

`The language {1} is not supported by the solution {0}.`

Explanation:

You specified a language that is not defined for the given solution.

User response:

Specify a valid language for the solution.

IRU06092

`The <rpmPackages> element is not valid when the programType attribute value is not "rpm".`

Explanation:

You cannot use the `rpmPackages` element when the program type is not defined as RPM.

User response:

Either delete the `rpmPackages` element, or change the program type to be RPM.

IRU06094

`All computer host name attributes must be at least 1 character in length.`

Explanation:

One or more computer host name attributes were not at least 1 character in length.

User response:

Specify all computer host name attributes so that each is at least 1 character in length.

IRU06095

`The solutionFileName must be specified in either the command line or the solution wrapper.`

Explanation:

The `solutionFileName` is required.

User response:

Specify the `solutionFileName` in either the command line or the solution wrapper.

IRU06096

`All computer name attributes must be at least 1 character in length.`

Explanation:

One or more computer name attributes were not at least 1 character in length.

User response:

Specify all computer hostname attributes so that each is at least 1 character in length.

IRU06097

`The deployment wizard cannot save the changes to the solution file.`

Explanation:

Changes were made to the solution, but the deployment wizard cannot save them.

User response:

For information only. No action required.

IRU06098

There are no computers in the task to deploy to.

Explanation:

No computers are defined in this task.

User response:

For information only. No action required.

IRU06099

The file {0} must have an extension of .xml.

Explanation:

The specified file is not identified as an XML document with a file extension of .xml.

User response:

Ensure the file is an XML document. If so, rename it to include a file extension of .xml.

IRU06109

No computer was identified.

Explanation:

The task does not include any target computers.

User response:

Add the appropriate target host names to the task.

IRU06110

The attribute specified {0} conflicts with the attribute {1}.

Explanation:

The indicated attributes cannot be used together. You can use one or the other, but not both.

User response:

Correct the XML document to include only one of the attributes.

IRU06111

The language specified as the default for the <translationLanguages> element must also be included as a <language> element.

Explanation:

You specified a language as the default translation language that is not currently defined as a valid language for this application.

User response:

Either change the default language to one that is included, or add the default language using the `language` element.

IRU06129

`The {0} key in the {1} bundle for {2} locale cannot be found.`

Explanation:

An internal error prevented the message from being displayed.

User response:

Contact your solution provider.

IRU06130

`The SAX parser {0} is not in your classpath.`

Explanation:

The parser is required and must be included in the classpath.

User response:

Add the parser to your classpath.

IRU06131

`The binary application file {1} was created from the solution wrapper {0}.`

Explanation:

The binary application file was successfully created.

User response:

For information only. No action required.

IRU06132

`The attributes {0} and {1} cannot both be true for the {2} element.`

Explanation:

The specified attributes cannot both have a value of `true`.

User response:

Change one of the attribute values to `false`.

IRU06136

`The application {0} does not support the language specified in the task.`

Explanation:

You entered a language that is not supported in the task.

User response:

Specify a language supported by the task.

IRU06137

`The application {0} already exists in the task.`

Explanation:

The application specified by the file name was added more than once to the task.

User response:

Remove all but one occurrence of the application from the task.

IRU06138

`{0} is not a valid application ID.`

Explanation:

An invalid application ID was specified, either in the application XML or on the command line. Application IDs must be fewer than 200 characters in length, must begin with an alphabetic character, and can be made up only of alphanumeric characters, underscores, dashes and periods.

User response:

Modify the application XML or command-line invocation to include a valid application ID.

IRU06139

`{0} is not a valid solution ID.`

Explanation:

An invalid solution ID was specified, either in the solution XML or on the command line. Solution IDs must be fewer than 200 characters in length, must begin with an alphabetic character, and can be made up only of alphanumeric characters, underscores, dashes and periods.

User response:

Modify the solution XML or command-line invocation to include a valid solution ID.

IRU06140

Task {0} does not exist in the solution.

Explanation:

The task number that you specified does not exist in the solution.

User response:

Check the number of tasks in the solution and ensure that you are specifying a valid task number.

IRU06141

Task {0} is not an install task.

Explanation:

The task is not an installation task.

User response:

Specify a valid installation task.

IRU06142

Task {0} is not an install task.

Explanation:

The task number that you specified exists, but is not an install task.

User response:

Check the tasks in the solution and ensure that the task number you specify denotes an install task.

IRU06143

The solution {0} failed to build. See {1} for details

Explanation:

User response:

IRU06144

The application referenced by {0} does not exist.

Explanation:

The application does not exist.

User response:

IRU06146

`{0} is an invalid shared name.`

Explanation:

The shared name cannot contain the underscore (_) character.

User response:

Modify the shared name to remove the underscore.

IRU06147

`Shared booleanVariable {0} cannot have validation info.`

Explanation:

The specified variable is being shared with a variable containing validation information. Boolean variables cannot be associated with shared variables containing validation information (for example, minimum and maximum length, valid or invalid specifications and so on). A boolean variable can only hold values equal to "true" or "false" and associating them with variables containing validation information would cause solution deployment to fail.

User response:

Remove the validation information from the shared variable.

IRU06148

`Hidden or read-only variable {0} must have valid data.`

Explanation:

The variable specified contains invalid default data. Variables set to be hidden or read-only must have valid default data because the user is unable to edit their values.

User response:

Modify the variable to contain valid default data.

IRU06149

`Hidden or read-only variable {0} must either have valid data or be shared with an editable variable.`

Explanation:

The variable specified contains invalid default data. Shared variables set to be hidden or read-only must have valid default data or must be shared with another variable that is not hidden or read-only. The user is unable to edit the values.

User response:

Add valid default data to the specified variable, or make one of the shared variables editable.

IRU06150

The deployment package creation failed. Refer to the log file for more information.

IRU06151

A predeploymentChecker was specified. For each install locale, you must specify a fileList with the userPrograms attribute set to true.

Explanation:

Because a preDeploymentChecker was specified, user program fileList information must be provided for each locale.

User response:

Ensure that the preDeploymentChecker files are included in a user programs file list for each locale.

IRU06152

The XML builderVersion of {0} does not match the current version of {1}.

Explanation:

The builderVersion attribute in the application or solution XML does not match the current version of Express Runtime.

User response:

Update the XML so that the builderVersion attribute matches the current version of Express Runtime (for example, "3.0.1").

IRU06153

The .SER file builderVersion of {0} does not match the current version of {1}.

Explanation:

The builderVersion attribute in the .ser file does not match the current version of Express Runtime. The .ser file was built with a previous version of Express Runtime.

User response:

Update the builderVersion stored in the .ser file by rebuilding the solution using the current version of Express Runtime.

IRU06154

`{0} is not a valid deployment package name.`

Explanation:

A nonvalid deployment package name was specified.

User response:

Specify a valid deployment package name.

IRU06156

`Deployment package already exists; specify the -replace option to overwrite it.`

Explanation:

The deployment package already exists.

User response:

Specify the -replace option to overwrite it.

IRU06157

`You do not need to build a user program deployment package because you did not specify any user programs in your application wrapper. The user programs deployment package is not built.`

Explanation:

Applications that do not require user programs do not contain `fileList` elements with the `userPrograms` attribute. The deployment wizard requires `fileList` elements with the `userPrograms` attribute to build a user programs deployment package.

User response:

Either add user programs containing `fileList` elements with the `userPrograms` attribute to your application wrapper or do not attempt to create a user programs deployment package.

If you encounter this error while using the Express Runtime developer, no action is required. The Express Runtime developer will automatically attempt to build the user programs deployment package when it builds the solution.

IRU06158

`Access to {0} directory and its contents is denied.`

Explanation:

The user does not have read or write access authority to the directory.

User response:

Verify that you specified the correct software image root directory. The software image root can be specified in three places: the command line, the `softwareImageRoot` attribute in the application xml file, or the software image root property of the application xml file in the Express Runtime developer (right-click on the application xml file and make sure the correct software image root is displayed on the Properties panel). If the software image root directory is correct, verify that you can access all the directories you specified in the `fileList` element in the application xml.

IRU06159

The software image root {0} does not exist.

Explanation:

The directory specified as the software image root is not a valid directory.

User response:

Specify a valid directory as the software image root.

IRU06160

The software image root {0} is empty.

Explanation:

The directory specified as the software image root is an empty directory.

User response:

Ensure that the directory specified as the software image root contains the necessary files or specify another directory.

IRU06161

The file {0} must have an extension of .sxml.

Explanation:

The file does not have an extension of .sxml.

User response:

Provide a file name that has an extension of .sxml.

IRU06162

The file {0} must have an extension of .axml.

Explanation:

The file does not have an extension of .axml.

User response:

Provide a file name that has an extension of .axml.

IRU06163

```
The solution file {0} does not exist.
```

Explanation:

The solution file specified in the task file does not exist.

User response:

Ensure that the solution file name is entered correctly in the task file and that the solution file exists in the path specified.

IRU06164

```
Task {0} in solution {1} is not an install task.
```

Explanation:

The specified task in the task file is not an install task. Only install tasks can be deployed from a task file; manual tasks cannot.

User response:

Ensure that the task specified is an install task in the solution.

IRU06165

```
Task {0} does not exist in the solution {1}.
```

Explanation:

The task number specified in the task file is not a valid task number in the solution.

User response:

Enter a valid task number for the solution.

IRU06166

```
The application {0} does not exist in task number {1} in solution {2}.
```

Explanation:

The application id specified in the task file does not exist in the task in this solution.

User response:

Ensure that the application id was entered correctly in the task file and that it matches the id of the application.

IRU06167

Task number {0} has already been added in the taskSet for solution {1}.

Explanation:

A task cannot be deployed more than once in the same task set.

User response:

Remove one of the tasks from the task set. If the task must be deployed more than once in a task file, create another task set and include this task in the new task set.

IRU06168

The variable {0} does not exist in application {1}.

Explanation:

The variable id specified in the task file does not exist in the application.

User response:

Ensure that the variable id was entered correctly in the task file and that it matches the id of the variable as specified in the application XML.

IRU06169

Variable validation failed.

Explanation:

The validation failed for this variable.

User response:

When you receive this message, details regarding the failure of the variable validation will be provided in a more specific message displayed above this one. That message will vary, depending on the circumstances of the failure.

IRU06170

Variable {0} in application {1} in task number {2} in solution {3} is not editable. The input value {4} will be ignored.

Explanation:

This variable is a shared variable. It was defined in the solution as either read-only or hidden. Its value cannot be edited from a task file. Its value can only be modified based on another variable. The value entered will be ignored.

User response:

Ensure that the value for this variable is being set on the correct shared variable.

IRU06171

`The element {0} cannot be empty.`

Explanation:

The element specified is either empty or contains only white space characters. Valid data is required.

User response:

Fill in the element with appropriate data. Consult your solution provider for details.

IRU06172

`Task {0} in solution {1} deployed successfully.`

Explanation:

The task specified was successfully deployed.

User response:

For information only. No action required.

IRU06173

`Task {0} in solution {1} failed.`

Explanation:

The deployment of the task specified failed.

User response:

Consult the log file for details on the cause of the failure. Correct any errors listed and attempt the deployment again.

IRU06175

`The element {0} specifies the {1} attribute but also contains element data. You cannot include both.`

Explanation:

Data cannot be specified for the `argument` element when the `variableName` attribute is used.

User response:

Remove either the data or the `variableName` attribute from the `argument` element.

IRU06176

`The variableName attribute references the variable {0} which is not defined in the XML.`

Explanation:

The `variableName` attribute of the `argument` element points to a variable that does not exist in the application XML file.

User response:

Specify a variable that is defined in the application XML file.

IRU06177

```
The user programs root {0} does not exist.
```

Explanation:

The user programs root does not exist.

User response:

Specify a valid root.

IRU06178

```
The user programs root {0} is empty.
```

Explanation:

The user programs root is empty.

User response:

Specify a valid root.

IRU06179

```
Task {0} must contain at least one application.
```

Explanation:

The task does not contain at least one application.

User response:

Specify at least one application for the task..

IRU06180

```
The installation time specified is not valid.
```

Explanation:

The installation time that was specified is not valid.

User response:

Specify a valid installation time.

IRU06181

`The XML attribute {0} is deprecated.`

Explanation:

The XML attribute is deprecated.

User response:

Specify a valid XML attribute.

IRU06182

`The XML element {0} is deprecated.`

Explanation:

The XML element is deprecated.

User response:

Specify a valid XML element.

IRU06183

`The file {0} contains invalid, non-UTF data.`

Explanation:

The file contains nonvalid, non-UTF data.

User response:

Specify a file with valid UTF data.

IRU06184

`The element {0} in file {1} contains invalid, non-UTF data beginning at character {2}.`

Explanation:

The element in file contains nonvalid, non-UTF data beginning at the specified character.

User response:

Specify an element that contains valid UTF data.

IRU06185

`An application may not contain fileSet elements with different languages.`

Explanation:

The application might not contain fileSet elements with different languages.

User response:

Specify fileSet elements with the appropriate languages.

IRU07000 messages

IRU07000 messages

IRU07000

`The IBM Installation Agent is listening on port {0}.`

Explanation:

The IBM Installation Agent is listening on the specified port. This message indicates that the target computer is waiting for deployment wizard to start a deployment process.

User response:

For information only. No action required.

IRU07001

`The IBM Installation Agent failed to start. RC={0}`

Explanation:

The RMI registry naming service failed to start on port 1099. The agent might be currently running or the Java RunTime Environment on the target computer might be corrupted.

User response:

Run the `IRU_iia_stop-agent` executable file, and restart the IBM Installation Agent. For Windows, use the service control manager to stop the Agent. If the problem persists, restart the target computer and the agent again.

IRU07002

`The solution deployment was not successful.`

Explanation:

Some of the selected software failed to deploy on the target computer.

User response:

Analyze the log file associated with the failed deployments to determine the source of the error. Try to correct the error and then try the deployment again. If the problem persists, print the log file and contact your solution provider.

IRU07003

`The IBM Installation Agent cannot obtain the deployment package.`

Explanation:

The Agent was unable to obtain the deployment package.

User response:

Contact your solution provider.

IRU07004

`IBM Installation Agent, Version {0}, is starting.`

Explanation:

This message is logged each time the IBM Installation is started. The token {0} represents the full version of the agent.

User response:

Informational purposes only. No action required.

IRU07011

`The IBM Installation Agent failed to start.`

Explanation:

An internal programming error occurred.

User response:

Contact your solution provider.

IRU07012

`The value specified for the communicationPort is not valid.`

Explanation:

The value specified for the port is out of the valid range.

User response:

Specify a port number within the valid range.

IRU07013

`The communication link between the target computer and the staging server failed.`

Explanation:

The port specified for the communication link is probably being used by another process.

User response:

Change the port number and try again.

IRU07014

`The IBM Installation Agent has terminated.`

Explanation:

The IBM Installation Agent has stopped.

User response:

For information only. No action required.

IRU08000 messages

IRU08000 messages

IRU08010

`IBM Installation Agent is already installed on the target computer.`

Explanation:

This is an informational message.

User response:

No action is required.

IRU08011

`The install program you are running is not compatible with the operating system.`

Explanation:

You have selected to install a program that is incompatible with the operating system.

User response:

Verify the operating system before installation.

IRU08012

`Both phrases are required.`

Explanation:

Users are required to enter the key phrase and the confirm key phrase on the key maker panel.

User response:

Enter both the key phrase and the confirm key phrase.

IRU08013

`Phrases do not match.`

Explanation:

The key phrase and the confirm key phrase did not match on the key maker panel.

User response:

Enter matching pair of key phrases.

IRU08014

`The deployment wizard will not install software without valid key phrases.`
`You can generate the security keys at a later time using the Key Manager`
`program. Are you sure you want to continue without generating the security`
`keys?`

Explanation:

Display this message if the user selects the skip key creation check box on the key maker panel.

User response:

Select Yes to continue without generating key phrases. Select No to exit the deployment wizard and create key phrases.

IRU08015

`The directory name must include at least 1 character.`

Explanation:

The installation path on UNIX® systems must have at least 1 character.

User response:

Enter a path that has at least 1 character.

IRU08016

`The first character in the directory name must be a slash (/).`

Explanation:

The installation path must start with a /.

User response:

Enter a path that begins with /.

IRU08017

`The directory name must be at least 3 characters.`

Explanation:

You entered a Windows destination containing fewer than three characters.

User response:

Enter a valid destination path.

IRU08018

`IBM Installation Agent is already installed on the target computer.`

Explanation:

This is an informational message.

User response:

Cancel the operation.

IRU08019

`The first character in the directory name must be a valid drive letter.`

Explanation:

You entered an invalid character in the beginning of the directory name.

User response:

Enter a valid drive letter as the first character in the destination path. The acceptable range is from A to Z.

IRU08020

`The second character in the directory name must be a colon (:).`

Explanation:

The second character in a Windows path name must be a colon.

User response:

Enter a valid path.

IRU08021

`The third character in the directory name must be a backslash (\).`

Explanation:

The third character in a Windows path name must be a backslash.

User response:

Enter a valid path.

IRU08022

```
The following characters are not allowed in the directory name: : < > * ? ;
\ | /
```

Explanation:

You entered a Windows path name containing invalid path characters.

User response:

Enter a path that does not contain invalid characters.

IRU08023

```
The character {0} is not valid in the destination path.
```

Explanation:

You entered a UNIX path name containing invalid path characters.

User response:

Enter a path that does not include invalid characters. Invalid characters are ! \ # $ % & / ( ) * , : ; < = > ? @ [ ] ^ { } |

IRU08024

```
Double backslashes (\\) are not allowed in the directory name.
```

Explanation:

Windows path names cannot contain \\.

User response:

Enter a valid path.

IRU08025

```
Double slashes (//) are not allowed in the directory name.
```

Explanation:

UNIX path names cannot contain //.

User response:

Enter a valid path.

IRU08027

```
Install language = {0}
```

Explanation:

The language selected by the user for installation is {0}.

User response:

For information only. No action required.

IRU08028

```
Install Directory = {0}
```

Explanation:

The install directory specified by the user is {0}.

User response:

For information only. No action required.

IRU08029

```
Security Keys were created.
```

Explanation:

Key creation was successful.

User response:

For information only. No action required.

IRU08030

```
Security Keys were not created.
```

Explanation:

The security keys were not created because the user chose to skip key creation during the install or a problem was encountered when writing the keys to the disk.

User response:

Run the key manager.

IRU08035

```
The Windows registry was updated.
```

Explanation:

The Windows registry was updated.

User response:

For information only. No action required.

IRU08036

`Installation is complete.`

Explanation:

The installation has been successfully completed.

User response:

For information only. No action required.

IRU08039

`The directory does not exist. Do you want to create it?`

Explanation:

You specified an installation directory that does not exist.

User response:

Select Yes to create the directory or No to enter an existing directory.

IRU08040

`You must select at least one run level.`

Explanation:

The user did not select a run level. The agent will be started and listening when the machine is running at the run level selected.

User response:

Select at least one run level check box.

IRU08041

`Insufficient authority to install or uninstall {0}. Installation requires root authority.`

Explanation:

You are not authorized to perform the operation.

User response:

Log on with the proper authorization and perform the operation.

IRU08042

`The password you entered is not valid.`

Explanation:

The password provided for this user is not valid

User response:

Enter valid password for this user.

IRU08043

`The user name field must not be blank.`

Explanation:

The user name field is a required value.

User response:

Enter a user name.

IRU08044

`Both password fields are required.`

Explanation:

The password and confirm password fields are required values.

User response:

Enter passwords in both the password and confirm password fields.

IRU08045

`The passwords do not match.`

Explanation:

The values provided in the password and confirm password fields must match.

User response:

Enter matching values in the password and confirm password fields.

IRU08046

`Installing {0} ...`

Explanation:

The IBM Installation Agent service is in installing.

User response:

For information only. No action required.

IRU08047

`The user name you entered does not have administrator authority.`

Explanation:

The user name provided must have administrator authority to install the service.

User response:

Enter an existing user name that has administrator authority.

IRU08048

`The user name must not be longer than 20 characters.`

Explanation:

The value specified for the user name exceeded 20 characters.

User response:

Enter a user name 20 characters or fewer in length.

IRU08049

`The character {0} is not allowed in the user name.`

Explanation:

You specified an invalid character in the user name field. The following characters are invalid: * + , / : ; < = > ? [\ ] |

User response:

Enter a valid user name.

IRU08050

`{0} installation was successful.`

Explanation:

The IBM Installation Agent service was successfully installed.

User response:

For information only. No action required.

IRU08052

`Unable to connect to the service control manager for {0} installation.`

Explanation:

Could not connect to the service control manager for service installation.

User response:

Uninstall the IBM Installation Agent and reinstall.

IRU08053

`{0} installation failed.`

Explanation:

The IBM Installation Agent service could not be created.

User response:

Uninstall the IBM Installation Agent and reinstall.

IRU08054

`{0} already exists.`

Explanation:

Write message to log during the installation of the IBM Installation Agent service.

User response:

Uninstall the old agent and install the new agent.

IRU08055

`{0} update failed.`

Explanation:

The update of the agent from a previously existing version failed.

User response:

Delete the `HKEY_LOCAL_MACHINE\SYSTEM\ CurrentControlSet\Services\IIAService` registry key, reboot the computer, and try the installation again.

IRU08056

`This operating system is not supported.`

Explanation:

The supported operating systems are Windows 98, NT, 2K, XP, HP-UX, Linux, AIX®, Solaris and OS/400 (i5/OS).

User response:

Check product documentation for a list of supported platforms.

IRU08057

`You specified an invalid directory for {0} installation.`

Explanation:

Write message to log during the installation of the IBM Installation Agent service.

User response:

Enter a valid directory.

IRU08058

`Unable to start {0}.`

Explanation:

Write message to log during the installation of the IBM Installation Agent service.

User response:

Analyze the log file associated with the failed installation to determine the source of the error. Try to correct the error and attempt the installation again. If the problem persists, print the log file and contact your solution provider.

IRU08059

`Failed to add registry entry for Windows 98 service.`

Explanation:

No registry entry for the agent service on Windows 98 was made.

User response:

Analyze the log file associated with the failed installation to determine the source of the error. Try to correct the error and attempt the installation again. If the problem persists, print the log file and contact your solution provider.

IRU08060

`Could not write service setup information file.`

Explanation:

There was a problem writing the service setup information file.

User response:

Retry the installation.

IRU08062

`Installation of {0} requires a user name.`

Explanation:

You did not enter a user name for the installation.

User response:

Enter a valid user name.

IRU08063

`Installation of {0} requires a run level.`

Explanation:

Install program failed.

User response:

Contact solution provider.

IRU08065

`Failed to create user for {0}.`

Explanation:

The user name or password was invalid.

User response:

Retry the installation using a valid user ID and password.

IRU08066

`Errors occurred during {0} installation.`

Explanation:

An unknown error occurred during the installation of the IBM Installation Agent service.

User response:

Analyze the log file associated with the failed installation to determine the source of the error. Try to correct the error and attempt the installation again. If the problem persists, print the log file and contact your solution provider.

IRU08067

`Uninstalling {0} ...`

Explanation:

This message is displayed when the IBM Installation Agent service is being uninstalled.

User response:

For information only. No action required.

IRU08068

`Invalid run level set for {0} installation.`

Explanation:

An internal software error occurred when trying to establish the run level.

User response:

Provide a valid run level in the installation response file.

IRU08069

`The rc file was not found for {0} installation.`

Explanation:

The rc directory corresponding to the selected run level was not found on the system.

User response:

Retry the installation. If the error persists, contact your solution provider.

IRU08070

`Cannot install the script for {0} installation.`

Explanation:

The installer failed to install the script that controls the IBM Installation Agent service.

User response:

Analyze the log file associated with the failed installation to determine the source of the error. Try to correct the error and attempt the installation again. If the problem persists, print the log file and contact your solution provider.

IRU08072

`Unable to start {0} for this run level.`

Explanation:

The IBM Installation Agent service was not started because the current run level was not specified.

User response:

Restart machine in the run level specified during installation.

IRU08073

`Failed to create a link.`

Explanation:

The installer failed to create a symbolic link from the rc directory to the service script.

User response:

Retry the installation. If the error persists, contact your service provider.

IRU08074

```
Failed to remove {0} key.
```

Explanation:

The security keys were not removed during uninstall.

User response:

Manually remove the key file in the install directory (DJT_IBM_JSDT_PRIVATE_KEY DJT_IBM_JSDT_PUBLIC_KEY).

IRU08075

```
Failed to stop {0}.
```

Explanation:

The IBM Installation Agent service failed to stop during uninstall.

User response:

Stop the IBM Installation Agent manually and retry the uninstall. If the error persists, contact your solution provider.

IRU08077

```
Failed to remove a symbolic link for {0}.
```

Explanation:

The installer failed to remove a symbolic link from the rc directory to the service script during uninstall.

User response:

Analyze the log file associated with the installation and attempt to manually remove symbolic link. If problem persists, contact your solution provider.

IRU08078

```
Failed to remove script file for {0}.
```

Explanation:

The installer failed to remove the script that controls the IBM Installation Agent service.

User response:

Contact your solution provider.

IRU08079

`{0} uninstallation was successful.`

Explanation:

The uninstall was successful.

User response:

For information only. No action required.

IRU08080

`Errors occurred during {0} uninstallation. See the log file for details.`

Explanation:

An unknown error occurred during the uninstallation of the IBM Installation Agent service.

User response:

Analyze the log file associated with the failed uninstall to determine the source of the error. Try to correct the error and attempt the uninstall again. If the problem persists, print the log file and contact your solution provider.

IRU08081

`The user name you entered for {0} is {1}.`

Explanation:

This message logs what user name was entered to start the Agent for Windows installs.

User response:

For information only. No action required.

IRU08082

`The run level you entered for {0} is {1}.`

Explanation:

This message logs what run levels were selected to start the Agent for UNIX installs.

User response:

For information only. No action required.

IRU08083

`Password cannot contain any space.`

Explanation:

The password that you entered contained a space.

User response:

Enter a password that does not contain spaces.

IRU08086

```
The rpm-build package is not installed on this computer.
```

Explanation:

The RPM build package is not installed. Although an RPM entry for this install will not be created, the install will complete successfully.

User response:

For information only. No action required.

IRU08087

```
Only the root user has authority to uninstall the IBM Installation Agent.
```

Explanation:

The user does not have root authority. The uninstall will be aborted.

User response:

Log in as root and uninstall the agent.

IRU08088

```
The current user ID does not have Administrator authority. Only users with
Administrator authority can uninstall the IBM Installation Agent.
```

Explanation:

The user does not have Administrator authority. The uninstall will be aborted.

User response:

Log in as Administrator and uninstall the agent.

IRU08090

```
The Provider ID {0} can not be used to install to the destination provided.
This destination already contains a copy of Express Runtime with another
Provider ID. Please click Back and enter another destination location or
click Cancel to abort the installation.
```

Explanation:

During the install of Express Runtime, if the destination path specified already contains a copy of Express Runtime with another Provider ID, then the installation

cannot continue. For an interactive install, you can go back and re-enter the destination path. For a silent install, it automatically aborts the installation.

User response:

Restart the install and specify a different Provider ID.

IRU08091

`The Provider ID can not contain the characters : < > * ? \ " | / .`

Explanation:

The Provider ID cannot contain the characters mentioned for a Windows Express Runtime installation.

User response:

Enter a valid Provider ID.

IRU08092

`The Provider ID can not contain more than 25 characters.`

Explanation:

If the Provider ID in the response file for an Express Runtime installation contains more than 25 characters, then the installation is aborted and this message is displayed in the log file.

User response:

Enter a valid Provider ID.

IRU08093

`There was a problem creating the RPM entry {0}.`

Explanation:

During the installation of Express Runtime, the RPM entries were not created.

User response:

For information only. No action required.

IRU08094

`There was a problem removing the old RPM entry for Express Runtime: {0}`

Explanation:

During an upgrade or uninstall of Express Runtime, RPM entries were not removed.

User response:

For information only. No action required.

IRU08095

`This is not a supported distribution of {0}.`

Explanation:

The distribution of the operating system is not supported.

User response:

Check product documentation for supported operating system distributions and restart the install on a supported platform.

IRU08096

`An earlier version of the IBM Installation Agent was found on this machine.`

Explanation:

During the install of the Agent, an earlier version was found and the installation must be aborted.

User response:

Uninstall the previous version and restart the install.

IRU08102

`The top level shortcut folder, {0}, already contains an installation of Express Runtime from a different location. Click Cancel to exit the installation.`

Explanation:

During the install of Express Runtime, if the folder name where all shortcuts are placed is already in use by another Express Runtime installation, then the installation cannot continue. This message is displayed in the log file for silent installs and on the panel for interactive installs.

User response:

Specify a different shortcut folder in the response file.

