IBM Business Process Manager
Version 8 Release 5

IBM Business Process Manager Express Installation Guide

IBM

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Contents

Chapter 1. Roadmap: Installing and configuring IBM Business Process Manager Express

The IBM® Business Process Manager Express® installation and configuration programs accommodate various development and production scenarios. This roadmap guides you through the most common paths for installing and configuring IBM Business Process Manager Express.

Alternatively, you can use the Interactive Installation and Configuration Guide to answer a series of questions about your target environment and receive installation and configuration topics that are customized to your installation needs.

The roadmap provides the most relevant links for each common installation and configuration scenario, grouped by operating system.

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- "Linux"
- "AIX"
- "Windows" on page 2

Linux

To install IBM Business Process Manager on Linux, follow this roadmap.

Planning
> Before proceeding with the installation, determine which type of installation you want to perform: typical or custom. Then see Planning for IBM Business Process Manager.

Preparing
> Review the hardware and software requirements, prepare the operating system for installation, and ensure that you installed the database management system:
> - System requirements
> - Preparing Linux systems for installation with a new DB2 Express database
> - Preparing Linux systems for installation with an existing database

Installing
> Based on the decisions made earlier, select the installation option that is most appropriate for your deployment environment, and then complete the steps to install the software.
> - Typical installation and configuration
> - Custom installation and configuration

Configuring
> No configuration is required after you complete the typical installation. After a custom installation, complete the steps in the following procedure to configure the software.
> - Configuring profiles and databases

AIX

To install IBM Business Process Manager on AIX, follow this roadmap.

Note: The Express installation on AIX is available for IBM Master Data Management (MDM) users only.

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Planning

Before proceeding with the installation, determine which type of installation you want to perform: typical or custom. Then see Planning for IBM Business Process Manager.

Preparing

Review the hardware and software requirements, prepare the operating system for installation, and ensure that you installed the database management system:

- System requirements
- Preparing AIX systems for installation

Installing

Based on the decisions made earlier, select the installation option that is most appropriate for your deployment environment, and then complete the steps to install the software.

- Typical installation and configuration
- Custom installation and configuration

Configuring

No configuration is required after you complete the typical installation. After a custom installation, complete the steps in the following procedure to configure the software.

- Configuring profiles and databases

Windows

To install IBM Business Process Manager on Microsoft Windows, follow this roadmap.

Planning

Before proceeding with the installation, determine which type of installation you want to perform: typical or custom. Then see Planning for IBM Business Process Manager.

Preparing

Review the hardware and software requirements, prepare the operating system for installation, and ensure that you installed the database management system:

- System requirements
- Preparing Windows systems for installation

Installing

Based on the decisions made earlier, select the installation option that is most appropriate for your deployment environment, and then complete the steps to install the software.

- Typical installation and configuration
- Custom installation and configuration

Configuring

No configuration is required after you complete the typical installation. After a custom installation, complete the steps in the following procedure to configure the software.

- Configuring profiles and databases

Chapter 2. Installation types and profiles

There is a relationship between the type of installation you perform, **Typical** or **Custom** and how profiles associated with the installation type are created for each IBM BPM configuration (Express, Standard, Advanced and Advanced: Process Server).

The following tables describe the relationships.
- "IBM BPM Advanced"
- "IBM BPM Advanced: Process Server"
- "IBM BPM Standard" on page 4
- "IBM BPM Express" on page 4

IBM BPM Advanced

Table 1. Profile configuration as part of installation: IBM Business Process Manager Advanced

Type of installation	Media	Creates deployment manager and managed-node profiles and configures a single cluster deployment environment?	Profile Management Tool optionally started?	Quick Start console optionally started?	Features available for selection from Installation Manager?
Typical using Launchpad	DVD or electronic image	Yes	No	Yes	Not Applicable
Custom	DVD or electronic image	No	Yes	No	Yes

IBM BPM Advanced: Process Server

Table 2. Profile configuration as part of installation: IBM Business Process Manager Advanced: Process Server

Type of installation	Media	Creates deployment manager and managed-node profiles and configures a single cluster deployment environment?	Profile Management Tool optionally started?	Quick Start console optionally started?	Features available for selection from Installation Manager?
Typical using Launchpad	DVD or electronic image	Yes	No	Yes	Not Applicable
Custom	DVD or electronic image	No	Yes	No	Yes

IBM BPM Standard

Table 3. Profile configuration as part of installation: IBM Business Process Manager Standard

Type of installation	Media	Creates deployment manager and managed-node profiles and configures a single cluster deployment environment	Profile Management Tool optionally started?	Quick Start console optionally started?	Features available for selection from Installation Manager?
Typical using Launchpad	DVD or electronic image	Yes	No	Yes	Not Applicable
Custom	DVD or electronic image	No	Yes	No	Yes

IBM BPM Express

Table 4. Profile configuration as part of installation: IBM Business Process Manager Express

Type of installation	Media	Creates stand-alone profile?	Profile Management Tool optionally started?	Quick Start console optionally started?	Features available for selection from Installation Manager?
Typical using Launchpad	DVD or electronic image	Yes	No	Yes	Not Applicable
Custom	DVD or electronic image	No	Yes	No	Yes

Chapter 3. Preparing to install and configure the software

Before preparing to install and configure the software, create a plan for the deployment environment that you want to create.

Use the information listed in the following table to prepare for installing and configuring IBM Business Process Manager.

Table 5. Preparing for installation and configuration

Task	Where to find information	Result after completing the task
Review hardware and software requirements	Depending on your IBM BPM configuration, visit: • IBM Business Process Manager Advanced system requirements • IBM Business Process Manager Standard system requirements • IBM Business Process Manager Express system requirements	You understand the system requirements necessary to support your IBM Business Process Manager installation.
Prepare your operating system	**AIX** Preparing AIX systems for installation for IBM Master Data Management (MDM) customers **Linux** Preparing Linux systems for installation with a new DB2 Express database or Preparing Linux systems for installation with an existing database **Windows** Preparing Windows systems for installation	You have prepared the operating system of each workstation to be used.

Table 5. Preparing for installation and configuration (continued)

Task	Where to find information	Result after completing the task
Make sure you have installed your database management system.	Consult your database documentation for information about installing and administering your database management system.	Your database management system is installed. IBM Business Process Manager embeds the DB2 Express database. If you want to use DB2 Express as your database, you can select it as a feature from the installer and it is installed and configured automatically. The user must have administrative privileges (root or Administrator) to install DB2 Express. DB2 Enterprise is available with IBM Master Data Management. **Note:** If you already have a version of DB2 installed and you want to install DB2 Express, you must uninstall DB2 before running the IBM Business Process Manager installer. If the installer detects a version of DB2 installed and you have selected to install DB2 Express from the installer, you will receive a warning message and will not be able to install DB2 Express. **Important:** `Linux` If you are installing DB2 Express as a root user, you must ensure that all kernel requirements are met before the DB2 Express installation begins. See Kernel parameter requirements (Linux) for a list of the kernel requirements. You can locate the current values by parsing the output of the **ipcs -l** command. **Important:** You will not be able to properly install and use DB2 Express if the password that is specified does not meet operating system or company restrictions, because an operating system user is created on install.

Chapter 4. Planning for IBM Business Process Manager

To ensure that the system that you implement meets your needs, plan your IBM Business Process Manager before you introduce its software into your enterprise information system.

Planning your path through the installation documentation

The installation process for IBM Business Process Manager, with its various components and potential configurations, supports many scenarios and topologies, ranging from a basic proof-of concept, demonstration, or test environment, to a mature distributed high-availability production environment. You might need some help with the many installation options.

The topics that you need as you work through your installation process are not necessarily together in the navigation tree and, depending on your search query, might not be easy to pick out in the search results.

To address this situation, use the Interactive Installation and Configuration Guide to generate a set of installation and configuration topics that are customized to your precise installation needs. In the Interactive Installation and Configuration Guide form, select the options you need for your installation scenario. As you select each option, the tool automatically removes options that are ruled out by your previous selections. For example, if you indicate that you plan to install on the AIX operating system, it removes the option to install a new instance of DB2 Express as part of the installation.

After you fill out the form, the tool generates a single topic containing all of the installation and configuration instructions that apply to your scenario. You can save these instructions so that they are sharable and portable. You can also go back, change your selections, and generate a new set of instructions. Each time you need to install product components with other options, return to the form and generate a new guide, or use the tool to see what the installation and configuration process looks like when you choose different options.

This following topics describe some of the options presented in the Interactive Installation and Configuration Guide form, the factors you should consider as you plan your installation process, and what causes some options not to be available. The **Help me decide** links in the form bring you to these topics, to help you understand the decisions you make and their impact on the resulting generated instructions.

The Interactive Installation and Configuration Guide options are not exhaustive. Some types of installation, for example installing into an existing WebSphere® Application Server instance, are supported and documented, but are not paths generated by the interactive guide tool. Browse the navigation or search the information center to find topics on these subjects.

Deciding which configuration to install

IBM BPM is available in four configurations: Advanced, Advanced: Process Server, Standard, and Express, each targeting various enterprise needs. To select which configuration to install, consider your enterprise's needs in terms of the level of business process management adoption and the product features and topology support that you want.

Table 6. Deciding which IBM Business Process Manager configuration to install

How far along the path to adopting full business process management capabilities is your enterprise?	What specific capabilities and availability support do you require?	Install this configuration:
Project-level adoption: You are starting your first business process management project and are looking primarily for rapid time-to-value and improving user productivity.	• Execution compatible with WebSphere Lombardi Edition • IBM Process Designer authoring tool • Collaborative editing and immediate playback • Interactive user interfaces • ILOG-based process rules • Real-time monitoring and reporting • Performance analytics and optimizer • Performance Data Warehouse • IBM Process Center, with a shared asset repository • Up to three process authors and 200 users • Two cores for developers, four cores for the product, but no clustering • Windows and Linux on Intel support	IBM Business Process Manager Express
Multiple projects: Your enterprise is involved in multiple business process management projects and requires basic integration support.	All the capabilities of IBM BPM Express, plus the following capabilities and support: • Unlimited authors and users • Clustering support for high availability • Linux on System z, AIX, and Solaris support • Network deployment support • DB2® for z/OS® support	IBM Business Process Manager Standard
Transformative: Your enterprise requires high-volume process automation and needs additional SOA components for extensive service integration and orchestration.	All the capabilities and high-availability support of IBM BPM Standard, plus the following capabilities and support: • Execution compatible with WebSphere Process Server • IBM Integration Designer authoring (BPEL and SOA) • Built-in enterprise service bus (ESB) • Transaction support • Integration adapters • Business Space user interface	IBM Business Process Manager Advanced
Your enterprise currently uses an earlier version of Process Server alone and you want to update to the latest release; or you want to install IBM Business Process Manager for z/OS.	All the Process Server-related capabilities and high-availability support of IBM BPM Advanced. Does not include Process Designer or Process Center. Available for installing on z/OS.	IBM Business Process Manager Advanced: Process Server

Choosing an operating system

You probably know which supported operating system you plan to install the server components on. Your options might be limited by the product configuration you are installing and your project preferences and available infrastructure. Furthermore, your operating system selection somewhat constrains the options that are available for other choices you make during the installation process.

If you are planning to install IBM BPM Express, you can install the server components on Windows or Linux on Intel systems, or, if you are an IBM Master Data Management customer, AIX. For IBM BPM Standard and IBM BPM Advanced, Windows, Linux on Intel and on System z, AIX, Solaris, and z/OS are supported.

Depending on your choice of operating system, the Interactive Installation and Configuration Guide automatically constrains the options that are available for supported databases, based on probable scenarios. You can choose from the remaining options to generate a custom set of instructions that you can follow when you install and configure the product.

If you choose to install server components on Linux on System z, AIX, Solaris, or z/OS, the generated installation guide includes the instructions for configuring IBM BPM to use an existing database server. If you choose Windows or Linux on Intel, you can choose to use an existing database server, or to have the installation process install and configure DB2 Express, which is useful for proof-of-concept or simple environment installations.

Choosing the type of installation

The installation type selection determines how you interact with the installation process to provide information and select the options you want.

A typical installation is the simplest and quickest method for installing and configuring. The installation program uses default values for as many installation options as possible, and you supply values for the remaining options using a graphical interface. This is suitable for a relatively quick proof-of-concept installation and when you are not using an existing WebSphere Application Server instance.

For IBM Business Process Manager Express, using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

For all other IBM Business Process Manager editions, using the product launchpad, the typical installation installs the software, configures the deployment manager and managed-node profiles, and configures a single cluster deployment environment that consists of a single node and single server.

Windows The typical installation also installs Process Designer on your machine.

With a custom installation using a graphical interface, you can customize all installation settings.

With a custom installation using a command line, you can run a command that specifies installation settings. This is more suitable if you only require a single installation.

With a custom installation using a response file, you create a file that specifies installation settings, and run an installation command that calls it. Using a response file is a better choice if you know that you need similar installations on several systems in your enterprise.

If you are installing IBM Business Process Manager for z/OS, then there is only one type of installation available, and it is performed using commands.

For all of the custom options, the generated guide includes information about creating profiles and the deployment environment after installation.

If you are migrating business data and applications from a previous version of IBM Business Process Manager, you must use one of the custom installation types. See the topics in Migrating to IBM Business Process Manager for additional information.

Deciding what type of environment to configure

The installation process installs IBM Process Center or IBM Process Server server components based on your selection. Process Center provides a repository for process assets, a runtime environment for testing and studying the performance of processes, and a console for administering access to assets and deploying processes to development, test, staging, or production environments. Process Server is a runtime environment for process applications and a data warehouse for collecting performance data from the applications. It includes administrative consoles for managing and maintaining the runtime environments and data warehouses.

To use these server components, you must configure an environment for them. Configuring environments for both Process Server and Process Center is two separate activities: you first configure an environment for one, and then another environment for the other.

When you install (deploy) a process application snapshot to a process server, the assets of that snapshot are moved from the Process Center repository to the selected process server. The process server can be connected to a Process Center or offline. Depending on your needs and whether the process server is connected or offline, you can use the Process Center console or wsadmin commands to install the snapshot. See Installing snapshots on offline process servers.

If you choose the offline server option during typical installation, Process Center is not installed. You might choose to install an offline Process Server if you already have a Process Center installed, or if the Process Server is behind a firewall. Once Process Server is installed, you can add the offline server to a Process Center in order to deploy your process applications.

If you are installing IBM BPM Advanced: Process Server, the Process Center option is not available.

Choosing whether to install DB2 Express

You can choose to have the installation process include automatically installing an instance of IBM DB2 Express. Choose this option if you do not have an existing or planned supported database server you intend to use to store content from Process Center or Process Server. If you are installing a test or proof-of-concept environment, you would likely choose to have a new DB2 Express installed automatically, unless one already exists on the system.

Choices you make for other installation options affect what is available for this choice. If you want the generated instructions to include automatically installing DB2 Express, you must install on Windows or Linux on an Intel system. If you are installing any product configuration onto Linux on System z, AIX, Solaris, or z/OS, the installation process does not offer to install DB2 Express; you must use a database server product that you have already installed or will install.

You cannot install DB2 Express on any system that already has DB2 installed on it. Furthermore, you must install as an administrative or root user to install DB2 Express.

The configuration steps configure Process Center or Process Server to use the database of your choice, regardless of whether you automatically install a new DB2 Express instance or you are using an otherwise-installed supported database server.

Choosing how to configure profiles and deployment environments

When performing a custom installation and configuration, you can select which tool to use to configure profiles and deployment environments, depending on which product edition you are installing and which operating system you are using.

For IBM BPM Express, you will use the `BPMConfig` command to create new stand-alone profiles.

For IBM BPM Standard, IBM BPM Advanced, and IBM BPM Advanced: Process Server, you can choose to configure the profiles and deployment environment all at the same time by using the **BPMConfig** command, or separately by using the Profile Management Tool (PMT) and the Deployment Environment wizard. Using the **BPMConfig** command to configure your environment all at once is more straight-forward and easier to do. However, if you want to set up nodes and customize security settings before setting up the topology, choose PMT to create the profiles and the Deployment Environment wizard to configure the deployment environment.

For creating profiles on z/OS, you have the option of using the graphical tool zPMT, or the **zpmt.sh** command.

PMT is not supported on Solaris. If you need to create profiles separately from the deployment environment on Solaris, you must first create just the profiles using the **BPMConfig** command. The Interactive Installation and Configuration Guide will provide those instructions if you select Solaris as your operating system and PMT as your profile creation method. Although it is possible to use the **BPMConfig** command to create only profiles on all operating systems, it is not a path suggested through the interactive guide, other than for Solaris.

The interactive guide does not provide information for the path to take if you are augmenting existing profiles because your are installing into an existing WebSphere Application Server. See help topics about the **manageprofiles** command for more information on augmenting profiles.

Restriction: When you create profiles using PMT, you must use parameter values that match the values that are specified in the properties file that the **BPMConfig** command uses for the deployment environment setup. For example, if you set the value of **cellName** to Cell1, the properties file that **BPMConfig** uses must also use the Cell1 value. If you omit optional parameter values, PMT creates default values that must also match the required parameter values that are used by **BPMConfig**. For more information and examples, see manageprofiles command-line utility.

Note: If your database is already created, you can choose to create the database tables during the creation of the deployment environment, using either the **BPMConfig** command or the Deployment Environment wizard. The interactive guide will include instructions on creating the databases, generating scripts, and running scripts to create the tables. You can skip those steps if you created the database tables during the configuration of the deployment environment.

Choosing what type of deployment environment to create

When you create a deployment environment by using the Deployment Environment Wizard, you can choose the type of deployment environment to create.

The deployment environment types enable different sets of function in your deployment environments:

Standard Process Center
>
> This type of deployment environment lets you store, test, and administer process applications and toolkits that are authored in IBM Process Designer.

Standard Process Server
>
> This type of deployment environment lets you run processes and services in process applications that are deployed from the Standard Process Center.

Advanced Process Center
>
> This type of deployment environment lets you store, test, and administer process applications and toolkits that are authored in Process Designer and IBM Integration Designer. This deployment environment type includes all of the Standard Process Center deployment environment function.

Advanced Process Server
>
> This type of deployment environment lets you run processes, services, and SCA modules in

process applications that are deployed from the Advanced Process Center, or run modules deployed directly. This deployment environment type includes all of the Standard Process Server deployment environment function.

Advanced-only Process Server

This type of deployment environment lets you run SCA modules only. You deploy these modules from the command line or the WebSphere administrative console. This server is the IBM BPM equivalent of WebSphere Process Server. It enables the function that is in the Advanced Process Server deployment environment, but not the function that is in the Standard Process Server deployment environment.

If you have installed IBM BPM Standard, you can select either Standard Process Center or Standard Process Server deployment environment, depending on what level of function you want to use. Usually, you will configure a deployment environment that corresponds to the component you installed. For example, configure a Standard Process Center deployment environment if you installed Process Center.

If you have installed IBM BPM Advanced, you can select any of the deployment environment types, depending on the function you want to use. Usually, you will configure a deployment environment that corresponds to the component you installed. For example, configure one of the Process Center deployment environment types if you installed Process Center.

If you have installed IBM BPM Advanced: Process Server, you can select any of the Process Server deployment environment types, depending on what level of function you want to use.

Assessing your requirements

To minimize rework and outages, take the time to study your current environment before you make installation and configuration decisions. Consider your current business requirements and design, the hardware and software already installed, and your current strengths and shortcomings. This planning could also help you minimize your financial investment.

Several factors determine your software needs. These factors can be organized into the following categories.
* Product hardware and software requirements, your own system resource constraints, and the availability of resources to administer and maintain your system
* Applications to be deployed to the runtime environment, and the intended use of the configured environment
* Products, and the versions of these products, to install to meet your requirements

To make wise choices for all these factors, you must understand the following concepts:
* The terminology as it applies to environment configuration
* The administrative architecture of the product that you will install, configure, administer, and maintain
* The available configuration options (through supplied patterns) and how to determine if a pattern addresses your intended use of the product
* The supported methods of implementation, including an understanding of the different task flows for installing the product and configuring the environment

You can use the information in this section to assess and analyze your current and future requirements to develop an environment to meet those requirements.

Important: For the latest information about platform-specific disk space requirements, supported operating systems, and supported database versions, click one of the following links. You can also find operating system fixes and patches that you must install to have a compliant operating system.
* IBM Business Process Manager Advanced system requirements

- IBM Business Process Manager Standard system requirements
- IBM Business Process Manager Express system requirements
- IBM Business Process Manager Tools and Add-Ons requirements

Process and process application considerations

Your current requirements provide the baseline on which to formulate a plan for streamlining integration of your business components. Your vision for the future of your business can provide a guideline that can help you make decisions as your business grows.

You need to know how your product or service is created and delivered. IBM Business Process Manager comes with deployment environment patterns designed to meet the requirements of both production and test environments.

Consider the following factors:
- Consider how process applications interact with existing services and back-end systems.
- Consider how process applications handle data and how data flows through your system to address a specific business need.

  Understand how data persists across retrievals, sessions, processes, and other boundaries when you are developing a solution and configuring its environment.

  Consider the following items regarding the process applications to be deployed to your environment:
  – Process application invocation patterns

    You must understand how the runtime environment handles asynchronous invocations and how the SCA runtime environment leverages the underlying message system to implement asynchronous invocations.

    Different applications have different needs. Those needs are determined by factors such as export types, component types, interactions between components, import types, resources needed such as databases or JMS resources, the need for business events, and their transmission mechanism.
  – Types of business processes that you plan to implement (transactional business processes, interruptible business processes, non-interruptible business processes)

    Non-interruptible business processes, or microflows, are short-running business processes that run in one transaction or without a transaction. Non-interruptible business processes are fast with little effect on performance. All activities within one process are processed in a single thread.

    Interruptible business processes, or macroflows, are long-running business processes that contain a set of activities, each of which is performed in its own transaction. Interruptible business processes can include activities that require human intervention or calls to remote systems or both. Asynchronous activities cause a business process to be interruptible because these activities might take minutes, hours, or even days to complete.

Resource considerations

Identify your assets to make the best use of your software and hardware resources and to make informed implementation decisions. Assess your current enterprise information system to determine whether you require any additional hardware or software to meet your business needs.

Consider the following factors:
- Familiarize yourself with current hardware and software. Prepare a list of the available assets.
- Determine the number of physical computer systems that you will use and itemize each piece of physical hardware. Record the following information:
  – Amount of installed memory
  – Number and type of installed microprocessors
  – External media

- Whether a particular unit can be upgraded
- Ensure all servers involved, both for the product and the databases, use the same network time protocol and are set to the same time.
- Itemize the currently installed software and database applications. Record the following information:
  - Function
  - Breadth of use across the company
  - Security requirements
- Prepare a list of your current IT personnel. Determine whether you have the required expertise to install and maintain IBM Business Process Manager, as well as the required expertise to manage your databases. Make sure that the appropriate users have user IDs with the authorizations to successfully install all products and files.

Development and deployment version levels

When you try to determine the version levels of IBM Business Process Manager that you need in your environment, your decision depends on the version levels that were used when your applications were developed. Generally, applications deployed in a previous version of IBM Business Process Manager can run on the next available version of IBM Business Process Manager.

The following table describes compatibility between IBM Business Process Manager V8.5, including IBM Integration Designer V8.5 (previously WebSphere Integration Developer) and IBM Process Designer V8.5, and prior releases.

Task	Supported?
Deployment from WebSphere Integration Developer version 6.2.0 or 7.0.0, IBM Integration Designer 7.5 or 8.0 to IBM Business Process Manager V8.5.	Yes. **Important:** For WebSphere Adapters V6.2.0, you must install the interim fix titled *Mandatory adapter fix for running 6.1 and 6.2 Adapters on WPS v7.0*. If you do not plan to update the WebSphere Adapter to a V7.0 level, and you plan to continue to use the application with WebSphere Adapter V6.2.0, you must apply this interim fix on the source environment. **Important:** Websphere Adapter for SAP V6.0.2, V6.1.0, V6.1.2 and V6.2.0 are not supported on IBM Business Process Manager V8.5. You must update Websphere Adapter for SAP to V7.0 before you can deploy any applications that use Websphere Adapter for SAP on IBM Business Process Manager V8.5.
Running IBM Business Process Manager V8.5 artifacts on WebSphere Process Server 6.2.0 or 7.0, or IBM Business Process Manager 7.5.	No. Applications authored with IBM Integration Designer V8.5 cannot be published to or installed on WebSphere Process Server 6.2.0, 7.0 or IBM Business Process Manager 7.5 (any prior release) servers. Applications authored with WebSphere Integration Developer 6.2.0, 7.0, or IBM Integration Designer 7.5 or 8.0 and then generated in IBM Integration Designer V8.5 cannot be published to or installed on WebSphere Process Server 6.2.0, 7.0, or IBM Business Process Manager 7.5 servers. Applications generated using `serviceDeploy` from IBM Business Process Manager V8.5 servers cannot be installed on WebSphere Process Server 6.2.0, 7.0, or IBM Business Process Manager 7.5 servers.

Consider also the following compatibility tips for IBM Process Designer and IBM Process Center before you make a decision. For more information, see *Performing a rolling upgrade* in the related tasks.

- The Process Designer and Process Center versions must match at all times. Version mismatches between the two components are not supported.
- Process applications that are deployed to an earlier version of Process Center with only a fourth digit mismatch can be deployed to Process Server by using an offline deployment mechanism. An online deployment is not supported in the case of a version mismatch.
- A later version of Process Center cannot deploy applications to an earlier version of Process Server.

Naming considerations for profiles, nodes, servers, hosts, and cells

This topic discusses reserved terms and issues you must consider when naming your profile, node, server, host, and cell (if applicable). This topic applies to distributed platforms.

Profile naming considerations

The profile name can be any unique name with the following restrictions. Do not use any of the following characters when naming your profile:

- Spaces
- Special characters that are not allowed within the name of a directory on your operating system, such as *, &, or ?.
- Slashes (/) or back slashes (\)

Double-byte characters are allowed.

Windows **Directory path considerations:** The installation directory path must be less than or equal to 60 characters. The number of characters in the *profiles_directory_path\profile_name* directory must be less than or equal to 80 characters.

Note: Use a short path naming convention when you create a profile in a Windows environment to avoid the Windows 255 character path length limitation.

Node, server, host, and cell naming considerations

Reserved names: Avoid using reserved names as field values. The use of reserved names can cause unpredictable results. The following words are reserved:

- cells
- nodes
- servers
- clusters
- applications
- deployments

Descriptions of fields on the Node and Hosts Names and Node, Host, and Cell Names pages: Use the appropriate naming guidelines when you create profiles.

- Stand-alone server profiles
- Deployment manager profiles
- Managed-node profiles

Table 7. Naming guidelines for stand-alone server profiles

Field name	Default value	Constraints	Description
Node name	**Linux** **UNIX** **Windows** *shortHostName* Node *NodeNumber* where: • *shortHost Name* is the short host name. • *NodeNumber* is a sequential number starting at 01.	Avoid using the reserved names.	Select any name you want. To help organize your installation, use a unique name if you plan to create more than one server on the system.
Server name	**Linux** **UNIX** **Windows** server1	Use a unique name for the server.	The logical name for the server.
Host name	**Linux** **UNIX** **Windows** The long form of the domain name server (DNS) name.	Use a fully qualified host name that is addressable through your network.	Use the actual DNS name or IP address of your workstation to enable communication with it. See additional information about the host name following this table.

Table 8. Naming guidelines for deployment manager profiles

Field name	Default value	Constraints	Description
Node name	**Linux** **UNIX** **Windows** *shortHostName* Cell Manager*Node Number* where: • *shortHost Name* is the short host name. • *NodeNumber* is a sequential number starting at 01.	Use a unique name for the deployment manager. Avoid using the reserved names.	The name is used for administration within the deployment manager cell.
Host name	**Linux** **UNIX** **Windows** The long form of the domain name server (DNS) name.	Use a fully qualified host name that is addressable through your network. Avoid using the reserved names.	Use the actual DNS name or IP address of your workstation to enable communication with it. See additional information about the host name following this table.

Table 8. Naming guidelines for deployment manager profiles (continued)

Field name	Default value	Constraints	Description
Cell name	`Linux` `UNIX` `Windows` *shortHostName* Cell *CellNumber* where: • *shortHost Name* is the short host name. • *CellNumber* is a sequential number starting at 01.	Use a unique name for the deployment manager cell. A cell name must be unique in any circumstance in which the product is running on the same physical workstation or cluster of workstations, such as a Sysplex. Additionally, a cell name must be unique in any circumstance in which network connectivity between entities is required either between the cells or from a client that must communicate with each of the cells. Cell names also must be unique if their name spaces are going to be federated. Otherwise, you might encounter symptoms such as a javax.naming.Name NotFoundException exception, in which case, you need to create uniquely named cells.	All federated nodes become members of the deployment manager cell , which you name in the Node, Host, and Cell Names page of the Profile Management Tool.

Table 9. Naming guidelines for managed-node profiles

Field name	Default value	Constraints	Description
Node name	`Linux` `UNIX` `Windows` *shortHostName* Node *NodeNumber* where: • *shortHost Name* is the short host name. • *NodeNumber* is a sequential number starting at 01.	Avoid using the reserved names. Use a unique name within the deployment manager cell.	The name is used for administration within the deployment manager cell to which the managed-node profile is added. Use a unique name within the deployment manager cell.
Host name	`Linux` `UNIX` `Windows` The long form of the domain name server (DNS) name.	Use a fully qualified host name that is addressable through your network.	Use the actual DNS name or IP address of your workstation to enable communication with it. See additional information about the host name following this table.

