



**Provide a simple way to deliver
your business application with
middleware from IBM in a single
easy-to-deploy package.**

IBM Express Runtime V2.1 Technical White Paper

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Introduction

The fastest-growing segment of IT spending today is in mid-size businesses, generally defined as companies with 100 to 1000 employees. Companies in this segment often address their IT needs by obtaining business applications from a solution provider (Independent Software Vendor, System Integrator). In order to provide an environment for the application, either the solution provider or their customers must obtain the software required to run the application program. This software, or middleware, often consists of a database server, an application server and a Web server.

IBM Express Runtime V2.1 is an offering designed specifically for solution providers who need to quickly deliver a total solution to their mid-size customers. Express Runtime contains IBM DB2 Universal Database Express Edition, IBM WebSphere Application Server - Express, IBM HTTP Server, and a simple tool for deploying the middleware with an application as a single cohesive package. Express Runtime also provides a simple integrated console that makes it easy to monitor and administer the middleware.

IBM Express Runtime enables solution providers to deploy their solutions quickly, reliably and flexibly on Windows, Linux and i5/OS (OS/400) platforms either from CDs or from a system connected to their customers systems. Express Runtime allows solution providers to “drop in” the complete solution as a single package.

Challenges facing solution providers

Mid-size companies are looking for complete solutions from vendors who know their businesses and specialize in a particular solution within their industry, such as warehouse management or supply chain integration. As a solution provider, you need to find ways to deliver your world-class application or solution and improve customer satisfaction while reducing your cost of doing business.

In order to provide an environment for the business solution, either the Independent Software Vendor (ISV) who develops an application, or the System Integrator (SI) who deploys an application as part of a solution, or the end customer, must obtain the software needed to run the application program. This software typically consists of a database server, an application server and a Web server. These software components, which are not actually part of the application but are required to support it, are known as middleware.

The process of obtaining, installing, configuring and supporting the middleware components often falls to the solution provider, who must absorb the cost of setting up the environment. In other cases the end customer is responsible for establishing the environment, but the time and effort needed to perform these tasks often requires adding IT staff or taking existing staff away from other duties. Ultimately, the ISV, SI, or the end customer has to manage this complexity before any business value can be realized.

The solution: IBM Express Runtime

IBM Express Runtime is an offering designed specifically for solution providers like you who need to deliver a total solution to their customers. Express Runtime provides the basic middleware infrastructure required to deliver your business application or your business solution to mid-size customers. This market-leading middleware from IBM includes the database, application server, and Web server components that you need to build and run secure, robust solutions. In addition, a simple integrated console lets you monitor and administer the middleware with a single browser.

Express Runtime delivers the functions that allow you to offer all of the middleware, or just the components you need, plus your application in a single, cohesive unit that can be easily and quickly deployed on your customer's system. In those cases where the middleware and the application are not deployed at the same time, Express Runtime can be used to just install the middleware components and you can add an application separately. And, in order to make it easier for you to do business and reduce your time to value, Express Runtime provides one license, one contact for support, and one competitive price that covers all the included IBM middleware.

IBM Express Runtime components

IBM DB2 Universal Database Express Edition

IBM Express Runtime contains DB2 Universal Database Express Edition, providing a fully functional, standards-based relational database specifically designed to support

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mid-size business applications. DB2 UDB Express delivers simplified deployment, easy administration, and transparent integration with your applications as well as simplicity in packaging, installation, and deployment —helping reduce the complexity, skills and resources required to install and manage it. A member of the IBM DB2 family, DB2 Express is compatible with the other members of the DB2 relational database family.

IBM WebSphere Application Server - Express

Express Runtime contains WebSphere Application Server - Express, providing a standards-based application server that can support the delivery of Web components such as servlets and JavaServer Pages (JSP), as well as Enterprise JavaBeans (EJB) and Java Message Service (JMS) support for those who need full J2EE capability in their application. The software easily integrates with the relational database and other system services, providing cross-organizational views and access to application data and functionality.

IBM HTTP Server

Express Runtime contains the full IBM HTTP Server to help you service multiple Web requests and feed them into the application server. The IBM HTTP Server provides a security-rich, standards-based Web environment capable of handling fast, high-bandwidth transactions.

IBM HTTP Plug-in for WebSphere Application Server

Express Runtime also includes the IBM HTTP Plug-in for WebSphere Application Server, which helps automate the configuration of the IBM HTTP Server and the WebSphere Application Server - Express. This automated configuration greatly reduces the time and resources required to establish and configure a secure, fully functional Web environment.