IRU08103

`The system requirements are not met. For more information on system requirements, refer to your product documentation.`

Explanation:

During an OS/400 (i5/OS) installation of the agent, if system requirements are not met, then this message is displayed and the installation cannot continue. If the

installation is silent, then the message is displayed in the log file and the install is automatically aborted.

User response:

Check product documentation for system requirements.

IRU08109

```
{0} requires a user with "secofr" authority.
```

Explanation:

During an installation to an OS/400 (i5/OS) machine, if the logged in user does not have "secofr" access, then the installation is aborted and the message is logged.

User response:

Log in as a user with SECOFR authority.

IRU08110

```
The character {0} is not valid in the shortcut folder name.
```

Explanation:

An invalid character was specified for the shortcut folder name in the response file.

User response:

Specify a valid shortcut folder name and retry the installation.

IRU08111

```
The Provider ID can not contain the character {0}.
```

Explanation:

An invalid Provider ID was specified in the response file.

User response:

Specify a valid Provider ID and retry the installation.

IRU08112

```
The installation has been aborted.
```

Explanation:

The installation was aborted. Analyze the log file for details.

User response:

For information only. No action required.

IRU08113

`Directory name can not contain any space.`

Explanation:

This error message is displayed if spaces were put in the destination path for UNIX-based operating systems.

User response:

Enter a valid UNIX destination path.

IRU08115

`The IBM Installation Agent will be upgraded to a new version.`

Explanation:

An earlier version of the IBM Installation Agent was detected and will be upgraded to a new version.

User response:

For information only. No action required.

IRU08116

`Express Runtime will be migrated to a new version.`

Explanation:

An earlier version of Express Runtime was detected and will be upgraded to a new version.

User response:

For information only. No action required.

IRU08117

`The following features were not selected, but must be upgraded because they were part of a previous installation:`

Explanation:

During an upgrade of Express Runtime, if previously installed features were not selected to upgrade, they will automatically be upgraded.

User response:

For information only. No action required.

IRU08118

`IBM Installation Agent is already installed on the target computer, so installation was terminated.`

Explanation:

During a silent install of the Agent, if a current or later version of it is already installed, then the installation is aborted.

User response:

For information only. No action required.

IRU08119

```
This is not a supported distribution of {0}, so installation was
terminated.
```

Explanation:

During a silent install of the IBM Installation Agent or Express Runtime on the machine, if the distribution is not supported then the installation is aborted.

User response:

Check product documentation for supported Linux distributions and restart the install on a supported platform.

IRU08120

```
An earlier version of the IBM Installation Agent was found on this machine.
```

Explanation:

During a silent install of the agent, if an earlier version is already installed and cannot be upgraded, the installation is aborted.

User response:

For information only. No action required.

IRU08121

```
The deployment wizard was unable to stop the agent service for the previous
installation. To continue, you must manually stop and restart the agent
service.
```

Explanation:

During the upgrade of the agent, if the agent service fails to stop, the old agent will continue to run. To run the new agent, the service must be manually stopped and restarted.

User response:

Manually stop and restart the agent service.

IRU08122

```
The directory you selected does not have enough space. Please select
another location.
```

Explanation:

One-click installs require a certain amount of temporary disk space. The directory that you selected does not meet the space requirement.

User response:

Provide a location that has sufficient disk space for the one-click install.

IRU08123

The solution file could not be found. Please contact your service provider.

Explanation:

The installer could not find the solution file specified in the `setup.iss` response file.

User response:

Ensure that the solution file name specified in the response file is valid and that the file exists in the `bin` directory. If the error persists, contact your service provider.

IRU08124

You did not select any Eclipse-based or Workbench products for the Express Runtime developer extension. You can select them at a later time by running this installer again.

Explanation:

An Eclipse-based or Workbench product was not selected to link to the Express Runtime developer extension. Therefore, the extension will not start with any product.

User response:

Install an Eclipse-based or Workbench product before retrying the installation of Express Runtime.

IRU08125

Invalid command line arguments specified... exiting.

Explanation:

Invalid options were included in the command line invocation of the LaunchPad.

User response:

Invoke the LaunchPad using only the following options:

-p <property file>: Runs the LaunchPad with the specified properties file (required) -d: Runs the LaunchPad in the default locale (optional) -o <options file> : Runs the LaunchPad with the specified options file (optional) -l <locale> : Runs the LaunchPad in the specified locale (optional)

IRU08126

Using the options file {0} instead of command line arguments.

Explanation:

Informs you that the LaunchPad is using the options file provided.

User response:

For information only. No action required.

IRU08127

Could not open options file.

Explanation:

The options file specified could not be found or opened.

User response:

Designate a valid options file.

IRU08128

Could not load resource bundle... exiting.

Explanation:

The resource bundle could not be opened given the specified properties file. For example, if you provide SE_LaunchPad.properties as the properties file, you must ensure that you have an SE_LaunchPad_xx.properties file for each of the locales you support, where xx is the two letter locale code.

User response:

Ensure that appropriate properties files exist for each supported locale.

IRU08129

Unknown builtin command: {0}

Explanation:

An unknown builtin command was specified in the properties file.

User response:

The only supported builtin command is exit. Do not use any other builtin commands.

IRU08130

Unknown command type: {0}

Explanation:

The command specified in the properties file is not supported. The supported commands are: `file://`, `exec://`, `builtin://`, `html://`, and `exec_usepath://`.

User response:

Provide a supported command in your properties file.

IRU08131

`Unable to display HTML document. See logfile.`

Explanation:

The HTML file you are attempting to load cannot be displayed.

User response:

Review the log file (in Express Runtime, the log file is IRU_DeploymentWizard.log; in the IBM Installation Agent, the log file is IRU_IIA.log). If the problem cannot be resolved, contact your solution provider.

IRU08132

`Unable to launch command. See logfile.`

Explanation:

There is a problem completing the command, such as a command to run the deployer, run the Express Runtime developer, or to start and stop the agent.

User response:

Review the log file (in Express Runtime, the log file is IRU_DeploymentWizard.log; in the IBM Installation Agent, the log file is IRU_IIA.log). If the problem cannot be resolved, contact your solution provider.

IRU08133

`The Express Runtime developer is already installed on this machine.`

Explanation:

The Express Runtime developer is already installed on the system. This might be from another solution provider's installation of the Express Runtime developer. You can have only one copy of the Express Runtime developer installed on a system at one time.

User response:

For information only. No action required.

IRU08134

`The install program is unable to finish writing files to the temporary directory {0} because there is not enough space.`

Explanation:

This message is displayed when you click on Install in the LaunchPad if there is not enough space in the default temporary directory to store the temporary files needed to run the installation.

User response:

Launch the installation from the command line specifying `-is:tempdir <temp location>` as a command line option to relocate the temporary files.

IRU08135

```
You are attempting to install a new version of the Express Runtime
developer function of Express Runtime, but a previous version of the
Express Runtime developer is already installed on this system. You must
uninstall the existing version of Express Runtime first. After you
uninstall Express Runtime, refer to the migration steps provided to your
Development group for reinstallation instructions so that you can migrate
your user data from the previous version.
```

Explanation:

The user is attempting to install a new version of the Express Runtime developer on a machine with an older version already installed.

User response:

Contact your solution provider.

IRU08136

```
The Solution Launcher was unable to locate the following license file -
{0}. Contact your solution provider.
```

Explanation:

The Solution Launcher was unable to find the specified license file.

User response:

Contact your solution provider.

IRU08137

```
An error occurred while reading the license file. The encoding of {0} might
not match the encoding specified in the response file. The exception is
printed below.
```

Explanation:

The encoding of the license file does not match the encoding specified in the response file for the current locale.

User response:

Correct the encoding in the response file to match that of the license file.

IRU08139

`Unable to create the temp directory {0}.`

Explanation:

The Solution Launcher was unable to create a temporary directory in which to install the components for this solution deployment.

User response:

Ensure that the parent directory of the temporary directory specified is writable. If the error persists, contact your solution provider.

IRU08140

`The installation agent is already installed in a directory other than the`
`one you specified in the response file. You cannot install the installation`
`agent to multiple locations. The installation aborted.`

Explanation:

The IBM Installation Agent cannot be installed to more than one location on the target machine.

User response:

Either uninstall the existing installation agent and reinstall it in the new directory, or change the directory in the response file to the location where the existing agent is already installed. Retry the installation.

IRU08142

`Only a user belonging to the local administrator group or a domain`
`administrator can install {0}.`

Explanation:

You are not authorized to perform the operation.

User response:

Log on with the proper authorization and perform the operation.

IRU08143

`Insufficent authority to install the {0}. Installation requires root`
`authority.`

Explanation:

You are not authorized to perform the operation.

User response:

Log on with the proper authorization and perform the operation.

IRU08144

```
Solution files will be placed in directory:
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU08145

```
The IBM Installation Agent will not be upgraded to a new version.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10000 messages

IRU10000 messages are log messages that are created during solution deployment.
They are logged during the deployment of multiple applications.

IRU10000
Explanation:

The command issued during deployment. : The following command was issued:
{0}

User response:

This is an informational message. No action is required.

IRU10001

```
Exception occurred issuing command. Exception: {0}
```

Explanation:

The command failed due to the listed exception.

User response:

This is an informational message. No action is required.

IRU10002

```
Get properties failed : The properties file could not be read during
deployment.
```

User response:

This is an informational message. No action is required.

IRU10003

`Copy file {0} to {1} was successful`

Explanation:

The file copy was successful.

User response:

This is an informational message. No action is required.

IRU10004

`Copy file {0} to {1} failed`

Explanation:

The file could not be copied.

User response:

This is an informational message. No action is required.

IRU10005

`Unzipping file {0}`

Explanation:

The file listed is being unzipped.

User response:

This is an informational message. No action is required.

IRU10006

`Unzipped file {0} successfully`

Explanation:

The file was unzipped successfully.

User response:

This is an informational message. No action is required.

IRU10007

`Failed to unzip file {0}.`

Explanation:

The file could not be unzipped.

User response:

This is an informational message. No action is required.

IRU10008

```
Extracting from tar file {0}.
```

Explanation:

Files are being extracted from the listed tar file.

User response:

This is an informational message. No action is required.

IRU10009

```
Failed to extract from tar file {0}.
```

Explanation:

Files could not be extracted from the listed tar file.

User response:

This is an informational message. No action is required.

IRU10010

```
Command failed with return code {0}.
```

Explanation:

The issued command failed with the listed return code.

User response:

This is an informational message. No action is required.

IRU10011

```
Command succeeded.
```

Explanation:

The command completed successfully.

User response:

This is an informational message. No action is required.

IRU10012

```
Creating file {0}.
```

Explanation:

The file listed is being created.

User response:

This is an informational message. No action is required.

IRU10013

```
Exception occurred creating file. {0}
```

Explanation:

The file could not be created due to the listed exception.

User response:

This is an informational message. No action is required.

IRU10014

```
Failed creating file {0}
```

Explanation:

The file could not be created.

User response:

Refer to message IRU10013 for the reason the file could not be created.

IRU10015

```
IBM HTTP Server is a prerequisite product.
```

Explanation:

The IBM HTTP server must be installed.

User response:

Install the IBM HTTP server.

IRU10016

```
The IBM Installation Agent must run with {0} special authority to perform
an install.
```

Explanation:

The special authority, listed in the message, is required to perform the necessary install actions.

User response:

Stop the IBM Installation Agent and restart it from a user ID with the correct authority.

IRU10017

PTF {0} for product {1} applied successfully.

Explanation:

The PTF was successfully applied to the system.

User response:

This is an informational message. No action is required.

IRU10018

Failed to apply PTF {0} for product {1}.

Explanation:

The PTF could not be applied to the system.

User response:

This is an informational message. No action is required. This condition could result when a particular language feature is not installed for the product.

IRU10019

Group PTF {0} level {1} for product {2} applied successfully.

Explanation:

The group PTF was successfully applied to the system.

User response:

This is an informational message. No action is required.

IRU10020

Failed to apply group PTF {0} level {1} for product {2}.

Explanation:

The group PTF was not able to be applied to the system.

User response:

This is an informational message. No action is required.

IRU10023

Port {0} is in use.

Explanation:

User response:

IRU10024

Error reading file {0} \n {1}

Explanation:

The group PTF was not able to be applied to the system.

User response:

This is an informational message. No action is required.

IRU10028

Missing required values for service user id, password, or both.

Explanation:

These variables are conditional. If you specify a value for one of them, you must also specify a value for the others.

User response:

Specify values for all fields listed in the message.

IRU10029

Specified user ID, {0}, does not exist on target system.

Explanation:

The specified user ID does not exist on target system.

User response:

Specify a valid user ID.

IRU10030

The installation of {0} cannot continue because there is a conflict with {1}, which is installed on the target computer.

Explanation:

The installation cannot continue because there is a conflict with the product, which is installed on the target computer.

User response:

Contact your solution provider.

IRU10800 messages

IRU10800 messages are related to the install of the Express Runtime.

IRU10800

`The install program you are running is not compatible with the operating system.`

Explanation:

You have selected to install a program that is incompatible with the operating system.

User response:

Verify the operating system before installing the product.

IRU10801

`The directory name must include at least 1 character.`

Explanation:

The installation path on UNIX systems must have at least 1 character.

User response:

Enter a path name that consists of at least one character.

IRU10802

`The first character in the directory name must be a slash (/).`

Explanation:

The installation path must start with a slash (/).

User response:

Enter a path that begins with a slash.

IRU10803

`The directory name must be at least 3 characters.`

Explanation:

A Microsoft Windows(C) destination was specified with less than three characters.

User response:

Enter a valid destination path.

IRU10804

`The first character in the directory name must be a valid drive letter.`

Explanation:

An invalid character was entered at the beginning of the directory name.

User response:

Enter a valid drive letter as the first character in the destination path. The range is from A to Z.

IRU10805

`The second character in the directory name must be a colon (:).`

Explanation:

The second character in a Windows path name must be a colon.

User response:

Enter a valid path using a colon as the second character.

IRU10806

`The third character in the directory name must be a backslash (\).`

Explanation:

The third character in a Windows path name must be a backslash (\).

User response:

Enter a valid path using a backslash as the third character.

IRU10807
Explanation:

A Microsoft Windows path name contains characters that are not valid.

User response:

Enter a path that contains valid characters.

IRU10808

`Path names cannot contain double backslashes (\\)`

Explanation:

Microsoft Windows path names cannot contain double backslashes (\\).

User response:

Enter a valid path.

IRU10809

```
The directory you selected does not have enough space. Please select
another location.
```

Explanation:

A destination path does not contain enough space to complete the installation.

User response:

Enter another path.

IRU10810

```
The temporary directory does not have sufficient space. Click Browse to
select an alternate temporary location.
```

Explanation:

The temporary directory must contain enough space to initiate the installation.

User response:

Enter another path.

IRU10811

```
The directory does not exist. Do you want to create it?
```

Explanation:

The requested destination directory does not exist.

User response:

Click Yes to create the directory.

IRU10812

```
The character \"{0}\" is not valid in the destination path.
```

Explanation:

A Microsoft Windows destination was specified with an invalid character.

User response:

Enter a valid destination path.

IRU10813

```
Double slashes (//) are not allowed in the directory name.
```

Explanation:

A Microsoft Windows destination was specified with an invalid character combination.

User response:

Enter a valid destination path.

IRU10814

```
The installation aborted. Some of the program files might not have been
removed.
```

Explanation:

The installation was aborted, either by user request or by program failure, but some installation files might remain on the computer.

User response:

Analyze the log file for details about why the installation aborted. Remove any remaining program files from the directory you specified during the installation.

IRU10815

```
Installation language = {0}
```

Explanation:

Specifies the language the user selected for the Express Runtime installation program.

User response:

This is an informational message. No action is required.

IRU10816

```
Installation directory = {0}
```

Explanation:

Specifies the location in which the Express Runtime program is installed.

User response:

This is an informational message. No action is required.

IRU10817

```
Installation is complete.
```

Explanation:

Informs the user that the install has completed.

User response:

This is an informational message. No action is required.

IRU10818

```
The destination directory should contain a maximum of 40 characters.
```

Explanation:

The destination panel restricts the user to enter no more than 40 characters for the destination directory.

User response:

Enter a destination directory with 40 or fewer characters.

IRU10819

```
Uninstallation directory = {0}
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10820

```
Uninstallation is complete. Check for any error messages in this log file.
```

Explanation:

The uninstallation process is finished.

User response:

Verify that no errors occurred.

IRU10821

```
A version of the IBM Express Runtime program is already installed. Click
Next to replace the installed version, or click Cancel to exit the
installation.
```

Explanation:

There is already an installation.

User response:

Continue and replace the previous installation, or cancel the installation.

IRU10822

Only a user belonging to the local administrator group or a domain administrator can install or uninstall IBM Express Runtime.

Explanation:

You are not authorized to perform the installation.

User response:

Log on with the proper authorization and restart the installation.

IRU10823

Insufficient authority to install or uninstall IBM Express Runtime. Installation requires root authority.

Explanation:

You are not authorized to perform the installation.

User response:

Log on with the proper authorization and restart the installation.

IRU10824

The base IBM Express Runtime product is not installed on the system.

Explanation:

The required prerequisite is not installed.

User response:

Abandon this installation or correct the problem and restart the installation.

IRU10825

The base IBM Installation Agent product is not installed on the system.

Explanation:

The required prerequisite is not installed.

User response:

Abandon this installation or correct the problem and restart the installation.

IRU10826

This fix does not apply to the installed version of the base IBM Express Runtime product.

Explanation:

The required prerequisite is not installed.

User response:

Abandon this installation or correct the problem and restart the installation.

IRU10827

```
This fix does not apply to the installed version of the IBM Installation
Agent product.
```

Explanation:

The required prerequisite is not installed.

User response:

Abandon this installation or correct the problem and restart the installation.

IRU10828

```
The same or higher level of IBM Installation Agent fix pack is already
installed. Click Next to replace the installed fix pack, or click Cancel to
exit the installation.
```

Explanation:

There is another fix pack installed.

User response:

Abandon this installation or continue the installation.

IRU10830

```
Stopping IBM Installation Agent...
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10831

```
The following user data files are updated by this fix pack: {1} These files
are backed up to the Backup directory in the {0} file. These files are also
backed up individually in their original location for quick access.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10832

```
An error occurred while backing up these files: {0}. If you want to
continue you can manually back up these files, though this action is not
required.
```

Explanation:

This is an informational message.

User response:

No action is required; you can manually back up the files, if needed.

IRU10833

```
An error occurred while backing up these files: {0}. If you want to
continue you can manually back up these files, though this action is not
required. Note: You are not able to roll back this fix pack because of this
error. Any previous rollbacks are removed.
```

Explanation:

This is an informational message.

User response:

No action is required; you can manually back up the files, if needed.

IRU10834

```
The following files cannot be rolled back because a backup error occurred
during the fix pack install: {0}. If you want to continue, you can manually
restore these files if you backed them up as suggested during the fix pack
install.
```

Explanation:

This is an informational message.

User response:

No action is required; you can manually restore the files, if needed.

IRU10835

```
An error occured while rolling back the fix pack. Contact service.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU10836

```
This rollback installation restores the product to the previous level, {0}.
Click Next to continue with the rollback or click Cancel to stop the
rollback.
```

Explanation:

The rollback installation can be continued or aborted.

User response:

Continue if you want the rollback done, or cancel the installation.

IRU10837

```
The rollback is complete.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10838

```
You modified the following user data files since the fix pack installation.
Select the files you want to back up into a new file {0} located in the
Runtime21 directory. For the files you do not select in the list below,
your changes will be lost.
```

Explanation:

This is an informational message.

User response:

No action is required; you can select files to be backed up.

IRU10839

```
The file {0} was not found.The file {0} was not found.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10841

The file {0} is renamed to {2} and is found in directory {1}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10842

The file {0} cannot be renamed. The file might be open or corrupted, or the directory might not be writable.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10843

Information required for file {0} cannot be located. You can continue with the installation of this fix pack; however, you might not be able to roll back this fix pack or any previous fix packs installed on the system.

Explanation:

The file cannot be used for rolling back the fix pack.

User response:

No action is required. You can correct the problem, and restart the installation, if desired.

IRU10844

Information required for file {0} cannot be located, therefore you cannot roll back the fix pack. Contact service.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU10845

The current user ID does not have administrator authority. Only users with administrator authority can uninstall the IBM Express Runtime.

Explanation:

You are not authorized to perform the installation.

User response:

Log on with the proper authorization and restart the installation.

IRU10846

```
The task file {0} is not valid.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10847

```
This version of the IBM Express Runtime program is already installed with
the following features: Express Runtime developer, Deployment Wizard. Click
Next to replace the installed version, or click Cancel to exit the
installation.
```

Explanation:

The product is already installed.

User response:

Confirm that you have the correct installation, or exit the installation process.

IRU10848

```
This version of the IBM Express Runtime program is already installed with
the following features: Deployment Wizard. Click Next to replace the
installed version, or click Cancel to exit the installation.
```

Explanation:

The product is already installed.

User response:

Confirm that you have the correct installation, or exit the installation process.

IRU10849

```
IBM Express Runtime, Version {0} is already installed with the following
features: Express Runtime developer, Deployment Wizard. Click Next to
upgrade to the new version, or click Cancel to exit the installation.
```

Explanation:

Another version of the product is already installed.

User response:

Confirm that you have the correct installation, or exit the installation process.

IRU10850

IBM Express Runtime, Version {0} is already installed with the following
features: Deployment Wizard. Click Next to upgrade to the new version, or
click Cancel to exit the installation.

Explanation:

Another version of the product is already installed.

User response:

Confirm that you have the correct installation, or exit the installation process.

IRU10851

IBM Express Runtime, Version {0} is already installed on this machine. This
version cannot be installed on top of a later version. Click Cancel to exit
the installation.

Explanation:

Another version of the product is already installed.

User response:

Confirm that you have the correct installation, or exit the installation process.

IRU10852

A backup of your workspace was successfully created in the file: {0}.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10853

There was an error backing up the workspace files. If the following
directories exist in the Runtime21 folder, back them up before continuing:
SolutionEnabler/workspace, SolutionEnabler/WindowsSampleWorkspace, and
SolutionEnabler/LinuxSampleWorkspace.

Explanation:

The workspace files could not be backed up; they are in danger of being lost if you continue.

User response:

Locate the files and manualy back them up before continuing.

IRU10854

```
The following features were not selected, but must be upgraded because they
were part of a previous installation:
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10855

```
You chose to upgrade only the Deployment Wizard. However, because the
Express Runtime developer is installed, you must choose either a Typical or
Custom Developer installation. The installation is canceled.
```

Explanation:

You did not choose a valid installation option.

User response:

Restart the installation with the correct installation option.

IRU10856

```
You chose to upgrade only the Deployment Wizard. However, because the
Express Runtime developer is installed, you must choose either a Typical or
Custom Developer installation. Click Back to choose an alternative setup
type, or click Cancel to exit the installation.
```

Explanation:

You did not choose a valid installation option.

User response:

Go back and continue the installation with the correct installation option.

IRU10857

```
IBM Express Runtime is already installed in a directory other than the one
you specified in the response file. You cannot install IBM Express Runtime
to multiple locations. The installation is canceled.
```

Explanation:

You did not choose a valid installation location.

User response:

Restart the installation with the correct installation location.

IRU10858

```
The IBM Installation Agent is in use. Wait for the solution installation to
complete before uninstalling the agent.
```

Explanation:

The agent cannot be uninstalled while it is performing an installation.

User response:

Attempt the uninstallation again after the agent has completed the installation in progress.

IRU10859

```
The Eclipse Workbench product selected is not supported for the Express
Runtime developer plug-in.
```

Explanation:

You did not choose a valid installation option.

User response:

Restart the installation with the correct installation option.

IRU10860

```
To continue the installation, you must select at least one feature.
```

Explanation:

You did not choose a valid installation option.

User response:

Restart the installation with the correct installation option.

IRU10862

```
Directory name cannot contain any spaces.
```

Explanation:

You did not enter a valid installation destination.

User response:

Restart the installation with the correct installation destination.

IRU10863

```
{0} is already installed on the target computer.
```

Explanation:

Another version of the product is already installed.

User response:

Confirm that you have the correct installation, or exit the installation process.

IRU10864

```
An earlier version of {0} is installed on this machine. No migration was
requested, so installation was terminated.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10865

```
{0} will be upgraded to version {1}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10866

```
{0} is already installed in a directory other than the one you specified in
the response file. You cannot install to multiple locations. The
installation aborted.
```

Explanation:

You did not enter a valid installation destination.

User response:

Restart the installation with the correct installation destination.

IRU10867

The Console Agent cannot be uninstalled. The following products are
registered to use the Console Agent and must be uninstalled first: {0}.

Explanation:

You did not uninstall these products before starting the uninstallation.

User response:

Restart the uninstallation after uninstalling these products.

IRU10868

The installation of Rational Web Developer 6.0 failed. See the log file
located in {0} for further details. Run the installation program once more
to try again or to plug in to another Eclipse-based product.

Explanation:

The installation could not complete.

User response:

Restart the installation and choose another Eclipse-based product.

IRU10869

A more recent version of {0} is installed. Click Cancel to end the
installation.

Explanation:

This message is displayed when a more recent version is installed..

User response:

Click Cancel to end the installation.

IRU10870

A newer version of Integrated Solutions Console is installed.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10871

An internal error occurred. Contact product service.

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU10872

```
Cannot locate the application server using path {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10873

```
Unable to start the Integrated Solutions Console. Check log files in {0}.
```

Explanation:

The Integrated Solutions Console failed to start.

User response:

Check the log file for errors; correct the error and retry.

IRU10874

```
Additional log files for the Integrated Solutions Console can be found in
the system temporary directory and {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10875

```
The Integrated Solutions Console has been installed successfully. It can be
found at {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10879

The current version of Integrated Solutions Console is already installed.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10880

Integrated Solutions Console is not installed on this system.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10881

Security is not enabled on the specified WebSphere Application Server installation.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10882

Security using the local operating system is enabled on the specified WebSphere Application Server installation.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10883

Security using a database user registry is enabled on the specified WebSphere Application Server installation.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10884

```
Security using LDAP is enabled on the specified WebSphere Application
Server installation.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10885

```
You must make a selection before continuing the uninstallation process.
```

Explanation:

You did not make a required selection.

User response:

Make the selection and continue.

IRU10887

```
Error deploying {0} module.
```

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU10887

```
The {0} module has already been deployed.
```

Explanation:

The module already exists.

User response:

Install a later version of the module, or cancel installation.

IRU10888

The prerequisite, IBM DB2, Version 8.2 is not installed. Install this
prerequisite and then invoke this install program again.

Explanation:

The required version of DB2 was not installed.

User response:

Install the required version of DB2 and restart the installation.

IRU10889

The installation path for IBM DB2, Version 8.2 could not be determined.
Ensure IBM DB2, Version 8.2 is properly installed and then invoke this
install program again.

Explanation:

The required version of DB2 could not be located.

User response:

Install the required version of DB2 and restart the installation.

IRU10890

The IBM Express Runtime or IBM Installation Agent must be installed on this
machine in order to install this product. Install one of these applications
and then invoke this install program again.

Explanation:

The required prerequisite product could not be located.

User response:

Install the required product and restart the installation.

IRU10892

The {1} port: {0}, is currently in use.

Explanation:

The port number you specified is not available.

User response:

Choose another port and continue the installation.

IRU10893

Ports required by this installation program are currently in use. See the
log file for additional details.

Explanation:

The port numbers you specified are not available.

User response:

Determine the used port numbers from the log file. Choose other ports and continue the installation.

IRU10894

Values required by this installation program were not specified. See the log file for additional details.

Explanation:

You did not specify all the required values.

User response:

Determine the missing information from the log file and restart the installation.

IRU10895

A valid value for the user ID was not specified. Specify a valid value for this field and then invoke this install program again.

Explanation:

You did not specify a valid user ID.

User response:

Use a valid user ID and restart the installation.

IRU10896

A valid value for the password was not specified. Specify a valid value for this field and then invoke this install program again.

Explanation:

You did not specify a valid password.

User response:

Use a valid password and restart the installation.

IRU10897

This version of the management extension for IBM DB2 is already installed. Click Cancel to exit the installation.

Explanation:

The product is already installed.

User response:

Cancel the installation.

IRU10898

The DB2 install location that was used to configure the DB2 Management
Extension has changed. Click Next to reconfigure the Management Extension
for IBM DB2 for the new DB2 install location. Click Cancel to exit the
installation and perform a complete uninstall and reinstall.

Explanation:

The location where the product was previously installed has been changed; the
installation cannot continue.

User response:

Cancel the installation. You must uninstall the product and install it anew.

IRU10899

Only a user belonging to the local administrator group or a domain
administrator can install or uninstall the management extension for IBM
DB2.

Explanation:

You are not authorized to perform the installation.

User response:

Log on with the proper authorization and restart the installation.

IRU10900

A version of the Mozilla Web browser was not found on the local computer;
you cannot administer the console from the local computer.