Host name considerations:

The host name is the network name for the physical workstation on which the node is installed. The host name must resolve to a physical network node on the server. When multiple network cards exist in the server, the host name or IP address must resolve to one of the network cards. Remote nodes use the host name to connect to and to communicate with this node.

IBM Business Process Manager is compliant to both Internet Protocol version 4 (IPv4) and version 6 (IPv6). Wherever you can enter IP addresses in the administrative console, or elsewhere, you can do so in either format. Note that if IPv6 is implemented on your system you must enter the IP address in IPv6 format, and conversely, if IPv6 is not yet available to you, enter IP addresses in IPv4 format. For more information on IPv6 refer to the following description: IPv6.

The following guidelines can help in determining the appropriate host name for your workstation:

* Select a host name that other workstations can reach within your network.
* Do not use the generic identifier, localhost, for this value.
* Do not attempt to install IBM Business Process Manager products on a server with a host name that uses characters from the double-byte character set (DBCS). DBCS characters are not supported when used in the host name.
* Avoid using the underscore (_) character in server names. Internet standards dictate that domain names conform to the host name requirements described in Internet Official Protocol Standards RFC 952 and RFC 1123. Domain names must contain only letters (upper or lower case) and digits. Domain names can also contain dash characters (-) as long as the dashes are not on the ends of the name. Underscore characters (_) are not supported in the host name. If you have installed IBM Business Process Manager on a server with an underscore character in the server name, access the server with its IP address until you rename it.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in a domain name server (DNS) look-up table. Configuration files for servers do not provide domain name resolution for multiple IP addresses on a workstation with a single network address.

The value that you specify for the host name is used as the value of the hostName property in configuration documents. Specify the host name value in one of the following formats:

* Fully qualified domain name servers (DNS) host name string, such as xmachine.manhattan.ibm.com
* The default short DNS host name string, such as xmachine
* Numeric IP address, such as 127.1.255.3

The fully qualified DNS host name has the advantages of being totally unambiguous and flexible. You have the flexibility of changing the actual IP address for the host system without having to change the server configuration. This value for host name is particularly useful if you plan to change the IP address frequently when using Dynamic Host Configuration Protocol (DHCP) to assign IP addresses. A disadvantage of this format is being dependent on DNS. If DNS is not available, then connectivity is compromised.

The short host name is also dynamically resolvable. A short name format has the added ability of being redefined in the local hosts file so that the system can run the server even when disconnected from the network. Define the short name to 127.0.0.1 (local loopback) in the hosts file to run disconnected. A disadvantage of the short name format is being dependent on DNS for remote access. If DNS is not available, then connectivity is compromised.

A numeric IP address has the advantage of not requiring name resolution through DNS. A remote node can connect to the node you name with a numeric IP address without DNS being available. A disadvantage of this format is that the numeric IP address is fixed. You must change the setting of the hostName property in configuration documents whenever you change the workstation IP address. Therefore, do not use a numeric IP address if you use DHCP, or if you change IP addresses regularly. Another disadvantage of this format is that you cannot use the node if the host is disconnected from the network.

Preparing necessary security authorizations

Depending on your security policy, you might need a user ID and password to complete tasks such as creating files and folders and accessing the database. Prepare secure user IDs to prevent problems when the servers attempt to access protected data.

- Complete the design of your database.
- Determine the authentication system to use, for example, Lightweight Directory Access Protocol (LDAP).
- Determine what controls are in place that affect the authorizations required for your IBM Business Process Manager installation.
- Identify the systems on which you are installing the product.

The security policies for your site enables global security which indicates that you require specific authorities to install software, create databases or tables, or access databases. To successfully install and operate the product you must do these steps.

To prepare security authorizations for an IBM Business Process Manager database, complete the following steps:

- Prepare a list of user IDs and passwords that have authority to install software on the systems. You must run the installation wizards for IBM Business Process Manager user IDs that have the authority to create files and folders.
- Prepare a list of user IDs, passwords, and roles that are needed for daily operations of the system:
  - Administrative console user IDs and roles to limit capabilities. You can have user IDs for configuring, administering, or monitoring roles.
  - User IDs for each system bus to authenticate system communications.
- Prepare a list of user IDs and passwords that the system uses to access the database tables that it uses during operation.
- Optional: Prepare a list of user IDs and passwords that the system uses to create databases or database tables during installation. Your site policies might restrict this authority to the database administrator. In this case, you must provide generated scripts to the administrator to create the databases or database tables.

You can install and operate your servers in a secure environment.

Installation directories for the product and profiles

The installation directories for IBM Business Process Manager are represented by several variables. The meaning of those variables can differ for a number of factors.

For ease of access, you can use these links to view the tables for the default installation directories in the sections that follow:

- *install_root* default directory
- *profile_root* default directory
- DB2 Express default directory
- IBM Business Process Manager and WebSphere Application Server default installation directory
- Default installation directory for a profile named *profile_name*
- Process Designer default directory
- Installation Manager default installation directories
- Installation Manager default agent data directories
- IBM Business Process Manager for z/OS default installation and configuration file system directories

Variables used in the documentation

Several variables representing specific default directories are used throughout the documentation. These file paths are default locations. You can install the product and other components and create profiles in any directory for which you have write access. Multiple installations of IBM Business Process Manager products or components require multiple locations.

Here are the main variables used in the documentation:

install_root
> Installation location of IBM Business Process Manager. IBM Business Process Manager is always installed in the same location as the WebSphere Application Server Network Deployment installation with which it is associated.

profile_root
> Location of an IBM Business Process Manager profile.

How variable meanings can differ

The meaning of variables used to represent installation directories can differ based on whether you are installing the product on a clean workstation or on a workstation that has an existing installation of WebSphere Application Server or WebSphere Application Server Network Deployment. The variables can also differ depending on whether you are performing the installation as a root (Administrator on a Windows system) or nonroot user.

Limitations of nonroot installers

Root, Administrator, and nonroot users can install the product. The default directories the installation program provides differ based on whether the user has root (Administrator) privileges. Root and Administrator users can register shared products and install into system-owned directories (globally shared resources that are available to all users), while nonroot users cannot. Nonroot users can install only into directories they own.

Default directories for Typical Installation

The following tables show the default installation locations of the IBM Business Process Manager base installation and its profiles during a typical installation.

Table 10 shows the default installation root directory into which the installation program installs both IBM Business Process Manager and WebSphere Application Server Network Deployment for both root (Administrator) and nonroot users.

Table 10. install_root default directory

Default *install_root* for root or Administrator users	Default *install_root* for nonroot users
AIX `/opt/IBM/BPM/v8.5`	AIX `user_home/IBM/BPM/v8.5`
Linux `/opt/ibm/BPM/v8.5`	Linux `user_home/ibm/BPM/v8.5`
Windows `C:\IBM\BPM\v8.5`	Windows `C:\IBM\BPM\v8.5`

Table 11 on page 21 shows the default installation directory for a profile named *profile_name* for both root (Administrator) and nonroot users.

Table 11. profile_root default directory

Default *profile_root* for root or Administrator users	Default *profile_root* for nonroot users
`AIX` `/opt/IBM/BPM/v8.5/profiles/`*`profile_name`*	`AIX` *`user_home`*`/IBM/BPM/v8.5/profiles/`*`profile_name`*
`Linux` `/opt/ibm/BPM/v8.5/profiles/`*`profile_name`*	`Linux` *`user_home`*`/ibm/BPM/v8.5/profiles/`*`profile_name`*
`Windows` `C:\IBM\BPM\v8.5\profiles\`*`profile_name`*	`Windows` `C:\IBM\BPM\v8.5\profiles\`*`profile_name`*

Table 12 shows the DB2 Express installation location. DB2 Express is installed under the same directory as IBM Business Process Manager. Nonroot or non-administrator installation of DB2 Express is not supported.

Table 12. DB2 Express default directory

Default DB2 Express binary location	Database Instance location
`Linux` `/opt/ibm/BPM/v8.5/DB2`	`Linux` Database instance is created under the `bpminst` user. For example: *`user_home`*`/bpminst`
`Windows` `C:\IBM\BPM\v8.5\DB2`	`Windows` The BPMINST database instance is created under the root (\) of the drive where IBM Business Process Manager is installed. For example, if IBM Business Process Manager is installed under `C:\IBM\BPM\v8.5\` then you will see `C:\BPMINST`.

Default directories for Custom Installation or existing installation of WebSphere Application Server or WebSphere Application Server Network Deployment

The following tables show the default installation locations of the product and its profiles. If you choose to install IBM Business Process Manager on top of an existing supported version of WebSphere Application Server or WebSphere Application Server Network Deployment, IBM Business Process Manager is installed into the same location. Table 13 shows the default installation root directory in such a case for both root (Administrator) and nonroot users.

Table 13. IBM Business Process Manager and WebSphere Application Server default installation directory

Default *install_root* for root or Administrator users	Default *install_root* for nonroot users
`AIX` `/usr/IBM/WebSphere/AppServer`	`AIX` *`user_home`*`/IBM/WebSphere/AppServer`
`Linux` `Solaris` `/opt/IBM/WebSphere/AppServer`	`Linux` `Solaris` *`user_home`*`/IBM/WebSphere/AppServer`
`Windows` `C:\Program Files\IBM\WebSphere\AppServer`	`Windows` *`user_home`*`\IBM\WebSphere\AppServer`

Table 14. Default installation directory for a profile named profile_name

Default *profile_root* for root or Administrator users	Default *profile_root* for nonroot users
`AIX` `/usr/IBM/WebSphere/AppServer/profiles/`*`profile_name`*	`AIX` *`user_home`*`/IBM/WebSphere/AppServer/profiles/`*`profile_name`*
`Linux` `Solaris` `/opt/IBM/WebSphere/AppServer/profiles/`*`profile_name`*	`Linux` `Solaris` *`user_home`*`/IBM/WebSphere/AppServer/profiles/`*`profile_name`*
`Windows` `C:\Program Files\IBM\WebSphere\AppServer\profiles\`*`profile_name`*	`Windows` *`user_home`*`\IBM\WebSphere\AppServer\profiles\`*`profile_name`*

Table 15 shows the Process Designer installation location.

Table 15. Process Designer default directory

Default Process Designer installation location for root or Administrator users	Default Process Designer installation location for nonroot users
`Windows` `C:\IBM\ProcessDesigner\v8.5`	`Windows` `C:\IBM\ProcessDesigner\v8.5`

Default installation directories for IBM Installation Manager

The following tables show two default directories that are related to the Installation Manager tool. Values are given for both root (Administrator) and nonroot (non-administrator) users.

- The directories in Table 16 are the defaults (per operating system) into which Installation Manager is installed.

  For more information about other defaults for Installation Manager, see Installing as an administrator or non-administrator in the Installation Manager documentation.

- The agent data directories in Table 17 are the defaults (per operating system) used by Installation Manager for data associated with the application, such as the state and history of operations performed by Installation Manager.

  For more information about the agent data location, see Agent data location in the Installation Manager documentation.

Installation Manager also uses another directory to store shared program objects and cached files that are generated when you install a product. You can specify this shared resources directory when you install WebSphere Application Server and IBM Business Process Manager. This value is set the first time that a product is installed with a particular Installation Manager instance. For further information about the shared resources directory, see Overview of package groups and the shared resources directory. For information about how to locate the shared resources directory, see Backing up and restoring Installation Manager.

Table 16. Installation Manager default installation directories

Defaults for root or Administrator users	Defaults for nonroot or non-administrator users
`Linux` `/opt/IBM/InstallationManager`	`Linux` `/user_home/IBM/InstallationManager`
`UNIX` `/opt/IBM/InstallationManager`	`UNIX` `/user_home/IBM/InstallationManager`

`Windows XP Professional` `C:\Program Files\IBM\Installation Manager`
 	
`Windows Vista`, `Windows 2008`, `Windows 7`, `Windows 8`, and `Windows 2012` `C:\Program Files [(x86)]\IBM\Installation Manager`
	`Windows XP Professional` `C:\Documents and Settings\user\IBM\Installation Manager`
	
	`Windows Vista`, `Windows 2008`, `Windows 7`, `Windows 8`, and `Windows 2012` `C:\Users\user\IBM\ Installation Manager`

Table 17. Installation Manager default agent data directories

Defaults for root or Administrator users	Defaults for nonroot or non-administrator users
`Linux` `/var/ibm/InstallationManager`	`Linux` `/user_home/var/ibm/InstallationManager`
`UNIX` `/var/ibm/InstallationManager`	`UNIX` `/user_home/var/ibm/InstallationManager`

Table 17. Installation Manager default agent data directories (continued)

Defaults for root or Administrator users	Defaults for nonroot or non-administrator users
`Windows XP Professional` `C:\Documents and Settings\All Users\Application Data\IBM\Installation Manager`	`Windows XP Professional` `C:\Documents and Settings\user\Application Data\IBM\Installation Manager`
`Windows Vista` , `Windows 2008` , `Windows 7` , `Windows 8` , and `Windows 2012` `C:\ProgramData\IBM\ Installation Manager`	`Windows Vista` , `Windows 2008` , `Windows 7` , `Windows 8` , and `Windows 2012` `C:\Users\user\ AppData\Roaming\IBM\Installation Manager`

Planning your network deployment environment

Setting up a network deployment environment involves many decisions, such as the number of physical workstations and the type of pattern you choose. Each decision affects how you set up your deployment environment.

Before you plan your deployment environment complete the following tasks:
- Choose a database type
- Identify available resources
- Identify necessary security authorizations

When you plan the layout of interconnected servers, you must make some decisions. These decisions influence trade-offs that you make between the available hardware and physical connections, the complexity of the management and configuration and requirements such as performance, availability, scalability, isolation, security, and stability.

1. Identify the functional requirements of the deployment environment.
   a. Identify the features or runtime capabilities of your deployment environment.

      Consider the components that the deployment environment will support, such as the various process applications, toolkits, processes, or modules.
   b. Identify the component types that you will deploy.

      Consider the component types and the interactions between components as part of the requirements.
   c. Identify the import and export implementation types and transports.

      Consider the resources needed for the databases or Java™ Message Service (JMS) resources and the need for business events and their transmission mechanism.
   d. Identify any functional requirements that are not related to applications.

      Consider security servers, routers, and any other hardware or software requirements to handle business events.
2. Identify the capacity and performance requirements for your environment.
3. Decide on the number of physical servers that you need for each function.
4. Identify the redundancy requirements for your environment.
   a. Identify the number of servers that you need for failover.
   b. Identify the number of routers that you need.

      Your choice of router is influenced by exports of deployed modules, the types of queues you define on the service integration bus, Service Component Architecture (SCA) exports, and the type of load balancing that you want among your clusters. IBM provides an embedded router used for web services exports with Service Object Access Protocol (SOAP)/JMS transports, or JMS exports.

However, if you choose not to use this embedded router provided by IBM, you will need to determine how to balance the load among your clusters, based on the technology that you are using.

5. Design your deployment environment.

   Decide on the pattern. For IBM Business Process Manager, you can select one of two established topology patterns:

   - Single Cluster
   - Application, Remote Messaging, and Remote Support

   Note: If your configuration supports multiple IBM Business Process Manager and non-BPM products in addition to, and compatible with, IBM Business Process Manager, the patterns of those products would be available to you when you create your deployment environment.

   For more information about the patterns and the differences between them, see "Topologies of a network deployment environment" on page 26.

6. Understand the methods available to you for configuring your deployment environment.

   You can configure a standardized network deployment environment based on a topology pattern template included with the software, and you can implement it using the `BPMConfig` command or the Deployment Environment wizard.

   You can use the Deployment Environment wizard to create clusters with the Single Cluster and (if applicable) Application, Remote Messaging, and Remote Support topology patterns.

Overview: Deployment environment topologies and patterns

A network deployment environment can have many topologies, and can be created from several standard topology patterns.

What is a topology?

A topology is the physical layout of the *deployment environment* required to meet your business needs for capacity, availability, and scalability.

You can set up topologies for both the Process Center and Process Server components of IBM Business Process Manager.

Many factors affect how you design and implement your topology. For example, you must consider business and application requirements, resource requirements and constraints, the intended purpose of the environment, and the operating system.

IBM Business Process Manager includes patterns for the following topologies, which you can use to address many business scenarios, from proof-of-concept (POC) to a fully functional production environment:

- Single Cluster
- Application, Remote Messaging, and Remote Support

Each topology pattern has certain design characteristics that address a particular business need. For example, on distributed systems, the Single Cluster topology pattern is typically used for a testing or proof of concept scenario. On z/OS systems, this topology pattern is the default pattern and can be used in production environments.

The design characteristics of each topology have been captured as *topology patterns* that are supplied as configuration templates with the product.

The purpose of deployment environment patterns

A deployment environment topology pattern specifies the constraints and requirements of the components and resources involved in a deployment environment. There are IBM-supplied topology pattern for each topology layout. These topology patterns provide rules and guidelines for component interaction that are characteristic of the most commonly used BPM topology patterns. The IBM-supplied topology patterns are based on well-known and tested configuration scenarios. They contain a repeatable and automated method of creating a deployment environment. Each topology pattern is designed to meet the configuration requirements and business needs of the associated topology. Using topology patterns helps you create a deployment environment in the most straightforward way.

Because the deployment environment topology patterns represent recommended topologies with component configurations that work together, you can be sure that you are building a fully functional deployment environment. You can use the configuration rules of a deployment environment topology pattern to generate a fast path configuration. This action is possible because many design decisions are implemented in the topology pattern; for example, which components to configure, and which default parameters and resources are needed.

Each supplied deployment environment topology pattern addresses a specific set of requirements. Most requirement sets can be met when you use one of these topology patterns. To select a topology pattern, complete all of the following steps:
- Understand the requirements of the business solution that you are creating.
- Review and understand the capabilities and characteristics of the IBM-supplied topology patterns.
- Decide which topology pattern to use.

Databases and deployment environments

For a network deployment environment, you need the following databases on your database management system. The databases that you require depend on your installation.
- The Common database (CMNDB)
- The Process database (BPMDB)
- The Performance Data Warehouse database (PDWDB)

You or your database administrator might need to create and configure databases outside the installer.

For more information, see Planning your database configuration.

Functions of IBM-supplied deployment environment topology patterns

Any IBM Business Process Manager deployment contains a basic set of functions that together form a complete production environment.

To design a robust deployment environment, you must understand the functionality that each cluster can provide in an IBM-supplied topology pattern. You can allocate a specific type of function (for example, the support infrastructure function) to a particular cluster. Understanding the functions can help you choose the deployment environment topology pattern that best meets your needs.

For network deployment, clusters can collaborate to provide specific functionality to the environment. Depending on your requirements, you assign specific functions to each cluster within the deployment environment, to provide performance, failover, and capacity.

The clusters configured in a deployment environment provide the following functions.

The functions can exist in a single cluster, or can be spread across multiple clusters. Each standardized (IBM-supplied) topology pattern creates a different number of clusters to support the functions. The number of clusters in your deployment environment depends on the topology pattern that you are using.

Application deployment target

An application deployment target is the set of servers (cluster) to which you install your applications (for example, human tasks, business processes, and mediations). Depending on which deployment environment topology pattern you choose, the application deployment target might also provide messaging infrastructure and supporting infrastructure functions.

In a Single Cluster topology pattern, the application deployment target provides the entire functionality of the deployment environment.

Supporting infrastructure

The supporting infrastructure includes the following services. These services include:

- Business rules
- Selectors
- Human tasks
- Business processes

The business rules are not tied to the Supporting infrastructure cluster. In fact, business rules can exist and work everywhere in the cell. The business rules administrative function (performed from the Business Rules Manager) can be deployed on the supporting infrastructure cluster (in a three cluster configuration). The same principle applies to the human tasks and business processes. The human tasks and business processes run on the application deployment target cluster, because that is where the human task and business process containers are configured. However, you administer processes and tasks from the Business Process Choreographer Explorer, which can reside on the supporting infrastructure cluster (in a three cluster configuration).

Messaging engine infrastructure

The messaging infrastructure is the set of servers (cluster) where the messaging engines are located. The messaging infrastructure is used to provide asynchronous messaging support for your applications and for the internal messaging needs of the IBM Business Process Manager components. The messaging engines enable communication among the nodes in the deployment environment.

For topologies in all environments, the fundamental pieces of IBM Process Server is always similar. In all IBM Process Server cells, the deployment manager is the central point of administration for the cell.

Topologies of a network deployment environment

A topology is the physical layout of the deployment environment. You can create the topology that best addresses your business needs by choosing one of the patterns provided by IBM.

Related concepts:

Single Cluster topology pattern

The *Single Cluster* topology pattern is an IBM-supplied topology pattern. In a Single Cluster topology pattern, all the functions of the deployment environment are combined into a single cluster.

This is the default pattern for IBM Business Process Manager for z/OS.

A Single Cluster topology pattern is ideal for limited hardware. Because all the components are installed in the same cluster, fewer physical machines are required. However, because each server instance must run the supporting applications and your integration applications, you need more memory for the individual Java Virtual Machines (JVMs). In addition, one or more members of the cluster must also run the messaging engines required for asynchronous interactions. Thus, the Single Cluster topology pattern is typically used for proof of concept, development, and testing environments.

Combining all aspects of the IBM Business Process Manager environment into a single cluster has other implications aside from the increased memory requirements.
- Because asynchronous interactions (involving JMS and MQ/JMS bindings), human tasks, state machines, and long-running business processes can make extensive use of the messaging infrastructure, a single cluster environment is not ideal for applications with these components.
- Any messaging requirements must be kept to a minimum with this topology pattern (except for z/OS).
- Service Component Architecture (SCA) internal asynchronous invocations, the Java Message Service (JMS), and MQ messaging bindings do not support multiple messaging engines in the same cluster.

If necessary, choose the Application, Remote Messaging, and Remote Support topology pattern in which the messaging infrastructure is in a separate cluster from the application deployment target.

The Single Cluster topology pattern is suitable for scenarios that are focused on running applications and on synchronous invocations.

From an administrative and scalability perspective, the Single Cluster topology pattern has advantages. A single cluster where each member runs all the IBM Business Process Manager components are simpler to administer. Instead of several server instances in multiple clusters, you have a single cluster with fewer members. If the needs of your environment grow, scaling the infrastructure is a simple matter of adding additional nodes and cluster members. Thus, the process of adding capability is simple, but all components are scaled at the same rate. For example, if the messaging engines spread across server members use policies, there could be some additional administrative effort in creating and maintaining the policies.

In a Single Cluster topology pattern, all deployment environment functions and functional groups of components run on a single cluster:
- The applications:
  - Business Process Choreographer (BPC) container
  - Process Server
  - Business Rules manager
  - Business Space
  - Process Portal
  - REST API Services
- The messaging infrastructure cluster hosts a single service integration bus and single messaging engine that use the same database schema as the product database by default. Each deployment environment has its own bus. The single bus is called **BPM.***deployment_environment_name***.Bus**.
- The support infrastructure applications:
  - Performance Data Warehouse
  - Business Process Choreographer Explorer
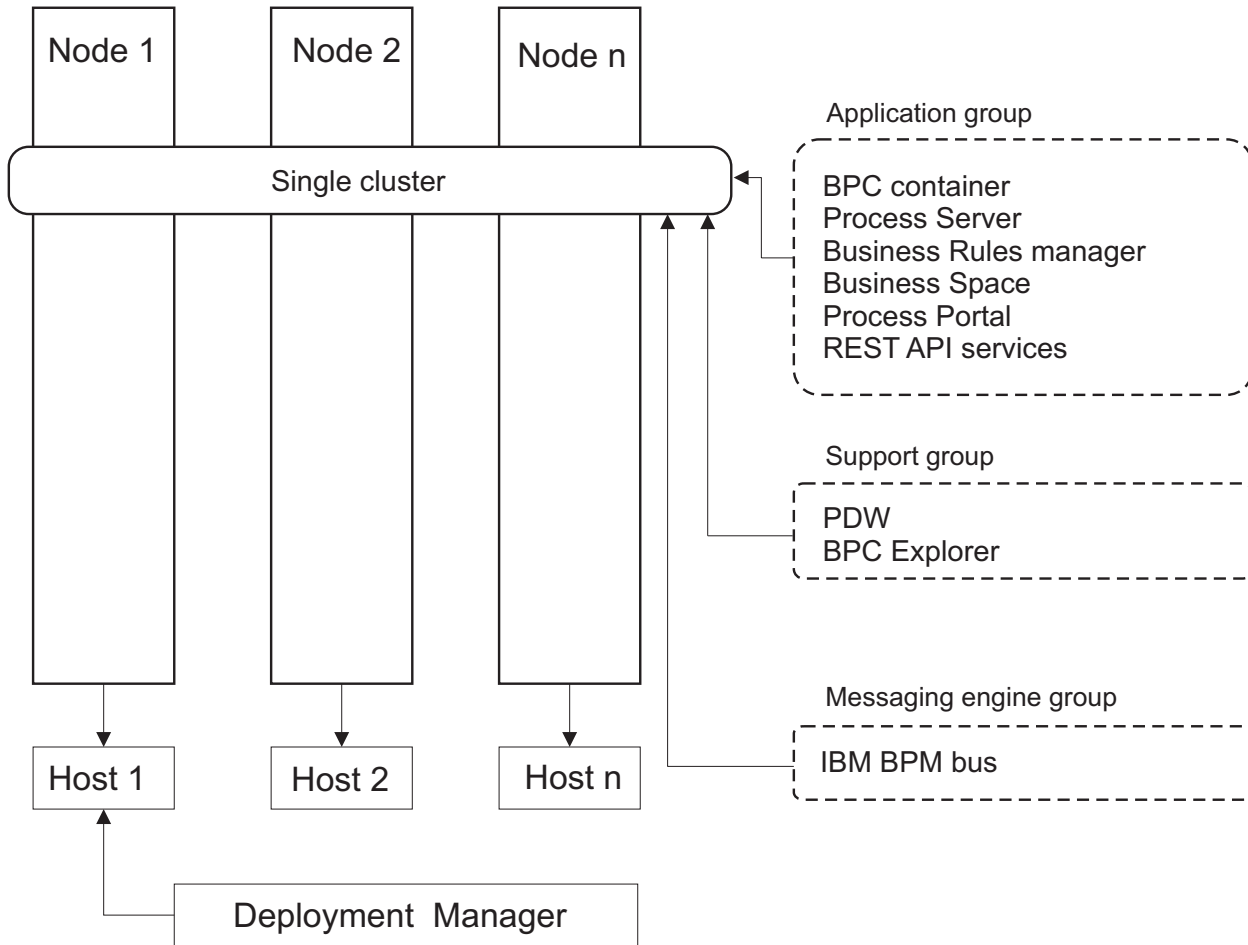
Figure 1. Single cluster topology pattern

Application, Remote Messaging, and Remote Support topology pattern

The *Application, Remote Messaging, and Remote Support* topology pattern is an IBM-supplied topology pattern. In this pattern, the deployment environment functions are divided among three separate clusters.

The Application, Remote Messaging, and Remote Support topology pattern is the preferred topology for IBM Business Process Manager Standard and IBM Business Process Manager Advanced. It is also the default for the **BPMconfig** command, except for z/OS.

The application deployment target cluster hosts the following functions:
- Business Process Choreographer (BPC) container
- Process Server
- Business Rules manager
- Business Space
- Process Portal
- REST API Services

The messaging infrastructure cluster hosts a single service integration bus and single messaging engine that use the same database schema as the product database by default. Each deployment environment has its own bus. The single bus is called **BPM.*deployment_environment_name*.Bus**.