IBM Express Runtime Console

The Express Runtime console provides the ability to perform basic administration tasks for all instances of the runtime components in a single, integrated, Web-based administrative console. With IBM Express Runtime console, complexity is reduced because the administrator launches a single console that presents key tasks in an easy to navigate, consistent format.

Solution Assembly Toolkit

Express Runtime contains a solution assembly toolkit that provides development and deployment tools for creating and delivering a complete solution package — containing the IBM middleware fully integrated with the business application.

The development environment for the solution assembly toolkit plugs into any existing Eclipse-based development environment, or it can be plugged into Rational Web Developer which is supplied with Express Runtime. The solution assembly toolkit makes it easy to *wrap* a component, such as your application, so it can be deployed along with the middleware components.

Wrapping a component consists of defining the processes and configuration steps that should be performed before, during and after component installation. With this

environment, you use the pre-wrapped IBM middleware components and your application components to produce a single, cohesive package.

The deployment wizard from the solution assembly toolkit is used to drive the installation and configuration of the wrapped components. It is not a replacement for an installer, but is instead used to drive the prerequisite checking, existing installation process and post-install configuration actions required to deploy a complete solution. The deployment wizard also enables delivery to remote operating systems. For example, DB2 UDB Express may be deployed to one Linux® system, the IBM HTTP Server to another Linux system, and WebSphere Application Server - Express and your application to a Microsoft® Windows® system.

Application Development

Express Runtime includes IBM Rational Web Developer which can be optionally installed on your development system. Rational Web Developer can be used to create Web-based applications that can run on Express Runtime.

Education components

Express Runtime contains an extensive set of developer documentation, written in both a task-based and role-based approach. The documentation is designed to help the reader understand the content of IBM Express Runtime, then quickly take advantage of its power.

Express Runtime provides all the wrappers for the IBM middleware in source form as samples. These samples are placed in a pre-built workspace that is installed into the development environment.

A complete functioning sample application program is also provided along with its sample wrappers. The sample application provides a pre-wrapped, sample document management application that can be deployed out-of-the box. You can use this sample as a model for your application deployment — helping to minimize set-up errors and delays. When the sample application is deployed, the solution assembly toolkit will use the pre-built wrappers to install DB2 UDB Express, create the tables required for the sample application and populate the tables with data. Then it will install and configure WebSphere Application Server - Express and a Web application to access the newly created tables, install the IBM HTTP Server and configure the IBM HTTP Plug-in for WebSphere Application Server. The result is a functional sample application.

Pre-built solutions

Express Runtime provides functional solution wrappers that let you deploy all of the middleware components to any of the supported platforms, right out-of-the box. For the solution provider or customer who only wants a simple way to deliver the required middleware components, Express Runtime provides a functional solution that does not require any additional development. The wrappers used to drive this deployment are provided as samples in the pre-built workspaces which come with the solution assembly toolkit development environment.

End-to-end scenarios

The most straightforward way to understand the content of Express Runtime is to examine the most typical user scenarios. The first usage scenario is simplifying integration and deployment of a full solution with your application, and the second scenario is delivering just the middleware infrastructure. We will cover each of these scenarios in more detail.

Usage Scenario: Simplifying integration and deployment of a full solution

This scenario (figure 1) provides a high level, end-to-end composite view of all the basic steps to create a complete solution.