Explanation:

You do not have the required Web browser.

User response:

Install the Mozilla Web browser and restart.

IRU10901

You need to restart Integrated Solutions Console before changes take
effect.

Explanation:

The changes have not yet been applied fully.

User response:

Stop and restart the Integrated Solutions Console.

IRU10902

An older version of Integrated Solutions Console is installed.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10903

Insufficient authority to install or uninstall management extension for IBM
HTTP Server. Installation requires root authority.

Explanation:

You are not authorized to perform the installation.

User response:

Log on with the proper authorization and restart the installation.

IRU10904

The hostname {0} specified in the response file does not match the
fully-qualified hostname of this computer. The install program will
terminate.

Explanation:

The response file did not have a valid host name.

User response:

Enter the fully qualified host name of your computer and restart the installation.

IRU10905

Certificate creation failed.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10906

`JaasLogon service installation failed.`

Explanation:

This message is used only by the IBM Support Center.

User response:

Provide the message output to the IBM Support Center representative.

IRU10907

`The file {0} cannot be found and cannot be renamed.`

Explanation:

This is an informational message.

User response:

No action is required.

IRU10908

`There is no Eclipse-based product at the specified location.`

Explanation:

This is an informational message.

User response:

No action is required.

IRU10909

`Insufficient authority to install or uninstall management extension for IBM DB2. Installation requires root authority.`

Explanation:

You are not authorized to perform the installation.

User response:

Log on with the proper authorization and restart the installation.

IRU10910

`The installation was successfull.`

Explanation:

This is an informational message.

User response:

No action is required.

IRU10911

`The installation failed. See {0} for details.`

Explanation:

The installation could not be completed.

User response:

Determine the cause and restart the installation after correcting it.

IRU10912

`Only a user belonging to the local administrator group or a domain administrator can enable SSL security for this product. Specify a user who meets this requirement.`

Explanation:

You are not authorized to perform the operation.

User response:

Log on with the proper authorization and perform the operation.

IRU10913

`The user ID and password specified do not match. Specify a valid user ID and password.`

Explanation:

You did not enter a valid user ID and password.

User response:

Enter the correct user ID and password; retry the operation.

IRU10914

`Invalid user data was specified. Please see the log file for additional details.`

Explanation:

You did not enter valid user data.

User response:

Enter the correct user data; retry the operation.

IRU10915

The DB2 install location for the initial install was {0}, but is now {1}.
The management extension for IBM DB2 will be reconfigured for the new IBM
DB2 install location.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10916

The console agent is still required by other products; it will not be
uninstalled.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10917

A valid destination directory was not specified. Specify a valid
destination directory and then invoke this install program again.

Explanation:

You did not enter a valid installation destination.

User response:

Restart the installation with the correct installation destination.

IRU10918

The destination directory specified was not used, because an existing
management extension was found at {0}. This destination will be used
instead.

Explanation:

This is an informational message.

User response:

No action is required.

IRU10919

Only a user belonging to the local administrator group or a domain
administrator can install or uninstall the management extension for IBM
HTTP Server.

Explanation:

You are not authorized to perform the installation.

User response:

Log on with the proper authorization and restart the installation.

IRU10920

You must choose an IBM HTTP Server location.

Explanation:

You did not choose a valid location.

User response:

Select a valid location and continue.

IRU10921

The Embedded Websphere Application Server failed to start. Refer to product
documentation for possible causes and resolution.

Explanation:

The product could not start.

User response:

Refer to the Websphere Application Server documentation.

IRU10922

The console agent failed to start. Refer to product documentation for
possible causes and resolution.

Explanation:

The console agent could not start.

User response:

Refer to the troublshooting section of the documentation.

IRU10923

The installation of the IBM Express Runtime console failed. See the log
file {0} for details.

Explanation:

The installation did not succeed.

User response:

Correct any problems found using the log file and restart the installation.

IRU10924

```
A valid license file was not found. Provide a valid license file and begin
the installation again.
```

Explanation:

You did not have the required license file.

User response:

Provide the required license file and restart the installation.

IRU10925

```
The prerequisite, IBM WebSphere Application Server - Express, Version 6.0,
is not installed to the location specified; install this prerequisite and
then invoke this install program again.
```

Explanation:

The required version of IBM WebSphere Application Server - Express could not be located.

User response:

Install the required version of IBM WebSphere Application Server - Express and restart the installation.

IRU10926

```
Only a user belonging to the local administrator group or a domain
administrator can install or uninstall this product.
```

Explanation:

You are not authorized to perform the installation.

User response:

Log on with the proper authorization and restart the installation.

IRU10928

```
Server has been stopped successfully for profile {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10929

```
A problem occurred stopping the server; check the stopServer log of the
current profile.
```

Explanation:

The operation could not complete.

User response:

Determine the cause of the problem by examining the log file; then retry the operation.

IRU10930

```
Server has been started successfully for profile {0}.
```

Explanation:

This is an informational message.

User response:

No action is required.

IRU10931

```
A problem occurred starting the server; check the startServer log of the
current profile.
```

Explanation:

The operation could not complete.

User response:

Determine the cause of the problem by examining the log file; then retry the operation.

IRU10937

```
There are no features to update. Click Cancel to exit the installation.
```

Explanation:

The entire product was installed and there are no updates that need to be made.

User response:

Click Cancel to exit the installation.

IRU10940

This fix pack is already installed. Click Next to update the product with
this fix pack or click Cancel to exit the installation.

Explanation:

This fix pack has already been applied. If you have updated any features from the
base installation, then you can reapply this fix pack.

User response:

Click Next to update the product or Cancel to exit.

IRU10941

Fix pack {0} has been installed multiple times. This installation rollback
only reverts to the level of the product installed before the last
application of the fix pack.

Explanation:

The fix pack was installed multiple times. The installation rollback only reverts to
the level of the product installed before the last application of the fix pack.

User response:

Click Next to update the product or Cancel to exit.

IRU10942

Fix pack {0} is already installed. Reinstall the fix pack to ensure that
all features are updated.

Explanation:

Ensure that all features are updated by reinstalling the fix pack.

User response:

Reinstall the fix pack.

IRU10947

{0} is not a fully-qualified hostname. Refer to the product documentation
for how to setup your computer with a fully-qualified hostname.

Explanation:

The hostname of the computer is not fully-qualified.

User response:

Assign a fully-qualified hostname to the computer.

IRU11000 messages

IRU11000 messages are logged during the deployment of the WebSphere Express application.

IRU11000

`Installation of WebSphere Express is in progress.`

Explanation:

The WebSphere Express application installation has started.

User response:

This is an informational message. No action is required.

IRU11001

`Installation of WebSphere Express was successful.`

Explanation:

The WebSphere Express application installation completed successfully.

User response:

This is an informational message. No action is required.

IRU11002

`Installation of WebSphere Application Server - Express failed.`

Explanation:

The installation did not complete successfully.

User response:

Refer to the log file for more information.

IRU11003

`Configuring WebSphere ports.`

Explanation:

The configuration script to modify the WebSphere ports has been invoked.

User response:

This is an informational message. No action is required.

IRU11004

`Port assignment {0} = {1}.`

Explanation:

The WebSphere port assignment was successful.

User response:

This is an informational message. No action is required.

IRU11005

`Configuring WebSphere Administration ports.`

Explanation:

The configuration script to modify the WebSphere Administration ports has been invoked.

User response:

This is an informational message. No action is required.

IRU11006

`Installation of WebSphere Administration console is in progress.`

Explanation:

The script to install the WebSphere Administration console has been invoked.

User response:

This is an informational message. No action is required.

IRU11007

`Installation of WebSphere Administration console was successful.`

Explanation:

The WebSphere Administration console has been deployed.

User response:

This is an informational message. No action is required.

IRU11008

`Installation of WebSphere Administration console failed.`

Explanation:

The WebSphere Administration console has not been deployed.

User response:

Refer to the log file for more information.

IRU11009

`Starting WebSphere Application Server - Express.`

Explanation:

The WebSphere Application Server - Express started during deployment.

User response:

This is an informational message. No action is required.

IRU11010

`Stopping WebSphere Application Server - Express.`

Explanation:

WebSphere Application Server - Express was stopped during deployment.

User response:

This is an informational message. No action is required.

IRU11011

`WebSphere Application Server - Express installation directory: {0}`

Explanation:

The message lists the installation directory for WebSphere Application Server - Express.

User response:

This is an informational message. No action is required.

IRU11012

`Configuring WebSphere ports failed.`

Explanation:

The configuration of the WebSphere ports failed.

User response:

Refer to the log file for more information.

IRU11013

`Configuring WebSphere Administration ports failed.`

Explanation:

The configuration of the WebSphere Administration ports failed.

User response:

Refer to the log file for more information.

IRU11014

`Started WebSphere Application Server - Express.`

Explanation:

The WebSphere Application Server - Express started successfully.

User response:

This is an informational message. No action is required.

IRU11015

`Stopped WebSphere Application Server - Express.`

Explanation:

The WebSphere Application Server - Express was stopped successfully.

User response:

This is an informational message. No action is required.

IRU11016

`Failed to start WebSphere Application Server - Express.`

Explanation:

WebSphere Application Server - Express did not start successfully.

User response:

Refer to the log file for more information.

IRU11017

`Failed to stop WebSphere Application Server - Express.`

Explanation:

The WebSphere Application Server - Express was not stopped successfully.

User response:

Refer to the log file for more information.

IRU11018

`Creation of WebSphere Express Application Server {0} was successful.`

Explanation:

The named application server was successfully created.

User response:

This is an informational message. No action is required.

IRU11019

```
Creation of WebSphere Express Application Server {0} failed.
```

Explanation:

A failure occurred when trying to create the named application server.

User response:

Refer to the log file for more information.

IRU11020

```
There is already a WebSphere Express Application Server named {0} on the
target system.
```

Explanation:

It is not possible to create the named application server because a server with that name already exists. While server names on OS/400 (i5/OS) are case sensitive, two servers cannot exist where the names vary only by upper and lower case.

User response:

Either select a different server name or delete the existing server before retrying.

IRU11021

```
Deployment of sample application snoop was successful.
```

Explanation:

The snoop servlet was successfully deployed in the new application server.

User response:

This is an informational message. No action is required.

IRU11022

```
Deployment of sample application snoop failed.
```

Explanation:

The snoop servlet was not able to be deployed in the new application server.

User response:

Refer to the log file for more information.

IRU11023

`The range of WebSphere ports {0} overlaps with the HTTP server port {1}.`

Explanation:

The range of WebSphere ports selected for the application server cannot overlap with the port selected for the HTTP server. This results in a conflict at runtime.

User response:

Enter a different value for either the starting WebSphere port or for the HTTP server port.

IRU11024

`WebSphere Application Server - Express has not been configured to start automatically after a reboot.`

Explanation:

WebSphere Application Server - Express must be started manually given the current configuration.

User response:

For informational purposes only. No action required.

IRU11025

`WebSphere Application Server - Express installation directory {0} already exists.`

Explanation:

There is already an installation directory for WebSphere Application Server - Express in the location specified. A new directory does not need to be created.

User response:

For informational purposes only. No action required.

IRU11026

`User {0} does not have sufficient rights or privileges. Upgrading the user's rights to meet installation requirements.`

Explanation:

The access rights and privileges of the specified user must be upgraded before continuing.

User response:

For informational purposes only. No action required.

IRU11027

```
The WebSphere Application Server - Express was installed successfully.
However, the verification test failed. See the log file for more details.
```

Explanation:

User response:

IRU11028

```
WebSphere Application Server - Express has been configured to start
manually after a reboot.
```

Explanation:

WebSphere Application Server - Express has been configured to start manually after a reboot.

User response:

This is an informational message. No action is required.

IRU11029

```
WebSphere Application Server - Express restart after a reboot has been
disabled.
```

Explanation:

The WebSphere Application Server - Express restart function, after a reboot, has been disabled.

User response:

This is an informational message. No action is required.

IRU11030

```
User {0} does not have sufficient rights or privileges. Upgrading the
user's rights to meet install requirements.
```

Explanation:

The user ID does not have sufficient rights or privileges.

User response:

IRU11031

```
The WebSphere Application Server was installed successfully. However the
verification test failed. See the log for more details.
```

Explanation:

The WebSphere Application Server was installed successfully. However the verification test failed. See the log for more details.

User response:

Review the log.

IRU11032

```
Instructed to ignore port conflicts.
```

Explanation:

The program will ignore port conflicts

User response:

This is an informational message. No action is required.

IRU11033

```
Cell name = {0}.
```

Explanation:

This message displays a cell name, for example `wasNode02Cell`.

User response:

This is an informational message. No action is required.

IRU11034

```
Node name = {0}.
```

Explanation:

This message displays a node name, for example `wasNode02`.

User response:

This is an informational message. No action is required.

IRU11035

```
Host name = {0}.
```

Explanation:

This message displays a host name, for example `was`.

User response:

This is an informational message. No action is required.

IRU11036

`Profile name = {0}.`

Explanation:

This message displays a profile name, for example `default`.

User response:

This is an informational message. No action is required.

IRU11037

`WebSphere Application Server - Express installation directory {0} already exists.`

Explanation:

The WebSphere Application Server - Express installation directory already exists.

User response:

Specify a new directory path.

IRU11038

`WebSphere Application Server - Express will restart with user ID {0}.`

Explanation:

WebSphere Application Server - Express will restart with the user ID specified.

User response:

This is an informational message. No action is required.

IRU11039

`Another version of WebSphere Application Server - Express is already installed in the target directory. The version found is {0} and the version to install is {1}.`

Explanation:

Another version of WebSphere Application Server - Express is already installed in the target directory. The version that was found and the version to install are displayed in the message.

User response:

IRU11040

`Deployment failed because product {0}, option {1} is not installed.`

Explanation:

The deployment failed because the required product and option specified were not installed on the system.

User response:

Install the missing product and option and run the deployment again.

IRU11100 messages

IRU11100 messages

IRU11100

Upgrade of DB2 Express from version {0} to version {1} in progress.

Explanation:

There is an existing version of DB2 Express on the system. Express Runtime is upgrading DB2 Express to the version it includes.

User response:

For informational purposes only. No action required.

IRU11102

No Satellite Id provided. You must provide a Satellite Id or deselect Satellite Synchronization.

Explanation:

These variables are conditional. If you select Satellite Synchronization, you must specify a value for the Satellite ID field.

User response:

Specify values for all fields listed in the message.

IRU11103

Missing required values for the DB2 Administration User Id, the DB2 Administrator Password, or both. These values are required if any of the following fields have a value: DB2 Administration User Id, DB2 Administrator Password, and DB2 Administration User Domain.

Explanation:

These variables are conditional. If you specify a value for one of them, you must also specify a value for the other.

User response:

Specify values for all fields listed in the message.

IRU11104

```
Missing required values for DB2 Metadata Database user name or DB2 Metadata
Database user password. You must provide values for both fields or leave
both of them blank.
```

Explanation:

These variables are conditional. If you specify a value for one of them, you must also specify a value for the other.

User response:

Specify values for all fields listed in the message.

IRU11105

```
Missing required values for the Administrative Contact Name or
Administrative Contact email fields. You must provide values for both
fields or leave both of them blank.
```

Explanation:

These variables are conditional. If you specify a value for one of them, you must also specify a value for the other.

User response:

Specify values for all fields listed in the message.

IRU11106

```
Missing one or more required values for DB2 fenced user name, DB2 fenced
user password, DB2 fenced group name, or DB2 fenced home directory. You
must provide a value for all fields or leave them all blank.
```

Explanation:

These variables are conditional. If you specify a value for one of them, you must also specify a value for the others.

User response:

Specify values for all fields listed in the message.

IRU11107

```
Missing one or more required values for DB2 tools catalog database name,
DB2 tools catalog schema name, or DB2 tools catalog instance name. You must
provide a value for all fields or leave them all blank.
```

Explanation:

These variables are conditional. If you specify a value for one of them, you must also specify a value for the others.

User response:

Specify values for all fields listed in the message.

IRU11108

```
Missing one or more required values for DB2 Informix database server name,
or DB2 Informix database client install directory. You must provide a value
for all fields or leave them all blank.
```

Explanation:

These variables are conditional. If you specify a value for one of them, you must also specify a value for the other.

User response:

Specify values for all fields listed in the message.

IRU11109

```
A more recent version of DB2 UDB has been detected. The version detected on
the system is {0}. Deployment canceled.
```

Explanation:

A more recent version of DB2 UDB cannot be overwritten by a back-level version.

User response:

For informational purposes only. No action required.

IRU11110

```
Upgrading DB2 Server from unknown version to {0}.
```

Explanation:

The DB2 server is being upgraded.

User response:

This is an informational message. No action is required.

IRU11111

```
Unknown version of DB2 already installed.
```

Explanation:

A version of DB2 already installed.

User response:

This is an informational message. No action is required.

IRU11200 messages

IRU11200

HTTP Server for OS/400 (i5/OS) release level {0} not installed. Target
system OS/400 (i5/OS) release level is {1}.

Explanation:

The HTTP server application for OS/400 (i5/OS) is tied to the operating system
release level. This application could not be installed on the target system because
of a mismatch.

User response:

The HTTP server application for the appropriate target OS/400 (i5/OS) release will
install successfully. If no HTTP server applications exist for the OS/400 (i5/OS)
release of the target system, specify a different target system that has a valid
OS/400 (i5/OS) release installed.

IRU11201

Configuration of OS/400 (i5/OS) HTTP server failed. OS/400 release must be
at release level {0} or later.

Explanation:

The HTTP server could not be created and configured because the target system is
not at the minimum OS/400 (i5/OS) release or later.

User response:

Specify a target system that has a valid OS/400 (i5/OS) release installed.

IRU11202

Configuration of OS/400 (i5/OS) HTTP server failed. The HTTP server product
{0} is not installed on target system.

Explanation:

The HTTP server could not be created and configured because the HTTP server
product is not installed on the target system.

User response:

Deploy the HTTP server application task to the target system.

IRU11203

Configuration of OS/400 (i5/OS) HTTP server failed. An HTTP server named
{0} is already defined on the target system.

Explanation:

The HTTP server could not be created and configured because there is already a server on the target system with the same name.

User response:

Either specify a different server name or delete the existing server before retrying.

IRU11204

```
The HTTP server root directory {0} already exists. Renaming the directory
to {1} and creating a new root directory.
```

Explanation:

The server root directory needs to be created for the new server, but the directory already exists. The existing directory will be renamed and a new one created in its place with the necessary contents and authorities for the new server.

User response:

This is an informational message. No action is required.

IRU11205

```
Configuration of IBM HTTP server {0} was successful.
```

Explanation:

The HTTP server was created and configured successfully.

User response:

This is an informational message. No action is required.

IRU11206

```
Configuration of OS/400 (i5/OS) HTTP server {0} failed.
```

Explanation:

The HTTP server could not be created or configured successfully.

User response:

Refer to the log file for more information.

IRU11207

```
Configuration of OS/400 (i5/OS) HTTP server configuration file {0} was
successful.
```

Explanation:

The configuration file was created and written successfully.

User response:

This is an informational message. No action is required.

IRU11208

`Configuration of OS/400 (i5/OS) HTTP server configuration file {0} failed.`

Explanation:

The configuration file was not created successfully.

User response:

Refer to the log file for more information.

IRU11209

`Creation of directory {0} was successful.`

Explanation:

The specified directory was created.

User response:

This is an informational message. No action is required.

IRU11210

`Creation of directory {0} failed.`

Explanation:

The specified directory was not created.

User response:

Refer to the log file for more information.

IRU11211
Explanation:

The HTTP server instance file was created and written successfully.

User response:

This is an informational message. No action is required.

IRU11212

`Configuration of OS/400 (i5/OS) HTTP server instance file {0} failed.`

Explanation:

The HTTP server instance file was not created successfully.

User response:

Refer to the log file for more information.

IRU11213

```
Configuration of OS/400 (i5/OS) HTTP server failed. The WebSphere Express
Application Server named {0} does not exist on the target system.
```

Explanation:

The HTTP server configuration was not modified because the named WebSphere Express Application server could not be found on the target system.

User response:

Refer to the log file for more information.

IRU11214

```
IBM HTTP Server is using port {0}.
```

Explanation:

User response:

This is an informational message. No action is required.

IRU11215

```
The administration user id and password were not provided for deployment.
Security for the IBM HTTP Administration Server has not been enabled. Refer
to the IBM HTTP Server documentation to enable security.
```

Explanation:

You have not enabled security for the IBM HTTP Administration Server. Data might be compromised.

User response:

This is an informational message. No action is required.

IRU11216

```
Upgrading HTTP Server from version {0} to {1}.
```

Explanation:

User response:

This is an informational message. No action is required.

IRU11217

```
Installation of HTTP Server successful.
```

Explanation:

The HTTP Server was successfully installed.

User response:

This is an informational message. No action is required.

IRU11218

```
Installation of HTTP Server failed. Check previous messages or system logs
for more details.
```

Explanation:

The HTTP Server installation failed.

User response:

Check previous messages or system logs for more details.

IRU11219

```
This version of IHS is already installed at {0}.
```

Explanation:

User response:

This is an informational message. No action is required.

IRU11220

```
A more recent version of IBM HTTP Server has been detected. The version
detected on the system is {0}. Deployment canceled.
```

Explanation:

A more recent version of the IBM HTTP Server has been detected. The version detected on the system is displayed in the message text.

User response:

The deployment is canceled. No action is required.

IRU11221

```
Unknown version of IBM HTTP Server already installed.
```

Explanation:

A version of IBM HTTP Server is already installed.

User response:

This is an informational message. No action is required.

IRU11222

```
Upgrading HTTP Server from unknown version to {0}.
```

Explanation:

The IBM HTTP Server is being upgraded to the version displayed in the message text.

User response:

This is an informational message. No action is required.

IRU11223

```
IHS upgrade from release {0} to {1} is not supported.
```

Explanation:

IBM HTTP cannot be upgraded from the old release that was specified to the new release that was specified.

User response:

This is an informational message. No action is required.

IRU11300 messages

IRU11300 messages

IRU11300

```
The version of the HTTP Server on the system must be the same version as
the HTTP Server Plugin you are installing. Installation cancelled.
```

Explanation:

The versions of the HTTP Server installed on the system and the plug-in installation you are attempting do not match.

User response:

Deploy installation of appropriate version of the HTTP Server if the installed version is older and try the deployment of the plug-in again, or upgrade the plug-in if the version of the HTTP Server is newer.

IRU11301

```
A newer version of the HTTP Plugin was found on the system: {0}.
Installation is canceled.
```

Explanation:

You are trying to install an out-of-date version of the plug-in.

User response:

For informational purposes only. No action required.

IRU11302

```
You must enter the WebSphere Application Server host name or installation
location. Installation could not proceed.
```

Explanation:

Required information was not entered using the deployment wizard.

User response:

Use the deployment wizard to provide either the WebSphere Application Server host name (if this is a remote deployment) or the WebSphere Application Server installation location (if this is a local deployment). Then run the deployment again.

IRU11303

```
An existing plugin-cfg.xml file was found. Manual configuration steps must
be completed after installation.
```

Explanation:

The existence of the plugin-cfg.xml file indicates the that another plug-in is either still on the system or was not completely uninstalled.

User response:

Complete the necessary post-installation configuration steps.

IRU11304

```
The WebSphere Application Server - Express signature file was not found.
Installation is canceled.
```

Explanation:

You indicated during deployment that IBM WebSphere Application Server - Express is installed on the target computer, but it was not found.

User response:

Exit the plug-in installation and install WebSphere Application Server - Express or connect to a remote installation.

IRU11305

```
The version of WebSphere Application Server Express and the version of the
HTTP Plug-in do not match. Installation is cancelled.
```

Explanation:

You are deploying a plug-in installation to a host with WebSphere Application Server - Express installed. During installation, the plug-in is configured to use the

local installation of WebSphere Application Server - Express, but the version of the Application Server and the plug-in do not match.

User response:

Deploy installation of appropriate version of WebSphere Application Server - Express and try the plug-in deployment again. Upgrade plug-in to match the version of Application Server if the Application Server version is newer than that of the plug-in.

IRU11306

```
The HTTP Server httpd.conf file was not found. Installation cancelled.
```

Explanation:

The HTTP Server httpd.conf file was not found. The installation was cancelled.

User response:

Specify the correct httpd.conf file name and retry the installation.

IRU11307

```
The version of the IBM HTTP Server installed on this system, {0}, is not
valid for this version of the HTTP plugin. Plugin installation is canceled.
```

Explanation:

The version of the plug-in deployed is more recent than the version of IBM HTTP Server installed.

User response:

Exit the plug-in installation and install the appropriate version of IBM HTTP Server.

IRU11308

```
A newer version of the IBM HTTP Server was found on the system {0}. Plugin
installation continues.
```

Explanation:

The existing installation of IBM HTTP Server is newer than the version expected by the plug-in.

User response:

For informational purposes only. No action required.

IRU11309

```
The version of the IBM WebSphere Application Server - Express installed on
this system, {0}, is not valid for this version of the HTTP plugin. Plugin
installation is canceled.
```

Explanation:

The version of the plug-in deployed is more recent than the version of WebSphere Application Server - Express installed.

User response:

Exit the plug-in installation and install the appropriate version of WebSphere Application Server - Express or connect to a remote installation that is the right version.

IRU11310

```
A newer version of the IBM WebSphere Application Server - Express was found
on the system. Installation continues.
```

Explanation:

The existing installation of WebSphere Application Server - Express is newer than the version expected by the plug-in.

User response:

For informational purposes only. No action required.

IRU11311

```
An older version of the HTTP plugin {0} was found in the target directory.
The newer version of the plugin will be installed.
```

Explanation:

User response:

For informational purposes only. No action required.

IRU11312

```
An error occurred while checking for the version of IBM HTTP Server
installed on this computer. Version found {0} has an unrecognized format.
Version to be installed is {1}. Plugin installation canceled.
```

Explanation:

An error occurs while comparing the expected version of the HTTP Server against the version that is actually installed. For example, the version string of the installed version might contain an alphabetic character.

User response:

Check the version information and take appropriate actions.

IRU11313

An error occurred while checking for the version of IBM WebSphere
Application Server - Express installed on this computer. Version found {0}
has an unrecognized format. Version to be installed is {1}. Plugin
installation canceled.

Explanation:

An error occurs while comparing the expected version of WebSphere Application
Server - Express against the version that is actually installed. For example, the
version string of the installed version might contain an alphabetic character.

User response:

Check the version information and take appropriate actions.

IRU11314

An error occurred while checking for the version of IBM WebSphere
Application Server - Express plug-in for the IBM HTTP Server installed on
this computer. Version found {0} has an unrecognized format. Version to be
installed is {1}. Plugin installation canceled.

Explanation:

An error occurs while comparing the expected version of WebSphere Application
Server - Express HTTP plug-in and the version actually installed. For example, the
version string of the installed version might contain an alphabetic character.

User response:

Check the version information and take appropriate actions.

IRU11315

A valid WebSphere Application Server - Express installation was not found.
Plug-in installation cancelled.

Explanation:

A valid WebSphere Application Server - Express installation was not found. The
plug-in installation cancelled.

User response:

Specify a valid WebSphere Application Server - Express and retry the plug-in
installation.

IRU11316

Multiple installations of WebSphere Application Server - Express were
found, configuration parameters did not specify which installation to use.
Plug-in installation cancelled.

Explanation:

Multiple installations of WebSphere Application Server - Express were found, and the configuration parameters did not specify which installation to use. The plug-in installation was cancelled.

User response:

Specify the correct installation of WebSphere Application Server - Express and retry the plug-in installation.

IRU11317

```
Multiple installations of WebSphere Application Server - Express were
found, but the specified installation {0}, was not found. Plug-in
installation cancelled.
```

Explanation:

Multiple installations of WebSphere Application Server - Express were found, but the specified installation was not found. Plug-in installation cancelled.

User response:

Specify the correct installation of WebSphere Application Server - Express and retry the plug-in installation.

IRU11318

```
The WebSphere Application Server - Express installation directory, {0} was
detected and will be used instead of the specified directory, {1}. Plug-in
installation continues.
```

Explanation:

The WebSphere Application Server - Express installation directory was detected and will be used instead of the specified directory. The plug-in installation continues.

User response:

This is an informational message. No action is required.

IRU11319

```
The plugin-cfg.xml file was not found at the specified location, {0}.
Plug-in installation will continue and a new plugin-cfg.xml file will be
created.
```

Explanation:

The plugin-cfg.xml file was not found at the specified location. The plug-in installation will continue and a new plugin-cfg.xml file will be created.

User response:

This is an informational message. No action is required.

IRU11320

```
The HTTP plug-in installation has completed but a partial complete return
code was issued by the installation program. Check the log file for details
of the installation.
```

Explanation:

The HTTP plug-in installation has completed but a return code was issued by the installation program denoting that the installation was only partially complete.

User response:

Check the log file for errors that occurred during the installation.

IRU11321