The support infrastructure cluster hosts the following functions:
- Performance Data Warehouse
- Business Process Choreographer Explorer

In a Application, Remote Messaging, and Remote Support topology pattern, the deployment environment functions are divided among three separate clusters. One cluster is used for applications, one cluster is used for messaging functionality, and one cluster for support functionality.
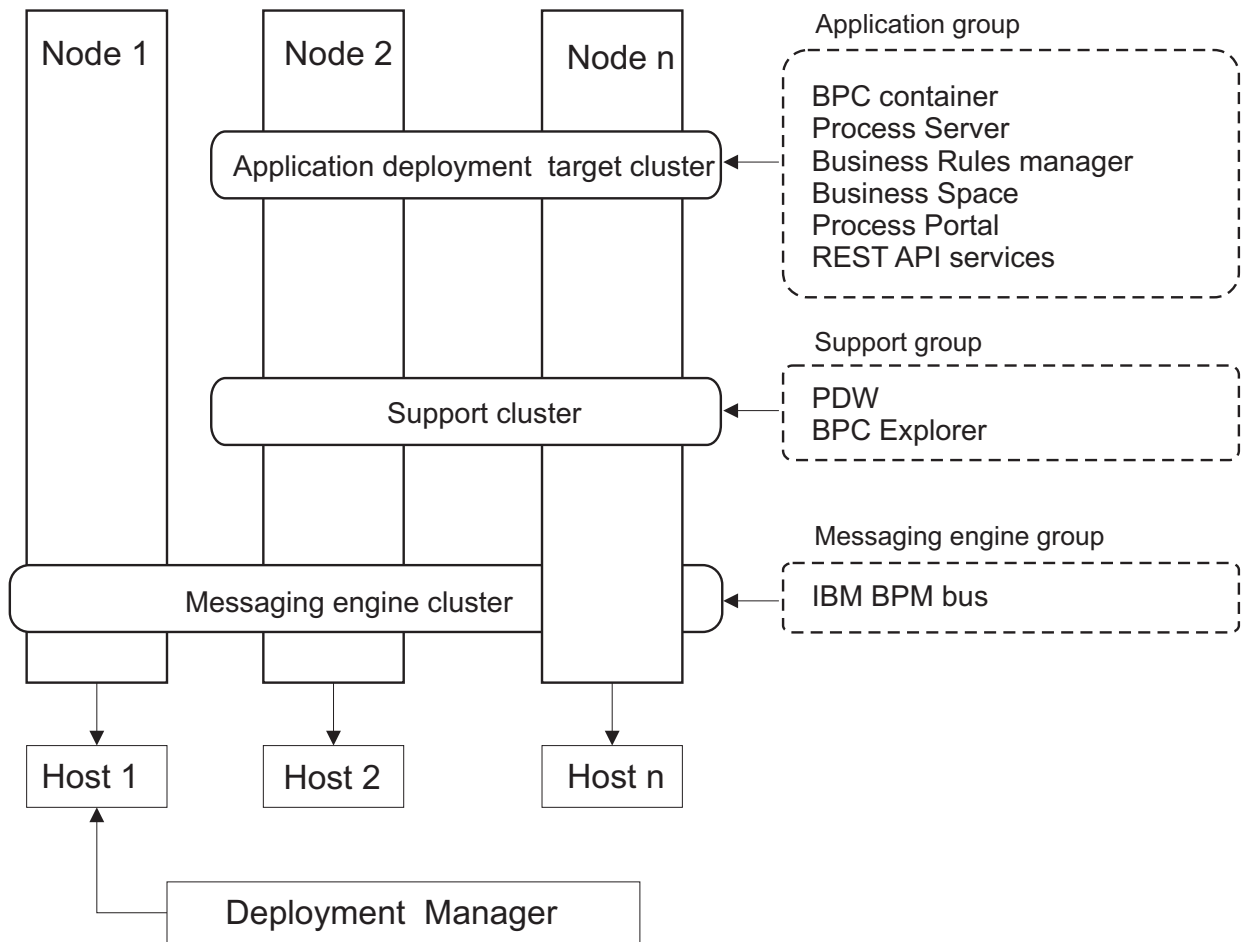
Figure 2. Application, Remote Messaging, and Remote Support pattern

Important: In this topology you must also configure a routing server such as IBM HTTP Server, WebSphere Application Server proxy server, or a reverse proxy server to ensure that requests that are intended for Process Portal are directed to the correct cluster.

Considerations for selecting a topology

Selecting an appropriate topology for your deployment environment depends upon several factors.

When you select a topology pattern, consider the following factors:
- Available hardware resources
- Application invocation patterns
- Types of business processes that you plan to implement (interruptible versus non-interruptible)
- Individual scalability requirements

• Administrative effort involved

The Application, Remote Messaging, and Remote Support topology pattern is the preferred topology for IBM Business Process Manager Standard and IBM Business Process Manager Advanced, but the choice ultimately depends upon your individual requirements.

The IBM-supplied topologies can be applied to Process Server, Advanced-only Process Server, and Process Center topologies. Therefore, your Process Center, Advanced-only Process Server, and Process Server network deployment environments can be organized in a similar way. The procedures for creating environments for Process Server, Advanced-only Process Server, and Process Center based on IBM-supplied topologies are also similar. The only difference related to IBM-supplied patterns is the recommended patterns for a production environment, and the components configured on the clusters for those patterns.

For information on the components, features, and functionality available in each of the IBM Business Process Manager configurations, see IBM Business Process Manager V8.5 configuration capabilities

Condensed topology pattern selection criteria

Consider the information listed in the following table, which is a quick guide to selecting your production topology. This table provides a condensed list of the advantages and disadvantages of each of the topology patterns.

For information about which BPM products support the supplied topology patterns, see *Topology patterns and supported BPM product features*.

Table 18. Considerations for selecting a topology for your deployment environment

	Topology Pattern	
Consideration	Single cluster	Application, Remote Messaging, and Remote Support
Number of clusters to maintain	One cluster for all components	Three clusters: One cluster for applications One cluster for support infrastructure One cluster for messaging
Hardware requirements	Can be implemented on limited hardware	Most hardware intensive
Asynchronous interactions	Use should be minimal	Ideal environment for asynchronous interactions
Long-running processes, state machines, and human tasks	Use should be minimal	Ideal environment for interruptible processes, state machines, and human tasks
Administrative burden	Relatively small	Requires most administrative effort
Scalability	All components scaled at the same rate	Easiest to scale All functions separated Messaging cluster scalability still limited (benefit comes when other BPM products are introduced)

Related concepts:

"Topology patterns and supported product features" on page 31
A topology is the physical layout of the deployment environment. The product features and default usage

depends on your choice of topology pattern.

"Topologies of a network deployment environment" on page 26
A topology is the physical layout of the deployment environment. You can create the topology that best
addresses your business needs by choosing one of the patterns provided by IBM.

Topology patterns and supported product features

A topology is the physical layout of the deployment environment. The product features and default usage
depends on your choice of topology pattern.

If you are using the Deployment Environment Configuration wizard on the administrative console to
create the deployment environment, the availability of topology patterns on which you base your
deployment environment varies depending on the following conditions and configuration decisions:

- The operating system on which you have installed IBM Business Process Manager
- The primary deployment environment feature and the complimentary feature

Table 19 and "Topology patterns and supported product features" show the relationship between the
topology patterns and product features.

Table 19. Available supplied patterns and their relationship to product features

Topology pattern	Number of clusters	Description	Supported BPM products and features
Single Cluster	1	Messaging, application deployment target, and application support functions are contained in a single cluster. This topology pattern is useful for synchronous messaging, proof of concept, or application testing environments. A Single Cluster topology pattern is ideal for limited hardware. Because all of the components are installed in the same cluster, fewer physical machines are required.	Supported by the following product: - IBM Business Process Manager Advanced and Standard configurations
Application, Remote Messaging, and Remote Support	3	This topology pattern defines one cluster for application deployment, one remote cluster for the messaging infrastructure, and one remote cluster for supporting applications.	Supported by the following product: - IBM Business Process Manager Advanced and Standard configurations

Configurable components for each configuration

When you install the various configurations of IBM Business Process Manager, certain components are
visible to you during the installation and configuration process. For network deployment, these
components can be in one cluster or in multiple clusters.

Table 20 shows the components for each of the different configurations.

Table 20. IBM Business Process Manager components

Component	Adv	Std	Exp
Process Server	X	X	X
Performance Data Warehouse	X	X	X
Common database	X		

Table 20. IBM Business Process Manager components (continued)

Component	Adv	Std	Exp
Service Component Architecture (SCA)	X		
Business Space	X	X	X
Process Portal	X	X	X
Business Process Choreographer	X		
Business Process Choreographer Explorer	X		
IBM BPM messaging engine (service integration bus)	X	X	X

Related concepts:

"Considerations for selecting a topology" on page 29
Selecting an appropriate topology for your deployment environment depends upon several factors.

"Topologies of a network deployment environment" on page 26
A topology is the physical layout of the deployment environment. You can create the topology that best addresses your business needs by choosing one of the patterns provided by IBM.

Load balancing and failover with IBM HTTP Server

In a network deployment environment, you can configure a routing server, such as IBM HTTP Server, WebSphere Application Server proxy server, or others, as a proxy server for workload balancing and failover purposes. Instead of incoming HTTP requests going directly to an application server, they go to the proxy server, which then distributes the requests across multiple application servers that perform the work.

Tip: You do not have to use IBM HTTP Server for load balancing, you can use any other type of routing server, for example, WebSphere Application Server proxy server, any other web server, reverse proxy server, or network layer IP sprayer.

Although the specific configuration steps differ depending on your environment, the following general tasks can help you plan for and implement workload balancing and failover with IBM HTTP Server.

1. Install IBM HTTP Server.
2. Install and configure the appropriate web server plug-in.
3. Configure Secure Sockets Layer (SSL) between the deployment manager for WebSphere Application Server and the IBM HTTP Server administration server.. You must configure the Application Server to accept a self-signed certificate from IBM HTTP Server so that SSL connections are accepted and transactions are completed.
4. Customize the Process Server or Process Center cluster so that the configuration file points to the web server and communication is enabled for HTTP over SSL or HTTP Secure (HTTPs). See Customizing the Process Server or Process Center cluster to work with a web server on V8.5.0.0 or Customizing the Process Server or Process Center cluster to work with a web server on V8.5.0.1.

Expanding your topology

There are three ways to expand your topology: adding members to a cluster, adding cells, or adding deployment environments.

Adding cluster members

The easiest way to expand your infrastructure is to add more cluster members to your existing clusters. You can add cluster members to each cluster independently or in combination, depending on where you see the need for growth. In a single-cluster topology, you can expand the cluster (which provides the application, support, and messaging capabilities). In a three-cluster topology with separate application

cluster, support cluster, and messaging cluster, you can add new cluster members for any one, any two, or all three clusters. By expanding your clusters in this way, you can improve your application throughput.

Consider adding cluster members when one of the following situations occurs:
- You plan to deploy new applications to your existing environment.
- You anticipate increased volume requirements for your existing applications.
- You need more capacity for operational purposes, such as failover.

However, there are some cases where expanding existing clusters is not appropriate. Consider another solution in the following cases:
- You have applications or sets of applications that serve different business purposes and you want to keep them distinct. If you deploy these distinct applications to the same deployment environment, you might introduce dependencies between otherwise unrelated business domains. Dependencies can affect such things as maintenance schedules and application availability when, for example, unrelated applications are less reliable.
- After you analyze your performance characteristics, you realize that planned deployments might push your system beyond the limits of the current deployment target. They might introduce too many modules from new applications or new versions of applications to run in the existing memory space, or use your database tables too heavily.

Adding cells

If you decide that expanding your existing clusters is not an appropriate solution, consider creating another deployment environment in another cell. This approach gives you the most room for growth, the most flexibility for expanded functional requirements, and complete isolation for your applications.

To add another cell, you duplicate common cell-level configurations, such as global security settings. You use multiple consoles to manage your applications, such as separate administrative consoles and failed event managers.

Adding deployment environments

If the previous two options do not satisfy your requirements, there is a third alternative for expanding your topology. You can create two independent deployment environments for your applications in the same cell.

Consider adding a second deployment environment when one of the following situations occurs:
- You must expand the capacity of your environment, but adding cluster members does not satisfy your requirements.
- You want to isolate process applications into separate Java virtual machines (JVMs), associating each application group with a specific set of JVMs.
- You want to set up multiple test environments quickly without having to configure security or nodes each time.

The second deployment environment is for IBM Process Server only, not for IBM Process Center. You need one Process Center per cell, or the single repository experience is lost.

Running two deployment environments in the same cell is an advanced topology that requires research and planning.

Considerations for multiple deployment environments in the same cell
Before you implement this advanced topology, there are several important things to consider.

Maintenance considerations

Maintenance is more difficult with more than one deployment environment in the same cell.

- If there is an issue with one application in the cell, it is not possible to apply an interim fix only to the affected deployment environment. Interim fixes affect all servers, deployment environments, and clusters in the cell. Fixes for one application might have an unanticipated effect on the other applications that are running in the cell.

- Testing an interim fix from IBM is more difficult when several deployment environments are in the same cell. Separate cells help ensure that fixes do not break other applications.

- You might have to bring down all your servers to apply interim fixes for one set of clusters, resulting in downtime across all the sets of clusters using the cell. Although the exact arrangement of servers varies, a common arrangement of servers is to have one member of each cluster on each node. In such an arrangement, all servers and cluster members that share the node are affected by the steps to apply the interim fix.

Application considerations

Consider how applications are used with two different deployment environments in the same cell.

- You cannot install two instances of the same Service Component Architecture (SCA) application in the cell. You can install many SCA applications, but they must have different module names. You can use the `serviceDeploy` utility to rename them.

  As an example of this problem, if you create an environment with two deployment environments in the same cell and then try to import into both of them an IBM BPM export (.twx) file that contains BPEL processes, the second import fails because the SCA module names are the same and an SCA module name must be unique within a cell.

  There are several ways to manage this problem.
  - You can use module naming conventions that incorporate the name of the target deployment environment.
  - If you are deploying the modules as part of a process application in Process Center, you can use process app naming conventions that incorporate the name of the target deployment environment.
  - If you are deploying directly as an EAR file, you can use module versioning where the version name uses a naming convention that incorporates the name of the target deployment environment.

- For late binding to work, new versions of a BPEL business process or human task (template) must be deployed to the same deployment environment as the earlier version. The correct target to bind to must be found in the same deployment environment. Make sure that parent-child relationships between processes or between human tasks are scoped to the deployment environment. There are some relationships, like parent-child flows, that should not cross JVMs.

- Each Process Portal has one view to each deployment environment and requires unique context roots. Consider whether to use a different web server for each deployment environment. If not, you must provide different virtual hosts to ensure unique context roots for applications.

Administration considerations

Consider how administration works with more than one deployment environment in the same cell.

- Each application cluster must have a corresponding support cluster and messaging engine cluster.
- Selecting the correct failed event manager to retry events might be difficult when you have more than one deployment environment.
- You must ensure unique names for all applications that contain SCA modules such as BPEL processes, calendars, rules, selectors, and relationships.
- You must ensure unique names for IBM BPM applications as well as for customer applications.
- You must add databases and schemas for each set of clusters, which increases administration responsibilities. Each set of clusters requires databases and schemas for:

– Process database

– Performance Data Warehouse database

– Common database at the deployment environment level

You do not need separate database instances in DB2. If you use one database, you must provide separate user IDs for each Process Server and Performance Data Warehouse. These user IDs are used as the schema and keep the tables separate.

On-demand routing and dynamic cluster support

Migrating the WebSphere Virtual Enterprise technology to a WebSphere Application Server V8.5 Intelligent Management cell in IBM WebSphere Application Server V8.5 provides support for on-demand routing and dynamic clustering.

WebSphere Application Server Network Deployment V8.5 provides extended application infrastructure virtualization capabilities that include intelligent load balancing and clustering techniques. It introduces the concepts of on-demand routing and dynamic clustering, which provide an on-demand flexible infrastructure for enterprise-scalable applications.

On-demand routing

The on-demand router (ODR) is an intelligent load balancer that receives, prioritizes, and distributes all the incoming requests across multiple servers. Unlike a regular load balancer that can route requests to an overloaded or hung server, the ODR has knowledge of the available processing capacity and health of the application servers and, based on this information, determines where the requests should be run.

The ODR can support business goals at peak times by making smart decisions about the incoming work and by efficiently routing the different flows of requests to balance the workload.

Dynamic clusters

Clustering improves the availability of web applications or resources by routing user requests from overloaded systems to systems that can handle the workload. Application servers can be started or stopped in the cluster to meet the current demand for applications that are deployed to the cluster.

Configuring IBM BPM for on-demand routing and dynamic clustering

To enable IBM Business Process Manager to adjust workloads during peak times, you can augment its existing cluster topology with the dynamic cluster functionality that is provided with IBM WebSphere Application Server Network Deployment V8.5 or later.

Review and meet the system requirements for IBM BPM V8.5: IBM Business Process Manager Advanced detailed system requirements.

Complete the following steps:

Note: This procedure is provided as an example. You can adjust the IBM BPM configuration steps according to your business needs. For example, you can choose to configure IBM BPM in a single-cluster topology, or you can set up a different proxy server or no proxy server at all.

1. Install the required IBM BPM and IBM WebSphere Application Server interim fixes:
   - Required interim fixes for the IBM Business Process Manager products
   - Fix list for IBM WebSphere Application Server V8.5
2. Configure the ODR as a proxy server for IBM BPM:
   a. Set up the IBM BPM with the IBM HTTP Server (IHS):
      1) Install IBM BPM V8.5 on three systems, for example, SUSE130, SUSE131, SUSE132. For more information, see the *Planning your network deployment environment* parent topic.
      2) Create one deployment manager node on SUSE130, and two custom nodes on each of the SUSE131 and SUSE132 systems.

3) Generate a three-cluster IBM BPM deployment environment on these nodes using IBM DB2 V10.1.

b. Create the ODR:

1) Create another custom node on SUSE130, which is the system that has the deployment manager, and then federate this node to the deployment manager.

2) Point your browser to `http://<dmgr_host>:<dmgr_port>/ibm/console` and log in to the administrative console.

3) Click **Servers** > **Server Types** > **On Demand Routers**, and then click **New**. Select the node that corresponds to the ODR and complete the steps in the wizard to create and save the new ODR server.

4) On the On-Demand Routers page, click **Start** to start the ODR server.

You can now log in to the `Process Admin/portal/bpc` using the host name and the port number of the ODR server.

c. Configure the ODR server to work with IHS:

Note: Ignore this step if you chose not to configure the IBM HTTP Server for IBM BPM.

1) In the administrative console, click **Servers** > **Server Types** > **On Demand Routers** > **On Demand Router Settings** > **On Demand Router Properties** > **On Demand Router Settings** > **Trusted security proxies** and add the IHS server host name to the corresponding field.

2) Click **Servers** > **Server Types** > **On Demand Routers** > **On Demand Router Settings** > **On Demand Router Properties** > **On Demand Router Settings** > **Proxy Plugin Configuration Policy** and set the plug-in scope to `Cell`.

3) Click **OK** and then click **Save**.

4) Restart the ODR server.

5) Copy the `<WAS_HOME>/profiles/ODR_profiles_name/etc/Plugin-cfg.xml` file to the `<IHS_Plugin_Location>/Plugins/config/webserver1` directory on the IHS server. If the `Plugin-cfg.xml` file already exists, replace it with the latest version.

6) Restart the IHS server.

Note: For more information about ODR configuration, see Creating and configuring ODRs. You can now log in to the `Process Admin/portal/bpc` using the host name and the port number of the IHS server.

3. Configure the IBM BPM topology with dynamic clusters as described in Creating dynamic clusters.

Tip: When configuring the dynamic clusters, to ensure that you can exploit all of the dynamic cluster features, it is recommended that you convert each static cluster to a dynamic cluster and set the **Minimum number of cluster instances** to keep one instance started at all times for each dynamic cluster. For example, in your IBM BPM configuration with a three-cluster network deployment environment, convert all three static clusters to dynamic clusters, and then set the **Minimum number of cluster instances** to keep at least one instance started at all times for each dynamic cluster.

4. To monitor the environment, configure the health management for IBM BPM V8.5. For more information, see Configuring health management.

Planning your database configuration

To plan your database configuration, you need to know which databases must be in place and configured to use the software, which components of IBM Business Process Manager you will use and their associated databases, the tasks required to administer the databases, and the security privileges of the database system that you are using.

For IBM Business Process Manager, three separate databases are required for the Process Server, the Performance Data Warehouse, and the common database components.

In IBM Business Process Manager V8.5, the common (shared) database is split into two pieces. One is cell-scoped, used for the entire cell. The other is deployment-environment-scoped, and must be configured for each deployment environment.

The Process Server and Performance Data Warehouse components do not support case-sensitive databases. These databases must *not* be case-sensitive.

For Microsoft SQL Server and Oracle databases, the following restrictions apply:
- For Microsoft SQL Server databases, components other than Process Server or Performance Data Warehouse require that their databases be case-sensitive.
- For Oracle databases, the Process Server, Performance Data Warehouse, and Common database components must use a separate schema/user. They can use the same instance.

When configuring databases, the system default tablespaces are used. However, if you want to use scripts that create custom tablespaces for the Business Process Choreographer and the Business Space components with DB2 and Oracle, see the **usetablespaces** property as described in the Database and cell properties section of Configuration properties for the BPMConfig command.

You can run one of the following commands:
- run **BPMConfig -create -sqlfiles** *properties_file_name* **-outputDir** *output_directory*
- run **BPMConfig -create -de** *properties_file_name* when **bpm.de.deferSchemaCreation** is set to **true**.

The generated SQL files can be found in the output directory that you specified or in `profile_root`/dbscripts. The files include additional `createTablespace*.sql` files that you must run before the `createSchema*.sql` files to create the tablespaces for Business Process Choreographer or Business Space. The generated `createSchema*.sql` files include the appropriate references to the tablespaces that you specified.

Supported database types and JDBC providers

Choosing a database depends on your operating system and on the features that you will use with IBM Business Process Manager.

The following database types and providers are supported with IBM Business Process Manager V8.5:

Table 21. Supported database types and JDBC providers

Database type	JDBC provider
DB2	DB2 Data Server JDBC Provider (XA)
DB2 for z/OS	DB2 Universal JDBC Provider (XA)
	DB2 Universal JDBC Provider, to use the connection pool for DB2 for z/OS
Oracle	Oracle JDBC Provider
SQLServer	Microsoft SQL Server JDBC Provider

JDBC drivers and locations

The following tables list the supported JDBC drivers. The first table contains the names and locations of the JDBC drivers that are provided with the product. The second table contains the names of the JDBC drivers that are supported but not provided with the product.

Restriction: The JDBC driver used by IBM Business Process Manager might not be the latest JDBC driver level delivered with your database product. Compare the latest version of the JDBC driver that is available from the database vendor with the JDBC driver that is delivered with IBM Business Process Manager. If a later version is available, update to that driver.

The following supported JDBC drivers are included with the product installation files.

Table 22. Supported JDBC drivers and locations that are provided with the product

Server	Driver description	Driver location
DB2	IBM DB2 Universal JDBC Driver 3.61.65	`install_root`/jdbcdrivers/DB2
	IBM Data Server Driver for JDBC and SQLJ 4.11.69	
Oracle	Oracle JDBC Driver 11g 11.2.0.1.0	`install_root`/jdbcdrivers/Oracle
SQL Server	Microsoft SQL Server JDBC Driver 4.0	`install_root`/jdbcdrivers/SQLServer

The following supported JDBC drivers are not included with the product installation files.

Table 23. Supported JDBC drivers that are not provided with the product

Server	Driver description
Oracle	Oracle JDBC Driver 11g 11.1.0.6

Database server setup options

The Set up the Database Server page in the Installation launch pad offers varying options depending on your database server back-end.

Using an existing database or installing a new database

You can choose to have the installation process include automatically installing an instance of DB2 Express. Choose this option if you do not have an existing or planned supported database server you intend to use to store content from Process Center or Process Server. If you are installing a test or proof-of-concept environment, you would likely choose to have a new DB2 Express installed automatically, unless one already exists on the system. You must be installing as an administrator to have DB2 Express installed automatically.

Applying Windows authentication

Enable this option if you want to use an existing Windows user ID and password for SQL Server authentication rather than providing a user ID and password in the database options. For more information, see the SQL Server documentation: http://technet.microsoft.com/en-us/library/ms144284.aspx.

Specifying the Oracle instance name

If you are using an Oracle database server, provide the name of the Oracle instance to be configured. You can use a single instance of Oracle for configuring IBM BPM. The Oracle instance must exist and be available for access. Consult the Oracle documentation to create an Oracle instance. If you use a single Oracle instance, make sure that you use different user IDs for the three different IBM BPM databases.

Planning the number of databases

To edit the BPMConfig properties file as required, you must know the number of databases that must be set up for a shared or an unshared database environment, for either a new installation or a migration from a previous version of IBM Business Process Manager. The number of databases can be adjusted based on the configuration of your deployment environment.
- "IBM BPM Standard" on page 39
- "IBM BPM Advanced" on page 41

Databases are different from database schemas. Database schemas can share the same database. IBM BPM components such as Messaging, BusinessSpace, and ProcessServer are assigned to database schemas. When no name conflicts occur between database objects, components can share the same database. Components such as Process Server and Performance Data Warehouse (PDW) do not have database schema support; therefore, they cannot share the same database.

The default database configuration always uses as few databases as possible. For each deployment environment configuration, the following images illustrate the default database configuration.

IBM BPM Standard

The default configuration for IBM BPM Standard uses three databases, with the corresponding database schemas and assigned components.

*   The SharedDB schema contains the database objects for the Messaging and BusinessSpace components.
*   The ProcessServerDB schema contains the database objects for the ProcessServer and EmbeddedECM (IBM BPM document store) components.
*   The PerformanceDB schema contains the database objects for the Performance Data Warehouse (PDW) component.

In the following image, the database names are shown in blue, and the database schema names are shown in green.

CMNDB (DE)
SharedDB
(Messaging,
BusinessSpace)

BPMDB
ProcessServerDB
(Process Server,
EmbeddedECM)

PDWDB
PerformanceDB
(Performance
Data Warehouse)
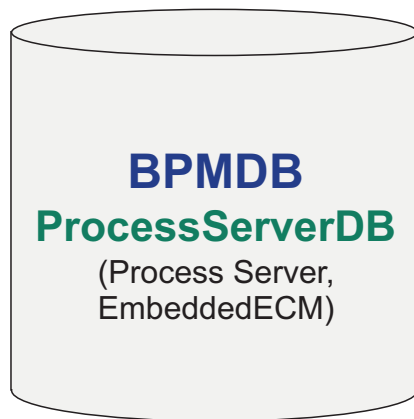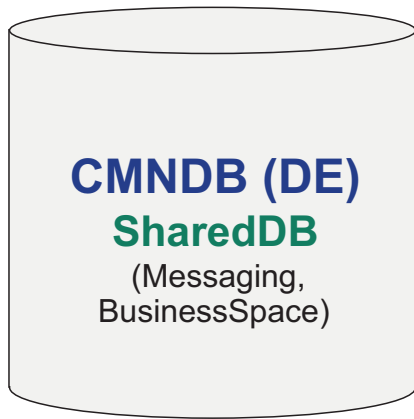
Legend

EmbeddedECM - IBM BPM document store

For example, the configuration properties file for a Standard DE configuration can have the following configuration properties:

```
bpm.de.db.2.name=ProcessServerDb
bpm.de.db.2.dbCapabilities=ProcessServer,EmbeddedECM
bpm.de.db.2.databaseName=BPMDB
```

IBM BPM Advanced

The default configuration for IBM BPM Advanced uses three databases, with the corresponding database schemas and assigned components.

- The CellOnlyDB schema exists only in the Advanced and AdvancedOnly deployment environments, and is part of the CMNDB database by default. The CellOnlyDB schema contains the database objects for the Application scheduler (AppSched), Mediations (Meds), Relationship manager (Rels), and Enterprise Service Bus Logger Mediation (ESBLogMed) components.
- The SharedDB schema, which is also a part of the CMNDB database, contains the database objects for the Messaging (MEDB), CommonDB, BusinessSpace (BSpace), and Business Process Choreographer (BPC) components.

In the following image, the database names are shown in blue, and the database schema names are shown in green.

CMNDB (DE)

SharedDB

(Messaging, CommonDB,
BusinessSpace, BPC)

CellOnlyDB

(AppSched, Meds,
Rels, ESBLogMed)

BPMDB

ProcessServerDB

(Process Server,
EmbeddedECM)

PDWDB

PerformanceDB

(Performance
Data Warehouse)
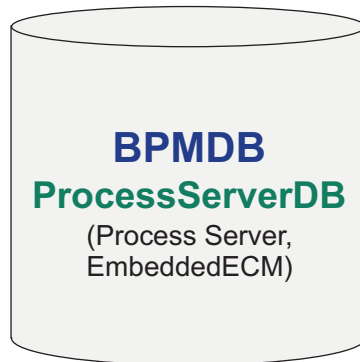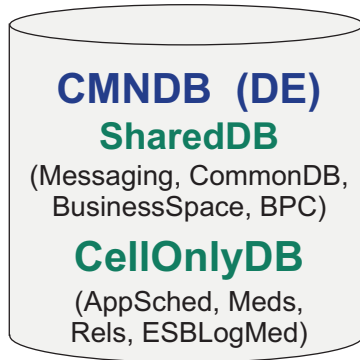
Legend

BPC - Business Process Choreographer

AppSched = Application scheduler

Meds = Mediations

Rels = Relationship manager

ESBLogMed = Enterprise Service Bus Logger Mediation

EmbeddedECM - IBM BPM document store

Important: If you configure the optional Business Process Archive Manager, which allows you to move completed BPEL process instances and human tasks from the Business Process Choreographer database to a separate archive database, then you also require the BPARCDB database.

If you configured an Advanced-only Process Server deployment environment, the default configuration uses one database, CMNDB, with the corresponding database schemas (CellOnlyDB and SharedDB) and assigned components.
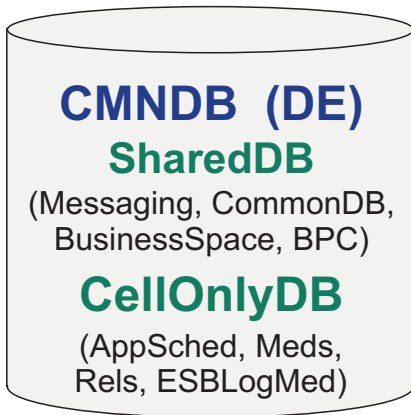
CMNDB (DE)
SharedDB
(Messaging, CommonDB,
BusinessSpace, BPC)
CellOnlyDB
(AppSched, Meds,
Rels, ESBLogMed)

Legend

BPC - Business Process Choreographer

AppSched = Application scheduler

Meds = Mediations

Rels = Relationship manager

ESBLogMed = Enterprise Service Bus Logger Mediation

EmbeddedECM - IBM BPM document store

Database privileges

Set database privileges to determine the authority that you must have to create or access your data store tables for each supported database management system.

Related reference:

▸ Database privileges in WebSphere Application Server

DB2 database privileges

Set database privileges to determine the authority that you must have to create or access your data store tables for DB2 databases.