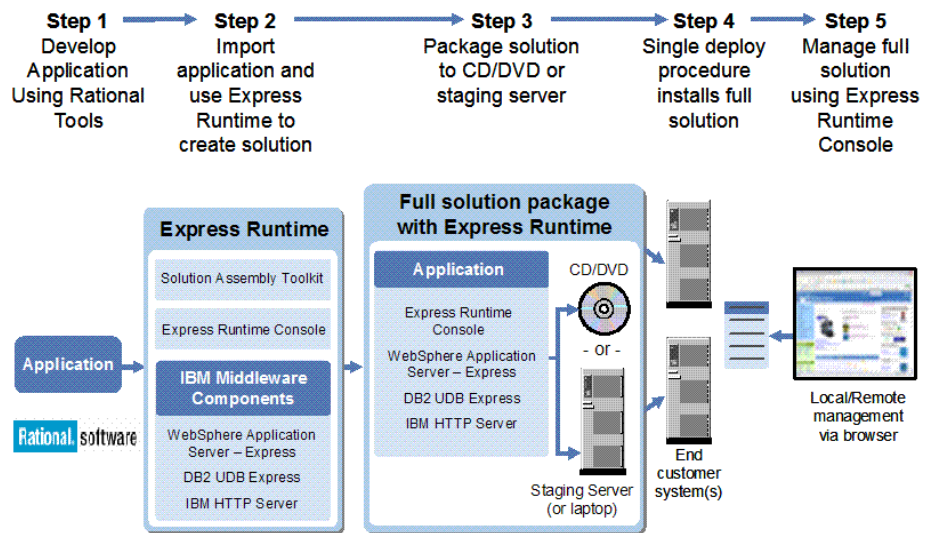


Figure 1: IBM Express Runtime end-to-end scenario

Step 1: Developing your application

The first step is to develop your application (J2EE Web application, database application, etc). You can use whatever tools you want to develop your application. Express Runtime provides a license for the Rational Web Developer product that you can use to develop your application. We will examine the installation, package creation and solution deployment scenarios in more detail.

Step 2: Install Express Runtime, Import your application and create a solution

Figure 2 describes the installation of IBM Express Runtime on your development system.

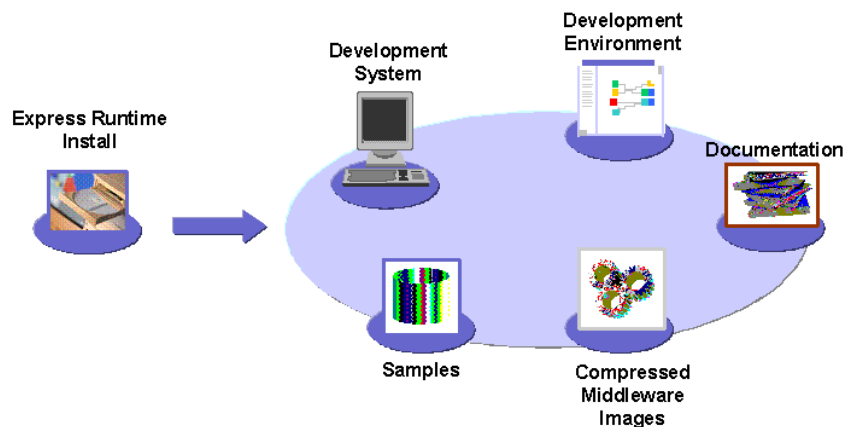


Figure 2: Installing IBM Express Runtime

When Express Runtime is installed on your development system, the following items are installed:

- The Express Runtime product itself, consisting of documents, license information and development environment
- The solution assembly toolkit environment including the preloaded workspaces with all the sample code
- The compressed images of the IBM middleware components (DB2 UDB Express, WebSphere Application Server - Express, IBM HTTP Server and IBM HTTP Plug-in for WebSphere Application Server). The compressed images are stored on the system and are installed only during the deployment process on the target system.

Figure 3 illustrates how to create a complete solution containing the required IBM middleware and your application for later deployment. In this step, it is assumed that you already have a completed application that requires some or all of the IBM middleware.

Using the development environment and the sample wrappers provided in the pre-built workspace as a guide, you can create a wrapper for the application itself. The application wrapper can be used to check for prerequisites, drive the install process and perform post-install configuration activities such as creating WebSphere Application Server - Express data sources, establishing port configuration or creating database tables.

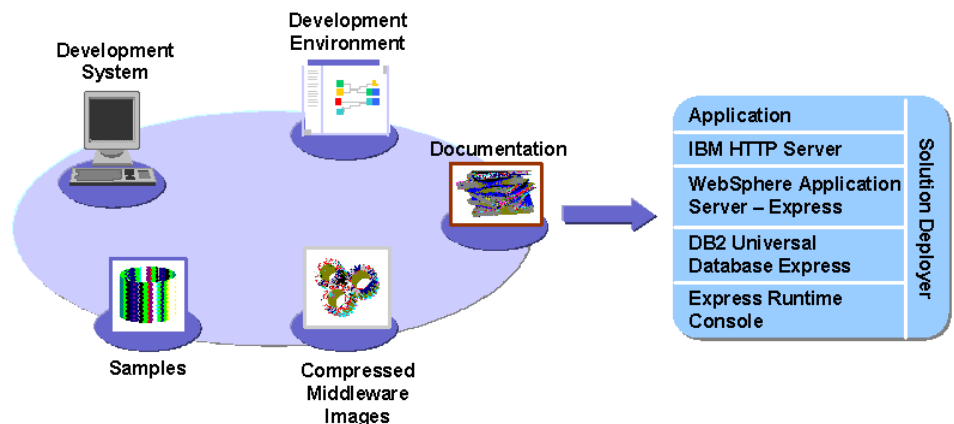


Figure 3: Creating a solution

Note that the wrappers do not replace the install technology for the wrapped components. Instead they allow you to use the existing install technology along with additional non-install technology, such as configuration scripts, to drive the complete install and configuration process.