```
The HTTP Plugin installation is complete, but manual configuration steps
are required by the installation program. Check log file for details of the
installation.
```

Explanation:

User response:

Complete the necessary post-installation configuration steps.

IRU11400 messages

IRU11400 messages are logged during the deployment of the Express Runtime Sample application.

IRU11400

```
Installation of the Express Runtime Sample Application is in progress.
```

Explanation:

The installation of the Express Runtime sample application has started.

User response:

This is an informational message. No action is required.

IRU11401

```
No WebSphere script was run
```

Explanation:

The WebSphere script for the Express Runtime sample application was not invoked.

User response:

This is an informational message. No action is required.

IRU11402

No DB2 script was run

Explanation:

The DB2 script for the Express Runtime sample application was not invoked.

User response:

For informational purposes only. No action required.

IRU11403

Unable to read the value of {0} from file {1}.

Explanation:

The DB2 script for the Express Runtime Sample application was not invoked.

User response:

This is an informational message. No action is required.

IRU11404

User profile {0} does not exist.

Explanation:

The user profile does not exist on the target system.

User response:

Specify a valid user profile name for the target system.

IRU11405

An error occurred attempting to swap to user {0}.

Explanation:

The swap to the user profile failed.

User response:

Specify a valid user profile name and password for the target system.

IRU15000 messages

IRU15000 messages are log messages that are created during solution deployment. They are logged during the deployment of the console.

IRU15000

Integrated Solutions console is not installed on this system.

Explanation:

The Integrated Solutions console is not installed on this system.

User response:

IRU15001

```
The current version of Integrated Solutions Console is installed on this
system.
```

Explanation:

The current version of Integrated Solutions Console is installed on this system.

User response:

This is an informational message. No action is required.

IRU15002

```
An older version of Integrated Solutions console is installed on this
system.
```

Explanation:

An older version of Integrated Solutions console is installed on this system.

User response:

Install the most current version of Integrated Solutions console.

IRU15003

```
A newer version of Integrated Solutions Console is installed on this
system.
```

Explanation:

A newer version of Integrated Solutions Console is installed on this system.

User response:

This is an informational message. No action is required.

IRU15004

```
DB2 Express version: {0} is a prerequisite product. Installation cancelled.
```

Explanation:

The DB2 Universal Database Express Edition version that was specified in the message text is a prerequisite product. The installation was cancelled.

User response:

Obtain the correct version of DB2 Universal Database Express Edition and retry the installation.

IRU15005

```
The user ID specified for enabling SSL for Embedded WebSphere Application
Server, {0}, does not exist on target system.
```

Explanation:

The user ID that was specified to enable SSL for Embedded WebSphere Application Server does not exist on target system.

User response:

Specify a valid user ID.

IRU15006

```
The user ID specified for installing the Console Agent service, {0}, does
not exist on target system.
```

Explanation:

The user ID that was specified to install the Console Agent service does not exist on target system.

User response:

Specify a valid user ID.

IRU15007

```
User ID and password specified for {0} do not match.
```

Explanation:

The user ID and password that were specified do not match.

User response:

Specify a valid user ID and password.

IRU15008

```
Installation of Console Management Extension for {0} successful.
```

Explanation:

The Console Management Extension was successfully installed.

User response:

This is an informational message. No action is required.

IRU15009

```
Installation of Console Management Extension for {0} failed. Check the
previous messages or system logs for more details.
```

Explanation:

The Console Management Extension was not successfully installed.

User response:

Check the previous messages or system logs to determine the cause of the problem.

IRU15010

```
WebSphere Application Server - Express version: {0} was not found in
required location: {1}. Installation cancelled.
```

Explanation:

The WebSphere Application Server - Express version was not found in the correct location. The installation was cancelled.

User response:

Specify the correct location for the WebSphere Application Server - Express version and retry the installation.

IRU15011

```
The user ID specified for administrating the WebSphere Application Server,
{0}, does not exist on target system.
```

Explanation:

The user ID that was specified in order to administer the WebSphere Application Server does not exist on target system.

User response:

Specify a valid user ID.

IRU15012

```
Management Extensions for WebSphere is not installed on this system.
```

Explanation:

The Management Extensions for WebSphere product is not installed on this system.

User response:

IRU15013

```
The current version of Management Extensions for WebSphere is installed on
this system.
```

Explanation:

The current version of Management Extensions for WebSphere is installed on this system.

User response:

This is an informational message. No action is required.

IRU15014

An older version, {0}, of Management Extensions for WebSphere is installed on this system.

Explanation:

An older version of Management Extensions for WebSphere is installed on this system.

User response:

Install the correct version of Management Extensions for WebSphere.

IRU15015

A newer version, {0}, of Management Extensions for WebSphere is installed on this system.

Explanation:

A newer version of Management Extensions for WebSphere is installed on this system.

User response:

This is an informational message. No action is required.

IRU15016

An unknown version, {0}, of Management Extensions for WebSphere is installed on this system.

Explanation:

An unknown version of Management Extensions for WebSphere is installed on this system.

User response:

IRU15017

Management Extensions for DB2 is not installed on this system.

Explanation:

Management Extensions for DB2 is not installed on this system.

User response:

IRU15018

```
The current version of Management Extensions for DB2 is installed on this
system.
```

Explanation:

Management Extensions for DB2 is already installed on this system.

User response:

This is an informational message. No action is required.

IRU15019

```
An older version, {0}, of Management Extensions for DB2 is installed on
this system.
```

Explanation:

An older version of Management Extensions for DB2 is installed on this system.

User response:

Install the correct version of Management Extensions for DB2.

IRU15020

```
A newer version, {0}, of Management Extensions for DB2 is installed on this
system.
```

Explanation:

A newer version of Management Extensions for DB2 is installed on this system.

User response:

This is an informational message. No action is required.

IRU15021

```
An unknown version, {0}, of Management Extensions for DB2 is installed on
this system.
```

Explanation:

An unknown version of Management Extensions for DB2 is installed on this
system.

User response:

Ensure that the correct version of Management Extensions for DB2 is installed.

IRU15022

`Management Extensions for IBM HTTP Server is not installed on this system.`

Explanation:

Management Extensions for IBM HTTP Server is not installed on this system.

User response:

Install Management Extensions for IBM HTTP Server.

IRU15023

`The current version of Management Extensions for IBM HTTP Server is installed on this system.`

Explanation:

Management Extensions for IBM HTTP Server is installed on this system.

User response:

This is an informational message. No action is required.

IRU15024

`An older version, {0}, of Management Extensions for IBM HTTP Server is installed on this system.`

Explanation:

An older version of An older version, {0}, of Management Extensions for IBM HTTP Server is installed on this system. is installed on this system.

User response:

Install the current version of Management Extensions for IBM HTTP Server.

IRU15025

`A newer version, {0}, of Management Extensions for IBM HTTP Server is installed on this system.`

Explanation:

A newer version of Management Extensions for IBM HTTP Server is installed on this system.

User response:

This is an informational message. No action is required.

IRU15026

An unknown version, {0}, of Management Extensions for IBM HTTP Server is installed on this system.

Explanation:

An unknown version of Management Extensions for IBM HTTP Server is installed on this system.

User response:

Install the current version of Management Extensions for IBM HTTP Server.

IRU15027

IBM HTTP Server version: {0} was not found in required location: {1}. Installation cancelled.

Explanation:

The IBM HTTP Server version was not found in the correct location. The installation was cancelled.

User response:

Install the correct version of IBM HTTP Server.

IRU15028

The DB2 Express found installed on the system, release {0}, is not compatible with this version of Management Extension. The required release is: {1}. Installation canceled.

Explanation:

The version of DB2 Express found installed on the system, release is not compatible with this version of Management Extension. The installation was canceled.

User response:

Ensure the version of DB2 Express that you are installing is compatible with this version of Management Extension.

Sample application messages

Sample application messages.

IRUS0000

The following command was issued:\n {0}

Explanation:

The command issued during deployment.

User response:

This is an informational message. No action is required.

IRUS0001

Exception occurred issuing command. Exception: {0}

Explanation:

The command failed due to the listed exception.

User response:

This is an informational message. No action is required.

IRUS0003

Copy file {0} to {1} was successful

Explanation:

The file copy was successful.

User response:

This is an informational message. No action is required.

IRUS0004

Copy file {0} to {1} failed

Explanation:

The file could not be copied.

User response:

This is an informational message. No action is required.

IRUS0010

Command failed with return code {0}.

Explanation:

The issued command failed with the listed return code.

User response:

This is an informational message. No action is required.

IRUS0015

Properties file not specified.

Explanation:

A properties file (also referred to as a response file) is required and was not specified.

User response:

Check the call to the predeployment checker or main program to ensure that a properties file is passed in as a parameter.

IRUS0016

```
Required property {0} not specified.
```

Explanation:

The specified property was not defined in the properties file.

User response:

Check the properties file that is used with the sample application and ensure that the property listed in the error is present and spelled correctly.

IRUS0017

```
OS/400 (i5/OS) release must be at release level {0} or later.
```

Explanation:

The version of OS/400 (i5/OS) on the target computer is not compatible with the sample application.

User response:

Upgrade your version of OS/400 (i5/OS) to the level specified or send the installation of the sample application to a computer with at least the specified version of OS/400 (i5/OS) installed.

IRUS1016

```
Failed to start WebSphere Application Server - Express.
```

Explanation:

WebSphere Application Server - Express did not start successfully.

User response:

Refer to the log file for more information.

IRUS1017

```
Failed to stop WebSphere Application Server - Express.
```

Explanation:

The WebSphere Application Server - Express was not stopped successfully.

User response:

Refer to the log file for more information.

IRUS1018

```
WebSphere Express server product {0} is not installed.
```

Explanation:

The named WebSphere product could not be found on the target computer. It is a prerequisite for the sample application.

User response:

Install WebSphere Application Server - Express Version 6.0 on the target computer or send the sample installation to a target computer that has WebSphere Application Server - Express installed.

IRUS1019

```
The WebSphere Application Server - Express named {0} does not exist on the
target system.
```

Explanation:

The WebSphere Application Server name you provided is not configured. The sample application cannot be installed.

User response:

Ensure that the server name you provided is correct, and that it is configured properly.

IRUS1100

```
DB2 is not installed.
```

Explanation:

The sample application requires that DB2 is installed on the target computer.

User response:

Install DB2 and attempt the installation again.

IRUS1200

```
Failed to start IBM HTTP Server.
```

Explanation:

The installation of the sample application stops and restarts the IBM HTTP Server. If an error is detected while attempting the restart, you receive this message. The command output is also displayed.

User response:

Check the command output for the error message before this one for more
information.

IRUS1201

```
Failed to stop IBM HTTP Server.
```

Explanation:

The installation of the sample application stops and restarts the IBM HTTP Server.
If an error is detected while attempting to stop the server, you receive this
message. The command output is also displayed.

User response:

Check the command output for the error message before this one for more
information.

IRUS1202

```
The HTTP server product {0} is not installed on target system.
```

Explanation:

The IBM HTTP Server could not be found on the target computer and the sample
application requires it for installation.

User response:

Install IBM HTTP Server on the target machine or send the sample application
installation to a remote target with IHS already installed.

IRUS1203

```
The HTTP server instance {0} does not exist.
```

Explanation:

The HTTP server name you provided is not configured. The sample application
cannot be installed.

User response:

Ensure that the server name you provided is correct, and that it is configured
properly.

IRUS1401

```
No WebSphere script was run
```

Explanation:

The WebSphere script for the Express Runtime sample application was not
invoked.

User response:

This is an informational message. No action is required.

IRUS1402

```
No DB2 script was run.
```

Explanation:

The DB2 script for the Express Runtime sample application was not invoked.

User response:

For informational purposes only. No action required.

IRUS1403

```
Unable to read the value of {0} from file {1}.
```

Explanation:

The DB2 script for the Express Runtime Sample application was not invoked.

User response:

This is an informational message. No action is required.

IRUS1404

```
User profile {0} does not exist.
```

Explanation:

The user profile does not exist on the target system.

User response:

Specify a valid user profile name for the target system.

IRUS1405

```
An error occurred attempting to swap to user {0}.
```

Explanation:

The swap to the user profile failed.

User response:

Specify a valid user profile name and password for the target system.

Reading XML schemas

XML schemas use special notation to describe what child elements or character data an element can contain and what types of values an attribute can have. ("Child elements" are elements nested within parent element tags.) For example, the following content model indicates that the element `translationLanguages` contains a child element called `language` that must occur at least once within its parent and can occur up to 10 times:

`translationLanguages ::= language`[1,10]

The XML markup in your documents is an expression of a content model. For example, applying the content model for `translationLanguages`, you might create the following markup:

```
<translationLanguages default="english">
  <language>english</language>
  <language>spanish</language>
</translationLanguages>
```

Content models define the rules for valid XML files. However, content models do not define the rules the deployment wizard follows when creating a deployment package file or when installing an application. As a consequence, you can create a valid XML file, but that file can lead to errors when building a wrapper or at the time of deployment. For example, the following content model indicates that the value for the attribute id is string , which is any combination of ASCII characters including white space:

`id ::= string`

If you type the following markup, which conforms to the content model, the parser will accept the input as valid, but it will produce an error when the deployment wizard creates the deployment package file because the Solution Deployer uses the identifier to name files and file names cannot contain spaces:

`id="WAS 32"`

The following definitions, rules, and notation apply to the content models used in this book:

- Expression of attribute values
  - To make attribute content models easier to read, the opening and closing quotation marks around values are omitted. For example, the following content model omits the quotation marks around the value integer:

    `attribute ::= integer`

    Applying this content model to your wrappers, you would type the following:

    `attribute="nnn"`

    where `nnn` is the installed size in kilobytes.
- Occurrences of child elements within parents
  - The superscript notation ^{n,m} after a child element means that the child can occur a minimum of n times and a maximum of m times within its parent. If m is an asterisk (*), it indicates that the number of occurrences is unlimited. For example, the following content model indicates that the child element language must occur at least once in its parent element translationLanguages and that it can occur as many as ten times:

    `translationLanguages ::= language`[1,10]

    Applying this content model to your wrappers, you might type the following:

```
<translationLanguages default="english">
  <language>english</language>
  <language>spanish</language>
</translationLanguages>
```

- A vertical bar (|), also called a pipe character, between child elements in an element content model or between values in an attribute content model indicates that only one of the elements or one of the values can occur. For example, the following content model indicates that you must select either issFileAssociation or cidFileAssociation:

```
stringVariable ::= labelText¹,¹
  (issFileAssociation | cidFileAssociation)¹,¹
```

- String literals
  - Single quotation marks (') indicate literal strings that must be typed exactly as they are displayed within the marks. For example, the following content model indicates that the element operatingSystem can contain only one of the specified operating systems:

```
operatingSystem ::= 'Windows' |
    'AIX' | 'Linux' | 'OS/400' | 'Solaris' | 'HP-UX'
```

  Similarly, single quotation marks in an attribute content model indicate that you must type the values exactly as they are displayed. For example, the following content model indicates that you must type either "true" or "false":

```
debug ::= 'true'|'false'
```

- Keywords
  - The keyword string indicates any combination of ASCII characters including white space (space characters, tabs, carriage returns, and line feeds). For example, the element description has the following content model:

```
description ::= string
```

  Applying this content model to your markup, you might type the following:

```
<description>Provide the following information and select Finish
            to proceed.</description>
```

  - The keyword integer indicates any whole number. For example, the following content model indicates that the value for attribute

```
attribute
```

  can be any whole number:

```
attribute ::= integer
```

  - The keyword EMPTY in an element content model indicates an empty element tag. For example, the following content model indicates that the element conflict does not have any content:

```
conflict ::= EMPTY
```

  Applying this content model to your markup, you might type the following:

```
<conflict applicationId="xxx"/>
```

  where applicationId is the attribute for the element and xxx is the value of the attribute.

  Similarly, the following content model indicates that the element name can be empty or that it can contain a string:

```
name ::= EMPTY | string
```

  Usually, when you see the expression EMPTY | string, it means that you can either type the string between the start and end tags of the element or, if you are using language documents, that you can use the attribute translatedKey to point to a specific element in a file that contains the translated text.

- Special characters in markup

– To use special characters in strings, you must use the following syntax in the XML file:

```
<element><![CDATA[special characters]]></element>
```

XML schemas

Application elements

application
(Purpose)

This is the root element of an application document.

Examples

```
<iru:application
 id="DJT_sia">
    ...
</iru:application>
```

Format

Parent	Root element
Occurrences within document	Required. Can occur only once.
Element content model	application ::= (translationLanguages)^{0,1} (applicationInformation)^{1,1} (fileLists)^{1,1} (fileSets)^{1,1} (preDeploymentChecker)^{0,1} (entryProgram)^{0,1} (mainProgram)^{1,1} (exitProgram)^{0,1} (variables (within the <application element))^{0,1} (externalJars)^{0,1}
Attribute content models	**Required:** id ::= string **Optional:** debug ::= ″true″ │ ″false″ deploymentPackageName ::= string deploymentPackageProtected ::= ″true″ │ ″false″ **Deprecated:** installSize ::= string

Parameters

The `application` element has the following attributes:

id   Use this attribute to specify a unique identifier for the application. Express Runtime uses the identifier to name the following files:

- Deployment package (<id_value>.locale.jar)

  Note:

  The `deploymentPackageName` attribute value overrides this value if you specify a `deploymentPackageName` attribute value to name the deployment package files.

- User programs package - if the application XML contains fileList elements with the userPrograms attribute set to true, the user programs JAR file is created with the name <id_value>.locale.userPrograms.jar.

- Resource file (<id_value>.properties)
- Binary application file (<id value>_<operatingSystem>.ser)

where <id_value> is the value of the attribute id and <operatingSystem> is the name of the target operating system.

For example, if you use an id value of "Puzzler" for an application that runs on a Windows target operating system, the deployment package file, the resource file, and the serialized file for the application would be named Puzzler.jar, Puzzler.properties, and Puzzler_win.ser, respectively.

When specifying a value for the id attribute, do not use spaces or file name characters that are invalid on target operating systems. The length of the value must conform to the length restrictions for file names and their paths on the target operating systems. For example, if a target operating system limits the length of a file name and its path to 255 characters, do not use a value that, when appended to a path name, exceeds 255 characters. In addition, the value must begin with an alphabetic character and can be made up only of alphanumeric characters, underscores, dashes and periods.

debug Use this attribute to specify whether you want debug information to be displayed on the agent console when the application is launched from the command line. If you set this value to "true," you can see debug information while you are testing your application from the command line interface.

deploymentPackageName

Use this attribute to specify a deployment package name. This attribute will be used for the main deployment package JAR file built by the deployment wizard. The format of the JAR file name will be `<deploymentPackageName>.<locale>` .jar for the main jar, and `<application ID>.<locale>.` userPrograms.jar if user programs are specified.

When specifying a value for the deploymentPackageName attribute, do not use spaces or file name characters that are invalid on target operating systems. The length of the value must conform to the length restrictions for file names and their paths on the target operating systems. For example, if a target operating system limits the length of a file name and its path to 255 characters, do not use a value that, when appended to a path name, exceeds 255 characters.

deploymentPackageProtected

Set this attribute to `true` to prevent an attempt by the user to regenerate the deployment package. If the user attempts to regenerate the deployment package and this attribute is set to `true`, the following error message is displayed:

```
You cannot generate the deployment package
because it already exists and is protected.
```

installSize (Deprecated)

The installSize attribute is deprecated. A deprecated element or attribute is one that is outdated in the latest versions of the schema. The attribute might become obsolete in future versions of the Express Runtime product and should not be used

Usage

Use the application start tag immediately after the document type declaration in an application document. Use the end tag at the conclusion of the document.

applicationInformation
(Purpose)

This element contains basic information about an application.

Examples

```
<iru:application>
  <applicationInformation
   version="1.0.0.0">

      <operatingSystems>
    <operatingSystem>Windows</operatingSystem>
    <operatingSystem>AIX</operatingSystem>
  </operatingSystems>
  <name translatedKey="name"/>
  <configurationInstructions translatedKey="configureText"/>
  <providerName translatedKey="providerName"/>
  </applicationInformation>
...
</iru:application>
```

Format

Parent	(application)
Occurrences within parent	Required. Must occur only once.
Element content model	applicationInformation ::= $(operatingSystems)^{1,1}$ $(configurationInstructions)^{0,1}$ $(name)^{1,1}$ $(providerName)^{0,1}$ $(license)^{0,1}$
Attribute content models	**Required:** version ::= string **Optional:** None. **Depricated:** builderVersion ::=string responseFileTemplate ::= string

Parameters

The applicationInformation element has the following attributes:

version
> Use this attribute to specify a version number. If you use this attribute, the version number is displayed in the properties window of the Deployment Parameters panel.

builderVersion (Deprecated)
> The builderVersion attribute is deprecated. A deprecated element or attribute is one that is outdated in the latest versions of the schema. The attribute might become obsolete in future versions of the Express Runtime product and should not be used.

responseFileTemplate (Deprecated)
> The responseFileTemplate attribute is deprecated. A deprecated element or

attribute is one that is outdated in the latest versions of the schema. The attribute might become obsolete in future versions of the Express Runtime product and should not be used.

argument
(Purpose)

This element contains a program parameter for a predeployment checker, an entry program, a main program, or an exit program.

Examples

```
<preDeploymentChecker type="java">
   <arguments>
        <argument>--clientonly</argument>
        <argument>-s</argument>
        <argument concatenateWithNextArgument="true">/F1</argument>
        <argument responseFile ="true"/>
        <argument variableName ="arggie"/>
   </arguments>
</preDeploymentChecker>

<mainProgram type="java"
    programName="testsuite.HelloWorld"
    logFile="hwMain.log">
    <arguments>
     <argument variableName="shouldCreateDb"/>
    </arguments>
</mainProgram>

   ...

<stringVariable
    name="arggie"
    minimumLength="2"
    maximumLength="25">
    <defaultData>arggieValue</defaultData>
    <labelText>Arggie</labelText>
    <helpText>no help for you</helpText>
</stringVariable>

<booleanVariable name="shouldCreateDb">
    <defaultData>true</defaultData>
    <labelText>Create Database</labelText>
    <helpText>shouldCreateDbHelp</helpText>
    <ismpFileAssociations>
      <ismpFileAssociation
          responseFileName="wpsSwd.rsp"
          propertyKeyType="product"
          propertyKey="CfgProps.dbCreateMode"
          valueIfFalse="use"
          valueIfTrue="create"/>
    </ismpFileAssociations>
</booleanVariable>
```

Format

Parent	(arguments)
Occurrences within parent	Optional. Can occur more than once.
Element content model	argument ::= string | EMPTY

Attribute content models	Optional: concatenateWithNextArgument ::= 'true' | 'false' responseFile ::= 'true' | 'false' logFile ::= 'true' | 'false' translatedKey ::= string variableName ::= string | 'true' | 'false'

Parameters

The `argument` element has the following attributes:

concatenateWithNextArgument
> Use this attribute to merge two arguments into one. In the example above, the result would be:

```
--clientonly -s /Flc:\Program\ReponseFileName
```

responseFile
> This attribute specifies that the response file name is inserted as the value of the argument.

logFile
> This attribute specifies that the log file name is inserted as the value of the argument.

translatedKey
> Use this attribute to indicate that the argument string has been translated and that the translated string is contained in separate translation XML files.
>
> **Note:** The `translatedKey` must begin with an alphabetic character.

variableName
> This attribute provides the capability to adjust the invocation arguments for predeployment checker, entry, main, and exit programs at run time. Use the `variableName` attribute to indicate a string or boolean variable declared elsewhere in the application XML file.

Usage

If the application uses multiple program arguments, use a separate `argument` element tag for each argument. For example:

```
<arguments>
   <argument>xxx</argument>
   <argument>yyy</argument>
</arguments>
```

arguments
(Purpose)

This element contains an unbounded number of `argument` elements.

Examples

```
<preDeploymentChecker
   program>
   <arguments>
      <argument>--clientonly</argument>
      <argument>-s</argument>
```

```
        <argument concatenateWithNextArgument="true">/F1</argument>
        <argument responseFile ="true" />
    </arguments>
</preDeploymentChecker>
```

Format

Parents	(preDeploymentChecker), (entryProgram), (mainProgram), (exitProgram)
Occurrences within each parent	Optional. Can occur only once.
Element content model	arguments ::= (argument)^{0,*}

Parameters

The arguments element does not have any attributes.

booleanVariable
(Purpose)

This element contains information about an interface element, such as a check box in an application's deployment parameters panel. The selection or deselection of the check box maps directly to the valueIfFalse or valueIfTrue values specified in the related file association element.

Examples

```
<variables>
  <booleanVariable
      >
      <labelText>Install Domino Administrator</labelText>
      <helpText>Install the Administrator Client in addition to the Notes Client.
      </helpText>
      <issFileAssociations>
        <issFileAssociation
          responseFileName="Domino504ClientW32.iss"
          keyword="svSetupType"
          section="SdSetupType-0"
          valueIfFalse="Notes Client"
          valueIfTrue="Domino Administrator"/>
        </issFileAssociations>
  </booleanVariable>
</variables>
```

Format

Parent	(variables)
Occurrences	Required. Can occur more than once.
Element content model	booleanVariable ::= (labelText)^{1,1} (helpText)^{0,1} (issFileAssociations)^{0,1} (cidFileAssociations)^{0,1} (propertiesAssociations)^{0,1} (ismpFileAssociations)^{0,1} (inputValidation)^{0,1}
Attribute content models	Required name ::= string

Parameters

The `booleanVariable` element has the following attributes:

name   Use this attribute to specify a name for the boolean variable.

Usage

Variables (boolean variables, string variables, and password variables) specify the content displayed on application deployment parameters panels. The top-to-bottom order in which variables are displayed on a panel depends on their order in an application wrapper. The first variable listed in a wrapper is the first variable displayed on a configuration panel; the second variable listed in a wrapper is the second variable displayed; and so on.

You can create as many variables as you need. However, the Solution Deployer provides only one scrollable configuration panel.

The `valueIfFalse` or `valueIfTrue` values in the file association element must be specified for a `booleanVariable` definition to be valid.

characters
(Purpose)

This element contains a string of characters that are defined as being either valid or invalid for a given variable.

Examples

```
<stringVariable

      minimumLength="2"
      maximumLength="14">
      <defaultData>siaUser</defaultData>
      <labelText translatedKey="userIdLabel"/>
      <helpText translatedKey="userIdHelp"/>
      <ismpFileAssociations>
        <ismpFileAssociation
          responseFileName="DJT_sia10setup.iss"
          propertyKeyType="product"
          propertyKey="product.username"/>
      </ismpFileAssociations>
      <inputValidation>
        <invalid>
          <prefixes>
            <prefix ignoreCase="true">BADPREFIX</prefix>
          </prefixes>
          <values>
            <value ignoreCase="true">BADVALUE</value>
          </values>
        </invalid>
        <valid>
          <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz0123456789
         </characters>
        </valid>
      </inputValidation>
    </stringVariable>
```

Format

Parents	(invalid), (valid)

Occurrences within parent	Optional. Can occur more than once.
Element content model	characters ::= string
Attribute content model	Optional: ignoreCase ::= 'true' | 'false' translatedKey ::= 'string'

Parameters

The characters element has the following attribute:

ignoreCase
> Use this attribute to specify whether to check for mixed case in the given string of characters. If the string characters are not case sensitive, set this to true. If the string characters are case sensitive, set it to false. The default is false.

translatedKey
> Use this attribute to indicate that the description has been translated and that the translated descriptions are contained in separate translation XML files.
>
> Note:
>
> The translatedKey must begin with an alphabetic character.

Usage

See (inputValidation) for more information.

cidFileAssociation
(Purpose)

This element contains configuration parameters that are inserted into a CID file template at deployment.

Examples
```
<stringVariable

   minimumLength="3">
   ...
   <cidFileAssociations>
    <cidFileAssociation
  responseFileName="Db2_Rc_Win.rsp"
      keyword="FILE"/>
    </cidFileAssociations>
   ...
</stringVariable>
```

Format

Parents	(cidFileAssociations)
Occurrences within each parent	Required. Can occur more than once.
Attribute content models	Required: responseFileName ::= string keyword ::= string Optional: valueIfTrue ::= string valueIfFalse ::= string

Parameters

The element `cidFileAssociation` has the following attributes:

responseFileName
Use this attribute to specify the name of the CID response file used during installation. For more information, see Specifying a response file.

keyword
Use this attribute to point to a particular keyword within the CID file template.

valueIfFalse
Use this attribute to specify what the value in the response file template should be if a boolean-type interface element is set to `false`.

valueIfTrue
Use this attribute to specify what the value in the response file template should be if a boolean-type interface element is set to `true`.

Usage

The deployment wizard inserts the content of the child element (defaultData) in the CID file template according to the keyword that you specify. For example:

```
<stringVariable

   minimumLength="3">
   ...
   <cidFileAssociation
      responseFileName="Db2_Rc_Win.rsp"
      keyword="FILE"/>
      ...
</stringVariable>
```

cidFileAssociations
(Purpose)

This element holds a group of `cidFileAssociation` elements.

Examples

```
<stringVariable

   minimumLength="3">
   ...
    <cidFileAssociations>
     <cidFileAssociation
      responseFileName="Db2_Rc_Win.rsp"
      keyword="FILE"/>
   </cidFileAssociations>
   ...
</stringVariable>
```

Format

Parents	(stringVariable), (booleanVariable), (passwordVariable)
Occurrences within each parent	Optional. Can occur only once.

Element content model	cidFileAssociations ::= (cidFileAssociation)^{1,*}

Parameters

The element `cidFileAssociations` does not have any attributes.

configurationInstructions
(Purpose)

This element provides the text that is displayed in the application deployment parameters panel that describes, in general terms, what the user should do.

Examples

```
<iru:application>
  <applicationInformation
    version="1.0.0.0">
    <operatingSystems>
      <operatingSystem>Windows</operatingSystem>
      <operatingSystem>AIX</operatingSystem>
    </operatingSystems>
    <name translatedKey="name"/>
    <configurationInstructions translatedKey="configureText"/>
    <providerName translatedKey="providerName"/>
  </applicationInformation>
...
</iru:application>
```

Format

Parent	(applicationInformation)
Occurrences within parents	Optional. Can occur only once.
Element content model	configurationInstructions ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

The `configurationInstructions` element has the following attribute.

translatedKey
> Use this attribute to indicate that the description has been translated and that the translated descriptions are contained in separate translation XML files.
>
> Note:
>
> The `translatedKey` must begin with an alphabetic character.

defaultData
(Purpose)

This element specifies the default value of the parent variable and is displayed on the Deployment Parameters panel.

Examples

```
<stringVariable

        minimumLength="2"
        maximumLength="14">
        <defaultData>siaUser</defaultData>
        <labelText translatedKey="userIdLabel"/>
        <helpText translatedKey="userIdHelp"/>
        <ismpFileAssociations>
          <ismpFileAssociation
            responseFileName="DJT_sia10setup.iss"
            propertyKeyType="product"
            propertyKey="product.username"/>
        </ismpFileAssociations>
        <inputValidation>
          <invalid>
            <prefixes>
              <prefix ignoreCase="true">BADPREFIX</prefix>
            </prefixes>
            <values>
              <value ignoreCase="true">BADVALUE</value>
            </values>
          </invalid>
          <valid>
            <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz0123456789
           </characters>
          </valid>
        </inputValidation>
    </stringVariable>
```

Format

Parents	(sharedVariable), (booleanVariable), (passwordVariable), (stringVariable)
Occurrences within document	Optional. Can occur only once.
Element content model	defaultData ::= string
Attribute content model	Optional: translatedKey ::= string

Parameters

The defaultData element has the following attribute:

translatedKey
> Use this attribute to indicate that the help text has been translated and that the translated text is contained in separate translation XML files.

> Note:

> The translatedKey must begin with an alphabetic character.

deploymentPackagePrompt
(Purpose)

This element contains a string that is displayed when users select to create a deployment package. The text should point users to the location of the deployment image files (for example, Insert CD-ROM number 1) or ask the user to browse to the location of the files. When users create the deployment package, the deployment package prompt directs them to the location of the software image file.

Examples

```
<fileSets>
  <fileSet fileListId="common"/>
  <fileSet fileListId="common"/>
  <deploymentPackagePrompt translatedKey="prompt"/>
</fileSets>
```

Format

Parents	(fileSets)
Occurrences within parent	Optional. Must occur only once.
Element content model	deploymentPackagePrompt ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

translatedKey

Use this attribute to indicate that the deployment package prompt string has been translated and that the translated string is contained in separate translation XML files.

Note:

The translatedKey must begin with an alphabetic character.

Usage

You can specify a deployment package prompt in both application documents and solution documents. The specification in the solution document takes precedence.

entryProgram
(Purpose)

This element contains information about an entry program for an application.

Examples

```
<iru:application>
  <entryProgram
    type="java"
    successType="returnCode"
    classpath="unpacked/starter"
    program>
</entryProgram>
</iru:application>
```

Format

Parent	(application)
Occurrences within parent	Optional. Can occur only once.
Element content model	entryProgram ::= (arguments)^{0,*} (environmentSettings)^{0,1} (logMessages)^{0,1}

Attribute content models	Required: type ::= 'installshield' | 'java' | 'custom' Optional: successType ::= 'returncode' | 'logstring' | 'ignore' programName ::= string logFile ::= string responseFile ::= string wait ::= 'true' | 'false' externalCommand ::= 'true' | 'false' classpath ::= string timeout ::= integer doesReboot ::= 'true' | 'false' executeReboot ::= 'true' | 'false'

Parameters

The `entryProgram` element has the following attributes:

type Use this attribute to specify a type of entry program. The deployment
wizard uses this information to identify the command that starts the entry
program.

> **installshield**
> InstallShield installation program.
>
> **java** Java program.
>
> **custom**
> Anything not specified here or one of the named types that you
> modify.
>
> For example, if the entry program is a Java program (`type="java"`), Express
> Runtime uses the JVM included with the IBM Installation Agent and the
> command java to start the program. The deployment wizard uses the value
> of the attribute `programName` to start the custom program (for example,
> `programName="setup.exe"`).
>
> If you use a `type="custom"` and you do not want the unpacked directory
> appended to your command line, be sure to specify
> `externalCommand="true"`.
>
> If you use a `type="custom"` on a Windows operating system, you might
> encounter a deployment problem where the computer hangs or is in an
> endless loop. If you specified a timeout setting, the deployment will
> terminate when that value is reached. Otherwise, the program will timeout
> after 90 minutes.

successType
Use this attribute to identify the method used to notify the deployment
wizard that the entry program has run successfully or that it has failed.
The default is `returncode` .

> **returncode**
> The success or failure of the entry program is determined by a
> return code.
>
> > **Note:** The return code values for all predeployment checkers,
> > entry, exit, and main programs running on Linux and
> > OS/400 (i5/OS)[7] platforms must be between -128 and +127.
>
> **logstring**
> The success or failure of the entry program is determined by a
> specific string located in a log file; you must use the `logMessage`
> element in conjunction with this attribute type.

---

7. The OS/400 operating system is known as the i5/OS operating system beginning with V5R3.

ignore No attempt is made to determine if the deployment was successful.

programName

Use this attribute to specify the name of an entry program.

logFile

Use this attribute to specify the name of a file to which log messages are written.

responseFile

Use this attribute to specify the name of a response file used by an entry program.

externalCommand

Set this attribute to `true` so that the `unpacked` directory is not appended to the command line. This attribute can only be used with a type of `custom`. The default is `false`.

classpath

Use this attribute to set the classpath for a Java program type. Any other use is ignored.

> **Note:** If your user programs are stored in sub-folders (for example, `userPrograms/EntryProgram.java`), your classpath must specify `unpacked/<sub folders>` to ensure that the user program is executed. Refer to Adding user programs for more information.

timeout

The length of time in minutes that the program will wait before ending. Some programs can take longer than others; be sure that you allow the program long enough to complete.

doesReboot

Set this attribute to `true` to indicate that the program will reboot the target machine during the deployment. The default is `false`.

> **Notes:**
> - If this attribute is set to `true`, you must set the `successType` attribute to `ignore`.
> - If this attribute is set to `true` and you are deploying to a target computer running Windows XP, Windows 2000 Server or Windows NT Workstation, a user must be logged on to the target machine during deployment.

executeReboot

Set this attribute to `true` to force the target machine to reboot after the program executes. The default is `false`.

> **Note:** When deploying to a target computer running Windows XP, if `executeReboot` is set to `true`, a user must be logged on to the target machine during deployment.

Usage

You can use entry programs to obtain information about target computers, ensure that target computers meet the minimum requirements for application deployments, and provide any required initialization on target computers for application deployments. Some examples of things an entry program can do include:

- Set up directories

- Check for free space
- Check locale
- Check for prerequisites
- Check operating system
- Check or add user IDs and groups

environmentSettings
(Purpose)

This element contains the environment settings for an application.

Examples

```
<iru:application>
  <entryProgram
     type="java"
     successType="returnCode"
     program
     logfile="WASStudioEntry.log">
       <environmentSettings>
  <setting>JAVA_HOME=/usr/jdk118</setting>
 /environmentSettings>
  </entryProgram>
</iru:application>
```

Format

Parents	(entryProgram), (mainProgram), (exitProgram)
Occurrences within each parent	Optional. Can occur only once.
Element content model	environmentSettings ::= (setting)^{0,*}

Parameters

The environmentSettings element does not have any attributes.

Usage

Any environment settings that you define here are in addition to those already running in the current session.

exitProgram
(Purpose)

This element contains information about an exit program for an application.

Examples

```
<iru:application>
  <exitProgram
  type="java"
    successType="returnCode"
    classpath="unpacked"
    programName="com.ibm.jsdt.examples.djt_sba.DJT_sbaExit">
 </exitProgram>
</iru:application>
```

Format

Parent	(application)
Occurrences within parent	Optional. Can occur only once.
Element content model	exitProgram ::= (arguments)^{0,1} (environmentSettings)^{0,1} (logMessages)^{0,1}
Attribute content models	Required: type ::= 'installshield' | 'java' | 'custom' Optional: successType ::= 'returncode' | 'logstring' | 'ignore' programName ::= string logFile ::= string responseFile ::= string wait ::= 'true' | 'false' externalCommand ::= 'true' | 'false' classpath ::= string timeout ::= integer doesReboot ::= 'true' | 'false' executeReboot ::= 'true' | 'false'

Parameters

The `exitProgram` element has the following attributes:

type Use this attribute to specify a type of exit program. The Solution Deployer uses this information to identify the command that starts the exit program.

> **installshield**
> InstallShield installation program.

> **java** Java program.

> **custom**
> Anything not specified here or any of the named types that you modify.

> For example, if the exit program is a Java program (`type="java"`), the deployment wizard uses the JVM for the IBM Installation Agent and the command `java` to start the program. The deployment wizard uses the value of the attribute `programName` to start the custom program (for example, `programName="setup.exe"`). The following types of programs have a default value for `programName`; in these cases, you do not need to specify the program name.

> If you use a `type="custom"` and you do not want the unpacked directory appended to your command line, be sure to specify `externalCommand="true"`.

> If you use a `type="custom"` on a Windows operating system, you might encounter a deployment problem where the computer hangs or is in an endless loop. If you specified a timeout setting, the deployment will terminate when that value is reached. Otherwise, the program will timeout after 90 minutes.

successType
> Use this attribute to identify the method used to notify the deployment wizard that the exit program has run successfully or that it has failed. The default is `returnCode` .

> **returnCode**
> The success or failure of the exit program is determined by a return code.

> **Note:** The return code values for all predeployment checkers, entry, exit, and main programs running on Linux or OS/400 (i5/OS)[8] platforms must be between -128 and +127.

logString

The success or failure of the exit program is determined by a specific string located in a log file; you must use the `logMessage` element in conjunction with this attribute type.

ignore No attempt is made to determine if the deployment was successful.

programName

Use this attribute to specify the name of an exit program.

logFile

Use this attribute to specify the name of a file to which log messages are written.

responseFile

Use this attribute to specify the name of a response file used by an exit program.

externalCommand

Set this attribute to `true` so that the `unpacked` directory is not appended to the command line. This attribute can only be used with a type of `custom`. The default is `false`.

classpath

Use this attribute to set the classpath for a Java program type. Any other use is ignored.

timeout

The length of time in minutes that the program will wait before ending. Some programs can take longer than others; be sure that you allow the program long enough to complete.

doesReboot

Set this attribute to `true` to indicate that the program will reboot the target machine during the deployment. The default is `false`.

> **Notes:**
> - If this attribute is set to `true`, you must set the `successType` attribute to `ignore`.
> - If this attribute is set to `true` and you are deploying to a target computer running Windows XP, Windows 2000 Server or Windows NT Workstation, a user must be logged on to the target machine during deployment.

executeReboot

Set this attribute to `true` to force the target machine to reboot after the program executes. The default is `false`.

> **Note:** When deploying to a target computer running Windows XP, if `executeReboot` is set to `true`, a user must be logged on to the target machine during deployment.

Usage

---

8. The OS/400 operating system is known as the i5/OS operating system beginning with V5R3.

You can use exit programs to verify that an application was successfully deployed and to clean up target computers (for example, to remove temporary directories).

externalJar
(Purpose)

This element specifies the name of an external JAR that is needed by your user programs at run time.

Examples

```
  <iru:application>
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:iru="http://www.ibm.com/xmlns/prod/iru/application"
xsi:schemaLocation"http://www.ibm.com/xmlns/prod/iru/application DJT_application.xsd"
debug="true"
id="DJT_sia"

...

<externalJars>
 <externalJar>../../externalSupportJars/IRU_Support.jar</externalJar>
 <externalJar>myDir/Any.jar</externalJar>
</externalJars>
...
 </iru:application>
```

Format

Parent	(externalJars)
Occurrences within parent	Required. Can occur more than once.
Element content model	externalJar ::= string
Attribute content models	None

Parameters

The element has no attributes.

Usage

The `externalJar` element specified must end with .jar and it must exist when you execute the Application generator. The JAR file specified will automatically be added to the classpath when the deployment wizard executes your user program.

Note: To expedite the development of user programs you might want to use the APIs in the support framework JAR, <Express Runtime Installation Path>/SolutionEnabler/externalSupportJars/IRU_Support.jar, by specifying it as an `externalJar`. For further information on this framework, refer to User Programs.

externalJars
(Purpose)

This element specifies external jars that are required by your user programs.

Examples

```
<iru:application>
 <externalJars>
    <externalJar>../../externalSupportJars/IRU_Support.jar</externalJar>
    <externalJar>myDir/Any.jar</externalJar>
 </externalJars>

...
</iru:application>
```

Format

Parent	application
Occurrences within parent	Optional. Can occur only once.
Element content model	externalJars ::= externalJar^{1,*} (link)
Attribute content models	None

Parameters

The externalJars element has no attributes.

Usage

The externalJars element is a container element for all external JARs.

file
(Purpose)

This element contains the name of a deployment image file, an entry or exit program file, or a directory that is used during deployment. If the file specified is a directory, all files and subdirectories are recursively included in the file list.

Examples

```
  <fileLists>
    <fileList id="common">
       <file>sbaImage</file>
       <file>com/ibm/jsdt/examples/djt_sba/DJTsbaEntry.class</file>
       <file>DJT_sba/usrePrograms/DJTsbaExit.class</file>
    </fileList>
  </fileLists>
```

Format

Parent	(fileList)
Occurrences within parent	Optional. Can occur more than once.
Element content model	file ::= string
Attribute content models	None

Usage

The `file` element might be a directory. If so, the directory and all its subdirectories are added to the list.

fileList
(Purpose)

This element contains a list of file elements.

Examples

```
<fileLists>
  <fileList id="common">
     <file>sbaImage</file>
     <file>com/ibm/jsdt/examples/djt_sba/DJTsbaEntry.class</file>
     <file>com/ibm/jsdt/examples/djt_sba/DJTsbaExit.class</file>
  </fileList>
</fileLists>
```

Format

Parent	(fileLists)
Occurrences within parent	Required. Can occur more than once.
Element content model	fileList ::= (file)^{0,*}
Attribute content model	**Required:** id ::= string **Optional:** softwareImageRoot ::= string userPrograms ::= 'true' | 'false' **Depricated:** includeAllFilesInSoftwareImageRoot ::= 'true' | 'false'

Parameters

The element `fileList` has the following attributes:

id   Use this attribute to identify and to refer to a specific file list. The element `fileSet` calls this identifier.

softwareImageRoot
Use this attribute to specify the path name of all the files or directories.

userPrograms
Use this attribute to specify that the file list contains user programs. This attribute will be used to package these files in the user programs JAR file when the product package is built.

Note:

For every locale for which one or more user program file lists are specified, there should be at least one `fileList` element that does not contain the `userPrograms` attribute.

includeAllFilesInSoftwareImageRoot (Deprecated)
The `includeAllFilesInSoftwareImageRoot` attribute is deprecated. A deprecated element or attribute is one that is outdated in the latest versions of the schema. The attribute might become obsolete in future versions of the Express Runtime product and should not be used

fileLists
(Purpose)

This element contains all the `fileList` elements in an application document.

Examples
```
<iru:application>
  <fileLists>
    <fileList id="common">
      <file>sbaImage</file>
      <file>com/ibm/jsdt/examples/djt_sba/DJTsbaEntry.class</file>
      <file>com/ibm/jsdt/examples/djt_sba/DJTsbaExit.class</file>
    </fileList>
  </fileLists>
</iru:application>
```

Restrictions

Parent	(application)
Occurrences within parent	Required. Must occur only once.
Element content model	fileLists ::= (fileList)^{1,*}

Parameters

The `fileLists` element does not have any attributes.

fileSet
(Purpose)

A file set allows you to associate lists of files with a particular installation language. A list of files might be associated to multiple file sets.

Examples
```
<fileSets>
  <fileSet fileListId="common"/>
  <deploymentPackagePrompt translatedKey="prompt"/>
</fileSets>
```

Format

Parent	(fileSets)
Occurrences within parent	Required. Can occur more than once.
Element content model	fileSet ::= EMPTY | string
Attribute content models	**Required:** fileListId ::= string **Deprecated:** language ::= 'english' | 'french' | 'german' | 'italian' | 'korean' | 'spanish' |'simplifiedchinese' | 'traditionalchinese' | 'japanese' | 'brazilianportuguese'

Parameters

The `fileSet` element has the following attributes:

`fileListId`
> Use this attribute to specify the identifier of a file list. (See (fileList).)

`language` (Deprecated)
> The `language` attribute is deprecated. A deprecated element or attribute is one that is outdated in the latest versions of the schema. The attribute might become obsolete in future versions of the Express Runtime product and should not be used.

fileSets
(Purpose)

This element contains all the `fileSet` elements in an application document.

Examples

```
<iru:application>
  <fileSets>
    <fileSet fileListId="common"/>
    <fileSet fileListId="common"/>
    <deploymentPackagePrompt translatedKey="prompt"/>
  </fileSets>
</iru:application>
```

Format

Parent	(application)
Occurrences	Required. Must occur only once.
Element content model	fileSets ::= (fileSet)^{1,*} (deploymentPackagePrompt)^{0,1} (helpText)^{0,1}

Parameters

The `fileSets` element does not have any attributes.

helpText
(Purpose)

This element contains information about an interface element (`stringVariable`, `booleanVariable`, or `passwordVariable`) on an application's Deployment Parameters panel. Help information about an interface element is displayed in a separate help window accessible through a help button on the configuration panel.

Examples

```
  <stringVariable

      minimumLength="2"
      maximumLength="14">
      <defaultData>siaUser</defaultData>
      <labelText translatedKey="userIdLabel"/>
      <helpText translatedKey="userIdHelp"/>
      <ismpFileAssociations>
        <ismpFileAssociation
          responseFileName="DJT_sia10setup.iss"
          propertyKeyType="product"
          propertyKey="product.username"/>
```

```
      </ismpFileAssociations>
      <inputValidation>
        <invalid>
          <prefixes>
            <prefix ignoreCase="true">BADPREFIX</prefix>
          </prefixes>
          <values>
            <value ignoreCase="true">BADVALUE</value>
          </values>
        </invalid>
        <valid>
          <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz0123456789
          </characters>
        </valid>
      </inputValidation>
    </stringVariable>
```

Format

Parents	(booleanVariable), (passwordVariable), (stringVariable), (fileSets)
Occurrences within each parent	Optional. Can occur only once.
Element content model	helpText ::= EMPTY | string
Attribute content models	Optional: translatedKey ::= string

Parameters

The `helpText` element has the following attribute:

translatedKey
> Use this attribute to indicate that the help text has been translated and that the translated text is contained in separate translation XML files.

> Note:

> The `translatedKey` must begin with an alphabetic character.

inputValidation
(Purpose)

This element allows input validation criteria to be specified on a per-variable basis. The validation occurs when the user configures the deployment parameters on the deployment wizard.

Examples
```
<stringVariable

    minimumLength="2"
    maximumLength="14">
    <defaultData>siaUser</defaultData>
    <labelText translatedKey="userIdLabel"/>
    <helpText translatedKey="userIdHelp"/>
    <ismpFileAssociations>
      <ismpFileAssociation
        responseFileName="DJT_sia10setup.iss"
        propertyKeyType="product"
        propertyKey="product.username"/>
    </ismpFileAssociations>
```

```
<inputValidation>
  <invalid>
    <prefixes>
      <prefix ignoreCase="true">BADPREFIX</prefix>
    </prefixes>
    <values>
      <value ignoreCase="true">BADVALUE</value>
    </values>
  </invalid>
  <valid>
    <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz
        0123456789</characters>
  </valid>
</inputValidation>
</stringVariable>
```

Format

Parents	(sharedVariable), (passwordVariable), (stringVariable), (booleanVariable)
Occurrences within each parent	Optional. Can occur only once.
Element content model	inputValidation ::=(valid)^{0,*} (invalid)^{0,*}

Parameters

The `inputValidation` element does not have any attributes.

Usage

You must include at least one of the elements (`valid` or `invalid`); you can include both.

invalid
(Purpose)

This element contains all the invalid criteria for a specific variable.

Examples

```
<stringVariable

    minimumLength="2"
    maximumLength="14">
    <defaultData>siaUser</defaultData>
    <labelText translatedKey="userIdLabel"/>
    <helpText translatedKey="userIdHelp"/>
    <ismpFileAssociations>
      <ismpFileAssociation
        responseFileName="DJT_sia10setup.iss"
        propertyKeyType="product"
        propertyKey="product.username"/>
    </ismpFileAssociations>
    <inputValidation>
      <invalid>
        <prefixes>
          <prefix ignoreCase="true">BADPREFIX</prefix>
        </prefixes>
        <values>
```

```
        <value ignoreCase="true">BADVALUE</value>
      </values>
    </invalid>
    <valid>
      <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz0123456789
     </characters>
    </valid>
  </inputValidation>
</stringVariable>
```

Restrictions

Parent	(inputValidation)
Occurrences within parent	Optional. Can occur more than once.
Element content model	invalid ::= (prefixes)^{0,1} (characters)^{0,*} (substrings)^{0,1} (values)^{0,1} (suffixes)^{0,1} (ranges)^{0,1}

Parameters

The `invalid` element does not have any attributes.

ismpFileAssociation
(Purpose)

This element contains configuration parameters that are inserted into an ISMP response file template at deployment.

Examples

```
<passwordVariable

    minimumLength="2"
    maximumLength="14">
    <labelText translatedKey="passwordLabel"/>
    <helpText translatedKey="passwordHelp"/>
    <ismpFileAssociations>
      <ismpFileAssociation
      responseFileName="responsefile.iss"
        propertyKeyType="product"
        propertyKey="product.password"/>
    </ismpFileAssociations>
    <inputValidation>
      <valid>
        <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz
            0123456789</characters>
      </valid>
    </inputValidation>
  </passwordVariable>
```

Format

Parents	(ismpFileAssociations)
Occurrences within each parent	Required. Can occur more than once.

Attribute content model	Required: responseFileName ::= string propertyKeyType ::= 'product'	'global'	'wizard' propertyKey ::= string Optional: valueIfTrue ::= string valueIfFalse ::= string

Parameters

The `ismpFileAssociation` element has the following attributes:

responseFileName
  Use this attribute to specify the name of the response file.

propertyKeyType
  Use this attribute to point to a particular type of entry in the specified response file template. Key types in a response file template are indicated by a dash (-) and some ISMP key type code uppercase letter. The type of entry value provided is converted into the ISMP code to precede the propertyKey value.

propertyKey
  Use this attribute to point to a particular keyword within the specified type of entry of the response file template.

valueIfFalse
  Use this attribute to specify what the value in the response file template should be if a boolean-type interface element is set to `false`.

valueIfTrue
  Use this attribute to specify what the value in the response file template should be if a boolean-type interface element is set to `true`.

ismpFileAssociations
(Purpose)

This element holds a group of `ismpFileAssociation` elements.

Examples

```
<passwordVariable

    minimumLength="2"
    maximumLength="14">
    <labelText translatedKey="passwordLabel"/>
    <helpText translatedKey="passwordHelp"/>
    <ismpFileAssociations>
      <ismpFileAssociation
        responseFileName="DJT_sia10setup.iss"
        propertyKeyType="product"
        propertyKey="product.password"/>
     </ismpFileAssociations>
    <inputValidation>
      <valid>
        <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz
            0123456789</characters>
      </valid>
    </inputValidation>
  </passwordVariable>
```

Format

Parents	(stringVariable), (booleanVariable), (passwordVariable)

Occurrences within each parent	Optional. Can occur only once.
Element content model	ismpFileAssociations ::= (ismpFileAssociation)^{1,*}

Parameters

The element `ismpFileAssociations` does not have any attributes.

issFileAssociation
(Purpose)

This element contains configuration parameters that are inserted into an InstallShield response file template at deployment.

Examples

```
<issFileAssociations>
  <issFileAssociation
   responseFileName="WASStudio302W32Setup.iss"
      section="SdAskDestPath-0"
      keyword="szdir"/>
</issFileAssociations>
```

Format

Parents	(issFileAssociations)
Occurrences within each parent	Required. Can occur more than once.
Attribute content model	Required: responseFileName ::= string keyword ::= string section ::= string Optional: valueIfTrue ::= string valueIfFalse ::= string

Parameters

The `issFileAssociation` element has the following attributes:

responseFileName
> Use this attribute to specify the name of the response file.

section
> Use this attribute to point to a particular section in the specified response file template. Sections in a response file template are indicated by brackets ([ ]).

keyword
> Use this attribute to point to a particular keyword within the specified section of the response file template.

valueIfFalse
> Use this attribute to specify what the value in the response file template should be if a boolean-type interface element is set to `false`.

valueIfTrue
> Use this attribute to specify what the value in the response file template should be if a boolean-type interface element is set to `true`.

ismpFileAssociations
(Purpose)

This element holds a group of `ismpFileAssociation` elements.

Examples

```
<passwordVariable

    minimumLength="2"
    maximumLength="14">
    <labelText translatedKey="passwordLabel"/>
    <helpText translatedKey="passwordHelp"/>
    <ismpFileAssociations>
      <ismpFileAssociation
        responseFileName="DJT_sia10setup.iss"
        propertyKeyType="product"
        propertyKey="product.password"/>
     </ismpFileAssociations>
    <inputValidation>
      <valid>
        <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz
            0123456789</characters>
      </valid>
    </inputValidation>
</passwordVariable>
```

Format

Parents	(stringVariable), (booleanVariable), (passwordVariable)
Occurrences within each parent	Optional. Can occur only once.
Element content model	ismpFileAssociations ::= (ismpFileAssociation)[1,*]

Parameters

The element `ismpFileAssociations` does not have any attributes.

labelText
(Purpose)

This element specifies the text that labels an input field on a task's application deployment parameters panel.

Examples

```
<passwordVariable

    minimumLength="2"
    maximumLength="14">
    <labelText translatedKey="passwordLabel"/>
    <helpText translatedKey="passwordHelp"/>
    <ismpFileAssociations>
      <ismpFileAssociation
        responseFileName="DJT_sia10setup.iss"
        propertyKeyType="product"
        propertyKey="product.password"/>
    </ismpFileAssociations>
    <inputValidation>
      <valid>
        <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz
```

```
        0123456789</characters>
      </valid>
    </inputValidation>
  </passwordVariable>
```

Format

Parents	(booleanVariable), (passwordVariable), (stringVariable)
Occurrences within each parent	Required. Must occur only once.
Element content model	labelText ::= EMPTY | string
Attribute content models	Optional: translatedKey ::= string

Parameters

The `labelText` element has the following attribute:

translatedKey
> Use this attribute to indicate that the label text has been translated and that the translated text is contained in separate translation XML files.

> Note:

> The `translatedKey` must begin with an alphabetic character.

language
(Purpose)

This element contains the name of a particular language.

Examples

```
<translationLanguages default="english">
  <language>english</language>
  <language>spanish</language>
</translationLanguages>
```

Format

Parent	(translationLanguages)
Occurrences within parent	Required. Cannot occur more than 10 times.
Element content model	language ::= 'english' | 'french' | 'german' | 'italian' | 'korean' | 'spanish' | 'simplifiedchinese' | 'traditionalchinese' | 'japanese' | 'brazilianportuguese'

Parameters

The `language` element does not have any attributes.

Usage

The list of languages that you include should match the language translations support by Express Runtime.

license
(Purpose)

This element contains the text for the application license. The license is displayed on the Application Properties License Acceptance window.

Examples