When you create database schemas using the typical installation or database scripts that are generated using the BPMConfig command-line utility, your user ID must have the authority to create tables. When the tables are created, you must have the authority to select, insert, update, and delete information in the tables.

The following table describes the database privileges that are needed to access the data stores.

Table 24. Database privileges

Minimum privileges that are required to create objects in the database	Minimum privileges that are required to access objects in the database
The user ID needs CREATETAB authority on the database and CREATETS to create the table space. The user ID also needs CREATEIN and DROPIN privilege on the schema. The user ID needs system privileges CREATEDBA and CREATEDBC. The user ID also needs ALTER, DELETE, INDEX, INSERT, REFERENCES, SELECT, and UPDATE privileges on the created tables.	The user ID needs SELECT, INSERT, UPDATE, and DELETE privileges on the tables. The user ID also needs EXECUTE ON PROCEDURE on stored procedures. See the following table for detailed DB2 database privileges for IBM Business Process Manager components.

The following table describes more DB2 database privileges for IBM Business Process Manager components. The installation privileges are the privileges that are required to install and configure the product. The runtime privileges are the database privileges that are required to run the product.

Table 25. Detailed DB2 database privileges

Component	Installation privileges	Runtime privileges
Common DB	CREATE TABLE, CREATE INDEXTYPE, ALTER TABLE, INSERT, CREATE SEQUENCE, CREATE USER, ALTER USER, CREATE TABLESPACE	SELECT, UPDATE, DELETE, INSERT, CREATE VIEW, CREATE PROCEDURE, USAGE ON SEQUENCE
Business Space	CREATE TABLE, CREATE INDEXTYPE, ALTER TABLE, INSERT, CREATE SEQUENCE, CREATE USER, ALTER USER, CREATE TABLESPACE	SELECT, UPDATE, DELETE, INSERT, CREATE VIEW, CREATE PROCEDURE
Business Process Choreographer	CREATE TABLE, ALTER TABLE, CREATE VIEW, CREATE TABLESPACE, CREATE USER, CREATE PROCEDURE	SELECT, UPDATE, DELETE, INSERT
Messaging Engines	CREATE TABLE, CREATE INDEXTYPE	SELECT, UPDATE, DELETE, INSERT, DROP ANY TABLE **Note:** Messaging Engines use the TRUNCATE TABLE SQL statement, which might require the DROP ANY TABLE privilege. See Database privileges.

Table 25. Detailed DB2 database privileges (continued)

Component	Installation privileges	Runtime privileges
Process Server or Performance Data Warehouse	Required to create the database: • CREATEDBA • CREATEDBC Required to populate the database with our schemas and stored procedures: • CREATETAB • CREATEIN • DROPIN Additional required privileges on the created tables: • ALTER • DELETE • INDEX • INSERT • REFERENCES • SELECT • UPDATE	Required privileges on the tables in the Process Server and Performance Data Warehouse databases: • DELETE • INSERT • REFERENCES • SELECT • UPDATE The runtime user must have EXECUTE ON PROCEDURE privileges on the six stored procedures in the createProcedure_ProcessServer.sql script. The runtime user requires all of the listed privileges on the Performance Tracking Server database as well. In addition, the user also must be able to create new tables in the Performance Tracking database, requiring the CREATETAB privilege. To read the system metadata tables, the SELECT permission is required on **syscat.tables**, **syscat.views**, **syscat.columns**, **syscat.tabconst**, and **sysibm.sysdummy1**.

Syntax for creating a database and assigning rights to a DB2 user:

```
create database @DB_NAME@ automatic storage yes  using codeset UTF-8 territory US pagesize 32768;
connect to @DB_NAME@;
grant dbadm on database to user @DB_USER@;
UPDATE DB CFG FOR @DB_NAME@ USING LOGFILSIZ 4096 DEFERRED;
UPDATE DB CFG FOR @DB_NAME@ USING LOGSECOND 64 DEFERRED;
connect reset;
```

In the above example, replace *@DB_NAME@* with the name that you want to use for the created database and *@DB_USER@* with the user name that you want to use for the database.

Related reference:

⮕ Database privileges in WebSphere Application Server

DB2 for z/OS database privileges

Set database privileges to determine the authority that you must have to create or access your data store tables for DB2 for z/OS databases.

When you create database schemas using the typical installation or database scripts that are generated using the BPMConfig command-line utility, your user ID must have the authority to create tables. When the tables are created, you must have the authority to select, insert, update, and delete information in the tables.

The following table describes the database privileges that are needed to access the data stores.

Table 26. Database privileges

Minimum privileges that are required to create objects in the database	Minimum privileges that are required to access objects in the database
The user ID needs CREATETAB authority on the database and CREATETS to create the table space. The user ID also needs CREATEIN and DROPIN privilege on the schema. To create storage groups for the database, the user ID needs CREATESG, CREATEDBA, and CREATEDBC system privileges. The user ID also needs ALTER, DELETE, INDEX, INSERT, REFERENCES, SELECT, and UPDATE privileges on the created tables.	The user ID needs SELECT, INSERT, UPDATE, and DELETE privileges on the tables. The user ID also needs EXECUTE ON PROCEDURE on stored procedures. See the following table for detailed DB2 for z/OS database privileges for IBM Business Process Manager components.

The following table describes more DB2 for z/OS database privileges for IBM Business Process Manager components. The installation privileges are the privileges that are required to install and configure the product. The runtime privileges are the database privileges that are required to run the product.

Table 27. Detailed DB2 for z/OS database privileges

Component	Installation privileges	Runtime privileges
Common DB	CREATE TABLE, CREATE INDEXTYPE, ALTER TABLE, INSERT, CREATE SEQUENCE, CREATE USER, ALTER USER, CREATE TABLESPACE	SELECT, UPDATE, DELETE, INSERT, CREATE VIEW, CREATE PROCEDURE, USAGE ON SEQUENCE, USAGE
Business Space	CREATE TABLE, CREATE INDEXTYPE, ALTER TABLE, INSERT, CREATE SEQUENCE, CREATE USER, ALTER USER, CREATE TABLESPACE	SELECT, UPDATE, DELETE, INSERT, CREATE VIEW, CREATE PROCEDURE, USAGE ON SEQUENCE
Business Process Choreographer	CREATE TABLE, ALTER TABLE, CREATE VIEW, CREATE TABLESPACE, CREATE USER, CREATE PROCEDURE	SELECT, UPDATE, DELETE, INSERT
Messaging Engines	CREATE TABLE, CREATE INDEXTYPE	SELECT, UPDATE, DELETE, INSERT, DROP ANY TABLE **Note:** Messaging Engines use the TRUNCATE TABLE SQL statement, which might require the DROP ANY TABLE privilege. See Database privileges.

Table 27. Detailed DB2 for z/OS database privileges (continued)

Component	Installation privileges	Runtime privileges
Process Server or Performance Data Warehouse	Required to create the database: • CREATESG • CREATEDBA • CREATEDBC Required to populate the database with our schemas and stored procedures: • CREATETS • CREATETAB • CREATEIN • DROPIN Additional required privileges on the created tables: • ALTER • DELETE • INDEX • INSERT • REFERENCES • SELECT • UPDATE	Required privileges on the tables in the Process Server and Performance Data Warehouse databases: • DELETE • INSERT • REFERENCES • SELECT • UPDATE The runtime user must have EXECUTE ON PROCEDURE privileges on the six stored procedures in the `createProcedure_ProcessServer.sql` script. The runtime user requires all of the listed privileges on the Performance Tracking Server database as well. In addition, the user also must be able to create new tables in the Performance Tracking database, requiring the CREATETS and CREATETAB privileges. To read the system metadata tables, the SELECT permission is required on **sysibm.systables**, **sysibm.sysviews**, **sysibm.syscolumns**, **sysibm.syschecks**, **sysibm.sysrels**, **sysibm.systabconst**, **sysibm.systablespace**, and, **sysibm.sysdummy1**.

Related reference:

 Database privileges in WebSphere Application Server

Oracle database privileges

Set database privileges to determine the authority that you must have to create or access your data store tables for Oracle databases.

When you create database schemas using the typical installation or database scripts that are generated using the BPMConfig command-line utility, your user ID must have the authority to create tables. When the tables are created, you must have the authority to select, insert, update, and delete information in the tables.

The following table describes the database privileges that are needed to access the data stores.

Table 28. Database privileges

Minimum privileges that are required to create objects in the database	Minimum privileges that are required to access objects in the database
The user ID needs sufficient privilege to create relational tables and indexes in the data store schema. The database also needs a space quota in the default table space of the owner of that schema.	The user ID needs the SESSION privilege to connect to the database. If the same user ID owns both the data store schema, and the component that is connecting to the database, the user ID has sufficient privilege to manipulate the tables. Otherwise, the user ID needs SELECT, INSERT, UPDATE, ALTER, and DELETE object privileges on the tables that make up the data store, and the DROP ANY TABLE system privilege to enable the use of the TRUNCATE TABLE statement. The user ID also requires the CREATE INDEX privilege. See the following table for detailed Oracle database privileges for IBM Business Process Manager and WebSphere Enterprise Service Bus components.

The following table describes more Oracle database privileges for IBM Business Process Manager components. The installation privileges are the privileges that are required to install and configure the product. The runtime privileges are the database privileges that are required to run the product.

Important: If you configure all the following components for a single Oracle database, you can create a superset of all the privileges that are specified for each component. If you configure the four components for numerous databases, you can set different privileges for each.

Table 29. Detailed Oracle database privileges

Component	Installation privileges	Runtime privileges
Common DB	The following privileges are for the situation when a DBA creates users and all the database objects for those users. The DBA requires the following privileges: CREATE USER, ALTER USER, CREATE ANY TABLE, ALTER ANY TABLE, DROP ANY TABLE, SELECT ANY TABLE, UPDATE ANY TABLE, INSERT ANY TABLE, DELETE ANY TABLE, CREATE ANY INDEX, DROP ANY INDEX, CREATE ANY VIEW, DROP ANY VIEW, CREATE ANY PROCEDURE, DROP ANY PROCEDURE, CREATE ANY SEQUENCE The following privileges are for the situation when a DBA has created a Common DB user and that user creates the database objects, owns them, and uses them at runtime: CREATE TABLE, CREATE VIEW, CREATE PROCEDURE, CREATE SEQUENCE	The following privileges are for the situation when a DBA has created a Common DB user and that user creates the database objects, owns them, and uses them at runtime. explicit privileges: CREATE PROCEDURE CREATE VIEW implicit privileges (included in the ownership of the database objects): SELECT INSERT UPDATE DELETE

Table 29. Detailed Oracle database privileges (continued)

Component	Installation privileges	Runtime privileges
Business Space	The following privileges are for the situation when a DBA creates users and all the database objects for those users. The DBA requires the following privileges: CREATE USER, ALTER USER, CREATE ANY TABLE, ALTER ANY TABLE, DROP ANY TABLE, SELECT ANY TABLE, UPDATE ANY TABLE, INSERT ANY TABLE, DELETE ANY TABLE, CREATE ANY INDEX, DROP ANY INDEX, CREATE ANY VIEW, DROP ANY VIEW, CREATE ANY PROCEDURE, DROP ANY PROCEDURE The following privileges are for the situation when a DBA has created a Business Space user and that user creates the database objects, owns them, and uses them at runtime: CREATE TABLE, CREATE VIEW, CREATE PROCEDURE	The following privileges are for the situation when a DBA has created a Business Space user and that user creates the database objects, owns them, and uses them at runtime. explicit privileges: CREATE PROCEDURE CREATE VIEW implicit privileges (included in the ownership of the database objects): SELECT INSERT UPDATE DELETE
Business Process Choreographer	The following privileges are for the situation when a DBA creates users and all the database objects for those users. The DBA requires the following privileges: CREATE USER, ALTER USER, CREATE TABLESPACE, CREATE ANY TABLE, ALTER ANY TABLE, DROP ANY TABLE, SELECT ANY TABLE, UPDATE ANY TABLE, INSERT ANY TABLE, DELETE ANY TABLE, CREATE ANY INDEX, DROP ANY INDEX, CREATE ANY VIEW, DROP ANY VIEW, CREATE ANY PROCEDURE, DROP ANY PROCEDURE The following privileges are for the situation when a DBA has created a Business Process Choreographer user and that user creates the database objects, owns them, and uses them at runtime: CREATE TABLE, CREATE VIEW, CREATE PROCEDURE.	The following privileges are for the situation when a DBA has created a Business Process Choreographer user and that user creates the database objects, owns them, and uses them at runtime. explicit privileges: CREATE PROCEDURE CREATE VIEW implicit privileges (included in the ownership of the database objects): SELECT INSERT UPDATE DELETE

Table 29. Detailed Oracle database privileges (continued)

Component	Installation privileges	Runtime privileges
Common Event Infrastructure (CEI)	The following privileges are for the situation when a DBA creates users and all the database objects for those users. The DBA requires the following privileges: CREATE USER, ALTER USER, CREATE INDEXTYPE, ALTER ANY TABLE, ALTER SESSION, CREATE TABLESPACE, CREATE PROFILE, CREATE ROLE, CREATE TEMPORARY TABLESPACE The following privileges are for the situation when a DBA has created a Common Event Infrastructure user and that user creates the database objects, owns them, and uses them at runtime: CREATE TABLE, CREATE VIEW, CREATE PROCEDURE.	The following privileges are for the situation when a DBA has created a Common Event Infrastructure user and that user creates the database objects, owns them, and uses them at runtime. explicit privileges: CREATE PROCEDURE implicit privileges (included in the ownership of the database objects): SELECT INSERT UPDATE DELETE
Messaging Engines	The following privileges are for the situation when a DBA creates users and all the database objects for those users. The DBA requires the following privileges: CREATE USER, ALTER USER, CREATE ANY TABLE, ALTER ANY TABLE, DROP ANY TABLE, SELECT ANY TABLE, UPDATE ANY TABLE, INSERT ANY TABLE, DELETE ANY TABLE, CREATE ANY INDEX, DROP ANY INDEX The following privileges are for the situation when a DBA has created a Messaging Engines user and that user creates the database objects, owns them, and uses them at runtime: CREATE TABLE	The following privileges are for the situation when a DBA has created a Messaging Engines user and that user creates the database objects, owns them, and uses them at runtime. explicit privileges: DROP ANY TABLE implicit privileges (included in the ownership of the database objects): SELECT INSERT UPDATE DELETE **Tip:** Messaging Engines use the TRUNCATE TABLE SQL statement, which might require the DROP ANY TABLE privilege. See Database privileges. If you prefer not to give the user this privilege, you can avoid it, at a performance cost, by using tuning. See Database privileges in WebSphere Application Server.

Table 29. Detailed Oracle database privileges (continued)

Component	Installation privileges	Runtime privileges

Process Server	The following privileges are for the situation when a DBA creates users and all the database objects for those users. The DBA requires the following privileges:
	
	    CREATE USER
	    ALTER USER
	    CREATE TABLESPACE
	    CREATE ANY TABLE
	    ALTER ANY TABLE
	    DROP ANY TABLE
	    SELECT ANY TABLE
	    UPDATE ANY TABLE
	    INSERT ANY TABLE
	    DELETE ANY TABLE
	    LOCK ANY TABLE
	    CREATE ANY INDEX
	    DROP ANY INDEX
	    CREATE ANY VIEW
	    DROP ANY VIEW
	    CREATE ANY PROCEDURE
	    DROP ANY PROCEDURE
	    CREATE ANY SEQUENCE
	    DROP ANY SEQUENCE
	
	The following privileges are for the situation when a DBA has created a Process Server user and that user creates the database objects, owns them, and uses them at runtime.
	
	• explicit privileges:
	    CREATE TABLE
	    CREATE PROCEDURE
	    CREATE SEQUENCE
	    CREATE VIEW
	• implicit privileges (included in the ownership of the database objects):
	    INSERT
	    UPDATE
	    DELETE
	    ALTER
	    DROP
		The following privileges are for the situation when a DBA created a Process Server user and that user creates the database objects, owns them, and uses them at runtime.
		
		• explicit privileges:
		    CREATE TABLE
		    CREATE PROCEDURE
		    CREATE SEQUENCE
		    CREATE VIEW
		• implicit privileges (included in the ownership of the database objects):
		    SELECT
		    INSERT
		    UPDATE
		    DELETE

Table 29. Detailed Oracle database privileges (continued)

Component	Installation privileges	Runtime privileges
Performance Data Warehouse	The following privileges are for the situation when a DBA creates users and all the database objects for those users. The DBA requires the following privileges: CREATE USER ALTER USER CREATE TABLESPACE CREATE ANY TABLE ALTER ANY TABLE DROP ANY TABLE SELECT ANY TABLE UPDATE ANY TABLE INSERT ANY TABLE DELETE ANY TABLE LOCK ANY TABLE CREATE ANY INDEX DROP ANY INDEX CREATE ANY VIEW DROP ANY VIEW CREATE ANY PROCEDURE DROP ANY PROCEDURE CREATE ANY SEQUENCE DROP ANY SEQUENCE The following privileges are for the situation when a DBA has created a Performance Data Warehouse user and that user creates the database objects, owns them, and uses them at runtime. explicit privileges: CREATE TABLE CREATE PROCEDURE CREATE SEQUENCE CREATE VIEW implicit privileges (included in the ownership of the database objects): INSERT UPDATE DELETE	The following privileges are for the situation when a DBA created a Performance Data Warehouse user and that user creates the database objects, owns them, and uses them at runtime. explicit privileges: CREATE TABLE CREATE PROCEDURE CREATE SEQUENCE CREATE VIEW implicit privileges (included in the ownership of the database objects): SELECT INSERT UPDATE DELETE All schemas or users that are creating or migrating IBM BPM profiles must have access to the **DBMS_LOCK** package. Set the **Execute** permission on the **DBMS_LOCK** package for the Oracle user or schema that is using the performance database as shown in the following example: `GRANT execute ON DBMS_LOCK TO <schema_name>` In this example, *schema_name* is the user ID that is used for the performance database.

Syntax for assigning rights to an Oracle user:

```
CREATE USER @DB_USER@ IDENTIFIED BY @DB_PASSWD@;
grant connect, resource, unlimited tablespace to @DB_USER@;
grant create view to @DB_USER@;
grant javauserpriv to @DB_USER@;
grant execute on dbms_lock to @DB_USER@;
```

Related reference:

⇨ Database privileges in WebSphere Application Server

SQL Server database privileges

Set database privileges to determine the authority that you must have to create or access your data store tables for SQL Server databases.

Permissions in SQL Server are assigned to roles which can be assigned to users, similar to windows user groups. There are two types of roles:

- **Server roles** provision database server related permissions such as backup, shutdown, creating new databases, managing logins, and linking to other servers.
- **Database roles** provision more traditional database permissions such as table access and those listed below.

Note: You can be a member of multiple roles such that you can combine the permissions of different fixed roles to find just the right combination for your requirements.

Assign the IBM Business Process Manager database user to the following three roles:

Note: The database must be created by the database administrator who can then assign these roles to the database user for IBM Business Process Manager.

- **db_ddladmin**
- **db_datawriter**
- **db_datareader**

For information about the permissions that are provided by these roles, see documentation from Microsoft.

When you create database schemas using the typical installation or database scripts that are generated using the BPMConfig command-line utility, your user ID must have the authority to create tables. When the tables are created, you must have the authority to select, insert, update, and delete information in the tables.

The above three fixed database roles cover 80% of the requirements, the remaining permissions are:

- •CREATE INDEXTYPE: No INDEXTYPE. but **db_ddladmin** can create indexes and specify the type
- •CREATE TABLESPACE: No TABLESPACE but similar concepts are WORKLOAD GROUP, RESOURCE POOL, and PARTITION SCHEME
- •ALTER LOCK TABLE: This functionality is available through Lock hinting using the read or write commands (eg SELECT * FROM *tbl name* WHERE TABLOCKX
- •CREATE SEQUENCE: This command is in the SQL Server 2012 documentation but not 2008 R2

The following table describes the database privileges that are needed to access the data stores.

Table 30. Database privileges

Minimum privileges that are required to create objects in the database	Minimum privileges that are required to access objects in the database
The user ID ideally requires DB OWNER privileges on the data stores used for IBM Business Process Manager.	Configure the SQL Server for SQL Server and Windows authentication so that authentication to be based on an SQL server login ID and password. The user ID must be the owner of the tables, or a member of a group that has sufficient authority to issue TRUNCATE TABLE statements. See the following table for the detailed privileges.

The following table describes more SQL Server database privileges for IBM Business Process Manager components. The installation privileges are the privileges that are required to install and configure the product. The runtime privileges are the database privileges that are required to run the product.

Table 31. Detailed SQL Server database privileges

Component	Installation privileges	Runtime privileges
Common DB	CREATE TABLE, ALTER TABLE, INSERT, CREATE USER, ALTER USER	SELECT, UPDATE, DELETE, INSERT, CREATE VIEW, CREATE PROCEDURE
Business Space	CREATE TABLE, ALTER TABLE, INSERT, CREATE USER, ALTER USER	SELECT, UPDATE, DELETE, INSERT, CREATE VIEW, CREATE PROCEDURE
Business Process Choreographer	CREATE TABLE, ALTER TABLE, CREATE VIEW, CREATE USER, CREATE PROCEDURE	SELECT, UPDATE, DELETE, INSERT
Messaging Engines	CREATE TABLE	SELECT, UPDATE, DELETE, INSERT, DROP ANY TABLE **Note:** Messaging Engines use the TRUNCATE TABLE SQL statement, which might require the DROP ANY TABLE privilege. See Database privileges.
Process Server	CREATE TABLE, SELECT, INSERT, UPDATE, DELETE TABLE, DROP TABLE, CREATE INDEX, CREATE VIEW, DROP VIEW, CREATE PROCEDURE, CREATE USER, ALTER USER	SELECT, UPDATE, DELETE, INSERT, CREATE VIEW, CREATE PROCEDURE, DROP TABLE, DROP VIEW
Performance Data Warehouse	CREATE TABLE, SELECT, INSERT, UPDATE, DELETE TABLE, DROP TABLE, CREATE INDEX, CREATE VIEW, DROP VIEW, CREATE PROCEDURE, CREATE USER, ALTER USER	SELECT, UPDATE, DELETE, INSERT, CREATE VIEW, CREATE PROCEDURE, DROP TABLE, DROP VIEW

Syntax for creating BPMDB and PDWDB databases in SQL Server is **CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS;**

Syntax for creating the CommonDB database in SQL Server is **CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS;**

Note:

- The BPMDB and PDWDB databases must be created as case-insensitive. Use the command **COLLATE SQL_Latin1_General_CP1_CI_AS**, where **CI** is the **COLLATE** attribute value that is applicable for the case-insensitive databases.
- The CommonDB database must be created as case-sensitive. Use the command **COLLATE SQL_Latin1_General_CP1_CS_AS**, where **CS** is the **COLLATE** attribute value that is applicable for the case-sensitive databases.

Syntax for creating the users and schemas for the SQL Server databases is as follows:

```
USE master
GO
CREATE LOGIN @DB_USER@ WITH PASSWORD='@DB_PASSWD@'
GO

USE @DB_NAME@
GO
CREATE USER @DB_USER@ FOR LOGIN @DB_USER@ WITH DEFAULT_SCHEMA=@DB_USER@
GO
CREATE SCHEMA @DB_USER@ AUTHORIZATION @DB_USER@
GO
EXEC sp_addrolemember 'db_ddladmin', @DB_USER@;
EXEC sp_addrolemember 'db_datareader', @DB_USER@;
EXEC sp_addrolemember 'db_datawriter', @DB_USER@;
```

Important: For Performance Data Warehouse users, note the following restrictions:
- The user cannot be assigned to the system administrator (SYSADMIN) role.
- The user must be mapped to the master database with the SqlJDBCXA user role.

For more information, see the WebSphere Application Server page in the related reference.

Related reference:

↪ Database privileges in WebSphere Application Server

User ID or schema name privileges

During the installation of IBM Business Process Manager, you can use the default schema name and user ID privileges to install your databases. However, your database design might require separate user ID or schema name privileges.

Review the provided scenarios to determine when and how to configure different schema names and user ID privileges when you install IBM Business Process Manager.

Scenario for a single user ID or schema name privileges

If you chose a default installation for your databases, IBM Business Process Manager requires a minimum of one user ID or schema name that can create tables and to select, insert, update, and delete rows in those tables. You can use the Profile Management Tool or the installer to create your databases.

The following table shows the default database configuration properties when you use DB2 as your database. Other databases have different default configuration properties for database configuration.

Table 32. Scenario: Single user ID or schema

Database tables	Default database name with DB2	User ID or schema name
Common database tables	CMNDB	IBM Business Process Manager provides a user ID during installation.

Table 32. Scenario: Single user ID or schema (continued)

Database tables	Default database name with DB2	User ID or schema name
Messaging tables	MEDB	IBM Business Process Manager provides a schema name during installation.

If your database design has different properties, you might need multiple user ID and schema name privileges. The following scenarios show you how to apply the configuration to achieve your design. Even if your particular design is not in the provided scenarios, you can adapt some of the ideas to implement your particular design.

Scenario 1 for multiple user ID or schema name privileges

In this scenario, you use a schema name that is the same as the user ID privileges, but you do not use the default schema name or a user ID that was specified during installation. This single user ID can access all of the database and also create all needed tables. The following examples show scenario 1 privileges:

* Schema name: dog
* Schema name for SCA.SYSTEM ME : dogSYS
* Schema name for SCA.APP ME: dogAPP
* Schema name for Event ME: dogEvent
* User ID to create schemas: dog
* User ID to select, insert, update, and delete schemas: dog

The following table contains information about how to set up the schema name and user ID privileges with DB2 as your database. If you choose a different database, see their documentation for setting up schema names and user ID privileges.

Table 33. Scenario 1: Multiple user ID or schema

Database tables	Database name with DB2	Schema name	User ID to create tables	User ID to select, insert, update, and delete rows
Common database tables	You supply this value in the • Installation wizard • Profile Management Tool • Silent install • Silent profile creation	This schema name is the same as the user ID that is used to select, insert, update, and delete rows.	This value is the same as the user ID that is used to select, insert, update, and delete rows.	You supply this value in the • Installation wizard • Profile Management Tool • Silent install • Silent profile creation

Scenario 2 for multiple user ID or schema name privileges

In this scenario, you use the same schema name and user ID to select, insert, update, and delete schemas. However, you use a different user ID to create the schemas. The following examples show scenario 2 privileges:

* Schema name: snow
* Schema name for SCA.SYSTEM ME: snowSYS
* Schema name for SCA.APP ME: snowAPP
* Schema name for Event ME: snowEvent
* User ID to create the schemas: rock
* User ID to select, insert, update, and delete schemas: snow

The following table contains information about how to set up the schema name and user ID privileges with DB2 as your database. If you choose a different database, see their documentation for setting up schema names and user ID privileges.

Table 34. Scenario 2: Multiple user ID or schema

Database tables	Database name with DB2	Schema name	User ID to create tables	User ID to select, insert, update, and delete rows

Common database tables	You supply this value twice:
	
	1. In table creation scripts
	2. During the IBM Business Process Manager configuration with one of the following tools:
	  • Administrative console
	  • Installation wizard
	  • Profile Management Tool
	  • Silent install
	  • Silent profile creation
	
	Restriction: If you run the installer first, then you supply the value once because the generated scripts already contain the correct schema name and user ID values.
		The table creation scripts need to be modified with the schema name that allows reading and writing rows.	The table creation script needs to be modified with the user ID that allows table creation.	You supply the user ID during profile creation through one of the following tools:
				  • Installation wizard
				  • Profile Management Tool
				  • Silent install
				  • Silent profile creation

Scenario 3 for multiple user ID or schema name privileges

In this scenario, you use the same user ID to create all schemas. However, each schema has a different user ID to select, insert, update, and delete rows. The following list shows examples of privileges for Scenario 3:

- Schema name: waterCom
- Schema name for common tables: waterCom
- Schema name for SCA.SYSTEM ME: waterSYSME
- Schema name for SCA.APP ME: waterAPPME
- Schema name for Event ME: waterEventME
- Schema name for ESBMessaging tables: waterESB
- User ID to create schemas: milk
- User ID to select, insert, update, and delete schemas:

Schema name	User ID to select, insert, update, and delete schemas
waterCom	waterCom
waterSYSME	waterSYSME

Schema name	User ID to select, insert, update, and delete schemas
waterAPPME	waterAPPME
waterEventME	waterEventME
waterESB	waterESB

The following table contains information about how to set up the schema name and user ID privileges with DB2 as your database. If you choose a different database, see their documentation for setting up schema names and user ID privileges.

Table 35. Scenario 3: Multiple user ID or schema

Database tables	Database name with DB2	Schema name	User ID to create tables	User ID to select, insert, update, and delete rows
Common database tables	You supply this value in the • Installation wizard • Profile Management Tool • Silent install • Silent profile creation	This schema name is the same as the user ID that is used to select, insert, update, and delete rows.	This value is the same as the user ID that is used to select, insert, update, and delete rows.	You supply the user ID during profile creation through one of the following tools: • Installation wizard • Profile Management Tool • Silent install • Silent profile creation
Messaging tables	You supply this value with the definition of each messaging engine.	The table creation scripts must include the schema name that is used to select, insert, update, and delete rows.	This value is the same as the user ID that is used to select, insert, update, and delete rows.	You supply this value during the creation of the messaging engine. Select the **Create Table** option during the messaging engine configuration.