Step 3: Packaging your solution

Once the solution wrappers are created, the wrappers (along with compressed images of the middleware components) and the compressed image of the application can be stored on CDs or on a staging server for later deployment to the customer's system.

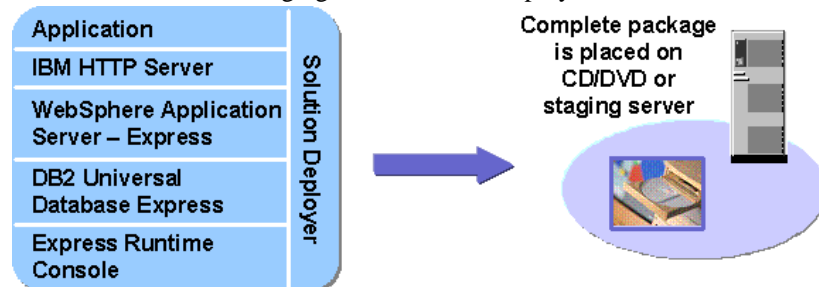


Figure 4: Packaging your complete solution

Step 4: Deploying your solution

The scenario depicted in Figure 5 illustrates deployment to the customer's system of the package created in the previous example. Note there are two distinct ways in which to deploy the solution. In both cases the deployment process is driven by the solution deployer that uses the previously created wrappers.

In the first approach, the solution is placed on a set of CDs. In this scenario, the deployer simply loads the CDs and the solution deployer is launched from the CD. The solution deployer wizard gathers the critical information required to complete the deployment and then drives the install and configuration. The components being deployed can be targeted to either the system where the CDs are loaded or to other remote systems in the network. For remote systems the target system must also have a small agent program installed (provided by Express Runtime), which is used to establish communication with the target system.

In the second approach, the solution is placed on a staging server which is used to drive the deployment. The deployment wizard is then launched from the staging server, and the small agent program installed on the target system is used to establish communication with the staging server.

The deployment wizard supports the deployment of the solution to multiple systems with a single deployment process. For example, the implementation of a solution might dictate deployment of DB2 UDB Express, WebSphere Application Server - Express and your application to one system and deployment of IBM HTTP Server to a second system.

The deployment process also allows you to determine which components need to be installed. For example, you could build a solution package containing all the middleware components but at deployment time you could choose to install and configure only one of them.

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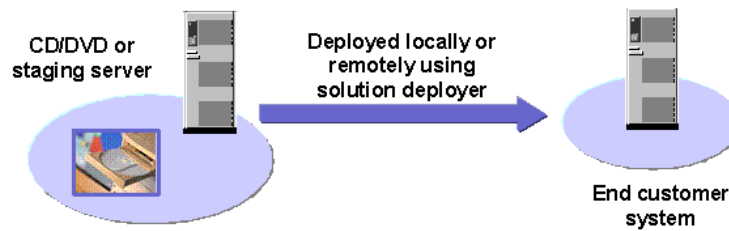


Figure 5: Deploying the solution to the end customer system

Step 5: Administration of your solution

The IBM Express Runtime console provides the ability to perform basic administration tasks for all instances of the runtime components in a single, integrated, Web-based administrative console.

As illustrated in Figure 6, the Express Runtime console provides a console infrastructure based on portlet technology that will allow integration of administrative functions in to a single console. It provides mechanisms to facilitate filtering of tasks based on the role of the user. It also allows you to perform common tasks such as starting and stopping the servers or monitoring for alerts.