```
<applicationInformation
  version="1.0.0.0">
  <operatingSystems>
    <operatingSystem>Windows</operatingSystem>
    <operatingSystem>AIX</operatingSystem>
  </operatingSystems>
  <name translatedKey="name"/>
  <configurationInstructions translatedKey="configureText"/>
  <providerName translatedKey="providerName"/>
  <license>This product is licensed for one user only.</license>
</applicationInformation>
```

Format

Parent	(applicationInformation)
Occurrences within parents	Optional. Can occur only once.
Element content model	license ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

translatedKey

Use this attribute to indicate that there are different license files for different languages and that the files are referenced in separate translation XML files.

Note:

The `translatedKey` must begin with an alphabetic character.

Usage

If a license is specified in the solution wrapper, that overrides any license specified in an application wrapper. When you begin a remote deployment, the license prompt is displayed with the solution license content even if you specified application licenses. If you do not specify a license for either the application or the solution, the license prompt is not displayed.

If no solution license is specified but application licenses are specified, when a deployment is started, the license prompt displays the license text of all the applications in the group.

logMessage
(Purpose)

This element contains the text of a message that can be searched for in a log file.

Examples

```
<entryProgram>
  <logMessages>
    <logMessage
        type="error">ReturnCode=-</logMessage>
  </logMessages>
...
</entryProgram>
```

Format

Parent	(logMessages)
Occurrences within parent	Optional. Can occur more than once.
Element content model	logMessage ::= string
Attribute content models	Optional: translatedKey ::= string type ::= 'success' | 'error'

Parameters

The `logMessage` element has the following attributes:

translatedKey
> Use this attribute to indicate that the log message has been translated and that the translated messages are contained in separate translation XML files.
>
> Note:
>
> The `translatedKey` must begin with an alphabetic character.

type Use this attribute to specify whether the log message applies to successful deployment or to failed deployments. Use a value of "success" for successful deployments and "error" for failed deployments.

Usage

The `logMessage` element can only be used in conjunction with a program successType of logString. The `logMessage` element provides a way to define specific messages for which you want to search in the log file that you specified in the `logFile` attribute of your program. For example, InstallShield defines a set of 12 return codes that are displayed in the log file (for example, `ReturnCode=0`, `ReturnCode=1`, and so on). Using the `logMessage` element, you can define those messages as strings.

When specifying log messages, you must define at least one success type message or one error type message.

logMessages
(Purpose)

This element contains all the `logMessage` elements for a defined program.

Examples

```
<entryProgram>
  <logMessages>
    <logMessage
```

```
       type="error">ReturnCode=-</logMessage>
  </logMessages>
...
</entryProgram>
```

Format

Parent	(entryProgram), (mainProgram), (exitProgram), (preDeploymentChecker)
Occurrences within each parent	Optional. Can occur only once.
Element content model	logMessages ::= (logMessage)^{0,*}

Parameters

The `logMessages` element does not have any attributes.

mainProgram
(Purpose)

This element contains information about the deployment program for an application.

Examples

```
<iru:application>
  <mainProgram
  type="java"
    classpath="unpacked/siaImage/DJT_sia10setup.jar"
    program
    responseFile="DJT_sia10setup.iss"
    successType="returnCode">
    <arguments>
      <argument>-options</argument>
      <argument responseFile="true"/>
    </arguments>
  </mainProgram>
...
</iru:application>
```

Restrictions

Parent	(application)
Occurrences within parent	Required. Must occur only once.
Element content model	mainProgram ::= (arguments)^{0,*} (environmentSettings)^{0,1} (logMessages)^{0,1}
Attribute content models	Required: type ::= 'custom' | 'installshield' | 'java' Optional: successType ::= 'returncode' | 'logstring' | 'ignore' programName ::= string logFile ::= string responseFile ::= string wait ::= 'true' | 'false' externalCommand ::= 'true' | 'false' classpath ::= string timeout ::= integer doesReboot ::= 'true' | 'false' executeReboot ::= 'true' | 'false'

Parameters

The `mainProgram` element has the following attributes:

type   Use this attribute to specify a type of deployment program. The deployment wizard uses this information to identify the command that starts the deployment program.

    installshield
        InstallShield installation program.

    java   Java program.

    custom
        Anything not specified here or any of the named types that you modify.

For example, if the deployment program is a Java program (`type="java"`), the deployment wizard uses the JVM included in the IBM Installation Agent and the command `java` to start the program. The Solution Deployer uses the value of the attribute programName to start the custom program (for example, programName="setup.exe"). The following types of programs have a default value for programName; in these cases, you do not need to specify the programName.

If you use a `type="custom"` and you do not want the `unpacked` directory appended to your command line, be sure to specify `externalCommand="true"`.

If you use a `type="custom"` on a Windows operating system, you might encounter a deployment problem where the computer hangs or is in an endless loop. If you specified a timeout setting, the deployment will terminate when that value is reached. Otherwise, the program will timeout after 90 minutes.

successType
    Use this attribute to identify the method used to notify the deployment wizard that the deployment program has run successfully or that it has failed. The default is `returncode` .

    returncode
        The success or failure of the main program is determined by a return code.

        Note: The return code values for all predeployment checkers, entry, exit, and main programs running on Linux or OS/400 (i5/OS)[9] platforms must be between -128 and +127.

    logstring
        The success or failure of the main program is determined by a specific string located in a log file; you must use the `logMessage` element in conjunction with this attribute type.

    ignore No attempt is made to determine if the deployment was successful.

programName
    Use this attribute to specify the name of a deployment program.

---

9. The OS/400 operating system is known as the i5/OS operating system beginning with V5R3.

logFile

Use this attribute to specify the name of a file to which log messages are written.

responseFile

Use this attribute to specify the name of a response file used by a deployment program.

externalCommand

Set this attribute to `true` so that the unpacked directory is not appended to the command line. This attribute can only be used with a type of `custom`. The default is `false`.

classpath

Use this attribute to set the classpath for a Java program type. Any other use is ignored.

timeout

The length of time in minutes that the program will wait before ending. Some programs can take longer than others; be sure that you allow the program long enough to complete.

doesReboot

Set this attribute to `true` to indicate that the program will reboot the target machine during the deployment. The default is `false`.

> **Notes:**
> - If this attribute is set to `true`, you must set the `successType` attribute to `ignore`.
> - If this attribute is set to `true` and you are deploying to a target computer running Windows XP, Windows 2000 Server or Windows NT Workstation, a user must be logged on to the target machine during deployment.

executeReboot

Set this attribute to `true` to force the target machine to reboot after the program executes. The default is `false`.

> **Note:** When deploying to a target computer running Windows XP, if `executeReboot` is set to `true`, a user must be logged on to the target machine during deployment.

name
(Purpose)

This element contains the name of an application. The application name is displayed in deployment wizard windows (for example, the Task Configuration window).

Examples

```
<applicationInformation
  version="1.0.0.0">
  <operatingSystems>
    <operatingSystem>Windows</operatingSystem>
  </operatingSystems>
  <name translatedKey="name"/>
  <configurationInstructions translatedKey="configureText"/>
  <providerName translatedKey="providerName"/>
</applicationInformation>
```

Restrictions

Parent	(applicationInformation)
Occurrences within parent	Required. Must occur only once.
Element content model	name ::= string
Attribute content model	Optional: translatedKey ::= string

Parameters

The `name` element has the following attribute:

translatedKey
> Use this attribute to indicate that the name has been translated and that the translated names are contained in separate translation XML files.
>
> Note:
>
> The `translatedKey` must begin with an alphabetic character.

operatingSystem
(Purpose)

This element contains the name of a particular operating system on which an application runs.

Examples

```
<applicationInformation
  version="1.0.0.0">
  <operatingSystems>
    <operatingSystem>Windows</operatingSystem>
  </operatingSystems>
  <name translatedKey="name"/>
  <configurationInstructions translatedKey="configureText"/>
  <providerName translatedKey="providerName"/>
</applicationInformation>
```

Format

Parent	(operatingSystems)
Occurrences within parent	Required. Cannot occur more than three times.
Element content model	operatingSystem ::= 'Windows' | 'Linux' | 'LinuxOnPOWER' | 'OS/400 (i5/OS)'

Parameters

The `operatingSystem` element does not have any attributes.

Usage

Use this element to specify which operating system this application can be installed to.

operatingSystems

(Purpose)

This element contains all the `operatingSystem` elements that this application supports.

Examples

```
<applicationInformation
  installSize="1000"
  version="1.0.0.0">
  <operatingSystems>
    <operatingSystem>Windows</operatingSystem>
  </operatingSystems>
  <name translatedKey="name"/>
  <configurationInstructions translatedKey="configureText"/>
  <providerName translatedKey="providerName"/>
</applicationInformation>
```

Format

Parents	(applicationInformation)
Occurrences within parents	Required. Must occur only once.
Element content model	operatingSystems ::= (operatingSystem)[1,3]

Parameters

The `operatingSystems` element does not have any attributes.

passwordVariable

Purpose

This element contains information about a password field in a task's application Deployment Parameters panel. The text is blocked from view and replaced with asterisks (****). A second password field is displayed so that the user can enter the password again for verification.

Examples

```
<variables>
  <passwordVariable
      minimumLength="2"
      maximumLength="14">
    <labelText translatedKey="passwordLabel"/>
    <helpText translatedKey="passwordHelp"/>
    <ismpFileAssociations>
      <ismpFileAssociation
        responseFileName="DJT_sia10setup.iss"
        propertyKeyType="product"
        propertyKey="product.password"/>
    </ismpFileAssociations>
    <inputValidation>
      <valid>
        <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz
            0123456789</characters>
```

```
            </valid>
        </inputValidation>
    </passwordVariable>
  </variables>
```

Format

Parent	(variables)
Occurrences within parent	Required. Can occur more than once.
Element content model	passwordVariable ::= (labelText)^{1,1} (helpText)^{0,1} (issFileAssociations)^{0,1} (cidFileAssociations)^{0,1} (propertiesAssociations)^{0,1}(ismpFileAssociations)^{0,1} (inputValidation)^{0,1} (defaultData)^{0,1}
Attribute content model	Required: name ::= string Optional: minimumLength ::= integer maximumLength ::= integer upperCase ::= 'true' | 'false' lowerCase ::= 'true' | 'false' required ::= 'true' | 'false'

Parameters

The passwordVariable has the following attributes:

name   Use this attribute to specify a name for the password variable.

minimumLength
>   Use this attribute to specify the minimum number of characters allowed in the variable string.

maximumLength
>   Use this attribute to specify the maximum number of characters allowed in a variable string.

upperCase
>   Use this attribute to specify whether all the string characters must be uppercase. If they must, specify true. If the string characters can be both uppercase and lowercase, specify false. To specify lowercase, use the lowerCase attribute. The default is false.

lowerCase
>   Use this attribute to specify whether all the string characters must be lowercase. If they must, specify true. If the string characters can be both uppercase and lowercase, specify false. To specify uppercase, use the upperCase attribute. The default is false.

required
>   Use this attribute to specify whether a value for the variable is required. If a value is not required, specify false. The default is true.

Usage

Variables (password variables, string variables, and boolean variables) specify the content on deployment parameters panels. The top-to-bottom order in which variables are displayed on a panel depends on their order in an application document. The first variable listed in a document is the first variable displayed on a configuration panel; the second variable listed in a document is the second variable displayed; and so on.

You can create as many variables as you need. However, all variables are displayed on the same deployment parameters panel and scrolling might be required in order to view them all.

preDeploymentChecker
(Purpose)

This element contains information about a program that runs prior to the application entry and application main programs and can be used to check the target computer to determine if any version of the application is already installed.

Examples

```
<iru:application
  <preDeploymentChecker
  type="java"
  successType="returnCode"
  logFile="DJT_siaPDC.log"
    programName="com.ibm.jsdt.examples.djt_sia.DJT_siaPDC"">
 </preDeploymentChecker>
...
</iru:application>
```

Format

Parent	(application)
Occurrences	Optional. Can occur only once.
Element content model	preDeploymentChecker ::= (arguments)^{0,1} (environmentSettings)^{0,1} (logMessages)^{0,1}
Attribute content model	Required: type ::= 'custom' | 'installshield' | 'java' Optional: successType ::= 'returncode' | 'logstring' | 'ignore' programName ::= string logFile ::= string responseFile ::= string wait ::= 'true' | 'false' externalCommand ::= 'true' | 'false' classpath ::= string timeout ::= integer doesReboot ::= 'true' | 'false' executeReboot ::= 'true' | 'false'

The `preDeploymentChecker` element has the following attributes:

type   Use this attribute to specify a type of deployment program. The deployment wizard uses this information to identify the command that starts the deployment program.

   installshield
        InstallShield installation program.

   java   Java program.

   custom
        Anything not specified here or any of the named types that you modify.

   For example, if the deployment program is a Java program (`type="java"`), the deployment wizard uses the JVM included in the IBM Installation Agent and the command `java` to start the program. The Solution Deployer uses the value of the attribute `programName` to start the custom program

(for example, programName="setup.exe"). The following types of programs have a default value for programName; in these cases, you do not need to specify the programName.

If you use a type="custom" and you do not want the unpacked directory appended to your command line, be sure to specify externalCommand="true".

If you use a type="custom" on a Windows operating system, you might encounter a deployment problem where the computer hangs or is in an endless loop. If you specified a timeout setting, the deployment will terminate when that value is reached. Otherwise, the program will timeout after 90 minutes.

successType

Use this attribute to identify the method used to notify the deployment wizard that the deployment program has run successfully or that it has failed. The default is returnCode .

returnCode

The success or failure of the program is determined by a return code.

Note: The return code values for all predeployment checkers, entry, exit, and main programs running on Linux or OS/400 (i5/OS)[10] platforms must be between -128 and +127.

logstring

The success or failure of the program is determined by a specific string located in a log file; you must use the logMessage element in conjunction with this attribute type.

ignore No attempt is made to determine if the deployment was successful.

programName

Use this attribute to specify the name of a deployment program.

logFile

Use this attribute to specify the name of a file to which log messages are written.

responseFile

Use this attribute to specify the name of a response file used by a deployment program.

externalCommand

Set this attribute to true so that the unpacked directory is not appended to the command line. This attribute can only be used with a type of custom. The default is false.

classpath

Use this attribute to set the classpath for a Java program type. Any other use is ignored.

timeout

The length of time in minutes that the program will wait before ending. Some programs can take longer than others; be sure that you allow the program long enough to complete.

---

10. The OS/400 operating system is known as the i5/OS operating system beginning with V5R3.

doesReboot

This attribute must be set to `false` when used with a predeployment checker. The default value is `false`.

executeReboot

Set this attribute to `true` to force the target machine to reboot after the program executes. The default is `false`.

Note: When deploying to a target computer running Windows XP, if `executeReboot` is set to `true`, a user must be logged on to the target machine during deployment.

Usage

The deployment wizard sends the user program JAR file, containing the predeployment checker, to the target computer. The predeployment checker is run, and if a return code of 0 is received, the deployment continues and the deployment package file is sent. If a return code of 1 is received, the application deployment is aborted.

prefixes
(Purpose)

This element holds a group of `prefix` elements.

Examples

```
<stringVariable

    minimumLength="2"
    maximumLength="14">
    <defaultData>siaUser</defaultData>
    <labelText translatedKey="userIdLabel"/>
    <helpText translatedKey="userIdHelp"/>
    <ismpFileAssociations>
      <ismpFileAssociation
        responseFileName="DJT_sia10setup.iss"
        propertyKeyType="product"
        propertyKey="product.username"/>
    </ismpFileAssociations>
    <inputValidation>
      <invalid>
        <prefixes>
          <prefix ignoreCase="true">BADPREFIX</prefix>
        </prefixes>
        <values>
          <value ignoreCase="true">BADVALUE</value>
        </values>
      </invalid>
      <valid>
        <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz
            0123456789</characters>
      </valid>
    </inputValidation>
  </stringVariable>
```

Format

Parent	(invalid), (valid)

Occurrences	Optional. Can occur only once.
Element content model	prefixes ::= (prefix)^{1,*}

Parameters

The `prefixes` element does not contain any attributes.

propertiesAssociation
(Purpose)

This element contains configuration parameters that are inserted into a properties file during deployment on the target computer.

Examples

```
<stringVariable

  minimumLength="3">
  ...
  <propertiesAssociations>
    <propertiesAssociation
  keyword="FILE"/>
 </propertiesAssociations>
  ...
</stringVariable>
```

Format

Parents	(propertiesAssociations)
Occurrences within each parent	Required. Can occur more than once.
Attribute content model	Required: keyword ::= string Optional: valueIfTrue ::= string valueIfFalse ::= string

Parameters

The `propertiesAssociation` element has the following attributes:

keyword
> Use this attribute to point to a particular keyword within the properties file.

valueIfFalse
> Use this attribute to specify what the value in the file template should be if a boolean-type interface element is set to `false`.

valueIfTrue
> Use this attribute to specify what the value in the file template should be if a boolean-type interface element is set to `true`.

propertiesAssociations
(Purpose)

This element holds a group of `propertiesAssociation` elements.

Examples

```
<stringVariable

  minimumLength="3">
  ...
  <propertiesAssociations>
    <propertiesAssociation
      keyword="FILE"/>
  </propertiesAssociations>
  ...
</stringVariable>
```

Format

Parent	(stringVariable), (booleanVariable), (passwordVariable)
Occurrences	Optional. Can occur only once.
Element content model	propertiesAssociations ::= (propertiesAssociation)^{1,*}

Parameters

The `propertiesAssociations` element does not contain any attributes.

providerName
(Purpose)

This element contains the name of the provider of an application (for example, IBM). The provider name is displayed on the deployment wizard windows (for example, the Deployment Parameters panel).

Examples

```
<applicationInformation
  version="1.0.0.0">
  <operatingSystems>
    <operatingSystem>Windows</operatingSystem>
    <operatingSystem>AIX</operatingSystem>
  </operatingSystems>
  <name translatedKey="name"/>
  <configurationInstructions translatedKey="configureText"/>
  <providerName translatedKey="providerName"/>
</applicationInformation>
```

Format

Parents	(applicationInformation)
Occurrences within parents	Optional. Can occur only once.
Element content model	providerName ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

translatedKey

Use this attribute to indicate that the provider name has been translated and that the translated names are contained in separate translation XML files.

Note:

The `translatedKey` must begin with an alphabetic character.

Usage

The provider name is added to the beginning of the application name to build the full name that is displayed.

range
(Purpose)

This element contains a string representation of a range of numeric values, defined as being either valid or invalid for a given variable.

Examples

```
<stringVariable

   minimumLength="2">
   ...
   <inputValidation>
    <invalid>
      <ranges>
         <range>8091 to 8095</range>
      </ranges>
    </invalid>
    <valid>
      <characters>0123456789</characters>
    </valid>
   </inputValidation>
</stringVariable>
```

Format

Parents	(ranges)
Occurrences within parent	Required. Can occur more than once.
Element content model	range ::= string
Attribute content model	Optional: translatedKey ::= string

Parameters

translatedKey

Use this attribute to indicate that the range has been translated and that the translated ranges are contained in separate translation XML files. You can specify the same or different range values for each language.

Note:

The `translatedKey` must begin with an alphabetic character.

Usage

Use this element to specify a numeric range for validation. The range must be specified in the following format:

```
n to nn
```

where n is the first numeric value and nn is the last numeric value in the range. The numeric value can be in decimal format, for example, 1.5.

ranges
(Purpose)

This element holds a group of range elements.

Examples

```
<stringVariable

   minimumLength="2">
   ...
   <inputValidation>
    <invalid>
      <ranges>
         <range>8091 to 8095</range>
      </ranges>
    </invalid>
    <valid>
      <characters>0123456789</characters>
    </valid>
   </inputValidation>
</stringVariable>
```

Format

Parent	(invalid), (valid)
Occurrences	Optional. Can occur only once.
Element content model	ranges ::= (range)^{1,*}

Parameters

The ranges element does not contain any attributes.

setting
(Purpose)

This element is a key=value pair that is applied to the environment in which the given program (predeployment checker, entry program, main program, or exit program) is executing.

Examples

```
  <iru:application>
    <entryProgram
       type="java"
       successType="returnCode"
       program
       logfile="WASStudioEntry.log">
         <environmentSettings>
```

```
            <setting>JAVA_HOME=/usr/jdk118</setting>
        </environmentSettings>
    </entryProgram>
  </iru:application>
```

Format

Parent	(environmentSettings)
Occurrences within parent	Optional. Can occur more than once.
Element content model	setting ::= string

Parameters

The `setting` element does not have any attributes.

stringVariable
(Purpose)

This element defines a deployment parameter to be entered by the user.

Examples

```
<stringVariable
    name="installProfile"
    minimumLength="5"
    maximumLength="25">
    <defaultData>install.prf</defaultData>
    <labelText translatedKey="profLabel"/>
    <helpText translatedKey="profHelp"/>
    <propertiesAssociations>
      <propertiesAssociation keyword="installProfile"/>
    </propertiesAssociations>
    <inputValidation>
      <valid>
        <suffixes>
          <suffix>.prf</suffix>
        </suffixes>
        <characters ignoreCase="true">abcdefghijklmnopqrstuvwxyz
            0123456789._</characters>
      </valid>
      <invalid>
        <substrings>
          <substring>\\</substring>
        </substrings>
        <characters>*?"|/@#$:\</characters>
      </invalid>
    </inputValidation>
</stringVariable>
```

Format

Parent	(variables)
Occurrences within parent	Required. Can occur more than once.

Element content model	stringVariable ::= (labelText)[1,1] (helpText)[0,1] (issFileAssociations)[0,1] (cidFileAssociations)[0,1] (propertiesAssociations)[0,1] (ismpFileAssociations)[0,1] (inputValidation)[0,1] (defaultData)[0,1]
Attribute content models	Required: name ::= string Optional: minimumLength ::= integer maximumLength ::= integer upperCase ::= 'true' | 'false' lowerCase ::= 'true' | 'false' required ::= 'true' | 'false'

Parameters

The `stringVariable` element has the following attributes:

name Use this attribute to specify a name for the string variable.

minimumLength
> Use this attribute to specify the minimum number of characters allowed in the variable string.

maximumLength
> Use this attribute to specify the maximum number of characters allowed in a variable string.

upperCase
> Use this attribute to specify whether all the string characters must be uppercase. If they must, specify `true`. If the string characters can be both uppercase and lowercase, specify `false`. To specify lowercase, use the `lowerCase` attribute. The default is `false`.

lowerCase
> Use this attribute to specify whether all the string characters must be lowercase. If they must, specify `true`. If the string characters can be both uppercase and lowercase, specify `false`. To specify uppercase, use the `upperCase` attribute. The default is `false`.

required
> Use this attribute to specify whether a value for the variable is required. If a value is not required, specify `false`. The default is `true`.

Usage

Variables (string variables, password variables, and boolean variables) specify deployment parameters to be collected from the user for the application being deployed. The top-to-bottom order in which variables are displayed on a panel depends on their order in an application document. The first variable listed in a document is the first variable displayed on a configuration panel; the second variable listed in a document is the second variable displayed; and so on.

You can create as many variables as you need. However, all variables are displayed on the same Deployment Parameters panel and scrolling might be required in order to view them all.

substring
(Purpose)

This element contains a string of characters that are defined as being either valid or invalid when they are displayed in a given variable.

Examples

```
<variables>
  <stringVariable
      name="installProfile"
      minimumLength="5"
      maximumLength="25">
    <defaultData>install.prf</defaultData>
    <labelText translatedKey="profLabel"/>
    <helpText translatedKey="profHelp"/>
    <propertiesAssociations>
      <propertiesAssociation keyword="installProfile"/>
    </propertiesAssociations>
    <inputValidation>
      <valid>
        <suffixes>
          <suffix>.prf</suffix>
        </suffixes>
        <characters ignoreCase="true">abcdefghijklmnopqrstuvwxyz
            0123456789._</characters>
      </valid>
      <invalid>
        <substrings>
          <substring>\\</substring>
        </substrings>
        <characters>*?"|/@#$:\</characters>
      </invalid>
    </inputValidation>
  </stringVariable>
</variables>
```

Format

Parents	(substrings)
Occurrences within parent	Required. Can occur more than once.
Element content model	substring ::= string
Attribute content model	Optional: translatedKey ::= string ignoreCase ::= 'true' | 'false'

Parameters

The `substring` element has the following attribute:

translatedKey
> Use this attribute to indicate that the substring has been translated and that the translated names are contained in separate translation XML files.
>
> **Note:** The `translatedKey` must begin with an alphabetic character.

ignoreCase
> Use this attribute to specify whether to check for mixed case in the given string of characters. If the string characters are not case sensitive, specify `true`. If the string characters are case sensitive, specify `false`. The default is `false`.

substrings

(Purpose)

This element holds a group of `substring` elements.

Examples

```
<variables>
  <stringVariable

      minimumLength="4"
      maximumLength="25">
 ...
 <inputValidation>
    <invalid>
         <substrings>
           <substring>\\</substring>
         </substrings>
         <characters>*?"|/@#$:\</characters>
       </invalid>
      </inputValidation>
    </stringVariable>
  </variables>
```

Format

Parent	(invalid), (valid)
Occurrences	Optional. Can occur only once.
Element content model	substrings ::= (substring)^{1,*}

Parameters

The `substrings` element does not contain any attributes.

suffix

(Purpose)

This element contains a string of characters that are defined as being either valid or invalid when they are displayed at the end of the value entered for a given variable.

Examples

```
<variables>
  <stringVariable
      name="installProfile"
      minimumLength="5"
      maximumLength="25">
      <defaultData>install.prf</defaultData>
      <labelText translatedKey="profLabel"/>
      <helpText translatedKey="profHelp"/>
      <propertiesAssociations>
        <propertiesAssociation keyword="installProfile"/>
      </propertiesAssociations>
      <inputValidation>
        <valid>
          <suffixes>
            <suffix>.prf</suffix>
          </suffixes>
          <characters ignoreCase="true">abcdefghijklmnopqrstuvwxyz
```

```
                  0123456789._</characters>
        </valid>
        <invalid>
          <substrings>
            <substring>\\</substring>
          </substrings>
          <characters>*?"|/@#$:\</characters>
        </invalid>
      </inputValidation>
    </stringVariable>
  </variables>
```

Format

Parents	(suffixes)
Occurrences within parent	Required. Can occur more than once.
Element content model	suffix ::= string
Attribute content model	Optional: translatedKey ::= string ignoreCase ::= 'true' | 'false'

Parameters

The `suffix` element has the following attributes:

translatedKey
> Use this attribute to indicate that the suffix has been translated and that
> the translated names are contained in separate translation XML files.
>
> **Note:** The `translatedKey` must begin with an alphabetic character.

ignoreCase
> Use this attribute to specify whether to check for mixed case in the given
> string of characters. If the string characters are not case sensitive, specify
> `true`. If the string characters are case sensitive, specify `false`. The default is
> `false`.

suffixes
(Purpose)

This element holds a group of `suffix` elements.

Examples

```
<variables>
  <stringVariable
      name="installProfile"
      minimumLength="5"
      maximumLength="25">
    <defaultData>install.prf</defaultData>
    <labelText translatedKey="profLabel"/>
    <helpText translatedKey="profHelp"/>
    <propertiesAssociations>
      <propertiesAssociation keyword="installProfile"/>
    </propertiesAssociations>
    <inputValidation>
      <valid>
        <suffixes>
          <suffix>.prf</suffix>
        </suffixes>
        <characters ignoreCase="true">abcdefghijklmnopqrstuvwxyz
```

```
         0123456789._</characters>
       </valid>
       <invalid>
         <substrings>
           <substring>\\</substring>
         </substrings>
         <characters>*?"|/@#$:\</characters>
       </invalid>
     </inputValidation>
   </stringVariable>
 </variables>
```

Format

Parent	(invalid), (valid)
Occurrences	Optional. Can occur only once.
Element content model	suffixes ::= (suffix)^{1,*}

Parameters

The `suffixes` element does not contain any attributes.

translationLanguages
(Purpose)

This element specifies the languages supported for globalization in the application and controls the language displayed on the configuration panels.

Examples

```
<iru:application>
  <translationLanguages default="english">
    <language>english</language>
    <language>spanish</language>
  </translationLanguages>
...
</iru:application>
```

Format

Parent	(application)
Occurrences within parents	Optional. Can occur only once.
Element content model	translationLanguages ::= (language)^{1,10}
Attribute content model	Required: default ::= string

Parameters

The `translationLanguages` element has the following attribute:

default
     Use this attribute to identify the default language for this application.

Usage

See Translation considerations for more information.

valid
(Purpose)

This element contains all the valid criteria for a specific variable.

Examples
```
<passwordVariable

    minimumLength="2"
    maximumLength="14">
    <labelText translatedKey="passwordLabel"/>
    <helpText translatedKey="passwordHelp"/>
    <ismpFileAssociations>
      <ismpFileAssociation
        responseFileName="DJT_sia10setup.iss"
        propertyKeyType="product"
        propertyKey="product.password"/>
    </ismpFileAssociations>
    <inputValidation>
      <valid>
        <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz
            0123456789</characters>
      </valid>
    </inputValidation>
</passwordVariable>
```

Restrictions

Parent	(inputValidation)
Occurrences within parent	Optional. Can occur more than once.
Element content model	valid ::= (prefixes)^{0,*} (characters)^{0,*} (substrings)^{0,*} (values)^{0,*} (suffixes)^{0,*} (ranges)^{0,*}

Parameters

The valid element does not have any attributes.

value
(Purpose)

This element contains a string of characters that are defined as being either valid or invalid for the value entered for a given variable.

Examples
```
<stringVariable

    minimumLength="2"
    maximumLength="14">
    <defaultData>siaUser</defaultData>
    <labelText translatedKey="userIdLabel"/>
    <helpText translatedKey="userIdHelp"/>
    <ismpFileAssociations>
      <ismpFileAssociation
        responseFileName="DJT_sia10setup.iss"
        propertyKeyType="product"
```

```
        propertyKey="product.username"/>
    </ismpFileAssociations>
    <inputValidation>
      <invalid>
        <prefixes>
          <prefix ignoreCase="true">BADPREFIX</prefix>
        </prefixes>
        <values>
          <value ignoreCase="true">BADVALUE</value>
        </values>
      </invalid>
      <valid>
        <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz
            0123456789</characters>
      </valid>
    </inputValidation>
  </stringVariable>
```

Format

Parents	(values)
Occurrences within parent	Required. Can occur more than once.
Element content model	value ::= string | EMPTY
Attribute content model	Optional: translatedKey ::= string ignoreCase ::= 'true' | 'false'

Parameters

The `value` element has the following attribute:

translatedKey

> Use this attribute to indicate that the value has been translated and that the translated names are contained in separate translation XML files.

> Note:

> The `translatedKey` must begin with an alphabetic character.

ignoreCase

> Use this attribute to specify whether to check for mixed case in the given string of characters. If the string characters are not case sensitive, specify `true`. If the string characters are case sensitive, specify `false`. The default is `false`.

values
(Purpose)

This element holds a group of `value` elements.

Examples

```
<stringVariable

minimumLength="2"
maximumLength="14">
<defaultData>siaUser</defaultData>
<labelText translatedKey="userIdLabel"/>
<helpText translatedKey="userIdHelp"/>
<ismpFileAssociations>
  <ismpFileAssociation
    responseFileName="DJT_sia10setup.iss"
```

```
            propertyKeyType="product"
            propertyKey="product.username"/>
        </ismpFileAssociations>
        <inputValidation>
          <invalid>
            <prefixes>
              <prefix ignoreCase="true">BADPREFIX</prefix>
            </prefixes>
            <values>
              <value ignoreCase="true">BADVALUE</value>
            </values>
          </invalid>
          <valid>
            <characters ignoreCase="true">@#$_abcdefghijklmnopqrstuvwxyz
                0123456789</characters>
          </valid>
        </inputValidation>
      </stringVariable>
```

Format

Parent	(valid), (invalid)
Occurrences	Optional. Can occur only once.
Element content model	values ::= (value)^{1,*}

Parameters

The `values` element does not contain any attributes.

variables
(Purpose)

This element holds a group of variable-type elements.

Examples
```
<iru:application>
  <variables>

 ...