Chapter 5. Installing and configuring IBM Business Process Manager Express

IBM Business Process Manager Express can be installed and configured for stand-alone topology only. You can install and configure all components on a single server (known as a stand-alone configuration). If you want to achieve a highly available environment with failover support, you should choose or upgrade to IBM Business Process Manager Standard, which can use the clustering mechanism of WebSphere Application Server.

Roadmap: Installing and configuring IBM Business Process Manager Express

The IBM Business Process Manager Express installation and configuration programs accommodate various development and production scenarios. This roadmap guides you through the most common paths for installing and configuring IBM Business Process Manager Express.

Alternatively, you can use the Interactive Installation and Configuration Guide to answer a series of questions about your target environment and receive installation and configuration topics that are customized to your installation needs.

The roadmap provides the most relevant links for each common installation and configuration scenario, grouped by operating system.

View all | View with tabs

Linux

To install IBM Business Process Manager on Linux, follow this roadmap.

Planning
> Before proceeding with the installation, determine which type of installation you want to perform: typical or custom. Then see Planning for IBM Business Process Manager.

Preparing
> Review the hardware and software requirements, prepare the operating system for installation, and ensure that you installed the database management system:
> - System requirements
> - Preparing Linux systems for installation with a new DB2 Express database
> - Preparing Linux systems for installation with an existing database

Installing
> Based on the decisions made earlier, select the installation option that is most appropriate for your deployment environment, and then complete the steps to install the software.
> - Typical installation and configuration
> - Custom installation and configuration

Configuring
> No configuration is required after you complete the typical installation. After a custom installation, complete the steps in the following procedure to configure the software.

- Configuring profiles and databases

AIX

To install IBM Business Process Manager on AIX, follow this roadmap.

Note: The Express installation on AIX is available for IBM Master Data Management (MDM) users only.

Planning

Before proceeding with the installation, determine which type of installation you want to perform: typical or custom. Then see Planning for IBM Business Process Manager.

Preparing

Review the hardware and software requirements, prepare the operating system for installation, and ensure that you installed the database management system:

- System requirements
- Preparing AIX systems for installation

Installing

Based on the decisions made earlier, select the installation option that is most appropriate for your deployment environment, and then complete the steps to install the software.

- Typical installation and configuration
- Custom installation and configuration

Configuring

No configuration is required after you complete the typical installation. After a custom installation, complete the steps in the following procedure to configure the software.

- Configuring profiles and databases

Windows

To install IBM Business Process Manager on Microsoft Windows, follow this roadmap.

Planning

Before proceeding with the installation, determine which type of installation you want to perform: typical or custom. Then see Planning for IBM Business Process Manager.

Preparing

Review the hardware and software requirements, prepare the operating system for installation, and ensure that you installed the database management system:

- System requirements
- Preparing Windows systems for installation

Installing

Based on the decisions made earlier, select the installation option that is most appropriate for your deployment environment, and then complete the steps to install the software.

- Typical installation and configuration
- Custom installation and configuration

Configuring

No configuration is required after you complete the typical installation. After a custom installation, complete the steps in the following procedure to configure the software.

- Configuring profiles and databases

Preparing to install and configure the software

Before preparing to install and configure the software, create a plan for the deployment environment that you want to create.

Use the information listed in the following table to prepare for installing and configuring IBM Business Process Manager.

Table 36. Preparing for installation and configuration

Task	Where to find information	Result after completing the task
Review hardware and software requirements	Depending on your IBM BPM configuration, visit: • IBM Business Process Manager Advanced system requirements • IBM Business Process Manager Standard system requirements • IBM Business Process Manager Express system requirements	You understand the system requirements necessary to support your IBM Business Process Manager installation.
Prepare your operating system	AIX Preparing AIX systems for installation for IBM Master Data Management (MDM) customers Linux Preparing Linux systems for installation with a new DB2 Express database or Preparing Linux systems for installation with an existing database Windows Preparing Windows systems for installation	You have prepared the operating system of each workstation to be used.

Table 36. Preparing for installation and configuration (continued)

Task	Where to find information	Result after completing the task
Make sure you have installed your database management system.	Consult your database documentation for information about installing and administering your database management system.	Your database management system is installed. IBM Business Process Manager embeds the DB2 Express database. If you want to use DB2 Express as your database, you can select it as a feature from the installer and it is installed and configured automatically. The user must have administrative privileges (root or Administrator) to install DB2 Express. DB2 Enterprise is available with IBM Master Data Management. **Note:** If you already have a version of DB2 installed and you want to install DB2 Express, you must uninstall DB2 before running the IBM Business Process Manager installer. If the installer detects a version of DB2 installed and you have selected to install DB2 Express from the installer, you will receive a warning message and will not be able to install DB2 Express. **Important:** � Linux If you are installing DB2 Express as a root user, you must ensure that all kernel requirements are met before the DB2 Express installation begins. See Kernel parameter requirements (Linux) for a list of the kernel requirements. You can locate the current values by parsing the output of the **ipcs -l** command. **Important:** You will not be able to properly install and use DB2 Express if the password that is specified does not meet operating system or company restrictions, because an operating system user is created on install.

System requirements

Before you install, ensure that your system meets all system requirements.

For the latest information about platform-specific disk space requirements, supported operating systems, and supported database versions, click one of the following links. You can also find operating system fixes and patches that you must install to have a compliant operating system.

- IBM Business Process Manager Express system requirements
- IBM Business Process Manager Tools and Add-Ons Requirements

Preparing operating systems for product installation

Before you can install IBM Business Process Manager, you must prepare your operating system. The configuration depends on the type of operating system you are using.

Before preparing the installation environment, complete the following tasks:

- Disable the firewall if you have a firewall running on the system where you plan to install IBM Business Process Manager.

- Ensure that your user login provides access to your DB2 or Oracle database commands.
- Complete additional tasks specific to your operating system.

Preparing AIX systems for installation

Before you can install IBM Business Process Manager, you must prepare your AIX® operating system.

Note: The steps for AIX systems are applicable for IBM Business Process Manager that is bundled with IBM Master Data Management.

Because certain steps are specific to a version of the operating system, all steps might not apply to your environment. If no qualifier is provided for a particular step, complete the step for all versions of the operating system.

Refer to the following technote for additional preparation information for configuring Installation manager to run on 64-bit AIX systems: Installation Manager graphical environment issues on Solaris, Linux, AIX.

Complete the following steps on your AIX system before installing IBM Business Process Manager:

1. Because WebSphere Application Server is a prerequisite of IBM Business Process Manager, complete the required preparation steps in the Preparing AIX systems for installation topic in the WebSphere Application Server information center.
2. Increase the maximum number of open files. The default setting is usually not enough. You can check your current maximum number of open files by using **ulimit -n**. The following example shows the maximum number of open files being increased to 8800, which is large enough for most systems. The ulimit requirement is dynamically calculated at installation time and might need to be larger based on the options you select.

    Before installing, run the following command:

    ulimit -n 8800

    Alternatively, you can use the following steps to edit the resource limits file:

    a. Open /etc/security/limits.
    b. Edit or add the **default** section and include this line:

        nofiles = 8800

    c. Save and close the file.
    d. Log off from the operating system and log in again.
3. Set the **umask** value to 077 using the following command:

    umask 077

    The value 077 is the most restrictive value that IBM Business Process Manager will tolerate. You can optionally choose to set a less restrictive **umask** value for the following access levels:

    - 037 for read-only access for a group of human administrators and tools
    - 027 for read and write access for a group of human administrators and tools
    - 007 for read, write, and execute access for a group of human administrators and tools
4. Ensure that you have a supported version of Mozilla Firefox installed.
5. Before starting the data movement service, increase the number of processes configured in the AIX operating system to avoid a connection reset error. You can increase the number of processing using a command, or using the AIX interface.

    - Run the command:

      ```
      chdev  -l sys0 -a maxuproc='256'
      ```

    - In the AIX interface, enter **smitty**, then select **System Environments > Change / Show Characteristics of Operating System > Number of processes allowed per user(Num.)**.
6. Complete the steps in Tuning AIX systems.

7. Ensure all servers involved are set to the same time. Use the same network time protocol for all servers on all cluster nodes, including application, support, and database clusters. A time mismatch will cause erratic behavior, including duplicate system tasks.

Related tasks:

⬆ Preparing AIX systems for installation

⬆ Tuning AIX systems

Preparing Linux systems for installation with a new DB2 Express database

Before you can install IBM Business Process Manager, you must prepare your Linux operating system.

Ensure that you have a supported version of Mozilla Firefox installed.

Because certain steps are specific to a version of the operating system, all steps might not apply to your environment. If no qualifier is provided for a particular step, complete the step for all versions of the operating system.

Complete the following steps on your Linux system before installing IBM Business Process Manager:

1. Because WebSphere Application Server is a prerequisite of IBM Business Process Manager, complete all the required preparation steps in the Preparing Linux systems for installation topic in the WebSphere Application Server information center.

2. Ensure that you have administrative (root) privileges. As a root user, you must also ensure that all kernel requirements are met before the DB2 Express installation begins. You can locate the current values by parsing the output of the **ipcs -l** command. To change the values, add the following lines, in the following order, to the /etc/sysctl.conf file. This example is for a computer with 16GB of RAM:

```
kernel.shmmni=4096
kernel.shmmax=17179869184
kernel.shmall=8388608
#kernel.sem=<SEMMSL><SEMMNS><SEMOPM><SEMMNI>
kernel.sem=250 256000 32 4096
kernel.msgmni=16384
kernel.msgmax=65536
kernel.msgmnb=65536
```

3. Run the following command to load the settings from the /etc/sysctl.conf file:

```
sysctl -p
```

For additional information, see Kernel parameter requirement for Linux in the DB2 information center.

4. Increase the allowable stack size, number of open files, and number of processes by adding the following lines to the end of the /etc/security/limits.conf file or changing the values if the lines already exist:

```
# - stack - max stack size (KB)
* soft stack 32768
* hard stack 32768
# - nofile - max number of open files
* soft nofile 65536
* hard nofile 65536
# - nproc - max number of processes
* soft nproc 16384
* hard nproc 16384
```

Save and close the file, and log off and log in again. You can check the current maximum number of open files by using **ulimit -n**. The `ulimit` requirement is dynamically calculated at installation time and might need to be larger based on the options you select. For more information about this

setting, run **man limits.conf** or see the topic Preparing the operating system for product installation in the WebSphere Application Server information center.

5. Check for the existence of a file named /etc/security/limits.d/90-nproc.conf, which overrides the **nproc** value set in the limits.conf file. If the 90-nproc.conf file exists, edit it and set the **nproc** values that are specified in the previous step.

6. If you have previously installed and uninstalled DB2, ensure that the previous database entries in the /etc/services file have been deleted. For example, if the previous entry DB2_instance-name_suffix 50000/tcp still exists, the new installation will use the next available port, 50001, which might not work with your configuration. For more information, see Verifying port range availability in the DB2 information center.

7. Reboot the system.

8. Install the following packages for your operating system:

Option	Description
Red Hat Enterprise Linux 5	libXp-1.0.0-8 rpm-build-4.4.2-37.el5

You can also install a later release of any of these packages if there are new packages as errata. If you have additional packages that are specific to your hardware, install them.

The following command example shows how to use the default package manager on supported Linux distributions.

- **Red Hat Enterprise Linux 5:**

  ```
  yum install libXp rpm-build
  ```

9. Set the **umask** value to 077 using the following command:

   umask 077

The value 077 is the most restrictive value that IBM Business Process Manager will tolerate. You can optionally choose to set a less restrictive **umask** value for the following access levels:

- 037 for read-only access for a group of human administrators and tools
- 027 for read and write access for a group of human administrators and tools
- 007 for read, write, and execute access for a group of human administrators and tools

10. On Red Hat Enterprise Linux 5 systems, disable SELinux, or set it to a permissive mode.

11. Restart the computer.

12. Complete the steps in Tuning Linux systems.

13. Ensure all servers involved are set to the same time. Use the same network time protocol for all servers on all cluster nodes, including application, support, and database clusters. A time mismatch will cause erratic behavior, including duplicate system tasks.

Related tasks:

Preparing Linux systems for installation

Tuning Linux systems

Related reference:

Unable to install Installation Manager on RHEL 6.0 (64-bit)

Related information:

General naming rules for DB2

Preparing Linux systems for installation

Before you can install IBM Business Process Manager, you must prepare your Linux operating system.

Ensure that you have a supported version of Mozilla Firefox installed.

Because certain steps are specific to a version of the operating system, all steps might not apply to your environment. If no qualifier is provided for a particular step, complete the step for all versions of the operating system.

Complete the following steps on your Linux system before installing IBM Business Process Manager:

1. Because WebSphere Application Server is a prerequisite of IBM Business Process Manager, complete all the required preparation steps in the Preparing Linux systems for installation topic in the WebSphere Application Server information center.

2. Increase the allowable stack size, number of open files, and number of processes by adding the following lines to the end of the /etc/security/limits.conf file or changing the values if the lines already exist:

```
# - stack - max stack size (KB)
* soft stack 32768
* hard stack 32768
# - nofile - max number of open files
* soft nofile 65536
* hard nofile 65536
# - nproc - max number of processes
* soft nproc 16384
* hard nproc 16384
```

   Save and close the file, and log off and log in again. You can check the current maximum number of open files by using **ulimit -n**. The `ulimit` requirement is dynamically calculated at installation time and might need to be larger based on the options you select. For more information about this setting, run **man limits.conf** or see the topic Preparing the operating system for product installation in the WebSphere Application Server information center.

3. Check for the existence of a file named /etc/security/limits.d/90-nproc.conf, which overrides the **nproc** value set in the limits.conf file. If the 90-nproc.conf file exists, edit it and set the **nproc** values that are specified in the previous step.

4. Install the following packages for your operating system:

Option	Description
Red Hat Enterprise Linux 5	libXp-1.0.0-8 rpm-build-4.4.2-37.el5

   You can also install a later release of any of these packages if there are new packages as errata. If you have additional packages that are specific to your hardware, install them.

   The following command example shows how to use the default package manager on supported Linux distributions.

   - **Red Hat Enterprise Linux 5:**

     ```
     yum install libXp rpm-build
     ```

5. Set the `umask` value to 077 using the following command:

   umask 077

   The value 077 is the most restrictive value that IBM Business Process Manager will tolerate. You can optionally choose to set a less restrictive `umask` value for the following access levels:

   - 037 for read-only access for a group of human administrators and tools
   - 027 for read and write access for a group of human administrators and tools
   - 007 for read, write, and execute access for a group of human administrators and tools

6. On Red Hat Enterprise Linux 5 systems, disable SELinux, or set it to a permissive mode.

7. Restart the computer.

8. Complete the steps in Tuning Linux systems.

9. Ensure all servers involved are set to the same time. Use the same network time protocol for all servers on all cluster nodes, including application, support, and database clusters. A time mismatch will cause erratic behavior, including duplicate system tasks.

10. If you are using DB2, make sure that all your DB2 parameters meet the DB2 naming rules.

Related tasks:

⇨ Preparing Linux systems for installation

⇨ Tuning Linux systems

Related reference:

⇨ Unable to install Installation Manager on RHEL 6.0 (64-bit)

Related information:

⇨ General naming rules for DB2

Preparing Windows systems for installation

Before you can install IBM Business Process Manager, you must prepare your Windows operating system.

If you are planning to use DB2 Express with your IBM Business Process Manager installation, the user account must have administrative privileges (Administrator) on the machine where you will perform the installation.

Because WebSphere Application Server is a prerequisite product for IBM Business Process Manager, you must complete all of the preparation tasks for WebSphere Application Server before installing IBM Business Process Manager.

Complete the following steps on your Windows system before installing IBM Business Process Manager:

1. Complete the steps in the Preparing Windows systems for installation topic in the WebSphere Application Server information center.

2. Complete the steps in Tuning Windows systems.

3. Ensure all servers involved are set to the same time. Use the same network time protocol for all servers on all cluster nodes, including application, support, and database clusters. A time mismatch will cause erratic behavior, including duplicate system tasks.

4. If you are installing on Windows 2008 R2 and you plan to install DB2 Express as part of the IBM Business Process Manager installation, ensure you have compatible Microsoft Visual C++ redistributable packages. See Errors when running the **db2start** command in the DB2 information center.

5. If you are using a Czech locale, you must change the system settings to prevent seeing corrupted characters in IBM Process Portal and IBM Process Designer. Change the Windows settings by completing the following steps:

   a. Click **Regional and Language Options**, and open the **Administrative** tab.

   b. In the **Language for non-Unicode programs** section, click **Change system locale . . .** to open the locale list.

   c. Select **Czech** from the list and click **OK**.

6. If you are using DB2, make sure that all your DB2 parameters meet the DB2 naming rules.

Related tasks:

⇨ Preparing Windows systems for installation

⮕ Tuning Windows systems

Related information:

⮕ General naming rules for DB2

Considerations for HADR setup and configuration

Review the following considerations while you plan to set up and configure DB2 for high availability disaster recovery (HADR).

- "Verify status of databases for takeover"
- "Configure data sources for HADR"
- "Set up programmatic transaction retry properties"
- "Specify user roles for HADR" on page 69
- "Start the messaging engine after the takeover" on page 69
- "Access additional information" on page 70

Verify status of databases for takeover

When a site failure occurs, HADR enables the standby database to take over as the primary database, with full DB2 functionality. Before the takeover occurs, verify the DB2 HADR status of both the primary database and the standby database to see if the takeover is allowed or if an error is returned. Sometimes, the takeover might cause an error or might not be allowed.

To check the DB2 HADR status, use the **db2pd** command. For example, if you configured a database named MEDB9 with HADR, use the following command to check the status:

```
db2pd -hadr -db MEDB9
```

To check the status of all databases, use the following command:

```
db2pd -hadr -alldbs
```

For more information, see the TAKEOVER HADR command topic. Review the command parameters and the usage notes to determine whether to perform the takeover.

Configure data sources for HADR

Configure the DB2 data sources for HADR in the IBM Business Process Manager admin console, as described in the Configuring client reroute for applications that use DB2 databases topic.

Keep in mind the following considerations when you configure the data sources for IBM Business Process Manager products:

- In order for client side connections to be automatically rerouted to the alternate database server, you must enable automatic client reroute when setting up DB2 HADR.
- For messaging engine and cell level data sources, the *Alternate server names* and *Alternate port numbers* properties must be configured.
- The alternate port must be the external port for the DB2 server, not the HADR service port that is specified in /etc/services. For example, if the HADR service port DB2_HADR_1, specified in /etc/services, is 55001, and the DB2 server uses the external port 50000, you must specify port 50000 for the data source alternate port in the admin console.

Set up programmatic transaction retry properties

To support programmatic transaction retries, two new properties have been added to the 00static.xml file, with the following values:

```
<transaction-reroute-retries>3</transaction-reroute-retries>
<transaction-reroute-retry-delay-in-millis>10000<transaction-reroute-retry-delay-in-millis>
```

Use the 100Custom.xml configuration file to customize the changes in 00Static.xml if values other than default are required. Complete the following steps:

1. Locate 100Custom.xml configuration file:
   - For a network deployment environment, the file path is *DMGR_profile_root*\config\cells\ *cell_name*\nodes\custom_node_name\servers*server_name*\server_type\config\ 100Custom.xml.
   - For a stand-alone server environment, the file path is *standalone_profile_root*\ config\cells*cell_name*\nodes*standalone_node_name*\servers*server_name*\ server_type\config\100Custom.xml.

2. Edit the 100Custom.xml file. Edit the following section to look like this example:
   ```
   <server merge="mergeChildren">
     <transaction-reroute-retries merge="replace">10</transaction-reroute-retries>
     <transaction-reroute-retry-delay-in-millis merge="replace">3000
   <transaction-reroute-retry-delay-in-millis>
   </server>
   ```

3. Save your changes.

Provide all the client reroute properties for all your data sources.

Specify user roles for HADR

When setting up HADR, specify appropriate user roles per platform to determine who can perform different HADR tasks.

- For Windows, use the DB2 administrative user: db2admin
- For Linux, use the DB2 instance user, db2inst1, rather than the administrative user, dasusr1.

For example, if the DB2 instance user is specified, the db2inst1 user backs up the primary database, copies the backup image to the standby server, and then restores or starts the standby server using this image. If the administrative user is specified, the dasusr1 user is the owner of the copied image, which the db2inst1 user who performs the backup and restore actions cannot access. Because the two users belong to different groups and have different access rights to files, the HADR setup might fail.

Start the messaging engine after the takeover

If the auto restart for the messaging engine is disabled, you must manually start the messaging engine after the database takeover occurs.

When two messaging engine servers exist in the same cluster, with messaging server 1 in an active state and messaging engine server 2 in a joined state, you might not have a running messaging engine server in your environment because of the following sequence of events:

1. The database that the messaging engines use has been taken over.
2. Messaging engine server 1 shut down to prevent data loss.
3. Messaging engine server 2 started all the messaging engines and is working as the active server while the messaging engine server 1 is still down.
4. Another takeover of the database occurred.
5. Messaging engine server 2 shut down to prevent data loss.
6. Both messaging engine servers 1 and 2 are down.

Access additional information

If more information is needed, use the following links.

- If an outage occurs in your DB2 HADR environment, see Detecting and responding to system outages in a high availability solution.
- After the failover occurs, if the DB2 HADR status is not `peer` and if some data loss occurs, configure the DB2 HADR status to `peer` as described in the following topics:
  - Performing an HADR failover operation
  - Reintegrating a database after a takeover operation

Configuring Oracle Data Guard for IBM Business Process Manager

You can configure Oracle Data Guard to be used with IBM Business Process Manager. Oracle Data Guard provides high availability, disaster recovery, and data protection and is used to create, manage, and monitor one or more standby databases so that production Oracle databases can survive disasters and data corruptions.

When IBM Business Process Manager is configured to use Oracle Data Guard, you typically have one production database, which is your primary database, and several standby databases. Then Oracle Data Guard automatically maintains each standby database by transmitting redo data from the primary database and applying the redo data to the standby database. If your production database becomes unavailable because of a planned or an unplanned outage, Oracle Data Guard enables you to switch any standby database to the production role, minimizing the downtime that is associated with the outage.

Oracle Data Guard automatically maintains each standby database by transmitting redo data from the primary database and then applying the redo to the standby database.

A Typical Data Guard Configuration
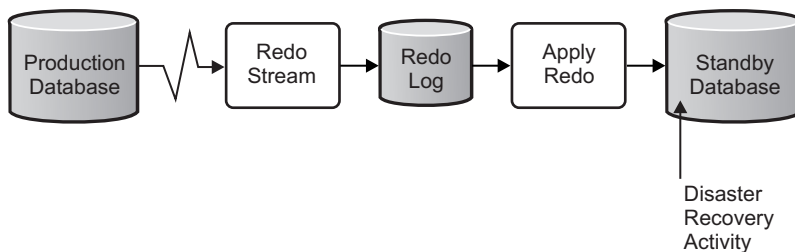
1. Set up the Oracle Data Guard environment.
2. Create a database service from the primary database:

   ```
   Exec DBMS_SERVICE.CREATE_SERVICE('BPM','BPM');
   ```

3. Create a trigger from the primary database by running the following command:

   ```
   CREATE OR REPLACE TRIGGER START_SERVICES AFTER STARTUP ON DATABASE
   DECLARE
    ROLE VARCHAR(30);
   BEGIN
    SELECT DATABASE_ROLE INTO ROLE FROM V$DATABASE;
    IF ROLE = 'PRIMARY' THEN
     DBMS_SERVICE.START_SERVICE('ORCL');  END IF;
   END;
   /
   ```

   Note: When you start a database, your primary database always starts a BPM service. Therefore, your client always connects to the primary database.

4. Restart the primary database or start the following service by running the following command:

   ```
   EXEC DBMS_SERVICE.START_SERVICE('BPM');
   ```

5. Install the IBM Business Process Manager.
6. Create profiles or a deployment environment that is similar to that of an Oracle instance database. While creating the profile, select **Oracle database** and connect to the database service that you created in step 2.

If all your primary and the standby databases are installed on the same server, the databases share the same IP address and Oracle listening port. No further configuration is required.

However, if your primary and standby databases are installed on different servers, they will have different IP addresses and the same Oracle listening port. If your primary and standby databases are on separate servers, you must modify all data sources, after which you will have a JDBC URL that resembles the following URL:

To modify the JDBC URL:
1. Log in to the IBM Business Process Manager administrative console.
2. Go to **Resources** > **JDBC** > **Data sources**.
3. Modify all data sources that connect to the Oracle database with the URLs that resemble the following URL:

```
jdbc:oracle:thin:@(DESCRIPTION=
 (ADDRESS_LIST=
 (ADDRESS=(PROTOCOL=TCP)(HOST=<host A>)(PORT=1521))
  (ADDRESS=(PROTOCOL=TCP)(HOST=<host B>)(PORT=1521))
  (ADDRESS=(PROTOCOL=TCP)(HOST=<host C>)(PORT=1521))
     (LOAD_BALANCE=off)
   (FAILOVER=on)
 )
        (CONNECT_DATA=(SERVICE_NAME=BPM))
 )
```

Installing and configuring IBM Business Process Manager Express

You can install IBM Business Process Manager using typical, custom, or silent installation. You can configure IBM Business Process Manager in a stand-alone environment.

Installing and configuring IBM Business Process Manager on Linux

Install IBM Business Process Manager on Linux and configure a stand-alone environment.

Typical installation and configuration

The Typical installation option is the simplest and quickest method for installing and configuring IBM Business Process Manager Express.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Related tasks:

"Preparing Linux systems for installation with a new DB2 Express database" on page 64
Before you can install IBM Business Process Manager, you must prepare your Linux operating system.

"Preparing Linux systems for installation" on page 66
Before you can install IBM Business Process Manager, you must prepare your Linux operating system.

Related reference:

IBM Business Process Manager Express system requirements

Installing and configuring IBM Business Process Manager Express with a new DB2 Express database server:

The typical installation can install DB2 Express on Linux and configure the required databases for IBM Business Process Manager. Only select this path if you have administrative privileges (root user) and do not have an existing DB2 database server on the system.

Installing and configuring Process Center with a new DB2 Express database server:

Process Center includes a repository for all processes, services, and other assets created in the IBM Business Process Manager authoring environments. You can use the integrated Process Server within Process Center to run processes as you build them. When you are ready, you can install and run those same processes on the Process Server in your runtime environments.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

The typical installation installs DB2 Express and configures the required databases for IBM Business Process Manager. Only select this path if you have administrative privileges (root user) and do not have an existing DB2 database server on the system.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   /user_home_directory/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=/launchpad_updates
   fixpack.WAS_REP=/WAS_updates
   fixpack.BPM_REP=/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage®. You can run only one launchpad at a time.

- If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

    mount_point/launchpad.sh

- If you are installing from images downloaded from Passport Advantage, perform the following steps:

    a. Go to the directory into which you extracted the images.

    b. Enter the following command to start the launchpad:

        extract_directory/launchpad.sh

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Center** and click **Next**.

6. Optionally change the location information:

   - **Hostname**: This field shows the name of your machine.

     Important: If a value of localhost or 127.0.0.1 is used for the hostname, Process Server installations on a remote system will not be able to connect to the Process Center.

   - **Location**: Enter the installation location for Process Center, or click **Browse** to select the location.

     Note:

     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.

     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

7. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

8. Specify the **Username** and **Password** for the deployment environment administrative account. The deployment environment administrator is the primary IBM Business Process Manager administrator. A user assigned to this role has administrative access to Process Center and Process Admin Console. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This account also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.

9. Click **Next**.

10. Select **No. I need one installed for me.** to install DB2 Express.

11. Specify the following DB2 administrative user names and passwords:

   - DB2 instance user

   - DB2 fenced user

   - DB2 administration server (DAS) user

   If the fenced user or administration (DAS) server user name exists, clear the **New User** check box.

Restriction:
- User names must not contain National Language Strings (NLS)
- User names must be maximum eight characters in length

12. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

   Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

   The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

   Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

   After successfully installing the product, you can use Installation Manager to install the required fixes.

13. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

14. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

⟶ Installation Manager updates

Installing and configuring Process Server with a new DB2 Express database server:

Process Server provides a single BPM runtime environment that can support a range of business processes for development, test, staging, or production.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

The typical installation installs DB2 Express and configures the required databases for IBM Business Process Manager. Only select this path if you have administrative privileges (root user) and do not have an existing DB2 database server on the system.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these

upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

Create the following file:

/user_home_directory/bpm_updates.properties

Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

```
ifix.1=/bpmUpdates
fixpack.2=http://test/rep
launchpad.1=/launchpad_updates
fixpack.WAS_REP=/WAS_updates
fixpack.BPM_REP=/BPM_updates
```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

     mount_point/launchpad.sh

   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

        extract_directory/launchpad.sh

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Server** and click **Next**.

6. Specify Process Server information:

   - **Hostname**: This field shows the name of your machine.

   - **Location**: Enter the installation location for Process Server or click **Browse** to select the location.

     Note:

     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.

     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

   - Environment **Type**: Select how the Process Server is used:

     – Select **Production** if the server is to be used in a production capacity.

     – Select **Stage** if the server is to be used as a temporary location to host changes before putting them into production.

     – Select **Test** if the server is to be used as a testing environment, for example, for load testing.

     – Select **Development** if the server is to be used in a development capacity.

- **Name**: Specify the name for the Process Server environment. This name is used to connect from a Process Center to this Process Server.

  Restriction: Do not mix production and non-production servers in the same cell.
- Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

Select **Use this server offline** if this Process Server will not be connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications, but the method for deploying process applications to an offline Process Server differs from the method for deploying process applications to an online Process Server.