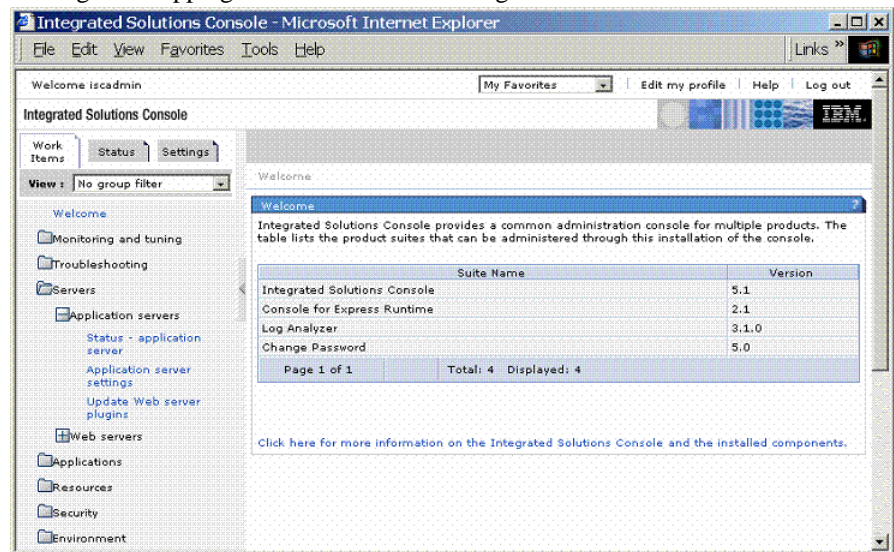


Figure 6: Express Runtime Console

Usage Scenario: delivering just the middleware infrastructure

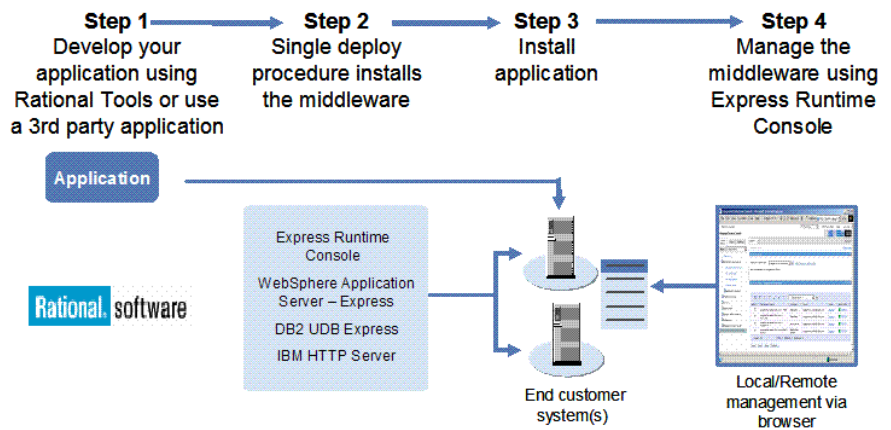


Figure 7: Express Runtime delivering just the middleware

Step 1: Develop your application

You can develop your own application or you can use an application from a 3rd party vendor. The Rational Web Developer tool is provided with Express Runtime for your application development needs, or you can use whatever tools you already have in use in your development team.

Step 2: Install Express Runtime configuring the middleware components

When you start the Express Runtime install, the wizard will ask you which install method you want to use. Select the “Install the Middleware Components” option. The install wizard will prompt you to select which middleware components you want to install (all or some of the components) and several standard server install questions based on the middleware components (install directory, database userid and password, etc). As before, if the target systems are remote systems on the network, they will communicate through the simple agent provided with Express Runtime

Step 3: Install the application

Once the Express Runtime middleware install is complete you can deploy any application you like to this infrastructure.

Step 4: Administration of the servers

The last step is management of the servers. You or the end customer can remotely control the middleware servers using the Express Runtime console, including all of the middleware servers, via one browser interface.

Supported Operating Systems

IBM Express Runtime supports the following operating systems: Windows, Linux, and i5/OS (OS/400).

For more details refer to the [system requirements](#).

Summary

Designed to reduce the time to value for solution providers (Independent Software Vendor, System Integrator) and their customers, IBM Express Runtime provides the functions that let you deliver ease-of-deployment with a single install of all IBM middleware plus (optionally) your application that can be deployed locally on one system or remotely to one or more systems.

Express Runtime provides the execution environments for the market-leading, standards-based middleware products from IBM: DB2 Universal Database Express Edition, WebSphere Application Server - Express and the IBM HTTP Server. These components are provided pre-wrapped and ready to deploy right out-of-the-box. IBM Express Runtime provides complete documentation, a standards-based development environment and samples, IBM Express Runtime lets you — and your customers achieve quick Return on Investment (ROI).

For more information

Solution Providers: <http://www.ibm.com/partnerworld/expressruntime>

End Customers: <http://www.ibm.com/software/webservers/expressruntime>

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