  </variables>
...
</iru:application>
```

Format

Parent	(application)
Occurrences	Optional. Can occur only once.
Element content model	variables ::= (booleanVariable)^{0,*} (passwordVariable)^{0,*} (stringVariable)^{0,*}

Parameters

The `variables` element does not contain any attributes.

Solution elements

aboutScreen
(Purpose)

This element contains the name of a graphics file for Express Runtime.

Examples

```
<solutionInformation>
  <title translatedKey="solution_title"/>
  <license translatedKey="license"/>
  <licensePrompt translatedKey="licensePrompt"/>
  <aboutScreen translatedKey="aboutScreen"/>
  <aboutScreenText translatedKey="aboutText"/>
  <icon>graphics/IRU_samples1.gif</icon>
</solutionInformation>
```

Format

Parent	(solutionInformation)
Occurrences within parent	Optional. Can occur only once.
Element content model	aboutScreen ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

The `aboutScreen` element has the following attribute:

translatedKey
> Use this attribute to indicate that the graphics file with the information "Product Information" has been translated and that the translated art files are referenced in separate language documents.
>
> Note:
>
> The `translatedKey` must begin with an alphabetic character.

Usage

The file for the `aboutScreen` element must be in either JPG or GIF format and should be no bigger than 340 x 590 pixels. This file must exist when you run the Solution generator.

The `aboutScreen` graphic and `aboutScreenText` are displayed in the Product Information window. This window is split into two parts: the graphic side on the left, and the text side on the right. The graphic area grows to the right as needed, reducing the display space for the text. The graphic is centered vertically and horizontally aligned on the left. The text area displays scroll bars, if necessary.

aboutScreenText
(Purpose)

This element allows you to provide legal information about your solution in an accessible format.

Examples

```
<solutionInformation>
  <title translatedKey="solution_title"/>
  <license translatedKey="license"/>
  <licensePrompt translatedKey="licensePrompt"/>
  <aboutScreen translatedKey="aboutScreen"/>
  <aboutScreenText translatedKey="aboutText"/>
  <icon>graphics/DJT_samples1.gif</icon>
</solutionInformation>
```

Format

Parent	(solutionInformation)
Occurrences within parent	Optional. Can occur only once.
Element content model	aboutScreenText ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

The `aboutScreenText` element has the following attribute:

translatedKey
> Use this attribute to indicate that the file with the information "Product Information" has been translated and that the translated files are referenced in separate language documents.

> Note:

> The `translatedKey` must begin with an alphabetic character.

Usage

The `aboutScreen` graphic and `aboutScreenText` are displayed in the Product Information window. This window is split into two parts: the graphic side on the left, and the text side on the right. The graphic area grows to the right as needed, reducing the display space for the text. The graphic is centered vertically and horizontally aligned on the left. The text area displays scroll bars, if necessary.

application
(Purpose)

This element specifies a particular application in an `installTask` in the solution.

Examples

```
  <installTask>
operatingSystem="AIX">
 <description translatedKey="aixInstallTask"/>
    <applications>
<application
     fileName="DJT_sia_aix.ser">
  <path translatedKey="BuildPath"/>
```

```
    </application>
  </applications>
</installTask>
```

Format

Parent	(applications)
Occurrences within document	Optional. Can occur more than once.
Element content model	application ::= (path)^{0,1} (dataPortNumber)^{0,1}
Attribute content models	Required: fileName ::= string Optional: alwaysShowDeploymentParameters ::= 'true' | 'false' stopDeploymentOnFail ::= 'true' | 'false'

Parameters

The `application` element has the following attributes:

fileName
> The file name and path of the binary application file on the staging server. This file must exist when you run the Solution generator.

alwaysShowDeploymentParameters
> If set to `true`, the deployment parameters panel for this application will always be included in the Deployment Wizard, regardless of whether or not the application is already configured.

stopDeploymentOnFail
> If set to `true`, the solution deployment will stop if the installation of this particular application fails on a target machine. The installation of any subsequent applications will not be attempted on the target machine where the failure occurred, and any remaining tasks in the solution will not be deployed. Other target machines in the same task will not be affected unless the same failure occurs on those target machines as well.

applications
(Purpose)

This element contains one or more (application) elements.

Examples

```
  <installTask>
operatingSystem="AIX">
<description translatedKey="aixInstallTask"/>
    <applications>
  <application
     fileName="DJT_sia_aix.ser">
  <path translatedKey="BuildPath"/>
    </application>
  /applications><
  </installTask>
```

Format

Parent	(solution)
Occurrences within document	Optional. Can occur more than once.
Element content model	applications ::= (application)[1,*]

Parameters

The applications element does not have any attributes.

communicationPortNumber
(Purpose)

This element specifies the TCP/IP port number used by the deployment wizard to communicate with the target computers.

Examples

```
<solutionInformation>
   <title translatedKey="solution_title"/>
   <license translatedKey="license"/>
   <licensePrompt translatedKey="licensePrompt"/>
   <aboutScreen translatedKey="aboutScreen"/>
   <aboutScreenText translatedKey="aboutText"/>
   <icon>graphics/DJT_samples1.gif</icon>
 <maximumNumberOfActiveTargets>75</maximumNumberOfActiveTargets>
   <maximumNumberOfDataConnections>75</maximumNumberOfDataConnections>
 <deploymentPackagePath>software/images/</deploymentPackagePath>
 <dataPortNumber>0</dataPortNumber>
 <communicationPortNumber>0</communicationPortNumber
</solutionInformation>
```

Format

Parent	(solutionInformation)
Occurrences within parent	Optional. Can occur only once.
Element content model	deploymentPackagePath ::= integer

Parameters

The communicationPortNumber element does not have any attributes.

Usage

If this port number is used by another process, you can change it to a different port number. The valid range is 0 to 65535. Consider, however, that ports 1 to 1023 are usually reserved for use by other programs (for example, FTP and Telnet).

dataPortNumber
(Purpose)

This element specifies the TCP/IP port number used by the deployment wizard to send data such as deployment packages to target computers.

Examples

```
<solutionInformation>
 <title translatedKey="solution_title"/>
 <license translatedKey="license"/>
 <licensePrompt translatedKey="licensePrompt"/>
 <aboutScreen translatedKey="aboutScreen"/>
 <aboutScreenText translatedKey="aboutText"/>
 <icon>graphics/DJT_samples1.gif</icon>
 <maximumNumberOfActiveTargets>75</maximumNumberOfActiveTargets>
 <maximumNumberOfDataConnections>75</maximumNumberOfDataConnections>
 <dataPortNumber>0</dataPortNumber>
 <communicationPortNumber>0</communicationPortNumber>
</solutionInformation>
```

Format

Parents	(solutionInformation)
Occurrences within parent	Optional. Can occur only once.
Element content model	dataPortNumber ::= integer

Parameters

The dataPortNumber element does not have any attributes.

Usage

If this port number is used by another process, you can change it to a different port number. The valid range is from 0 to 65535. Consider, however, that ports 1 to 1023 are usually reserved for use by other programs (for example, FTP and Telnet).

deploymentPackagePath
(Purpose)

This element identifies the path where the deployment packages will be located.

Examples

```
<solutionInformation>
   <title translatedKey="solution_title"/>
   <license translatedKey="license"/>
   <licensePrompt translatedKey="licensePrompt"/>
   <aboutScreen translatedKey="aboutScreen"/>
   <aboutScreenText translatedKey="aboutText"/>
   <icon>graphics/DJT_samples1.gif</icon>
   <maximumNumberOfActiveTargets>75</maximumNumberOfActiveTargets>
   <maximumNumberOfDataConnections>75</maximumNumberOfDataConnections>
  <deploymentPackagePath>software/images/</deploymentPackagePath>
 <dataPortNumber>0</dataPortNumber>
  <communicationPortNumber>0</communicationPortNumber>
</solutionInformation>
```

Format

Parent	(solutionInformation)

Occurrences within parent	Optional. Can occur only once.
Element content model	deploymentPackagePath ::= EMPTY | string

Parameters

The `deploymentPackagePath` element does not have any attributes.

deploymentPackagePrompt
(Purpose)

This element contains the text that displays in dialog boxes at the time users create deployment packages. The text of the prompt points them to the location of the deployment image files (for example, "Insert CD-ROM number 1") or asks them to browse to the location of the files. When users create deployment packages, the deployment package prompt text points them to the location of the main program files.

Examples

```
 <installTask>
operatingSystem="AIX">
<description translatedKey="aixInstallTask"/>
   <applications>
  <application
       fileName="DJT_sia_aix.ser">
   <path translatedKey="BuildPath"/>
     <deploymentPackagePrompt translatedKey="prompt"/>
  </application>
  </applications>
 </installTask>
```

Format

Parents	(application), (fileSets)
Occurrences within parent	Optional. Can occur only once.
Element content model	deploymentPackagePrompt ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

translatedKey

> Use this attribute to indicate that the deployment package prompt string has been translated and that the translated string is contained in separate language documents.

> Note:

> The `translatedKey` must begin with an alphabetic character.

Usage

You can specify a deployment package prompt in both application documents and solution documents. The specification in the solution document takes precedence. If none is provided, a default message is displayed.

icon
(Purpose)

This element contains the name of a graphics file for an icon that is displayed next to the name of the deployment wizard title in the title bar of the deployment wizard main window.

Examples

```
<solutionInformation>
  <title translatedKey="solution_title"/>
  <license translatedKey="license"/>
  <licensePrompt translatedKey="licensePrompt"/>
  <aboutScreen translatedKey="aboutScreen"/>
  <aboutScreenText translatedKey="aboutText"/>
  <icon>samples/graphics/IRU_samples1.gif/icon><
</solutionInformation>
```

Format

Parent	(solutionInformation)
Occurrences within parents	Optional. Can occur only once.
Element content model	icon ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

translatedKey
> Use this attribute to indicate that there are different graphics files for different languages and that the files are referenced in separate language documents.
>
> Note:
>
> The `translatedKey` must begin with an alphabetic character.

Usage

The icon file must be in either JPG or GIF format, and it must exist when you run the Solution generator.

installTask
(Purpose)

This element defines an installation task to be displayed in the deployment wizard window.

Examples

```
<installTask
 operatingSystem="Windows"
 addLocalHost="true"
 oneTargetDeployment="true"
 isOptional="true"
```

```
selectedByDefault="false">
<description translatedKey="windowsInstallTask"/>
<taskDetails translatedKey="taskDetails"/>
 <applications>
  <application
     fileName="DJT_sia_win.ser">
   <path translatedKey="BuildPath"/>
     </application>
   </applications>
 </installTask>
```

Format

Parent	(tasks)
Occurrences within parents	Unlimited.
Element content model	manualTask ::=description[1,1] taskDetails[1,1]
Attribute content model	**Required:** operatingSystem:=OS **Optional:** addLocalHost ::= 'true' | 'false' isOptional ::= 'true' | 'false' oneTargetDeployment ::= 'true' | 'false' selectedByDefault ::= 'true' | 'false' **Deprecated:** language ::= 'english' | 'french' | 'german' | 'italian' | 'korean' | 'spanish' |'simplifiedchinese' | 'traditionalchinese' | 'japanese' | 'brazilianportuguese'

Parameters

The installTask element has the following attributes:

operatingSystem
> Use this attribute to specify the operating system of the installTask.

addLocalHost
> Set this attribute to true to initialize the installTask with localHost as target.

isOptional
> Set this attribute to true to specify an installTask as optional.

oneTargetDeployment
> Set this attribute to true to specify that this installTask can only deploy to one target computer.

selectedByDefault
> Set this attribute to true to deploy this installTask by default.

> **Note:** If the isOptional attribute is set to false, selectedByDefault will return true

language (Deprecated)
> The language attribute is deprecated. A deprecated element or attribute is one that is outdated in the latest versions of the schema. The attribute might become obsolete in future versions of the Express Runtime product and should not be used.

Usage

An `installTask` is a task to install an application to a target machine using the deployment wizard. The `operatingSystem` attribute of the `installTask` refers to the operating system of the target computer. The `addLocalHost` attribute of the `installTask` initializes localHost as the target for the deployment of the install task. The `oneTargetDeployment` attribute of the `installTask` specifies that the install task can be deployed to only one computer.

instructions
(Purpose)

This element provides instructions for a `manualTask`.

Examples

```
<manualTask>
 <description translatedKey="description"/>
  <instructions translatedKey="instructions"/>
</manualTask>
```

Format

Parent	(manualTask)
Occurrences within parents	Required. Must occur only once.
Attribute content model	Required: translatedKey

Parameters

The `instructions` element has the following attribute:

translatedKey
> Use this attribute to specify key in the translated XML files that contain the actual text for the description.

> Note:

> The `translatedKey` must begin with an alphabetic character.

Usage

The instructions are displayed in the deployment wizard window when deploying or configuring a manual task. They provide instructions to the user for executing the manual task.

language
(Purpose)

This element contains the name of a particular language.

Examples

```
<translationLanguages default="english">
  <language>english</language>
  <language>french</language>
  <language>traditionalchinese</language>
</translationLanguages>
```

Format

Parent	(translationLanguages)
Occurrences within parent	Required. Cannot occur more than ten times.
Element content model	language ::= 'english' | 'french' | 'german' | 'italian' | 'korean' | 'spanish' | 'simplifiedchinese' | 'traditionalchinese' | 'japanese' | 'brazilianportuguese' | 'arabic' | 'czech' | 'danish' | 'dutch' | finnish' | 'greek' | 'hungarian' | 'hebrew' | 'norwegian' | 'polish' | 'portuguese' | 'russian' | 'swedish' | 'turkish' | 'albanian' | 'bulgarian' | 'byelorussian' | 'catalan' | 'croatian' | 'estonian' | 'icelandic' | 'latvian' | 'lithuanian' | 'macedonian' | 'romanian' | 'serbian' | 'slovakian' | 'slovenian' | 'thai' | 'ukranian' | 'kazakh'

Parameters

The language element does not have any attributes.

Usage

This element is used with the translationLanguages element.

For translationLanguages , only a subset of the languages listed here are valid. See (translationLanguages) for the list of valid languages you can use with that element.

Note:

Be sure to match your applications and solution to the translation languages of Express Runtime. If you do not, certain panels can be displayed with multiple languages.

license
(Purpose)

This element contains the text of the solution license agreement that is displayed when a deployment to a target computer is started. It is also displayed on the Application Property License panel.

Examples

```
<solutionInformation>
  <title translatedKey="solution_title"/>
  <license translatedKey="license"/>
  <licensePrompt translatedKey="licensePrompt"/>
  <aboutScreen translatedKey="aboutScreen"/>
  <aboutScreenText translatedKey="aboutText"/>
  <icon>graphics/IRU_samples1.gif</icon>
</solutionInformation>
```

Format

Parent	(solutionInformation)

Occurrences within parent	Optional. Can occur only once.
Element content model	license ::= EMPTY | string
Attribute content models	Optional: translatedKey ::= string

Parameters

The `license` element has the following attribute:

translatedKey
> Use this attribute to indicate that the license agreement has been translated and that the translated agreements are contained in separate language documents.

> Note:

> The `translatedKey` must begin with an alphabetic character.

Usage

If a license is specified in the solution wrapper, that overrides any license specified in an application wrapper. When you begin a remote deployment, the license prompt is displayed with the solution license content even if you specified application licenses. If you do not specify a license for either the application or the solution, the license prompt is not displayed.

licensePrompt
(Purpose)

This element contains a message displayed on the license agreement dialog.

Examples

```
<solutionInformation>
  <title translatedKey="solution_title"/>
  <license translatedKey="license"/>
  <licensePrompt translatedKey="licensePrompt"/>
  <aboutScreen translatedKey="aboutScreen"/>
  <aboutScreenText translatedKey="aboutText"/>
  <icon>graphics/IRU_samples1.gif</icon>
</solutionInformation>
```

Format

Parent	(solutionInformation)
Occurrences within document	Required. Must occur only once.
Element content model	licensePrompt ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

The `licensePrompt` element has the following attribute:

translatedKey

Use this attribute to indicate that the copyright message has been translated and that the translated messages are contained in separate language documents.

Note:

The `translatedKey` must begin with an alphabetic character.

Usage

If a license is specified in the solution wrapper, that overrides any license specified in an application wrapper. When you begin a remote deployment, the license prompt is displayed with the solution license content even if you specified application licenses. If you do not specify a license for either the application or the solution, the license prompt is not displayed.

manualTask
(Purpose)

This element defines a manual task for display in the deployment wizard window.

Examples

```
<manualTask
 isOptional="true"
 selectedByDefault="false">
 <description translatedKey="description"/>
  <taskDetails translatedKey="taskDetails"/>
  <instructions translatedKey="instructions"/>
</manualTask>
```

Format

Parent	(tasks)
Occurrences within parents	Unlimited.
Element content model	manualTask ::=description^{1,1} instructions^{1,1} taskDetails^{1,1}
Attribute content model	Optional: isOptional ::= 'true' | 'false' selectedByDefault ::= 'true' | 'false'

Parameters

The `manualTask` element has the following attributes.

translatedKey

Use this attribute to indicate an action that must be performed by the person installing the solution.

Note: The `translatedKey` must begin with an alphabetic character.

isOptional

Set this attribute to `true` to specify an `manualTask` as optional.

selectedByDefault

Set this attribute to `true` to deploy this `manualTask` by default.

> **Note:** If the `isOptional` attribute is set to false, `selectedByDefault` will
> return `true`.

Usage

Use the `manualTask` element to display instructions in the main window of the
deployment wizard. Additionally, during the solution deployment, a manual task
prompts the user to execute and confirm completion of an action or actions.

maximumNumberOfActiveTargets
(Purpose)

This element specifies the maximum number of target computers that can be
connected simultaneously with the staging server.

Examples

```
<iru:solution>
  <solutionInformation>
   <title translatedKey="solution_title"/>
   <license translatedKey="license"/>
   <licensePrompt translatedKey="licensePrompt"/>
   <aboutScreen translatedKey="aboutScreen"/>
   <aboutScreenText translatedKey="aboutText"/>
   <icon>graphics/IRU_samples1.gif</icon>
  <maximumNumberOfActiveTargets>75</maximumNumberOfActiveTargets>
  <maximumNumberOfDataConnections>75</maximumNumberOfDataConnections>
  <dataPortNumber>0</dataPortNumber>
  <communicationPortNumber>0</communicationPortNumber>
  </solutionInformation>
</iru:solution>
```

Format

Parent	(solutionInformation)
Occurrences within parents	Optional. Can occur only once.
Element content model	
	maximumNumberOfActiveTargets ::=integer

Parameters

The `maximumNumberOfActiveTargets` element does not have any attributes.

Usage

Express Runtime limits you to 100 target computers. You can lower that number
for a solution by using this element. The valid range is 1 to 100.

maximumNumberOfDataConnections
(Purpose)

This element specifies the maximum number of active data connections that a
staging server can have at one time.

Examples

```
<iru:solution>
  <solutionInformation>
    <title translatedKey="solution_title"/>
    <license translatedKey="license"/>
    <licensePrompt translatedKey="licensePrompt"/>
    <aboutScreen translatedKey="aboutScreen"/>
    <aboutScreenText translatedKey="aboutText"/>
    <icon>graphics/IRU_samples1.gif</icon>
  <maximumNumberOfActiveTargets>75</maximumNumberOfActiveTargets>
  <maximumNumberOfDataConnections>75</maximumNumberOfDataConnections>
  <dataPortNumber>0</dataPortNumber>
  <communicationPortNumber>0</communicationPortNumber>
  </solutionInformation>
</iru:solution>
```

Format

Parent	(solutionInformation)
Occurrences within parents	Optional. Can occur only once.
Element content model	maximumNumberOfDataConnections ::=integer

Parameters

The maximumNumberOfDataConnections element does not have any attributes.

Usage

Express Runtime limits you to 100 target computers. Therefore, you can have no more than 100 active data connections. The valid range is 1 to 100.

path
(Purpose)

This element contains the path name of an entry or exit program for a solution.

Examples
```
<application
    fileName="IRU_sba_win.ser">
    <path translatedKey="BuildPath"/>
</application>
```

Format

Parent	(application)
Occurrences within parents	Optional. Can occur only once.
Element content model	path ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

The path element has the following attribute:

translatedKey

Use this attribute to indicate that the path name has been translated and that the translated path names are contained in separate language documents.

Note:

The `translatedKey` must begin with an alphabetic character.

Usage

Specifies the `softwareImagePath` for the application.

sharedVariable
Purpose

This element defines a solution variable that might be shared by multiple application variables.

Examples

```
<variables> <sharedVariable

 minimumLength="4"
 maximumLength="25"
  <defaultData>DJT_sba10Setup.log</defaultData>
   <valid>
    <suffixes>
     <suffix>.log</suffix>
     <suffixes>
     <characters ignoreCase="true">abcdefghijklmnopqrstuvwxyz0123456789._
     </characters>
    </valid>
    <invalid>
     <substrings>
      <substring>\\</substring>
     </substrings>
     <characters>*?"|/@#$:\</characters>
    </invalid>
   </inputValidation>
 </sharedVariable>
</variables>
```

Format

Parent	(variables (within the top-level <solution element))
Occurrences within parent	Required. Can occur more than once
Element content model	(defaultData)^{0,1} (inputValidation)^{0,1}
Attribute content models	Required: name ::= string Optional: minimumLength ::= integer maximumLength ::= integer upperCase ::= 'true' | 'false' lowerCase ::= 'true' | 'false'

Parameters

The `sharedVariable` element has the following attributes:

name   Use this attribute to specify a name for the shared variable. Note that the name cannot contain the underscore character.

minimumLength

Use this attribute to specify the minimum number of characters allowed in the variable's value.

maximumLength

Use this attribute to specify the maximum number of characters allowed in a variable value.

upperCase

Set to this attribute to `true` to specify that all of the characters in the variable must be upper case. If it is set to `false`, the characters can be both upper and lower case. The default setting is `false`.

lowerCase

Set to this attribute to `true` to specify that all of the characters in the variable must be lower case. If it is set to `false`, the characters can be both upper and lower case. The default setting is `false`.

Usage

Shared variables are defined in the solution XML in order to provide default data, minimum and maximum length requirements, upper and lower case requirements and validation requirements to any application-defined variables with the `sharedAs` attribute set to the shared variable's name.

solution
(Purpose)

This is the root element of a solution document.

Examples

```
<iru:solution
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:iru="http://www.ibm.com/xmlns/prod/iru/solution"
xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/solution DJT_solution.xsd"
id="DJT_starterSSol"
debug="true">
...

</iru:solution>
```

Format

Parent	Root element
Occurrences within parent	Required Must occur only once
Element content model	solution ::= (solutionInformation)^{1,1} (translationLanguages)^{0,1} (tasks)^{0,1}
Attribute content models	**Optional:** version ::= string id ::= string debug ::= 'true' | 'false' **Depricated:** builderVersion ::= string

Parameters

The solution element has the following attributes:

version
Use this attribute to display a version number of a solution in the deployment wizard main window.

id   Use this attribute to create an identifier for the binary wrapper that contains information about all the applications in the solution.

Note:

Solution IDs must be fewer than 200 characters in length, must begin with an alphabetic character, and can be made up only of alphanumeric characters, underscores, dashes and periods.

debug Use this attribute to display information about the commands being run by the agent on the command line.

builderVersion (Deprecated)
The builderVersion attribute is deprecated. A deprecated element or attribute is one that is outdated in the latest versions of the schema. The attribute might become obsolete in future versions of the Express Runtime product and should not be used

Usage

Use the solution start tag immediately after the document type declaration in a solution document. Use the end tag at the conclusion of the document.

solutionInformation
(Purpose)

This element contains basic information about a solution.

Examples

```
<iru:solution>
  <solutionInformation>
   <title translatedKey="solution_title"/>
   <license translatedKey="license"/>
   <licensePrompt translatedKey="licensePrompt"/>
   <splashScreen translatedKey="splashScreen"/>
   <aboutScreen translatedKey="aboutScreen"/>
   <aboutScreenText translatedKey="aboutText"/>
   <icon>graphics/IRU_samples1.gif</icon>
  <maximumNumberOfActiveTargets>75</maximumNumberOfActiveTargets>
  <maximumNumberOfDataConnections>75</maximumNumberOfDataConnections>
  <dataPortNumber>0</dataPortNumber>
  <communicationPortNumber>0</communicationPortNumber>
 </solutionInformation>
</iru:solution>
```

Format

Parent	(solution)
Occurrences within parent	Required. Must occur only once.

Element content model	applicationInformation ::= (title)^{1,1}
	(license)^{0,1}
	(licensePrompt)^{1,1}
	(aboutScreen)^{0,1}
	(aboutScreenText)^{0,1}
	(icon)^{0,1}
	splashScreen^{0,1}

Parameters

The `solutionInformation` element does not have any attributes.

splashScreen
(Purpose)

This element specifies an image file that is used as the splash screen for the solution. It is displayed when the solution is opened in the Deployer.

Examples

```
<iru:solution>
  <solutionInformation>
   <title translatedKey="solution_title"/>
   <license translatedKey="license"/>
   <licensePrompt translatedKey="licensePrompt"/>
   <splashScreen translatedKey="splashScreen"/>
   <aboutScreen translatedKey="aboutScreen"/>
   <aboutScreenText translatedKey="aboutText"/>
   <icon>graphics/IRU_samples1.gif</icon>
  </solutionInformation>
</iru:solution>
```

Format

Parent	(solutionInformation)
Occurrences within parent	Optional. Can occur only once.
Element content model	splashScreen ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

The `splashScreen` element has the following attribute:

translatedKey
> Use this attribute to indicate that the splashScreen file name has been translated and that the translated file names are contained in separate language documents.
>
> Note:
>
> The `translatedKey` must begin with an alphabetic character.

taskDetails
(Purpose)

This element contains a brief description of a task on the task selection panel.

Examples

```
<tasks>
 <taskGroup>
    <taskGroupTitle translatedKey="WindowsTaskGroup"/>
    <taskGroupDetails translatedKey="WindowsTaskGroupDetails"/>
    <taskGroupPrompt translatedKey="WindowsTaskGroupPrompt"/>
 <installTask operatingSystem="Windows">
    <description translatedKey="WASInstallTask"/>
    <taskDetails translatedKey="WAStaskDetails"/>
    <applications>
      <application fileName="WAS_Windows.ser">
      <path translatedKey="BuildPath"/>
      </application>
    </applications>
  </installTask>

 <installTask operatingSystem="Windows">
    <description translatedKey="DB2InstallTask"/>
    <taskDetails translatedKey="DB2taskDetails"/>
    <applications>
      <application fileName="DB2_Windows.ser">
      <path translatedKey="BuildPath"/>
      </application>
    </applications>
 </installTask>

 ...