If you did not select **Use this server offline**, provide the following information for the Process Center that this server is to connect to:

- **Hostname**: Enter the host or virtual host that this Process Server will use to communicate with Process Center. Use a fully qualified host name. In an environment with a load balancer or proxy server between the Process Server and the Process Center services, make sure that what you designate here matches the URL for accessing the Process Center.
- **Port**: Enter the port number of the Process Center. In an environment with a load balancer or proxy server between the Process Server and the Process Center, make sure that what you designate here matches the URL for accessing the Process Center.
- **User name**: Enter the name of a Process Center user. Process Server will connect to Process Center as this user.
- **Password**: Enter the password for the Process Center user.

You can click **Test Connection** to check the connection to the Process Center.
7. Click **Next**.
8. Select **No. I need one installed for me.** to install DB2 Express.
9. Specify the following DB2 administrative user names and passwords:
   - DB2 instance user
   - DB2 fenced user
   - DB2 administration server (DAS) user

   If the fenced user or administration (DAS) server user name exists, clear the **New User** check box.

   Restriction:
   - User names must not contain National Language Strings (NLS)
   - User names must be maximum eight characters in length
10. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

    Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

    The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

After successfully installing the product, you can use Installation Manager to install the required fixes.

11. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

12. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

➥ Installation Manager updates

Installing and configuring IBM Business Process Manager Express with a DB2 database server:

You can install IBM Business Process Manager using an existing DB2 database server.

Creating DB2 databases:

You can create the required databases for IBM Business Process Manager V8.5 before you create profiles and configure your network deployment environment. Usually you require the Process database, the Performance Data Warehouse database, and the Common database. In the case of an Advanced-only deployment environment, you need only the Common database.

The Process Server and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

In an IBM Business Process Manager environment, the **createDatabase.sql** script is used to create the databases. It is available in the *BPM_HOME*/BPM/dbscripts/DB2/Create folder.

In the following example, replace *@DB_NAME@* with the name that you want to use for the created database and *@DB_USER@* with the user name that you want to use for the database.

1. If IBM Business Process Manager is installed on your machine, locate the SQL script **createDatabase.sql** to run. Otherwise, use the command line option.

2. Run the following sample script to create each database.

   BPM_HOME/BPM/dbscripts/DB2/Create/createDatabase.sql

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

   ```
   create database @DB_NAME@ automatic storage yes  using codeset UTF-8 territory US pagesize 32768;
   connect to @DB_NAME@;
   grant dbadm on database to user @DB_USER@;
   UPDATE DB CFG FOR @DB_NAME@ USING LOGFILSIZ 4096 DEFERRED;
   UPDATE DB CFG FOR @DB_NAME@ USING LOGSECOND 64 DEFERRED;
   connect reset;
   ```

   Note: If a command fails to execute from the DB2 command prompt, remove the semicolon (;) and rerun the command.

If IBM Business Process Manager is not installed, run the following command from the command line:

```
db2 -tvf createDatabase.sql
```

Installing and configuring Process Center with a DB2 database server:

Process Center includes a repository for all processes, services, and other assets created in the IBM Business Process Manager authoring environments. You can use the integrated Process Server within Process Center to run processes as you build them. When you are ready, you can install and run those same processes on the Process Server in your runtime environments.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty. The databases must be created with at least a 32K page size.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   /user_home_directory/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=/launchpad_updates
   fixpack.WAS_REP=/WAS_updates
   fixpack.BPM_REP=/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.
   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

     mount_point/launchpad.sh
   - If you are installing from images downloaded from Passport Advantage, perform the following steps:
     a. Go to the directory into which you extracted the images.
     b. Enter the following command to start the launchpad:

        extract_directory/launchpad.sh
3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.
4. After starting the launchpad, click **Typical installation** on the Welcome page.
5. Select **Install Process Center** and click **Next**.
6. Optionally change the location information:
   - **Hostname**: This field shows the name of your machine.

     Important: If a value of localhost or 127.0.0.1 is used for the hostname, Process Server installations on a remote system will not be able to connect to the Process Center.
   - **Location**: Enter the installation location for Process Center, or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).
7. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.
8. Specify the **Username** and **Password** for the deployment environment administrative account. The deployment environment administrator is the primary IBM Business Process Manager administrator. A user assigned to this role has administrative access to Process Center and Process Admin Console. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This account also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.
9. Click **Next**.
10. Select **Yes** to use an existing database.
11. Specify the required database information.

Table 37. Required database configuration fields for DB2

Field	Action needed
Username	Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Enter a password to authenticate with the database.
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of `50000` or enter the correct server port number.
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the name for the Process database.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the name for the Performance Data Warehouse database.

Click **Test Database Connection** to verify that you can connect to the BPM databases that are created. Only if the connections to the databases are successful, you can click **Next** to proceed.

12. Select **Create and initialize these databases during installation** to create databases as a part of the typical installation.

    This option is available only for DB2 databases. In order to use this option, the **Hostname** must be set to `localhost`. You must be authorized to create databases. If you are an administrative or root user, this option creates the databases. If you are a nonadministrative or nonroot user, this option adds the rights so that it can create the databases.

13. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

    Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

    The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

    Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

    After successfully installing the product, you can use Installation Manager to install the required fixes.

14. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

15. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

Installation Manager updates

Installing and configuring Process Server with a DB2 database server:

Process Server provides a single BPM runtime environment that can support a range of business processes for development, test, staging, or production.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty. The databases must be created with at least a 32K page size.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   /*user_home_directory*/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=/launchpad_updates
   fixpack.WAS_REP=/WAS_updates
   fixpack.BPM_REP=/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

```
    mount_point/launchpad.sh
```
   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

      a. Go to the directory into which you extracted the images.

      b. Enter the following command to start the launchpad:

```
         extract_directory/launchpad.sh
```

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Server** and click **Next**.

6. Specify Process Server information:
   - **Hostname**: This field shows the name of your machine.
   - **Location**: Enter the installation location for Process Server or click **Browse** to select the location.

     Note:
      – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
      – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

   - Environment **Type**: Select how the Process Server is used:
      – Select **Development** if the server is to be used in a development capacity.
      – Select **Production** if the server is to be used in a production capacity.
      – Select **Stage** if the server is to be used as a temporary location to host changes before putting them into production.
      – Select **Test** if the server is to be used as a testing environment, for example, for load testing.

   - **Name**: Specify the name for the Process Server environment. This name is used to connect from a Process Center to this Process Server.

     Restriction: Do not mix production and non-production servers in the same cell.

   - Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

   Select **Use this server offline** if this Process Server will not be connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications, but the method for deploying process applications to an offline Process Server differs from the method for deploying process applications to an online Process Server.

   If you did not select **Use this server offline**, provide the following information for the Process Center that this server is to connect to:
   - **Hostname**: Enter the host or virtual host that this Process Server will use to communicate with Process Center. Use a fully qualified host name. In an environment with a load balancer or proxy

server between the Process Server and the Process Center services, make sure that what you designate here matches the URL for accessing the Process Center.

- **Port**: Enter the port number of the Process Center. In an environment with a load balancer or proxy server between the Process Server and the Process Center, make sure that what you designate here matches the URL for accessing the Process Center.

- **User name**: Enter the name of a Process Center user. Process Server will connect to Process Center as this user.

- **Password**: Enter the password for the Process Center user.

You can click **Test Connection** to check the connection to the Process Center.

7. Click **Next**.
8. Select **Yes** to use an existing database.
9. Specify the required database information.

Table 38. Required database configuration fields for DB2

Field	Action needed
Username	Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Enter a password to authenticate with the database.
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of `50000` or enter the correct server port number.
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the name for the Process database.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the name for the Performance Data Warehouse database.

Click **Test Database Connection** to verify that you can connect to the BPM databases that are created. Only if the connections to the databases are successful, you can click **Next** to proceed.

10. Select **Create and initialize these databases during installation** to create databases as a part of the typical installation.

This option is available only for DB2 databases. In order to use this option, the **Hostname** must be set to `localhost`. You must be authorized to create databases. If you are an administrative or root user, this option creates the databases. If you are a nonadministrative or nonroot user, this option adds the rights so that it can create the databases.

11. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

After successfully installing the product, you can use Installation Manager to install the required fixes.

12. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

13. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

➦ Installation Manager updates

Installing and configuring IBM Business Process Manager Express with an Oracle database server:

You can install IBM Business Process Manager using an Oracle database server.

Creating users for Oracle databases:

You can create the users for Oracle databases before you create profiles and configure your network deployment environment. Create the cell-scoped user, the deployment environment-level user, the Process Server user, and the Performance Data Warehouse user. Note: The Process Server user and the Performance Data Warehouse user are not needed for an Advanced-only deployment environment.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

You can use a single instance of Oracle for configuring BPM. The Oracle instance must exist and be available for access. Consult the Oracle documentation to create an Oracle instance. If you use a single Oracle instance, make sure that you use different user IDs for the three different BPM databases.

If IBM Business Process Manager is installed, the *BPM_HOME*/BPM/dbscripts/Oracle/Create folder contains the **createUser.sql** script that is used to create the users for Oracle databases.

In the following examples, replace *@DB_USER@* with the user name that you want to use for the database and replace *@DB_PASSWD@* with the password for that user.

Run the following sample script to create the database users.
BPM_HOME/BPM/dbscripts/Oracle/Create/createUser.sql
Optionally, or if IBM Business Process Manager is not installed, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

```
CREATE USER @DB_USER@ IDENTIFIED BY @DB_PASSWD@;
grant connect, resource, unlimited tablespace to @DB_USER@;
grant create view to @DB_USER@;
grant javauserpriv to @DB_USER@;
grant execute on dbms_lock to @DB_USER@;
```

Installing and configuring Process Center with an Oracle database server:

Process Center includes a repository for all processes, services, and other assets created in the IBM Business Process Manager authoring environments. You can use the integrated Process Server within Process Center to run processes as you build them. When you are ready, you can install and run those same processes on the Process Server in your runtime environments.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   /user_home_directory/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=/launchpad_updates
   fixpack.WAS_REP=/WAS_updates
   fixpack.BPM_REP=/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

     mount_point/launchpad.sh

   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

b. Enter the following command to start the launchpad:

`extract_directory/launchpad.sh`

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Center** and click **Next**.

6. Optionally change the location information:

   - **Hostname**: This field shows the name of your machine.

     Important: If a value of localhost or 127.0.0.1 is used for the hostname, Process Server installations on a remote system will not be able to connect to the Process Center.

   - **Location**: Enter the installation location for Process Center, or click **Browse** to select the location.

     Note:
     - The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     - Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

7. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

8. Specify the **Username** and **Password** for the deployment environment administrative account. The deployment environment administrator is the primary IBM Business Process Manager administrator. A user assigned to this role has administrative access to Process Center and Process Admin Console. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This account also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.

9. Click **Next**.

10. Select **Yes** to use an existing database.

11. Specify the required database information.

Table 39. Required database configuration fields for Oracle

Field	Action needed
Instance name	Enter the name of the Oracle database instance.
Hostname	Accept the default value of localhost or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1521 or enter the correct server port number.
Common database	For the deployment environment-level Common database, enter values for the following parameters: • **User name**: Enter the Common database user name. • **Password**: Enter a password to authenticate with the Common database.

Table 39. Required database configuration fields for Oracle (continued)

Field	Action needed
Process database	For the Process database, enter values for the following parameters: • `User name`: Enter the Process database user name. • `Password`: Enter a password to authenticate with the Process database.
Performance Data Warehouse database	For the Performance Data Warehouse database, enter values for the following parameters: • `User name`: Enter the Performance Data Warehouse database user name. • `Password`: Enter a password to authenticate with the Performance Data Warehouse database.

12. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

    Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

    The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

    Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

    After successfully installing the product, you can use Installation Manager to install the required fixes.

13. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

14. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

➡ Installation Manager updates

Installing and configuring Process Server with an Oracle database server:

Process Server provides a single BPM runtime environment that can support a range of business processes for development, test, staging, or production.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty.

Be prepared to specify the following information during installation:
• The user name and password for database authentication
• The database server host name and port

- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   /*user_home_directory*/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=/launchpad_updates
   fixpack.WAS_REP=/WAS_updates
   fixpack.BPM_REP=/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

     mount_point/launchpad.sh

   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

        extract_directory/launchpad.sh

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.
5. Select **Install Process Server** and click **Next**.
6. Specify Process Server information:
   - **Hostname**: This field shows the name of your machine.
   - **Location**: Enter the installation location for Process Server or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).
   - Environment **Type**: Select how the Process Server is used:
     – Select **Development** if the server is to be used in a development capacity.
     – Select **Production** if the server is to be used in a production capacity.
     – Select **Stage** if the server is to be used as a temporary location to host changes before putting them into production.
     – Select **Test** if the server is to be used as a testing environment, for example, for load testing.
   - **Name**: Specify the name for the Process Server environment. This name is used to connect from a Process Center to this Process Server.

     Restriction: Do not mix production and non-production servers in the same cell.
   - Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

   Select **Use this server offline** if this Process Server will not be connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications, but the method for deploying process applications to an offline Process Server differs from the method for deploying process applications to an online Process Server.

   If you did not select **Use this server offline**, provide the following information for the Process Center that this server is to connect to:
   - **Hostname**: Enter the host or virtual host that this Process Server will use to communicate with Process Center. Use a fully qualified host name. In an environment with a load balancer or proxy server between the Process Server and the Process Center services, make sure that what you designate here matches the URL for accessing the Process Center.
   - **Port**: Enter the port number of the Process Center. In an environment with a load balancer or proxy server between the Process Server and the Process Center, make sure that what you designate here matches the URL for accessing the Process Center.
   - **User name**: Enter the name of a Process Center user. Process Server will connect to Process Center as this user.
   - **Password**: Enter the password for the Process Center user.

   You can click **Test Connection** to check the connection to the Process Center.
7. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user

assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

8. Click **Next**.
9. Select **Yes** to use an existing database.
10. Specify the required database information.

Table 40. Required database configuration fields for Oracle

Field	Action needed
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1521 or enter the correct server port number.
Instance name	Enter the name of the Oracle database instance.
Common database	For the deployment environment-level Common database, enter values for the following parameters: • **User name**: Enter the Common database user name. • **Password**: Enter a password to authenticate with the Common database.
Process database	For the Process database, enter values for the following parameters: • **User name**: Enter the Process database user name. • **Password**: Enter a password to authenticate with the Process database.
Performance Data Warehouse database	For the Performance Data Warehouse database, enter values for the following parameters: • **User name**: Enter the Performance Data Warehouse database user name. • **Password**: Enter a password to authenticate with the Performance Data Warehouse database.

11. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

    Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

    The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

    Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

    After successfully installing the product, you can use Installation Manager to install the required fixes.

12. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

13. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

⬏ Installation Manager updates

Installing and configuring IBM Business Process Manager Express with an SQL Server database server:

You can install IBM Business Process Manager using a Microsoft SQL Server database server.

Creating and configuring SQL Server databases before typical installation:

IBM Business Process Manager requires a Process database, Performance Data Warehouse database, and Common database. The Common database contains Business Space and other components. You can install and configure the required databases before you install.

Configuring XA transactions for SQL Server:

You must configure XA transactions after the Microsoft SQL Server database is installed and before you start the server. The SQL Server JDBC driver provides support for Java Platform, Enterprise Edition/JDBC 2.0 optional distributed transactions. JDBC connections obtained from the **SQLServerXADataSource** class can participate in standard distributed transaction processing environments such as Java Platform, Enterprise Edition (Java EE) application servers.

Failure to configure the XA transactions can result in the following error when the server starts:**javax.transaction.xa.XAException: com.microsoft.sqlserver.jdbc.SQLServerException: Failed to create the XA control connection. Error: "Could not find stored procedure 'master..xp_sqljdbc_xa_init_ex'."**..

The MS DTC service should be marked Automatic in Service Manager to make sure that it is running when the SQL Server service is started.

1. To enable MS DTC for XA transactions, you must follow these steps:

   On Windows XP and Windows Server 2003:
   a. Select **Control Panel** > **Administrative Tools** > **Component Services**.
   b. Select **Component Services** > **Computers** and right-click **My Computer**, and select **Properties**.
   c. Click the **MSDTC** tab, and then click **Security Configuration**.
   d. Select the **Enable XA Transactions** check box, and then click **OK**. This will cause a MS DTC service restart.
   e. Click **OK** again to close the **Properties** window, and then close **Component Services**.
   f. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

   On Windows Vista, Windows 7, and Windows Server 2008 R2:
   a. Select **Control Panel** > **Administrative Tools** > **Component Services**.
   b. Select **Component Services** > **Computers** > **My Computer** > **Distributed Transaction Coordinator**.
   c. Right-click **Local DTC** and then select **Properties**.
   d. Click the **Security** tab on the **Local DTC Properties** window.
   e. Select the **Enable XA Transactions** check box, and click **OK**. This will restart the MS DTC service.
   f. Click **OK** again to close the Properties window, and then close Component Services.
   g. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

2. Configure the JDBC Distributed Transaction Components:

a. If you haven't installed IBM Business Process Manager, download "Microsoft SQL Server JDBC Drive 3.0" driver from the Microsoft Site using the URL from Resources section and extract it to any folder.

b. If BPM is already installed, go to `bpm_install_root`/jdbcdrivers/SQLServer/xa to obtain the files you require in the following steps:

   - Copy the `sqljdbc_xa.dll` file from the `JDBC unarchived` directory to the `Binn` directory (for a default SQL Server install, the location is `C:/Program Files/Microsoft SQL Server/MSSQL10_50.MSSQLSERVER/MSSQL/Binn`) of SQL Server computer. If you are using XA transactions with a 32-bit SQL Server, use the `sqljdbc_xa.dll` file in the x86 folder, even if the SQL Server is installed on a x64 processor. If you are using XA transactions with a 64-bit SQL Server on the x64 processor, use the `sqljdbc_xa.dll` file in the x64 folder.

   - Run the `xa_install.sql` database script on SQL Server. For example; from the command prompt, run **sqlcmd -i xa_install.sql**. This script installs the extended stored procedures that are called by `sqljdbc_xa.dll`. These extended stored procedures implement distributed transaction and XA support for the Microsoft SQL Server JDBC Driver. You will need to run this script as an administrator of the SQL Server instance. You can ignore errors about unable to drop procedures that don't exist.

   - Open the SQL Server Management Studio to locate the security folder under the **master** database. To grant permissions to a specific user to participate in distributed transactions with the JDBC driver, add the user to the **SqlJDBCXAUser** role in the master database (for example, for a Lombardi user add master database in User mappings and check **SqlJDBCXAUser** role).

After you configure the XA transactions and before you start the server, you must configure your TCP/IP connectivity using the below steps:

1. From Start menu, click **Microsoft SQl Server 2008 R2** > **Configuration Tools** > **SQL Server Configuration Manager**.
2. Expand **SQl Server network Configuration** > **Protocols for SQL2008**
3. Locate **TCP/IP** on the right-hand side.
4. Double click **TCP/IP** and enable it under the **Protocol** tab.
5. Click the **IP Addresses** tab to enable the TCP port for each configured IP address.

Creating SQL Server databases:

You can create the required databases for IBM Business Process Manager V8.5 before you create profiles and configure your network deployment environment. Usually you require the Process database, the Performance Data Warehouse database, and the Common database. In the case of an Advanced-only deployment environment, you need only the Common database.

- You cannot share databases across multiple installations or Deployment Environments
- The Process and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.
- Process and Performance Data Warehouse components require the databases to be case-insensitive for SQL Server
- CommonDB (and legacy WPS) components require the databases to be case-sensitive for SQL Server
- The schema name used for each component should match the user

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

If IBM Business Process Manager is installed on your machine, the **createDatabase_CaseInsensitive.sql** and **createDatabase_CaseSensitive.sql** scripts are available in the *BPM_HOME*/BPM/dbscripts/SQLServer/ `Create` folder.

In the following examples, replace *@DB_NAME@* with the name that you want to use for the created database

1. If IBM Business Process Manager is installed on your machine, locate the SQL scripts to run. Otherwise, use the command line option.
2. Run the scripts to create the BPMDB and PDWDB databases. Run the following sample script:

   `BPM_HOME/BPM/dbscripts/SQLServer/Create/createDatabase_CaseInsensitive.sql`

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

   `CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS;`

   If IBM Business Process Manager is not installed, run the following command from the command line:

   `sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS"`

3. Run the script to create the CommonDB database. Run the following sample script:

   `BPM_HOME/BPM/dbscripts/SQLServer/Create/createDatabase_CaseSensitive.sql`

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

   `CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS;`

   If IBM Business Process Manager is not installed, run the following command from the command line:

   `sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS"`

   Note: The letter *CI* in the **COLLATE** attribute value is applicable for the case-insensitive databases and *CS* is applicable for case-sensitive databases.

Creating users and schemas for SQL Server databases:

You must create the users and schemas after creating the SQL Server databases.

Assign the IBM Business Process Manager database user to the following three roles:

Note: The database must be created by the database administrator who can then assign these roles to the database user for IBM Business Process Manager.

- db_ddladmin
- db_datawriter
- db_datareader

For information about the permissions that are provided by these roles, see documentation from Microsoft.

Important: In Microsoft SQL server, the default schema name associated with a user must be the same as the user name. For example, if the user name for the Performance Data Warehouse database is *dbuser* then the default schema name associated with the user *dbuser* must also be named *dbuser*. You must create an ordinary database user and assign the required rights to the user instead of using a super user, such as *sa*. This is because the default schema for the super user is `dbo` and this cannot be changed.

You can complete the following steps if existing tables are not associated with a schema that is the same as the user name.

1. In SQL Server Management Studio Object Explorer, right-click the table name and then click **Design**.
2. From the Design view, press F4 to view the Properties window.
3. From the Properties window, update the schema name.
4. Right-click the tab and select **Close** to close the Design view.
5. Click **OK** when prompted to save. The selected table is transferred to the schema.
6. Repeat the previous steps for all the tables in the Performance Data Warehouse database.

The **createUser.sql** script is available in the *BPM_HOME*/BPM/dbscripts/SQLServer/Create folder is used to create the users and schema for the SQL Server.

1. Locate the SQL scripts to run.
2. Run the scripts to create the users and schemas for SQL Server databases. For example, run the following sample script to create the required users.

   BPM_HOME/BPM/dbscripts/SQLServer/Create/createUser.sql

   Optionally, if the above script is unavailable during configuration, an copy the contents of the above SQL file and run the commands from the command line as follows:

   ```
   USE master
   GO
   CREATE LOGIN @DB_USER@ WITH PASSWORD='@DB_PASSWD@'
   GO

   USE @DB_NAME@
   GO
   CREATE USER @DB_USER@ FOR LOGIN @DB_USER@ WITH DEFAULT_SCHEMA=@DB_USER@
   GO
   CREATE SCHEMA @DB_USER@ AUTHORIZATION @DB_USER@
   GO
   EXEC sp_addrolemember 'db_ddladmin', @DB_USER@;
   EXEC sp_addrolemember 'db_datareader', @DB_USER@;
   EXEC sp_addrolemember 'db_datawriter', @DB_USER@;
   ```

   In the above example, replace *@DB_NAME@* with the BPM database name for which you created users and schema, *@DB_USER@* with the database user you want to create, and *@DB_PASSWD@* with the password for that user.

When you create database schemas the using the generated scripts, your user ID must have the authority to create tables. When the tables are created, you must have the authority to select, insert, update, and delete information in the tables.

The following table describes the database privileges that are needed to access the data stores.

Table 41. Database privileges

Minimum privileges that are required to create objects in the database	Minimum privileges that are required to access objects in the database
The user ID ideally requires DB OWNER privileges on the data stores used for IBM Business Process Manager.	Configure the SQL Server for SQL Server and Windows authentication so that authentication to be based on an SQL server login ID and password. The user ID must be the owner of the tables, or a member of a group that has sufficient authority to issue TRUNCATE TABLE statements. See the **Detailed SQL Server database privileges** table at SQL Server database privileges.

Installing and configuring Process Center with an SQL Server database server:

Process Center includes a repository for all processes, services, and other assets created in the IBM Business Process Manager authoring environments. You can use the integrated Process Server within Process Center to run processes as you build them. When you are ready, you can install and run those same processes on the Process Server in your runtime environments.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty.

Be prepared to specify the following information during installation:

- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   > */user_home_directory*/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=/launchpad_updates
   fixpack.WAS_REP=/WAS_updates
   fixpack.BPM_REP=/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

     > *mount_point*/launchpad.sh

   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

        > *extract_directory*/launchpad.sh

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do

not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Optionally change the location information:

   - **Hostname**: This field shows the name of your machine.

     Important: If a value of localhost or 127.0.0.1 is used for the hostname, Process Server installations on a remote system will not be able to connect to the Process Center.

   - **Location**: Enter the installation location for Process Center, or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

6. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

7. Specify the **Username** and **Password** for the deployment environment administrative account. The deployment environment administrator is the primary IBM Business Process Manager administrator. A user assigned to this role has administrative access to Process Center and Process Admin Console. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This account also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.

8. Click **Next**.

9. Select **Yes** to use an existing database.

10. Specify the required database information.

Table 42. Required database configuration fields for SQL Server

Field	Action needed
Username	Only required if you are not using Windows authentication.
	Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Only required if you are not using Windows authentication.
	Enter a password to authenticate with the database.
Select the **Apply Windows authentication** option to indicate that you will connect to your databases using your Windows authentication information. If you select this option, the previous fields are made inactive.	
Hostname	Accept the default value of localhost or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1433 or enter the correct server port number.

Table 42. Required database configuration fields for SQL Server (continued)

Field	Action needed
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the Process database name.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the Performance Data Warehouse database name.

11. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

   Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

   The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

   Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

   After successfully installing the product, you can use Installation Manager to install the required fixes.

12. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

13. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

Installation Manager updates

Installing and configuring Process Server with an SQL Server database server:

Process Server provides a single BPM runtime environment that can support a range of business processes for development, test, staging, or production.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   > */user_home_directory*/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=/launchpad_updates
   fixpack.WAS_REP=/WAS_updates
   fixpack.BPM_REP=/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

     > *mount_point*/launchpad.sh

   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

        > *extract_directory*/launchpad.sh

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Server** and click **Next**.

6. Specify Process Server information:

- **Hostname**: This field shows the name of your machine.
- **Location**: Enter the installation location for Process Server or click **Browse** to select the location.

  Note:
  - The installation location must either be an empty directory or a directory that does not exist and is created during installation.
  - Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).
- Environment **Type**: Select how the Process Server is used:
  - Select **Development** if the server is to be used in a development capacity.
  - Select **Production** if the server is to be used in a production capacity.
  - Select **Stage** if the server is to be used as a temporary location to host changes before putting them into production.
  - Select **Test** if the server is to be used as a testing environment, for example, for load testing.
- **Name**: Specify the name for the Process Server environment. This name is used to connect from a Process Center to this Process Server.

  Restriction: Do not mix production and non-production servers in the same cell.
- Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

Select **Use this server offline** if this Process Server will not be connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications, but the method for deploying process applications to an offline Process Server differs from the method for deploying process applications to an online Process Server.

If you did not select **Use this server offline**, provide the following information for the Process Center that this server is to connect to:

- **Hostname**: Enter the host or virtual host that this Process Server will use to communicate with Process Center. Use a fully qualified host name. In an environment with a load balancer or proxy server between the Process Server and the Process Center services, make sure that what you designate here matches the URL for accessing the Process Center.
- **Port**: Enter the port number of the Process Center. In an environment with a load balancer or proxy server between the Process Server and the Process Center, make sure that what you designate here matches the URL for accessing the Process Center.
- **User name**: Enter the name of a Process Center user. Process Server will connect to Process Center as this user.
- **Password**: Enter the password for the Process Center user.

You can click **Test Connection** to check the connection to the Process Center.
7. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables

administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

8. Click **Next**.
9. Select **Yes** to use an existing database.
10. Specify the required database information.

Table 43. Required database configuration fields for SQL Server

Field	Action needed
Username	Only required if you are not using Windows authentication. Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Only required if you are not using Windows authentication. Enter a password to authenticate with the database.
Select the **Apply Windows authentication** option to indicate that you will connect to your databases using your Windows authentication information. If you select this option, the previous fields are made inactive.	
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1433 or enter the correct server port number.
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the Process database name.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the Performance Data Warehouse database name.

11. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

    Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

    The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

    Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

    After successfully installing the product, you can use Installation Manager to install the required fixes.

12. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

13. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

⇨ Installation Manager updates

Custom installation and configuration

Use the Custom installation option to install IBM Business Process Manager Express, if you need any installation or configuration options that are not provided by the Typical installation option or if you want to install silently.

Related tasks:

"Preparing Linux systems for installation with a new DB2 Express database" on page 64
Before you can install IBM Business Process Manager, you must prepare your Linux operating system.

"Preparing Linux systems for installation" on page 66
Before you can install IBM Business Process Manager, you must prepare your Linux operating system.

Related reference:

⇨ IBM Business Process Manager Express system requirements

Installing IBM Business Process Manager Express:

With custom installation, you can choose to install IBM Business Process Manager Express interactively or silently.

Related tasks:

"Preparing Linux systems for installation with a new DB2 Express database" on page 64
Before you can install IBM Business Process Manager, you must prepare your Linux operating system.

"Preparing Linux systems for installation" on page 66
Before you can install IBM Business Process Manager, you must prepare your Linux operating system.

Related reference:

⇨ IBM Business Process Manager Express system requirements

Installing interactively with a new installation of WebSphere Application Server:

Using custom installation, you can install IBM Business Process Manager with a new installation of WebSphere Application Server.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

    - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

        mount_point/launchpad.sh

- If you are installing from images downloaded from Passport Advantage, perform the following steps:
    a. Go to the directory into which you extracted the images.
    b. Enter the following command to start the launchpad:

        extract_directory/launchpad.sh

2. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically.

   If you do not have access to the Internet and want updates to the launchpad to be installed from a local directory, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install. Create the following file:

   /user_home_directory/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

   The file uses a launchpad prefix, followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for launchpad upgrades. The locations can be either local directories or URLs. For example:

   launchpad.1=/launchpad_updates

3. After starting the launchpad, click **Custom installation** on the Welcome page.

4. Click **Install as administrative user** to install as an administrative user. If you are a root user, you can install as an administrative user. If you are not a root user, or if you want to install to your own user name without root privileges, clear this check box.

5. Click **Install**. When you install IBM Business Process Manager, the required WebSphere Application Server Network Deployment is automatically installed.

   Note: IBM Business Process Manager V8.5 can be installed only on top of WebSphere Application Server Network Deployment V8.5.

6. On the Install Packages page of the Installation Manager, the **WebSphere Application Server Network Deployment**, **IBM Business Process Manager Express** package, and **IBM DB2 Express** are selected by default. Clear the selection for **IBM DB2 Express**.

7. If you are connected to the Internet and want to check for the latest fix pack or refresh pack and recommended interim fixes for WebSphere Application Server and IBM Business Process Manager, click **Check for other Versions, Fixes, and Extensions**. Click **Next** to continue. You may be prompted to provide your IBM ID and password to connect to the IBM service repositories.

   An IBM ID and password can be obtained by registering at http://www.ibm.com.

   If there are any fix packs or interim fixes available, those are shown in the next dialog box after selecting the fix pack or refresh pack levels you want to install.

   Click **Cancel** to continue installing without downloading the required fixes from the Internet.

8. On the Licenses page, read the license agreement. If you agree to the terms of the license agreement, click **I accept the terms in the license agreements** and click **Next**.

9. On the Location page, the **Create new package group** option is selected by default. Select a location for the shared resources directory and a location for the Installation Manager and click **Next**. You must select location for the Installation Manager only if it is not already installed. The Install Packages wizard checks your system for operating system prerequisites. If you are at a higher major release of a supported operating system, or if the operating system itself is not on the supported list, you might encounter a warning. You can continue with the installation, but the installation or product operation might not succeed until you apply maintenance.

   If you see a warning, go to the product support web pages and obtain the latest maintenance packages to apply after installation. See the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

10. On the Features page, expand the plus symbol to select the package features that you want to install. Installation Manager automatically enforces any dependencies with other features and shows the updated download size and disk space requirements for the installation.

   a. Select the translations to install. Under **Translations Supported by All Packages**, **English** is selected by default for the English version. To install other language versions, select the appropriate language under **Translations Supported by Only Some Packages**.

   b. Optional: To see the dependency relationships between features, select **Show Dependencies**.

   c. Optional: Click a feature to view its brief description under **Details**.

   d. Select one of the following features to install.

      - IBM Process Center
      - IBM Process Server **Production** (the default) to use the server in production
      - IBM Process Server **Non-production** to use the server only for test, staging, or development. Your selection is recorded in the product tag for inventory purposes.

      Restriction: Do not mix production and non-production servers in the same cell.

   When you are finished selecting features, click **Next**.

11. On the Summary page, review your choices before installing the IBM Business Process Manager Express package. If you want to change the choices that you made on previous pages, click **Back** and make your changes. When you are satisfied with your installation choices, click **Install** to install the package. A progress indicator shows the percentage of the installation completed.

12. When the installation process is complete, a message confirms the success of the process.

   a. Optional: Click **View Log File** to open the installation log file for the current session in a new window. You must close the Installation Log window to continue.

   b. If you plan to use the `BPMConfig` command-line utility to create your Deployment Environment, you do not need to use the Profile Management Tool (PMT) and select **None** to complete the installation.

   c. Click **Finish** to close the Installation Manager.

After you install IBM Business Process Manager, you must configure profiles and databases by using the `BPMConfig` command.

Related information:

↪ Installation Manager updates

Installing interactively with a new DB2 Express database and a new installation of WebSphere Application Server:

The custom installation can install DB2 Express on Linux and configure the required databases for IBM Business Process Manager. Only select this path if you have administrative privileges (root user) and do not have an existing DB2 database server on the system.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

- If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

    mount_point/launchpad.sh

- If you are installing from images downloaded from Passport Advantage, perform the following steps:

    a. Go to the directory into which you extracted the images.

    b. Enter the following command to start the launchpad:

        extract_directory/launchpad.sh

2. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically.

    If you do not have access to the Internet and want updates to the launchpad to be installed from a local directory, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install. Create the following file:

    /user_home_directory/bpm_updates.properties

    Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

    The file uses a launchpad prefix, followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for launchpad upgrades. The locations can be either local directories or URLs. For example:

    launchpad.1=/launchpad_updates

3. After starting the launchpad, click **Custom installation** on the Welcome page.

4. Click **Install as administrative user** to install as an administrative user. If you are a root user, you can install as an administrative user. If you are not a root user, or if you want to install to your own user name without root privileges, clear this check box.

5. Click **Install**. When you install IBM Business Process Manager, the required WebSphere Application Server Network Deployment is automatically installed.

    Note: IBM Business Process Manager V8.5 can be installed only on top of WebSphere Application Server Network Deployment V8.5.

6. On the Install Packages page of the Installation Manager, the **WebSphere Application Server Network Deployment**, **IBM Business Process Manager Express** package, and **IBM DB2 Express** are selected by default.

7. If you are connected to the Internet and want to check for the latest fix pack or refresh pack and recommended interim fixes for WebSphere Application Server and IBM Business Process Manager, click **Check for other Versions, Fixes, and Extensions**. Click **Next** to continue. You may be prompted to provide your IBM ID and password to connect to the IBM service repositories.

    An IBM ID and password can be obtained by registering at http://www.ibm.com.

    If there are any fix packs or interim fixes available, those are shown in the next dialog box after selecting the fix pack or refresh pack levels you want to install.

    Click **Cancel** to continue installing without downloading the required fixes from the Internet.

8. On the Licenses page, read the license agreement. If you agree to the terms of the license agreement, click **I accept the terms in the license agreements** and click **Next**.

9. On the Location page, the **Create new package group** option is selected by default. Select a location for the shared resources directory and a location for the Installation Manager and click **Next**. The Install Packages wizard checks your system for operating system prerequisites. If you are at a higher major release of a supported operating system, or if the operating system itself is not on the supported list, you might encounter a warning. You can continue with the installation, but the installation or product operation might not succeed until you apply maintenance.

If you see a warning, go to the product support web pages and obtain the latest maintenance packages to apply after installation. See the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Attention: Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

10. On the Features page, expand the plus symbol to select the package features that you want to install. Installation Manager automatically enforces any dependencies with other features and shows the updated download size and disk space requirements for the installation.

   a. Select the translations to install. Under **Translations Supported by All Packages**, **English** is selected by default for the English version. To install other language versions, select the appropriate language under **Translations Supported by Only Some Packages**.

   b. Optional: To see the dependency relationships between features, select **Show Dependencies**.

   c. Optional: Click a feature to view its brief description under **Details**.

   d. Select one of the following features to install.

   • IBM Process Center

   • IBM Process Server **Production** (the default) to use the server in production

   • IBM Process Server **Non-production** to use the server only for test, staging, or development. Your selection is recorded in the product tag for inventory purposes.

   Restriction: Do not mix production and non-production servers in the same cell.

   When you are finished selecting features, click **Next**.

11. Specify the DB2 administrative user names and passwords on the Common Configurations page.

   • DB2 instance user

   • DB2 fenced user

   • DB2 administration server (DAS) user

   If the fenced user or administration (DAS) server user name exists, clear the **New User** check box. Click **Re-Validate** to confirm that your choices are correct.

   Restriction: User names must not contain National Language Strings (NLS).

12. On the Summary page, review your choices before installing the IBM Business Process Manager Express package. If you want to change the choices that you made on previous pages, click **Back** and make your changes. When you are satisfied with your installation choices, click **Install** to install the package. A progress indicator shows the percentage of the installation completed.

13. When the installation process is complete, a message confirms the success of the process.

   a. Optional: Click **View Log File** to open the installation log file for the current session in a new window. You must close the Installation Log window to continue.

   b. If you plan to use the **BPMConfig** command-line utility to create your Deployment Environment, you do not need to use the Profile Management Tool (PMT) and select **None** to complete the installation.

   c. Click **Finish** to close the Installation Manager.

After you install IBM Business Process Manager, you must configure profiles and databases by using the **BPMConfig** command.

Related information:

Installation Manager updates

Installing silently using the command line:

You can install IBM Business Process Manager silently using the command line. With this method, you only need to run one command to perform the installation.

If you do not have the prerequisite base products necessary for IBM Business Process Manager Express installation, you must install them as part of the silent installation. The required base products are:
* Installation Manager
* WebSphere Application Server Network Deployment, including the ejbdeploy and thinclient features.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

The silent installation performs the following tasks:
* Installs Installation Manager if it is not already installed or updates it to the appropriate level if it is installed.
* Installs the required base products and IBM Business Process Manager Express.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: Run the following command to generate encrypted passwords using IBM Installation Manager to securely connect to DB2 and the administrative console.

   `extract_directory/IM/tools/imutilsc -silent -nosplash encryptString password_to_encrypt`

   Note: If you are running on a 64-bit system and do not already have 32-bit Installation Manager installed, then you must run the command from the `extract_directory/IM64/tools` directory.

2. Read and accept the license terms before installing. Adding **-acceptLicense** to the command line means that you accept all licenses.

3. Run the following command:

   `extract_directory/IM/tools/imcl install list_of_product_IDs -acceptLicense`
   `-installationDirectory location -repositories repository`
   `-properties key=value,key=value -showVerboseProgress -log logName.log`

   Note: If you are running on a 64-bit system and do not already have 32-bit Installation Manager installed, then you must run the commands from the `extract_directory/IM64/tools` directory. where:
   * *list_of_product_IDs* is a list of the IDs for the products and features that you want to install. You must include the required features. The syntax is *productID,feature,feature*, with multiple products separated by spaces.

Table 44. Product IDs

Product	Product ID	Feature and Description
IBM BPM Express	com.ibm.bpm.EXP.v85	• **ExpressProcessCenter** • **ExpressProcessServer.NonProduction** - Test, staging, or development use. • **ExpressProcessServer.Production** - Production use.

Table 44. Product IDs (continued)

Product	Product ID	Feature and Description
WebSphere Application Server Network Deployment	com.ibm.websphere.ND.v85	• core.feature: Required. WebSphere Application Server core content. • ejbdeploy: Required. Pre-Enterprise JavaBeans (EJB) 3.0 modules. • thinclient: Required. Stand-alone thin clients and resource adapters. • embeddablecontainer: Embeddable EJB container. • samples: Sample applications feature. • com.ibm.sdk.6_32bit: 32-bit software development kit (SDK). You must specify either this feature or com.ibm.sdk.6_64bit. • com.ibm.sdk.6_64bit: 64-bit SDK This feature can only be selected on a 64-bit system. You must specify either this feature or com.ibm.sdk.6_32bit.
Installation Manager	com.ibm.cic.agent	• agent_core: Installation Manager core content. • agent_jre: Installation Manager Java Runtime Environment (JRE).
DB2 Express for Linux 32-bit	com.ibm.ws.DB2EXP. linuxia32	n/a: DB2 must match the operating system and bitness.
DB2 Express for Linux 64-bit	com.ibm.ws.DB2EXP. linuxia64	n/a: DB2 must match the operating system and bitness.

- *location* is the path to the directory where you want to install the products. If you want to install into an existing supported instance of WebSphere Application Server Network Deployment, specify its directory.
- *repository* is the path to the repository where you have extracted the files, one of the following directories:

  extract_directory/repository/repos_32bit
  extract_directory/repository/repos_64bit

  For more than one repository, separate the repository locations with commas.
- *key=value* is a list of the keys and values you want to pass to the installation, separated by commas. Do not put spaces between the commas. Create encrypted passwords using the IBM Installation Manager.

  Note: This table is applicable only when you install DB2 Express.

Table 45. Keys

Key	Description
user.db2.port	Port for the DB2 database. The default value is 50000.
user.db2.instance.username	DB2 instance user name.
user.db2.instance.password	Encrypted password for the DB2 instance user name.

Key	Description
user.db2.fenced.newuser	The value **true** is for a new user. The value **false** is for an existing user. If the value is **false**, then the *user.db2.fenced.password* is not needed.
user.db2.fenced.username	Fenced user name.
user.db2.fenced.password	Encrypted password for the fenced user name.
user.db2.das.newuser	The value *true* is for a new user. The value *false* is for an existing user. If the value is **false**, then the *user.db2.das.password* is not needed.
user.db2.das.username	Administration server (DAS) user name.
user.db2.das.password	Encrypted password for the administration server user name.

- *logName* is the name of the log file to record messages and results.

Running this command installs the product with the default features. If you want to install specific features or make other changes, see the reference link for the command-line arguments for imcl.

Installation Manager installs the list of products and writes a log file to the directory that you specified. The log file is empty if there are no errors or warnings.

The following example installs IBM Business Process Manager Express, WebSphere Application Server Network Deployment, and DB2 Express on Linux.

```
imcl install com.ibm.bpm.EXP.v85,ExpressProcessCenter
com.ibm.websphere.ND.v85,core.feature,ejbdeploy,thinclient,
embeddablecontainer,samples,com.ibm.sdk.6_64bit com.ibm.ws.DB2EXP10.linuxia64 -acceptLicense
-installationDirectory /usr/IBM/BPM85 -repositories /usr/tmp/BPM/repository
-properties user.db2.instance.username=bpmadmin,user.db2.instance.password=Vvrs88V/a9BUdxwodz0nUg==
-showVerboseProgress -log silentinstall.log
```

After you install IBM Business Process Manager, you must configure profiles and databases by using the **BPMConfig** command.

Related reference:

⬐ Command-line arguments for imcl

⬐ IBM Business Process Manager Express system requirements

Related information:

⬐ IBM WebSphere Application Server Information Center

Installing silently using a response file:

You can install IBM Business Process Manager Express silently by creating a response file and then running a command to use that response file to install the product.

If you do not have the prerequisite base products necessary for IBM Business Process Manager Express installation, you must install them as part of the silent installation. The required base products are:

- Installation Manager
- WebSphere Application Server Network Deployment, including the ejbdeploy and thinclient features.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all required images (three disk images for Linux systems on Intel; two disk images for other Linux systems), and extracted them to the same directory.

Restriction: Extract the installation files to a directory that does not contain spaces or special characters. The launchpad cannot be started from a directory path that contains spaces or special characters.

By using response files, you can simplify the silent installation and reduce error in the process because you set up your installation options once in a saved, sharable file that can be used on one or more machines. The installation software provides sample response files for each supported operating system and bit version. You can use an unmodified sample response file to perform a silent installation using default settings, or you can modify the response file to set particular values. The comments in the sample response files provide detailed instructions and information about setting the values.

The silent installation performs the following tasks:
- Installs Installation Manager if it is not already installed or updates it to the appropriate level if it is installed.
- Installs the required base products and IBM Business Process Manager Express.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: Run the following command to generate encrypted passwords using IBM Installation Manager to securely connect to DB2 and the administrative console.

   `extract_directory/IM/tools/imutilsc -silent -nosplash encryptString password_to_encrypt`

   Note: If you are running on a 64-bit system and do not already have 32-bit Installation Manager installed, then you must run the command from the `extract_directory/IM64/tools` directory.

2. Create the response file that will install the required base products and IBM Business Process Manager Express. Copy a sample response file, suitable for your bit version and user access level, from the following directory:

   `extract_directory/responsefiles/BPM/`

   Alternatively, you can create a response file by recording your actions in Installation Manager. When you record a response file, the selections that you make in Installation Manager are stored in an XML file. When you run Installation Manager in silent mode, Installation Manager uses the data in the XML response file to perform the installation.

3. The default values provided in the sample response files will perform a basic install, but you should review the file and its comments, and modify the parameters as needed for your environment and the access level of your user ID.

   In particular, review the following parameters and values:
   - For non-root user IDs, check that all location variables point to locations that the user has permissions for.
   - Repository location. If you are not running directly from the `extract_directory/responsefiles/BPM/` directory, point to the location of your installation repository. The repository can be local or remote. If you are running from the DVD, copy the response file from the DVD and point it back at the repository on the DVD.
   - Installation location (**installLocation**) where IBM Installation Manager is already installed or will be installed.
   - Installation location where IBM Business Process Manager Express will be installed. If you want to install into an existing supported instance of WebSphere Application Server Network Deployment, specify its directory.
   - Eclipse location (**eclipseLocation**). If you want to install into an existing supported instance of WebSphere Application Server Network Deployment, specify its Eclipse location directory.

- The list of features for the product.
- Production or non-production use.
- If you are installing DB2 Express, follow the instructions in the response file for providing the necessary user IDs and passwords. Use the instructions in step 1 for generating the encrypted passwords to include.

4. Read and accept the license terms before installing. Adding **-acceptLicense** to the command line means that you accept all licenses.

5. Run the following command:

   Note: If you are running on a 64-bit system and do not already have 32-bit Installation Manager installed, then you must run the command from the *extract_directory*/IM64/tools directory.

   Root user:

   ```
   extract_directory/IM/installc -acceptLicense input
     extract_directory/responsefiles/BPM/response_file_name.xml
     -log preferred_log_location/silent_install.log
   ```

   Nonroot user:

   ```
   extract_directory/IM/userinstc -acceptLicense input
     extract_directory/responsefiles/BPM/response_file_name.xml
     -log preferred_log_location/silent_install.log
   ```

Installation Manager installs any required prerequisites and IBM Business Process Manager Express, and writes a log file to the directory you specified.

After you install IBM Business Process Manager, you must configure profiles and databases by using the **BPMConfig** command.

Related tasks:

▪ Working in silent mode

▪ Recording a response file with Installation Manager

Related reference:

▪ IBM Business Process Manager Express system requirements

Granting write permission of files and directories to nonroot users for profile creation or augmentation:

If you are not the user who installed the product, you must have write permission to selected directories within the IBM Business Process Manager installation. The product installer can grant this permission or create a group with permission to create or augment profiles.

The product installer (who can be a root or nonroot user) can grant write permission to the appropriate IBM Business Process Manager files and directories to nonroot users. The nonroot users can then create profiles. Alternatively, the product installer can create a group for users who are authorized to create profiles or give individual users the authority to create profiles.

Nonroot users create their own profiles to manage their own environments. Typically, they manage environments for development purposes.

Nonroot users must store their profiles in their private directory structure, not in the *installation_root*/profiles directory of the product.

Restrictions:

- IBM Business Process Manager does not support changing ownership of existing profiles from the product installer to nonroot users. A nonroot user cannot augment profiles owned by another user.
- Mechanisms within the Profile Management Tool that suggest unique names and port values are disabled for nonroot users. The nonroot user must change the default field values in the Profile Management Tool for the profile name, node name, cell name, and port assignments. The product installer can assign nonroot users a range of values for each of the fields, and assign responsibility to the users for adhering to their assigned value ranges and for maintaining the integrity of their own definitions.

If you already created at least one profile, certain directories and files were created. You can skip the steps in this topic that create these directories and files. If no profile was previously created, you must complete the steps to create the required directories and files.

The following example task shows how to create a group that is authorized to create profiles. The terms "installer" and "product installer" refer to the user ID that installed IBM Business Process Manager. The installer can perform the following steps to create the `profilers` group and give the group appropriate permissions to create a profile.

1. Log on to the IBM Business Process Manager system as the product installer. The product installer can be a root or nonroot user.
2. Using operating system commands, perform the following steps:
   a. Create a group named **profilers**, which will contain all users who can create profiles.
   b. Create a user named **user1**, who can create profiles.
   c. Add users **product_installer** and **user1** to the **profilers** group.
3. Log off and log back on as the installer to pick up the new group.
4. If no profile exists, create the following directories as the installer:
   - Create the *install_root*/**logs/manageprofiles** directory:

     ```
     mkdir install_root/logs/manageprofiles
     ```
   - Create the *install_root*/**properties/fsdb** directory:

     ```
     mkdir install_root/properties/fsdb
     ```
5. If no profile exists, create the `profileRegistry.xml` file as the installer. For this example, the file path is:

   ```
    install_root/properties/profileRegistry.xml
   ```

   Add the following information to the `profileRegistry.xml` file. The file must be encoded as UTF-8.

   ```
   <?xml version="1.0" encoding="UTF-8"?>
   <profiles/>
   ```
6. As the product installer, use operating system tools to change directory and file permissions. The following example assumes that the variable **$WASHOME** is the IBM Business Process Manager root installation directory **/opt/IBM/WebSphere/AppServer**.

```
export WASHOME=/opt/IBM/WebSphere/AppServer
echo $WASHOME
echo "Performing chggrp/chmod per WAS directions..."
chgrp profilers $WASHOME/logs/manageprofiles
chmod g+wr  $WASHOME/logs/manageprofiles
chgrp profilers $WASHOME/properties
chmod g+wr  $WASHOME/properties
chgrp profilers $WASHOME/properties/fsdb
chmod g+wr  $WASHOME/properties/fsdb
chgrp profilers $WASHOME/properties/profileRegistry.xml
chmod g+wr  $WASHOME/properties/profileRegistry.xml
chgrp -R profilers $WASHOME/profileTemplates
```

Issue the following additional commands:

```
chgrp profilers $WASHOME/properties/Profiles.menu
chmod  g+wr $WASHOME/properties/Profiles.menu
```

You might have to change the permissions on additional files if the nonroot user encounters permission errors. For example, if the product installer authorizes a nonroot user to delete a profile, then the product installer might have to delete the following file:

install_root/properties/profileRegistry.xml_LOCK

Give write access to the nonroot user for the file to authorize the user to delete the file. If the nonroot user still cannot delete the profile, then the product installer can delete the profile.

The installer created the **profilers** group and gave the group the correct permissions to the directories and files required for a nonroot user to create profiles.

The nonroot user that belongs to the **profilers** group can create profiles in a directory that the nonroot user owns and to which the nonroot user has write permission. However, the nonroot user cannot create profiles in the installation root directory of the product.

The root user and the nonroot user can use the same tasks to manage profiles.

Configuring profiles and databases:

After you install the product, if you did not use typical installation, you must create or augment one or more profiles to define the runtime environment. Before starting a profile, you must have configured the databases that are to be used with the profile.

Configuring a stand-alone environment with a DB2 database server on Linux:

You can configure a stand-alone environment for a DB2 database server.

Creating DB2 databases:

You can create the required databases for IBM Business Process Manager V8.5 before you create profiles and configure your network deployment environment. Usually you require the Process database, the Performance Data Warehouse database, and the Common database. In the case of an Advanced-only deployment environment, you need only the Common database.

The Process Server and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

In an IBM Business Process Manager environment, the **createDatabase.sql** script is used to create the databases. It is available in the *BPM_HOME*/BPM/dbscripts/DB2/Create folder.

In the following example, replace @*DB_NAME*@ with the name that you want to use for the created database and @*DB_USER*@ with the user name that you want to use for the database.

1. If IBM Business Process Manager is installed on your machine, locate the SQL script **createDatabase.sql** to run. Otherwise, use the command line option.
2. Run the following sample script to create each database.

   BPM_HOME/BPM/dbscripts/DB2/Create/createDatabase.sql

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

```
create database @DB_NAME@ automatic storage yes  using codeset UTF-8 territory US pagesize 32768;
connect to @DB_NAME@;
grant dbadm on database to user @DB_USER@;
UPDATE DB CFG FOR @DB_NAME@ USING LOGFILSIZ 4096 DEFERRED;
UPDATE DB CFG FOR @DB_NAME@ USING LOGSECOND 64 DEFERRED;
connect reset;
```

Note: If a command fails to execute from the DB2 command prompt, remove the semicolon (;) and rerun the command.

If IBM Business Process Manager is not installed, run the following command from the command line:

```
db2 -tvf createDatabase.sql
```

Creating the BPM database tables and configuring stand-alone profiles:

Use the **BPMConfig** command to create a stand-alone profile and to create database tables at the same time or to generate scripts for creating the database tables at a later time. Use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Creating database tables and profiles simultaneously using the BPMConfig command:

If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

To create a stand-alone profile and the database tables at the same time, complete the following steps:

1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/config/express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called Express-PC-Standalone-DB2.properties.

2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples. To have the database tables created at the same time as the profile is created, ensure that the setting for **bpm.de.deferSchemaCreation** is set to false.

3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:

   BPM_home/bin/BPMConfig -create -de *my_environment.properties*

   The new stand-alone profile and the database tables are created using the settings provided your properties file.

Proceed to the Quick Start console and start the server for the stand-alone profile you created.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Creating database tables and profiles separately using the BPMConfig command:

If you want your databases to exist on a different computer from your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and to generate the scripts for creating your database tables at a later time.

Generating DB2 database scripts using the BPMConfig command:

You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Prepare the following information:

- Information about the database configuration that you are designing. This might be a document that describes the general purpose of the database configuration supplied by the database administrator or solution architect. Alternatively, it might be a description of required parameters and properties. This information must include:
  - The location of the databases.
  - The user ID and password for authenticating to the database.
- Information about how IBM Business Process Manager and its components have been installed, the database software used, and the properties required by that type of database.
- An understanding of the profiles that you plan to create, specifically, the functional relationship between the profile types and the databases.
- Information about the topology pattern to be implemented, and an understanding of how the database design fits into the pattern that you plan to use.

To generate the database SQL scripts that you can use to create your database tables, complete the following steps:

1. On the machine where you want to create the deployment environment, locate the appropriate sample properties file *BPM_HOME*/BPM/samples/config.
2. Find the sample properties file that most closely represents your target deployment environment and make a copy of this file.

   For more information about the sample configuration files, refer to Configuration properties for the BPMConfig command.
3. Run the **BPMConfig** command with the parameter **-sqlfiles** and the name of the equivalent properties file you choose.
   - To generate the database scripts in the dbscripts directory of the deployment manager profile, use the following syntax:

     BPM_HOME/bin/BPMConfig -create -sqlfiles *my_environment.properties*

     Note: The SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. These scripts are deleted if you run the **BPMConfig** command again or configure the deployment environment using the Deployment Environment wizard.
   - To generate the database scripts in an output directory of your choice, use the following syntax:

     BPM_HOME/bin/BPMConfig -create -sqlfiles *my_environment.properties* -outputDir /MyBPMScriptDir

     In the above syntax, **MyBPMScriptDir** is the directory you specify.

     Note: If you do not use the **-outputDir** parameter with the **BPMConfig** command, the profile is generated, if it does not exist, even before the database scripts are generated.

The database SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. This folder includes the following sub-folder:

- *deployment_environment_name* - For each Deployment Environment, this folder will contain the SQL files that need to be executed.

These subdirectories also contain a **createDatabase.sql** script, which you can use to run the database scripts to create the DB2 database tables.

A default configuration for a **Standard** deployment environment with DB2 databases contains the following sub-folders and SQL scripts:

- *deployment_environment_name*
  - DB2
    - *CMNDB*

- createSchema_Standard.sql
- createSchema_Messaging.sql
  - *BPMDB*
    - createSchema_Standard.sql
    - createProcedure_Standard.sql
  - *PDWDB*
    - createSchema_Standard.sql

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

Running the generated DB2 database scripts:

If you run the BPMConfig command with the property *bpm.de.deferSchemaCreation* set to **true**, or if you used the Deployment Environment Wizard and cleared the Create Tables option, you must run the generated database scripts manually to create the database tables.

Before you begin this task, you must have run the **BPMConfig** command or the Deployment Environment Wizard to generate the correct SQL scripts.

If the property *bpm.de.deferSchemaCreation* is set to **false**, or if you used the Deployment Environment Wizard and did not clear the Create Tables option, the SQL scripts are run during configuration of the deployment environment.

The database SQL scripts are generated in the *profile_name*/dbscripts folder by default.

1. Locate the generated SQL scripts.

   A default configuration for a **Standard** deployment environment with DB2 databases contains the following sub-folders and SQL scripts:
   - *deployment_environment_name*
     - DB2
       - *CMNDB*
         - createSchema_Standard.sql
         - createSchema_Messaging.sql
       - *BPMDB*
         - createSchema_Standard.sql
         - createProcedure_Standard.sql
       - *PDWDB*
         - createSchema_Standard.sql

   Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

2. Run the scripts to apply the schema to the CMNDB.

   For example, use the following commands to run the scripts manually for a **deployment environment-level** Common database configuration:

   ```
   db2 connect to CMNDB USER username USING password
   db2 -tvf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/CMNDB/createSchema_Standard.sql
   db2 -tvf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/CMNDB/createSchema_Messaging.sql
   db2 connect reset
   ```

3. Run the scripts to apply the schema to the BPMDB.

   For example, use the following commands to run the scripts manually for Process database configuration:

```
db2 -tvf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/BPMDB/createDatabase.sql
db2 connect to BPMDB USER username USING password
db2 -tvf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/BPMDB/createSchema_Standard.sql
db2 -tdGO -vf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/BPMDB/createProcedure_Standard.sql
db2 connect reset
```

4. Run the **bootstrapProcessServerData** command to load configuration data for the IBM BPM applications into the Process database. This data is required for the applications to run correctly.