 </taskGroup>
</tasks>
```

Format

Parent	(installTask) or (manualTask)
Occurrences within parents	Unlimited.
Element content model	taskDetails ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

The `taskDetails` element has the following attributes:

translatedKey
>Use this attribute to indicate that the description of the task has been translated and that the translated descriptions are contained in separate language documents.
>
>**Note:** The `translatedKey` must begin with an alphabetic character.

taskGroup
(Purpose)

This element defines a group of related tasks.

Examples

```
<tasks>
 <taskGroup>
    <taskGroupTitle translatedKey="WindowsTaskGroup"/>
```

```
      <taskGroupDetails translatedKey="WindowsTaskGroupDetails"/>
      <taskGroupPrompt translatedKey="WindowsTaskGroupPrompt"/>
  <installTask operatingSystem="Windows">
      <description translatedKey="WASInstallTask"/>
      <taskDetails translatedKey="WAStaskDetails"/>
      <applications>
        <application fileName="WAS_Windows.ser">
        <path translatedKey="BuildPath"/>
        </application>
      </applications>
   </installTask>

  <installTask operatingSystem="Windows">
      <description translatedKey="DB2InstallTask"/>
      <taskDetails translatedKey="DB2taskDetails"/>
      <applications>
        <application fileName="DB2_Windows.ser">
        <path translatedKey="BuildPath"/>
        </application>
      </applications>
  </installTask>

  ...

 </taskGroup>
</tasks>
```

Format

Parent	(tasks)
Occurrences within parents	Unlimited.
Attribute content model	None.

Parameters

The taskGroup element has no attributes.

Usage

The taskGroup element does not require that all tasks within that group be
deployed, but provides the user with a logical grouping of related tasks.

taskGroupDetails
(Purpose)

This element provides a brief description of a task group on the task group
selection panel.

Examples

```
<tasks>
 <taskGroup>
    <taskGroupTitle translatedKey="WindowsTaskGroup"/>
    <taskGroupDetails translatedKey="WindowsTaskGroupDetails"/>
    <taskGroupPrompt translatedKey="WindowsTaskGroupPrompt"/>
 <installTask operatingSystem="Windows">
    <description translatedKey="WASInstallTask"/>
    <taskDetails translatedKey="WAStaskDetails"/>
    <applications>
      <application fileName="WAS_Windows.ser">
      <path translatedKey="BuildPath"/>
      </application>
```

```
    </applications>
  </installTask>

 <installTask operatingSystem="Windows">
    <description translatedKey="DB2InstallTask"/>
    <taskDetails translatedKey="DB2taskDetails"/>
    <applications>
      <application fileName="DB2_Windows.ser">
      <path translatedKey="BuildPath"/>
      </application>
    </applications>
 </installTask>

 ...

 </taskGroup>
</tasks>
```

Format

Parent	taskGroup
Occurrences within parents	Exactly one.
Element content model	taskGroupDetails ::= EMPTY | string
Attribute content model	**Optional:** translatedKey ::= string

Parameters

The `taskGroupDetails` element has the following attributes:

translatedKey
> Use this attribute to indicate that the task group description is translated
> and that the translated descriptions are contained in separate language
> documents.
>
> **Note:** The `translatedKey` must begin with an alphabetic character.

taskGroupPrompt
(Purpose)

This element contains a message displayed on the task group selection panel.

Examples

```
<tasks>
 <taskGroup>
    <taskGroupTitle translatedKey="WindowsTaskGroup"/>
    <taskGroupDetails translatedKey="WindowsTaskGroupDetails"/>
    <taskGroupPrompt translatedKey="WindowsTaskGroupPrompt"/>
 <installTask operatingSystem="Windows">
    <description translatedKey="WASInstallTask"/>
    <taskDetails translatedKey="WAStaskDetails"/>
    <applications>
      <application fileName="WAS_Windows.ser">
      <path translatedKey="BuildPath"/>
      </application>
    </applications>
  </installTask>

 <installTask operatingSystem="Windows">
    <description translatedKey="DB2InstallTask"/>
    <taskDetails translatedKey="DB2taskDetails"/>
```

```
    <applications>
      <application fileName="DB2_Windows.ser">
      <path translatedKey="BuildPath"/>
      </application>
    </applications>
 </installTask>

 ...

 </taskGroup>
</tasks>
```

Format

Parent	(taskGroup)
Occurrences within parents	Exactly once.
Element content model	taskGroupPrompt ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

The taskGroupPrompt element has the following attribute:

translatedKey
> Use this attribute to indicate that the prompt has been translated and that the translated messages are contained in separate language documents.
>
> The translatedKey must begin with an alphabetic character.

taskGroupTitle
(Purpose)

This element defines a name for a task group. This name is displayed next to the selection check box on the task group selection panel.

Examples

```
<tasks>
 <taskGroup>
    <taskGroupTitle translatedKey="WindowsTaskGroup"/>
    <taskGroupDetails translatedKey="WindowsTaskGroupDetails"/>
    <taskGroupPrompt translatedKey="WindowsTaskGroupPrompt"/>
 <installTask operatingSystem="Windows">
    <description translatedKey="WASInstallTask"/>
    <taskDetails translatedKey="WAStaskDetails"/>
    <applications>
      <application fileName="WAS_Windows.ser">
      <path translatedKey="BuildPath"/>
      </application>
    </applications>
  </installTask>

 <installTask operatingSystem="Windows">
    <description translatedKey="DB2InstallTask"/>
    <taskDetails translatedKey="DB2taskDetails"/>
    <applications>
      <application fileName="DB2_Windows.ser">
      <path translatedKey="BuildPath"/>
      </application>
    </applications>
 </installTask>
```

```
 ...

 </taskGroup>
</tasks>
```

Format

Parent	(taskGroup)
Occurrences within parents	Exactly once.
Element content model	taskGroupTitle ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

The `taskGroupTitle` element has the following attributes:

translatedKey
> Use this attribute to indicate that the name of the task group has been translated and that the translated names are contained in separate language documents.
>
> **Note:** The `translatedKey` must begin with an alphabetic character.

tasks
(Purpose)

This is a container element for all task groups, installation tasks, and manual tasks.

Examples

```
<tasks>
 <taskGroup>
    <taskGroupTitle translatedKey="WindowsTaskGroup"/>
    <taskGroupDetails translatedKey="WindowsTaskGroupDetails"/>
    <taskGroupPrompt translatedKey="WindowsTaskGroupPrompt"/>
 <installTask operatingSystem="Windows">
    <description translatedKey="WASInstallTask"/>
    <taskDetails translatedKey="WAStaskDetails"/>
    <applications>
      <application fileName="WAS_Windows.ser">
      <path translatedKey="BuildPath"/>
      </application>
    </applications>
  </installTask>

 <installTask operatingSystem="Windows">
    <description translatedKey="DB2InstallTask"/>
    <taskDetails translatedKey="DB2taskDetails"/>
    <applications>
      <application fileName="DB2_Windows.ser">
      <path translatedKey="BuildPath"/>
      </application>
    </applications>
 </installTask>

 ...

 </taskGroup>
</tasks>
```

Format

Parent	(solution)
Occurrences within parents	Exactly once.
Attribute content model	None.

Parameters

The `tasks` element has no attributes.

title
(Purpose)

This element contains the name of a solution. This name is displayed in the title bar of the deployment wizard main window and in the Product Information panel.

Examples

```
<iru:solution>
  <solutionInformation>
   <title translatedKey="solution_title"/>
   <license translatedKey="license"/>
   <licensePrompt translatedKey="licensePrompt"/>
   <aboutScreen translatedKey="aboutScreen"/>
   <aboutScreenText translatedKey="aboutText"/>
   <icon>graphics/IRU_samples1.gif</icon>
  </solutionInformation>
</iru:solution>
```

Format

Parent	(solutionInformation)
Occurrences within parent	Required. Must occur only once.
Element content model	title ::= EMPTY | string
Attribute content model	Optional: translatedKey ::= string

Parameters

The `title` element has the following attribute:

translatedKey
> Use this attribute to indicate that the title has been translated and that the translated titles are contained in separate language documents.
>
> Note:
>
> The `translatedKey` must begin with an alphabetic character.

translationLanguages
(Purpose)

This element contains one or more `language` elements.

Examples

```
<iru:solution>
  <translationLanguages default="english">
    <language>english</language>
    <language>spanish</language>
  </translationLanguages>
</iru:solution>
```

Format

Parent	(solution)
Occurrences within parents	Optional. Must occur only once.
Element content model	translationLanguages ::= (language)^{1,10}
Attribute content model	Required: default ::= string

Parameters

The `translationLanguages` element has the following attribute:

default
  Use this attribute to identify the default language for this application.

Usage

See Translation considerations for a list of valid language values for this element, as well as other considerations.

variable
(Purpose)

This element contains the data for an individual variable.

Examples

```
<applications>
  <application
    fileName="IRU_sia_win.ser">
    <variables>
    <variable id="USER_NAME"> adminUser</variable>
    </variables>
    <path translatedKey="BuildPath"/>
    <deploymentPackagePrompt translatedKey="prompt"/>
</application>
</applications>
```

Format

Parent	(variables (within the <application element))
Occurrences within parents	Optional Can occur more than once

Element content model	Required:
	id ::=string
	Optional:
	sharedAs ::=string
	readonly ::= 'true' | 'false'
	hidden ::= 'true' | 'false'

Parameters

The `variable` element has the following attributes.

id   Use this attribute to identify the variable. This `id` must match the `name` attribute of the variable defined in the application wrapper.

sharedAs

Use this attribute to make this variable share its value with another variable. If set, this variable will share a common value with any other variable whose `sharedAs` attribute is set to the same string. All default data, minimum and maximum requirements, and so on will be determined by the solution-defined `sharedVariable` with the same name as the `sharedAs` attribute. If there is no such shared variable, any application-defined default data will be removed.

Note:

This attribute cannot contain the underscore character.

readonly

Use this attribute to make this variable is displayed as a read-only field on the configuration panel. If this variable has validation requirements, or a minimum length, the default data for the variable must be valid, because the user will be unable to configure the read-only field.

hidden

Use this attribute to keep the variable from being displyed on the configuration panel. If this variable has validation requirements, or a minimum length, the default data for the variable must be valid. The user will be unable to see or modify the variable from the configuration panel.

Usage

The `variable` element is used to define a default value for a deployment parameter in an application.

variables (within the top-level <solution element)
(Purpose)

This element contains one or more variable elements.

Examples

```
<iru:solution>
    <variables>
```

```
      ...

    </variables>
</iru:solution>
```

Format

Parent	(solution)
Occurrences within parents	Optional. Can occur only once.
Element content model	variables ::=sharedVariable[1,*]

Parameters

The `variables` element does not have any attributes.

variables (within the <application element)
(Purpose)

This element contains one or more variable elements.

Examples

```
<applications>
  <application
    fileName="IRU_sia_win.ser">
    <variables>
    <variable id="USER_NAME">adminUser</variable>
    </variables>
    <path translatedKey="BuildPath"/>
    <deploymentPackagePrompt translatedKey="prompt"/>
</application>
</applications>
```

Format

Parent	(application)
Occurrences within parents	Optional. Can occur only once.
Element content model	variables ::=variable[0,*]

Parameters

The `variables` element does not have any attributes.

Task Elements

application
(Purpose)

This element specifies an application for an install task.

Examples

```
<iru:tasks
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:iru="http://www.ibm.com/xmlns/prod/iru/task"
 xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/task DJT_task.xsd"
 silent="false">
    <createKey phrase="password"></createKey>
    <taskSet
     solutionFileName="TestSuite.ser"
     logFileName="IRU_DeploymentWizard.log">
    <createDeploymentPackage
     applicationId="sampleApplication"
     language="english"
     softwareImageRoot="D:\sandbox\testsuite">
    </createDeploymentPackage>
   <deploy taskNumber="1">
     <targetHostnames>
       <targetHostname>localhost</targetHostname>
     </targetHostnames>
     <applications>
      <application id="DJT_sia">
         <variables>
           <variable id="SIA_prod_path">C:\IBM</variable>
         </variables>
      </application>
     </applications>
   </deploy>
   </taskSet>
</iru:tasks>
```

Format

Parent	(applications)
Occurrences within parent	Required. Must occur at least once.
Attribute content models	Required: id ::= string

Parameters

The application element has the following attributes:

id   The id attribute specifies an application to be configured in the task file.
         The application must exist in the task, and the id must match the id as
         defined in the application.axml. In addition, application IDs must be fewer
         than 200 characters in length, must begin with an alphabetic character, and
         can be made up only of alphanumeric characters, underscores, dashes and
         periods.

applications
(Purpose)

This element contains one or more application elements.

Examples

```
<iru:tasks
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:iru="http://www.ibm.com/xmlns/prod/iru/task"
 xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/task DJT_task.xsd"
 silent="false">
    <createKey phrase="password"></createKey>
    <taskSet
```

```
      solutionFileName="TestSuite.ser"
      logFileName="IRU_DeploymentWizard.log">
    <createDeploymentPackage
     applicationId="sampleApplication"
     language="english"
     softwareImageRoot="D:\sandbox\testsuite">
    </createDeploymentPackage>
    <deploy taskNumber="1">
      <targetHostnames>
        <targetHostname>localhost</targetHostname>
      </targetHostnames>
      <applications>
        <application id="DJT_sia">
          <variables>
            <variable id="SIA_prod_path">C:\IBM</variable>
          </variables>
        </application>
      </applications>
    </deploy>
    </taskSet>
</iru:tasks>
```

Format

Parent	(deploy)
Occurrences within parent	Optional. Can occur only once.
Attribute content models	Required: None. Optional: None.

Parameters

The applications element has no attributes

createDeploymentPackage
(Purpose)

This element enables you to create a deployment package.

Examples

```
<iru:tasks
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:iru="http://www.ibm.com/xmlns/prod/iru/task"
 xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/task DJT_task.xsd"
 silent="false">
  <createKey phrase="password"></createKey>
  <taskSet
   solutionFileName="TestSuite.ser"
   logFileName="IRU_DeploymentWizard.log">
  <createDeploymentPackage applicationId="sampleApplication"
   language="english"
   softwareImageRoot="D:\sandbox\testsuite">
  </createDeploymentPackage>
  <deploy taskNumber="12" />
  </taskSet>
</iru:tasks>
```

Format

Parent	(taskSet)

Occurrences within parent	Optional. Can occur more than once.
Attribute content models	Required: applicationId ::= string language ::= string softwareImageRoot ::= string Optional: deploymentPackagePath ::= string logFileName ::= string replace ::= string solutionFileName ::= string userProgramsRoot ::= string

Parameters

The `createDeploymentPackage` element has the following attributes:

applicationId
Use this attribute to specify the application for which you want to create the deployment package.

language
Use this attribute to specify the language for the application. The valid values are as follows:

```
english | german | spanish | french | italian | japanese | korean |
brazilianportuguese | simplifiedchinese | traditionalchinese | arabic |
czech | danish | dutch | finnish | greek | hungarian | hebrew | norwegian |
polish | portuguese | russian | swedish | turkish | albanian | bulgarian |
byelorussian | catalan | croatian | estonian | icelandic | latvian |
lithuanian | macedonian | romanian | serbian | slovakian | slovenian |
thai | ukranian | kazakh
```

softwareImageRoot
Use this attribute to specify the location of the files used to create the deployment package.

deploymentPackagePath
Specifies the output path for the product image deployment package.

logFileName
Use this attribute to specify the name of the log file. Any messages received during task execution are written to the log file.

replace
Replaces previously built software with the software that is being built.

solutionFileName
Use this attribute to specify the solution with which this application is associated.

userProgramsRoot
Specifies the user program's root for the software that is being built.

createKey
(Purpose)

This element enables you to generate a security key. A set of security keys on both the staging server and the selected target computers must match in order for authentication to be successful.

Examples

```
<iru:tasks
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:iru="http://www.ibm.com/xmlns/prod/iru/task"
 xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/task DJT_task.xsd"
 silent="false">
  <createKey phrase="password"/>
  <taskSet solutionFileName="TestSuite.ser"
   logFileName="IRU_DeploymentWizard.log">
  <createDeploymentPackage applicationId="sampleApplication"
   language="english"
   softwareImageRoot="D:\sandbox\testsuite">
  </createDeploymentPackage>
<deploy taskNumber="12" />
  </taskSet>
</iru:tasks>
```

Format

Parent	(tasks)
Occurrences within parent	Optional. Can occur only once.
Attribute content models	Required: phrase ::= string Optional: logFileName ::= string

Parameters

The `createKey` element has the following attributes:

phrase

> Use this attribute to specify the key phrase to use as the security key. This phrase must exactly match on both the staging server and the target computers.

logFileName

> Use this attribute to specify the name of the log file. Any messages received during task execution are written to the log file.

deploy
(Purpose)

This element enables you to deploy an install task.

Examples

```
<iru:tasks
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:iru="http://www.ibm.com/xmlns/prod/iru/task"
 xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/task DJT_task.xsd"
 silent="false">
  <createKey phrase="password"></createKey>
  <taskSet
   solutionFileName="TestSuite.ser"
   logFileName="IRU_DeploymentWizard.log">
  <createDeploymentPackage
   applicationId="sampleApplication"
   language="english"
   softwareImageRoot="D:\sandbox\testsuite">
  </createDeploymentPackage>
<deploy taskNumber="1">
    <targetHostnames>
      <targetHostname>localhost</targetHostname>
    </targetHostnames>
```

```
    <applications>
      <application id="DJT_sia">
        <variables>
          <variable id="SIA_prod_path">C:\IBM</variable>
        </variables>
      </application>
    </applications>
  </deploy>
  </taskSet>
</iru:tasks>
```

Format

Parent	(taskSet)
Occurrences within parent	Optional. Can occur more than once.
Attribute content models	Required: taskNumber ::= integer Note: This value represents the number of the task as displayed in the deployment wizard, and must represent an install task. A reference to a manual task will create an error. Optional: None.

Parameters

The `deploy` element has the following attributes:

taskNumber
> Use this attribute to specify the install task that you want to deploy.

targetHostname
(Purpose)

This element defines a target host name for an install task.

Examples

```
<iru:tasks
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:iru="http://www.ibm.com/xmlns/prod/iru/task"
 xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/task DJT_task.xsd"
 silent="false">
  <createKey phrase="password"></createKey>
  <taskSet
   solutionFileName="TestSuite.ser"
   logFileName="IRU_DeploymentWizard.log">
  <createDeploymentPackage
   applicationId="sampleApplication"
   language="english"
   softwareImageRoot="D:\sandbox\testsuite">
  </createDeploymentPackage>
 <deploy taskNumber="1">
    <targetHostnames>
      <targetHostname>localhost</targetHostname>
    </targetHostnames>
    <applications>
      <application id="DJT_sia">
        <variables>
          <variable id="SIA_prod_path">C:\IBM</variable>
        </variables>
      </application>
```

```
        </applications>
      </deploy>
    </taskSet>
</iru:tasks>
```

Format

Parent	(targetHostnames)
Occurrences within parent	Required. Must occur at least once.
Attribute content models	Required: None. Optional: None.

Parameters

The `targetHostname` element does not have any attributes.

targetHostnames
(Purpose)

This element contains one or more `targetHostname` elements.

Examples

```
<iru:tasks
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:iru="http://www.ibm.com/xmlns/prod/iru/task"
 xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/task DJT_task.xsd"
 silent="false">
   <createKey phrase="password"></createKey>
   <taskSet
    solutionFileName="TestSuite.ser"
    logFileName="IRU_DeploymentWizard.log">
   <createDeploymentPackage
    applicationId="sampleApplication"
    language="english"
    softwareImageRoot="D:\sandbox\testsuite">
   </createDeploymentPackage>
 <deploy taskNumber="1">
    <targetHostnames>
      <targetHostname>localhost</targetHostname>
    </targetHostnames>
    <applications>
      <application id="DJT_sia">
        <variables>
          <variable id="SIA_prod_path">C:\IBM</variable>
        </variables>
      </application>
    </applications>
  </deploy>
  </taskSet>
</iru:tasks>
```

Format

Parent	(deploy)
Occurrences within parent	Required. Must occur only once.
Attribute content models	Required: None. Optional: None.

Parameters

The `targetHostnames` element does not have any attributes.

tasks
(Purpose)

This is the root element of a task XML document.

Examples

```
<iru:tasks
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:iru="http://www.ibm.com/xmlns/prod/iru/task"
  xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/task DJT_task.xsd"
  silent="false">
  <createKey phrase="password"></createKey>
  <taskSet solutionFileName="TestSuite.ser"
   logFileName="IRU_DeploymentWizard.log">
  <createDeploymentPackage applicationId="sampleApplication"
   language="english"
   softwareImageRoot="D:\sandbox\testsuite">
  </createDeploymentPackage>
 <deploy taskNumber="12" />
</taskSet>
</iru:tasks>
```

Format

Parent	Root element
Occurrences within document	Required. Must occur only once.
Element content model	tasks ::= (createKey)^{0,1}(taskSet)^{0,*}
Attribute content models	Optional: silent ::= 'true' | "false"

Parameters

The `tasks` element has the following attribute:

silent Use this attribute to specify that the task file should run in silent mode, sending no messages to the screen.

Usage

Use the `tasks` start tag immediately after the document type declaration in a task document. Use the end tag at the conclusion of the document.

taskSet
(Purpose)

This element identifies the solution that you want to execute using a task file on the command line.

Examples

```
<iru:tasks
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:iru="http://www.ibm.com/xmlns/prod/iru/task"
  xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/task IRU_task.xsd"
```

```
  silent="false">
  <createKey phrase="password"></createKey>
   <taskSet solutionFileName="TestSuite.ser"
    logFileName="IRU_DeploymentWizard.log">
    <createDeploymentPackage applicationId="sampleApplication"
     language="english"
     softwareImageRoot="D:\sandbox\testsuite">
    </createDeploymentPackage>
    <deploy taskNumber="12" />
   </taskSet>
</iru:tasks>
```

Format

Parent	(tasks)
Occurrences within parent	Optional. Can occur more than once.
Element content model	taskSet ::= (createDeploymentPackage)^{0,*} (deploy)^{0,*}
Attribute content models	Required: solutionFileName ::= string Optional: logFileName ::= string

Parameters

The taskSet element has the following attributes:

solutionFileName
>   Use this attribute to specify the solution that you want to deploy through this task.

logFileName
>   Use this attribute to specify the name of the log file. Any messages received during task execution are written to the log file.

variable
(Purpose)

This element configures a variable for an application in an install task.

Examples

```
<iru:tasks
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:iru="http://www.ibm.com/xmlns/prod/iru/task"
 xsi:schemaLocation="http://www.ibm.com/xmlns/prod/iru/task DJT_task.xsd"
 silent="false">
  <createKey phrase="password"></createKey>
  <taskSet
   solutionFileName="TestSuite.ser"
   logFileName="IRU_DeploymentWizard.log">
  <createDeploymentPackage
   applicationId="sampleApplication"
   language="english"
   softwareImageRoot="D:\sandbox\testsuite">
  </createDeploymentPackage>
 <deploy taskNumber="1">
   <targetHostnames>
     <targetHostname>localhost</targetHostname>
   </targetHostnames>
   <applications>
     <application id="DJT_sia">
       <variables>
```

```
        <variable id="SIA_prod_path">C:\IBM</variable>
      </variables>
    </application>
  </applications>
  </deploy>
  </taskSet>
</iru:tasks>
```

Format

Parent	(targetHostnames)
Occurrences within parent	Required. Must occur at least once.
Attribute content models	Required: id ::= string Optional: None.

Parameters

The `variable` element has the following attributes:

id   The `id` attribute specifies a variable to be configured in the task file. The variable must exist in the application, and the `id` must match the id as defined in the application.axml.

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Chapter 11. Accessibility

Accessibility overview

This section provides information about the accessibility features of IBM Express Runtime for IBM and its accompanying documentation. Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

Accessibility features

These are the major accessibility features in Express Runtime:

- You can operate all features using the keyboard instead of the mouse.
- You can use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen.

Note: The Express Runtime Information Center and its related publications are accessibility-enabled for the IBM Home Page Reader.

Navigating by keyboard

You can use keys or key combinations to perform operations and initiate many menu actions that can also be done with a mouse. You can navigate the Express Runtime developer, deployment wizard, and InfoCenter from the keyboard by using the following key combinations:

- To traverse to the next link, button or topic, press Tab inside a frame (page).
- To expand or collapse a tree node, press Right Arrow or Left Arrow, respectively.
- To move to the next topic node, press Down Arrow or Tab.
- To move to the previous topic node, press Up Arrow or Shift+Tab.
- To scroll all the way up or down, press Home or End, respectively.
- To go back, press Alt+Left Arrow.
- To go forward, press Alt+Right Arrow.
- To go to the next frame, press Ctrl+Tab.
- To move to the previous frame, press Shift+Ctrl+Tab.
- To print the current page or active frame, press Ctrl+P.

Note: In order to use keyboard shortcuts with the deployment wizard on a computer running Linux, ensure that the numbers lock (NumLock) option is not enabled.

Chapter 12. Related information

Documentation for contained products

IBM Express Runtime

Installed on your system:
- **Windows:** Start > Programs > IBM Express Runtime 2.1 > Documentation > Express Runtime Documentation
- **RedHat Linux 8.0:** Extras > Other > IBM Express Runtime 2.1 > Documentation > Express Runtime Documentation
- **SUSE Linux 8.1:** Start > Programs > IBM Express Runtime 2.1 > Documentation > Express Runtime Documentation

DB2 UDB Express

On the Web: http://www.ibm.com/software/data/info/db2express/ (for **iSeries:** http://www.ibm.com/servers/eserver/iseries/db2/)

After DB2 Express is installed you can access its documentation through menu shortcuts:
- **Windows:** Start > Programs > IBM DB2 > Information > Information Center
- **RedHat Linux 8.0:** Extras > Other > IBM DB2 > Information > Information Center
- **SUSE Linux 8.1:** Start > Programs > IBM DB2 > Information > Information Center

IBM HTTP Server

On the Web: http://www.ibm.com/software/webservers/httpservers/ (for **iSeries:** http://www.ibm.com/servers/eserver/iseries/software/http/)

After IBM HTTP Server is installed you can access its documentation through menu shortcuts:
- **Windows:** Start > Programs > IBM HTTP Server > Documentation
- **RedHat Linux 8.0:** Extras > Other > IBM HTTP Server > Documentation
- **SUSE Linux 8.1:** Start > Programs > IBM HTTP Server > Documentation

WebSphere Application Server - Express

On the Web: http://www.ibm.com/software/websphere/info/express/index.jsp (for **iSeries:** http://www.ibm.com/servers/eserver/iseries/software/webspher)

When WebSphere Application Server Express is installed you can access its documentation through menu shortcuts:
- **Windows:** Start > Programs > IBM WebSphere Application Server - Express 5.1 > FirstSteps, Readme, Getting Started
- **RedHat Linux 8.0:** Extras > Other > IBM WebSphere Application Server - Express 5.1 > FirstSteps, Readme, Getting Started

- **SUSE Linux 8.1:** Start > Programs > IBM WebSphere Application Server - Express 5.1 > FirstSteps, Readme, Getting Started

JACL: A TCL implementation in Java

On the Web:
http://www.usenix.org/publications/library/proceedings/tcl97/full_papers/lam/lam.pdf

Integrated Solutions Console

After the Integrated Solutions Console (ISC) is installed you can access its documentation through the user interface:

- **Windows:** Log on to ISC. Click the help icon at the top right corner of the screen.
- **RedHat Linux 8.0:** Log on to ISC. Click the help icon at the top right corner of the screen.
- **SUSE Linux 8.1:** Log on to ISC. Click the help icon at the top right corner of the screen.

Appendix. Notices

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