   For example:

   Use the following command to load bootstrap data onto a server that is part of an ND environment but not part of a cluster:

   ```
   bootstrapProcessServerData.sh -nodeName node1 -serverName myServer
   ```

   Use the following command to load bootstrap data onto a cluster that hosts the Process Server or Process Center:

   ```
   bootstrapProcessServerData.sh -clusterName myAppCluster
   ```

   Additional information about running the **bootstrapProcessServerData** command is found in the topic "Loading the database with system information in a network deployment environment."

5. Run the scripts to apply the schema to the PDWDB.

   For example, use the following commands to run the scripts manually for Performance Data Warehouse database configuration:

   ```
   db2 connect to PDWDB USER username USING password
   db2 -tvf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/PDWDB/createSchema_Standard.sql
   db2 connect reset
   ```

Related tasks:

"Generating DB2 database scripts using the BPMConfig command" on page 113
You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Creating stand-alone profiles with a DB2 database server using the BPMConfig command:

You can configure a stand-alone profile using the **BPMConfig** command.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/config/express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called Express-PC-Standalone-DB2.properties.

2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples.

3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:

   ```
   BPM_home/bin/BPMConfig -create -profile my_environment.properties
   ```

   The new stand-alone profile is created according to the settings provided in your properties file.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.

- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Augmenting stand-alone profiles using the manageprofiles command-line utility:

You can use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Remember to shut down any servers associated with a profile you plan to augment.

Make sure that you are not already running the **manageprofiles** command-line utility on the same profile. If an error message is displayed when you run the command, determine if there is another profile creation or augmentation action in progress. If so, wait until it completes.

1. Determine the template that was used to create the existing profile that you want to augment. You must augment a stand-alone profile.

   Restriction: You cannot augment a stand-alone profile where the default WebSphere VMM user registry has been changed, for example, to using LDAP.

   You can determine the template by viewing the profile registry in the *installation_root*/properties/ profileRegistry.xml file. Do not modify this file; use it only to view the templates.

2. Find the appropriate template to use for the augmentation.

   Templates for each profile are located in the *installation_root*/profileTemplates/BPM directory for BPM templates. For stand-alone profiles, use the BPM/BpmServer template. This template is available with IBM BPM Express only.

3. Use the augment parameter to make changes to an existing profile with an augmentation template. The augment parameter causes the **manageprofiles** command-line utility to update or augment the profile identified in the **-profileName** parameter using the template in the **-templatePath** parameter. The augmentation templates that you can use are determined by which IBM products and versions are installed in your environment. The file path for **-templatePath** need not be fully qualified; /profileTemplates is automatically added as a prefix.

   Note: Do not manually modify the files that are located in the *installation_dir*/profileTemplates/ BPM directory.

4. Run the file from the command line. Do not supply a **-profilePath** parameter. For example:

   ```
   manageprofiles.sh -augment -templatePath BPM/BpmServer
   -profileName MyProfileName
   -adminUsername celladmin -adminPassword celladmin
   ```

   The status is written to the console window when the command completes running.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Related tasks:
Creating database tables and profiles simultaneously using the BPMConfig command
If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

Configuring a stand-alone environment with an Oracle database server on Linux:

You can configure a stand-alone environment for an Oracle database server.

Creating users for Oracle databases:

You can create the users for Oracle databases before you create profiles and configure your network deployment environment. Create the cell-scoped user, the deployment environment-level user, the Process Server user, and the Performance Data Warehouse user. Note: The Process Server user and the Performance Data Warehouse user are not needed for an Advanced-only deployment environment.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

You can use a single instance of Oracle for configuring BPM. The Oracle instance must exist and be available for access. Consult the Oracle documentation to create an Oracle instance. If you use a single Oracle instance, make sure that you use different user IDs for the three different BPM databases.

If IBM Business Process Manager is installed, the *BPM_HOME*/BPM/dbscripts/Oracle/Create folder contains the **createUser.sql** script that is used to create the users for Oracle databases.

In the following examples, replace *@DB_USER@* with the user name that you want to use for the database and replace *@DB_PASSWD@* with the password for that user.

Run the following sample script to create the database users.
BPM_HOME/BPM/dbscripts/Oracle/Create/createUser.sql
Optionally, or if IBM Business Process Manager is not installed, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

```
CREATE USER @DB_USER@ IDENTIFIED BY @DB_PASSWD@;
grant connect, resource, unlimited tablespace to @DB_USER@;
grant create view to @DB_USER@;
grant javauserpriv to @DB_USER@;
grant execute on dbms_lock to @DB_USER@;
```

Creating the BPM database tables and configuring stand-alone profiles:

Use the **BPMConfig** command to create a stand-alone profile and to create database tables at the same time or to generate scripts for creating the database tables at a later time. Use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Creating database tables and profiles simultaneously using the BPMConfig command:

If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

To create a stand-alone profile and the database tables at the same time, complete the following steps:
1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/config/express. For example, the sample configuration properties file for a Process Center environment using Oracle with IBM BPM Express is called Express-PC-Standalone-Oracle.properties.
2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples. To have the database tables created at the same time as the profile is created, ensure that the setting for **bpm.de.deferSchemaCreation** is set to false.
3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:
   BPM_home/bin/BPMConfig -create -de *my_environment.properties*
   The new stand-alone profile and the database tables are created using the settings provided your properties file.

Proceed to the Quick Start console and start the server for the stand-alone profile you created.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Creating database tables and profiles separately using the BPMConfig command:

If you want your databases to exist on a different computer from your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and to generate the scripts for creating your database tables at a later time.

Generating Oracle database scripts using the BPMConfig command:

You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Prepare the following information:
- Information about the database configuration that you are designing. This might be a document that describes the general purpose of the database configuration supplied by the database administrator or solution architect. Alternatively, it might be a description of required parameters and properties. This information must include:
  - The location of the databases.
  - The user ID and password for authenticating to the database.
- Information about how IBM Business Process Manager and its components have been installed, the database software used, and the properties required by that type of database.
- An understanding of the profiles that you plan to create, specifically, the functional relationship between the profile types and the databases.
- Information about the topology pattern to be implemented, and an understanding of how the database design fits into the pattern that you plan to use.

Important: If you are using an Oracle database, you must include the database user name and password for all databases, including the optional ones.

To generate the database SQL scripts that you can use to create your database tables, complete the following steps:
1. On the machine where you want to create the deployment environment, locate the appropriate sample properties file *BPM_HOME*/BPM/samples/config.
2. Find the sample properties file that most closely represents your target deployment environment and make a copy of this file.

   For more information about the sample configuration files, refer to Configuration properties for the BPMConfig command.
3. Run the **BPMConfig** command with the parameter **-sqlfiles** and the name of the equivalent properties file you choose.
   - To generate the database scripts in the dbscripts directory of the deployment manager profile, use the following syntax:

     BPM_HOME/bin/BPMConfig -create -sqlfiles *my_environment.properties*

     Note: The SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. These scripts are deleted if you run the **BPMConfig** command again or configure the deployment environment using the Deployment Environment wizard.
   - To generate the database scripts in an output directory of your choice, use the following syntax:

     BPM_HOME/bin/BPMConfig -create -sqlfiles *my_environment.properties* -outputDir /MyBPMScriptDir

     In the above syntax, **MyBPMScriptDir** is the directory you specify.

     Note: If you do not use the **-outputDir** parameter with the **BPMConfig** command, the profile is generated, if it does not exist, even before the database scripts are generated.

The database SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. This folder includes the following sub-folder:

- *deployment_environment_name* - For each Deployment Environment, this folder will contain the SQL files that need to be executed.

These subdirectories also contain a **createDatabase.sql** script, which you can use to run the database scripts to create the Oracle database tables.

A default configuration for a **Standard** deployment environment with Oracle databases contains the following sub-folders and SQL scripts:

- *deployment_environment_name*
  - Oracle
    - *orcl*
      - *cmnuser*
        - createSchema_Standard.sql
        - createSchema_Messaging.sql
      - *psuser*
        - createSchema_Standard.sql
        - createProcedure_Standard.sql
      - *pdwuser*
        - createSchema_Standard.sql

In the above example, **orcl** is the Oracle instance, **cmnuser** is the **deployment environment-level** user, **psuser** is the Process Server user, and **pdwuser** is the Performance Data Warehouse user.

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

Running the generated Oracle database scripts:

If you run the BPMConfig command with the property *bpm.de.deferSchemaCreation* set to **true**, or if you used the Deployment Environment Wizard and cleared the Create Tables option, you must run the generated database scripts manually to create the database tables.

Before you begin this task, you must have run the **BPMConfig** command or the Deployment Environment Wizard to generate the correct SQL scripts.

If the property *bpm.de.deferSchemaCreation* is set to **false**, or if you used the Deployment Environment Wizard and did not clear the Create Tables option, the SQL scripts are run during configuration of the deployment environment.

The database SQL scripts are generated in the *profile_name*/dbscripts folder by default.

1. Locate the generated SQL scripts.

   A default configuration for a **Standard** deployment environment with Oracle databases contains the following sub-folders and SQL scripts:

   - *deployment_environment_name*
     - Oracle
       - *orcl*
         - *cmnuser*
           - createSchema_Standard.sql
           - createSchema_Messaging.sql

- *psuser*
  - createSchema_Standard.sql
  - createProcedure_Standard.sql
- *pdwuser*
  - createSchema_Standard.sql

In the above example, **orcl** is the Oracle instance, **cmnuser** is the **deployment environment-level** user, **psuser** is the Process Server user, and **pdwuser** is the Performance Data Warehouse user.

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

2. Run the scripts to apply the schema to the CMNDB.

   For example, use the following commands to run the scripts manually for a **deployment environment-level** Common database configuration:

   ```
   sqlplus cmnuser/cmnpassword@orcl @BPM_HOME/profiles/DmgrProfile/dbscripts/deployment_environment_name/Oracle/orcl/cmn
   sqlplus cmnuser/cmnpassword@orcl @BPM_HOME/profiles/DmgrProfile/dbscripts/deployment_environment_name/Oracle/orcl/cmn
   ```

3. Run the scripts to apply the schema to the BPMDB.

   For example, use the following commands to run the scripts manually for the Process database configuration:

   ```
   sqlplus psuser/pspassword@orcl @BPM_HOME/profiles/DmgrProfile/dbscripts/deployment_environment_name/Oracle/orcl/psuse
   sqlplus psuser/pspassword@orcl @BPM_HOME/profiles/DmgrProfile/dbscripts/deployment_environment_name/Oracle/orcl/psuse
   ```

4. Run the **bootstrapProcessServerData** command to load configuration data for the IBM BPM applications into the Process database. This data is required for the applications to run correctly.

   For example:

   Use the following command to load bootstrap data onto a server that is part of an ND environment but not part of a cluster:

   ```
   bootstrapProcessServerData.sh -nodeName node1 -serverName myServer
   ```

   Use the following command to load bootstrap data onto a cluster that hosts the Process Server or Process Center:

   ```
   bootstrapProcessServerData.sh -clusterName myAppCluster
   ```

   Additional information about running the **bootstrapProcessServerData** command is found in the topic "Loading the database with system information in a network deployment environment."

5. Run the scripts to apply the schema to the PDWDB.

   For example, use the following commands to run the scripts manually for the Performance Data Warehouse database configuration:

   ```
   sqlplus pdwuser/pdwpassword@orcl @BPM_HOME/profiles/DmgrProfile/dbscripts/deployment_environment_name/Oracle/orcl/pdw
   ```

Related tasks:

"Generating Oracle database scripts using the BPMConfig command" on page 119
You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Creating stand-alone profiles with an Oracle database server using the BPMConfig command:

You can configure a stand-alone profile using the **BPMConfig** command.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/config/express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called Express-PC-Standalone-DB2.properties.

2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples.

3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:

   `BPM_home/bin/BPMConfig -create -profile my_environment.properties`

   The new stand-alone profile is created according to the settings provided in your properties file.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Augmenting stand-alone profiles using the manageprofiles command-line utility:

You can use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Remember to shut down any servers associated with a profile you plan to augment.

Make sure that you are not already running the **manageprofiles** command-line utility on the same profile. If an error message is displayed when you run the command, determine if there is another profile creation or augmentation action in progress. If so, wait until it completes.

1. Determine the template that was used to create the existing profile that you want to augment. You must augment a stand-alone profile.

   Restriction: You cannot augment a stand-alone profile where the default WebSphere VMM user registry has been changed, for example, to using LDAP.
   You can determine the template by viewing the profile registry in the *installation_root*/properties/ profileRegistry.xml file. Do not modify this file; use it only to view the templates.

2. Find the appropriate template to use for the augmentation.

   Templates for each profile are located in the *installation_root*/profileTemplates/BPM directory for BPM templates. For stand-alone profiles, use the BPM/BpmServer template. This template is available with IBM BPM Express only.

3. Use the augment parameter to make changes to an existing profile with an augmentation template. The augment parameter causes the **manageprofiles** command-line utility to update or augment the profile identified in the **-profileName** parameter using the template in the **-templatePath** parameter. The augmentation templates that you can use are determined by which IBM products and versions are installed in your environment. The file path for **-templatePath** need not be fully qualified; /profileTemplates is automatically added as a prefix.

   Note: Do not manually modify the files that are located in the *installation_dir*/profileTemplates/ BPM directory.

4. Run the file from the command line. Do not supply a **-profilePath** parameter. For example:

   ```
   manageprofiles.sh -augment -templatePath BPM/BpmServer
   -profileName MyProfileName
   -adminUsername celladmin -adminPassword celladmin
   ```

   The status is written to the console window when the command completes running.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Related tasks:

Creating database tables and profiles simultaneously using the BPMConfig command
If you are running your databases on the same computer as your deployment environment, you can use

the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

Configuring a stand-alone environment with an SQL Server database server on Linux:

You can configure a stand-alone environment for a Microsoft SQL Server database server.

Creating and configuring SQL Server databases before stand-alone profile creation:

You or your database administrator can create the databases before creating or augmenting stand-alone profiles.

Configuring XA transactions for SQL Server:

You must configure XA transactions after the Microsoft SQL Server database is installed and before you start the server. The SQL Server JDBC driver provides support for Java Platform, Enterprise Edition/JDBC 2.0 optional distributed transactions. JDBC connections obtained from the **SQLServerXADataSource** class can participate in standard distributed transaction processing environments such as Java Platform, Enterprise Edition (Java EE) application servers.

Failure to configure the XA transactions can result in the following error when the server starts:**javax.transaction.xa.XAException: com.microsoft.sqlserver.jdbc.SQLServerException: Failed to create the XA control connection. Error: "Could not find stored procedure 'master..xp_sqljdbc_xa_init_ex'."**.

The MS DTC service should be marked Automatic in Service Manager to make sure that it is running when the SQL Server service is started.

1. To enable MS DTC for XA transactions, you must follow these steps:

   On Windows XP and Windows Server 2003:
   a. Select **Control Panel** > **Administrative Tools** > **Component Services**.
   b. Select **Component Services** > **Computers** and right-click **My Computer**, and select **Properties**.
   c. Click the **MSDTC** tab, and then click **Security Configuration**.
   d. Select the **Enable XA Transactions** check box, and then click **OK**. This will cause a MS DTC service restart.
   e. Click **OK** again to close the **Properties** window, and then close **Component Services**.
   f. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

   On Windows Vista, Windows 7, and Windows Server 2008 R2:
   a. Select **Control Panel** > **Administrative Tools** > **Component Services**.
   b. Select **Component Services** > **Computers** > **My Computer** > **Distributed Transaction Coordinator**.
   c. Right-click **Local DTC** and then select **Properties**.
   d. Click the **Security** tab on the **Local DTC Properties** window.
   e. Select the **Enable XA Transactions** check box, and click **OK**. This will restart the MS DTC service.
   f. Click **OK** again to close the Properties window, and then close Component Services.
   g. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

2. Configure the JDBC Distributed Transaction Components:
   a. If you haven't installed IBM Business Process Manager, download "Microsoft SQL Server JDBC Drive 3.0" driver from the Microsoft Site using the URL from Resources section and extract it to any folder.
   b. If BPM is already installed, go to *bpm_install_root*/jdbcdrivers/SQLServer/xa to obtain the files you require in the following steps:
      • Copy the sqljdbc_xa.dll file from the JDBC unarchived directory to the Binn directory (for a default SQL Server install, the location is C:/Program Files/Microsoft SQL Server/

MSSQL10_50.MSSQLSERVER/MSSQL/Binn) of SQL Server computer. If you are using XA transactions with a 32-bit SQL Server, use the sqljdbc_xa.dll file in the x86 folder, even if the SQL Server is installed on a x64 processor. If you are using XA transactions with a 64-bit SQL Server on the x64 processor, use the sqljdbc_xa.dll file in the x64 folder.

- Run the xa_install.sql database script on SQL Server. For example; from the command prompt, run **sqlcmd -i xa_install.sql**. This script installs the extended stored procedures that are called by sqljdbc_xa.dll. These extended stored procedures implement distributed transaction and XA support for the Microsoft SQL Server JDBC Driver. You will need to run this script as an administrator of the SQL Server instance. You can ignore errors about unable to drop procedures that don't exist.

- Open the SQL Server Management Studio to locate the security folder under the **master** database. To grant permissions to a specific user to participate in distributed transactions with the JDBC driver, add the user to the **SqlJDBCXAUser** role in the master database (for example, for a Lombardi user add master database in User mappings and check **SqlJDBCXAUser** role).

After you configure the XA transactions and before you start the server, you must configure your TCP/IP connectivity using the below steps:

1. From Start menu, click **Microsoft SQl Server 2008 R2** > **Configuration Tools** > **SQL Server Configuration Manager**.
2. Expand **SQl Server network Configuration** > **Protocols for SQL2008**
3. Locate **TCP/IP** on the right-hand side.
4. Double click **TCP/IP** and enable it under the **Protocol** tab.
5. Click the **IP Addresses** tab to enable the TCP port for each configured IP address.

Creating SQL Server databases:

You can create the required databases for IBM Business Process Manager V8.5 before you create profiles and configure your network deployment environment. Usually you require the Process database, the Performance Data Warehouse database, and the Common database. In the case of an Advanced-only deployment environment, you need only the Common database.

- You cannot share databases across multiple installations or Deployment Environments
- The Process and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.
- Process and Performance Data Warehouse components require the databases to be case-insensitive for SQL Server
- CommonDB (and legacy WPS) components require the databases to be case-sensitive for SQL Server
- The schema name used for each component should match the user

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

If IBM Business Process Manager is installed on your machine, the **createDatabase_CaseInsensitive.sql** and **createDatabase_CaseSensitive.sql** scripts are available in the *BPM_HOME*/BPM/dbscripts/SQLServer/ Create folder.

In the following examples, replace @*DB_NAME*@ with the name that you want to use for the created database

1. If IBM Business Process Manager is installed on your machine, locate the SQL scripts to run. Otherwise, use the command line option.
2. Run the scripts to create the BPMDB and PDWDB databases. Run the following sample script:

   BPM_HOME/BPM/dbscripts/SQLServer/Create/createDatabase_CaseInsensitive.sql

Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

```
CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS;
```

If IBM Business Process Manager is not installed, run the following command from the command line:

```
sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS"
```

3. Run the script to create the CommonDB database. Run the following sample script:

```
BPM_HOME/BPM/dbscripts/SQLServer/Create/createDatabase_CaseSensitive.sql
```

Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

```
CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS;
```

If IBM Business Process Manager is not installed, run the following command from the command line:

```
sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS"
```

Note: The letter *CI* in the **COLLATE** attribute value is applicable for the case-insensitive databases and *CS* is applicable for case-sensitive databases.

Creating users and schemas for SQL Server databases:

You must create the users and schemas after creating the SQL Server databases.

Assign the IBM Business Process Manager database user to the following three roles:

Note: The database must be created by the database administrator who can then assign these roles to the database user for IBM Business Process Manager.

- db_ddladmin
- db_datawriter
- db_datareader

For information about the permissions that are provided by these roles, see documentation from Microsoft.

Important: In Microsoft SQL server, the default schema name associated with a user must be the same as the user name. For example, if the user name for the Performance Data Warehouse database is *dbuser* then the default schema name associated with the user *dbuser* must also be named *dbuser*. You must create an ordinary database user and assign the required rights to the user instead of using a super user, such as *sa*. This is because the default schema for the super user is dbo and this cannot be changed.

You can complete the following steps if existing tables are not associated with a schema that is the same as the user name.

1. In SQL Server Management Studio Object Explorer, right-click the table name and then click **Design**.
2. From the Design view, press F4 to view the Properties window.
3. From the Properties window, update the schema name.
4. Right-click the tab and select **Close** to close the Design view.
5. Click **OK** when prompted to save. The selected table is transferred to the schema.
6. Repeat the previous steps for all the tables in the Performance Data Warehouse database.

The **createUser.sql** script is available in the *BPM_HOME*/BPM/dbscripts/SQLServer/Create folder is used to create the users and schema for the SQL Server.

1. Locate the SQL scripts to run.
2. Run the scripts to create the users and schemas for SQL Server databases. For example, run the following sample script to create the required users.

```
BPM_HOME/BPM/dbscripts/SQLServer/Create/createUser.sql
```

Optionally, if the above script is unavailable during configuration, an copy the contents of the above SQL file and run the commands from the command line as follows:

```
USE master
GO
CREATE LOGIN @DB_USER@ WITH PASSWORD='@DB_PASSWD@'
GO

USE @DB_NAME@
GO
CREATE USER @DB_USER@ FOR LOGIN @DB_USER@ WITH DEFAULT_SCHEMA=@DB_USER@
GO
CREATE SCHEMA @DB_USER@ AUTHORIZATION @DB_USER@
GO
EXEC sp_addrolemember 'db_ddladmin', @DB_USER@;
EXEC sp_addrolemember 'db_datareader', @DB_USER@;
EXEC sp_addrolemember 'db_datawriter', @DB_USER@;
```

In the above example, replace *@DB_NAME@* with the BPM database name for which you created users and schema, *@DB_USER@* with the database user you want to create, and *@DB_PASSWD@* with the password for that user.

When you create database schemas the using the generated scripts, your user ID must have the authority to create tables. When the tables are created, you must have the authority to select, insert, update, and delete information in the tables.

The following table describes the database privileges that are needed to access the data stores.

Table 46. Database privileges

Minimum privileges that are required to create objects in the database	Minimum privileges that are required to access objects in the database
The user ID ideally requires DB OWNER privileges on the data stores used for IBM Business Process Manager.	Configure the SQL Server for SQL Server and Windows authentication so that authentication to be based on an SQL server login ID and password. The user ID must be the owner of the tables, or a member of a group that has sufficient authority to issue TRUNCATE TABLE statements. See the **Detailed SQL Server database privileges** table at SQL Server database privileges.

Creating the BPM database tables and configuring stand-alone profiles:

Use the **BPMConfig** command to create a stand-alone profile and to create database tables at the same time or to generate scripts for creating the database tables at a later time. Use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Creating database tables and profiles simultaneously using the BPMConfig command:

If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

To create a stand-alone profile and the database tables at the same time, complete the following steps:

1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/ config/express. For example, the sample configuration properties file for a Process Center environment using SQL Server with IBM BPM Express is called Express-PC-Standalone-SQLServer.properties.

2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples. To have the database tables created at the same time as the profile is created, ensure that the setting for **bpm.de.deferSchemaCreation** is set to false.

3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:

   BPM_home/bin/BPMConfig -create -de *my_environment.properties*

   The new stand-alone profile and the database tables are created using the settings provided your properties file.

Proceed to the Quick Start console and start the server for the stand-alone profile you created.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Creating database tables and profiles separately using the BPMConfig command:

If you want your databases to exist on a different computer from your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and to generate the scripts for creating your database tables at a later time.

Generating SQL database scripts using the BPMConfig command:

You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Prepare the following information:

- Information about the database configuration that you are designing. This might be a document that describes the general purpose of the database configuration supplied by the database administrator or solution architect. Alternatively, it might be a description of required parameters and properties. This information must include:
  - The location of the databases.
  - The user ID and password for authenticating to the database.
- Information about how IBM Business Process Manager and its components have been installed, the database software used, and the properties required by that type of database.
- An understanding of the profiles that you plan to create, specifically, the functional relationship between the profile types and the databases.
- Information about the topology pattern to be implemented, and an understanding of how the database design fits into the pattern that you plan to use.

To generate the database SQL scripts that you can use to create your database tables, complete the following steps:

1. On the machine where you want to create the deployment environment, locate the appropriate sample properties file *BPM_HOME*/BPM/samples/config.

2. Find the sample properties file that most closely represents your target deployment environment and make a copy of this file.

   For more information about the sample configuration files, refer to Configuration properties for the BPMConfig command.

3. Run the **BPMConfig** command with the parameter **-sqlfiles** and the name of the equivalent properties file you choose.
   - To generate the database scripts in the `dbscripts` directory of the deployment manager profile, use the following syntax:

     BPM_HOME/bin/BPMConfig -create -sqlfiles *my_environment.properties*

     Note: The SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. These scripts are deleted if you run the **BPMConfig** command again or configure the deployment environment using the Deployment Environment wizard.
   - To generate the database scripts in an output directory of your choice, use the following syntax:

     BPM_HOME/bin/BPMConfig -create -sqlfiles *my_environment.properties* -outputDir /MyBPMScriptDir

     In the above syntax, **MyBPMScriptDir** is the directory you specify.

     Note: If you do not use the **-outputDir** parameter with the **BPMConfig** command, the profile is generated, if it does not exist, even before the database scripts are generated.

The database SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. This folder includes the following sub-folder:

- *deployment_environment_name* - For each Deployment Environment, this folder will contain the SQL files that need to be executed.

These subdirectories also contain a **createDatabase.sql** script, which you can use to run the database scripts to create the SQL Server database tables.

A default configuration for sea **Standard** deployment environment with SQL Server databases contains the following sub-folders and SQL scripts:

- *deployment_environment_name*
  - SQLServer
    - *CMNDB*
      - *schema name*
        - `createSchema_Standard.sql`
        - `createSchema_Messaging.sql`
    - *BPMDB*
      - *schema name*
        - `createSchema_Standard.sql`
        - `createProcedure_Standard.sql`
    - *PDWDB*
      - *schema name*
        - `createSchema_Standard.sql`

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

Running the generated SQL Server database scripts:

If you run the BPMConfig command with the property *bpm.de.deferSchemaCreation* set to **true**, or if you used the Deployment Environment Wizard and cleared the Create Tables option, you must run the generated database scripts manually to create the database tables.

Before you begin this task, you must have run the **BPMConfig** command or the Deployment Environment Wizard to generate the correct SQL scripts.

If the property *bpm.de.deferSchemaCreation* is set to **false**, or if you used the Deployment Environment Wizard and did not clear the Create Tables option, the SQL scripts are run during configuration of the deployment environment.

The database SQL scripts are generated in the *profile_name*/dbscripts folder by default.

1. Locate the generated SQL scripts.

   A default configuration for sea **Standard** deployment environment with SQL Server databases contains the following sub-folders and SQL scripts:

   - *deployment_environment_name*
     - SQLServer
       - *CMNDB*
         - *schema name*
           - createSchema_Standard.sql
           - createSchema_Messaging.sql
       - *BPMDB*
         - *schema name*
           - createSchema_Standard.sql
           - createProcedure_Standard.sql
       - *PDWDB*
         - *schema name*
           - createSchema_Standard.sql

   Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

2. Run the scripts to apply the schema to the CMNDB.

   For example, use the following commands to run the scripts manually for a **deployment environment-level** Common database configuration:

   ```
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d CMNDB -i profiles/DmgrProfile/dbscripts/deployment_environment_name/SQLServer/C
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d CMNDB -i profiles/DmgrProfile/dbscripts/deployment_environment_name/SQLServer/C
   ```

   In the above and following examples, **schema1** is the name of the schema used.

3. Run the scripts to apply the schema to the BPMDB.

   For example, use the following commands to run the scripts manually for the Process database configuration:

   ```
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d BPMDB -i profiles/DmgrProfile/dbscripts/deployment_environment_name/SQLServer/B
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d BPMDB -i profiles/DmgrProfile/dbscripts/deployment_environment_name/SQLServer/B
   ```

4. Run the **bootstrapProcessServerData** command to load configuration data for the IBM BPM applications into the Process database. This data is required for the applications to run correctly.

   For example:

   Use the following command to load bootstrap data onto a server that is part of an ND environment but not part of a cluster:

   ```
   bootstrapProcessServerData.sh -nodeName node1 -serverName myServer
   ```

   Use the following command to load bootstrap data onto a cluster that hosts the Process Server or Process Center:

   ```
   bootstrapProcessServerData.sh -clusterName myAppCluster
   ```

   Additional information about running the **bootstrapProcessServerData** command is found in the topic "Loading the database with system information in a network deployment environment."

5. Run the scripts to apply the schema to the PDWDB.

For example, use the following commands to run the scripts manually for the Performance Data Warehouse database configuration. For example, use the following commands to run the scripts manually for the Performance Data Warehouse database configuration:

```
sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d PDWDB -i profiles/DmgrProfile/dbscripts/deployment_environment_name/SQLServer/PDW
```

Related tasks:
"Generating SQL database scripts using the BPMConfig command" on page 127
You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Creating stand-alone profiles with an SQL Server database server using the BPMConfig command:

You can configure a stand-alone profile using the **BPMConfig** command.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/ config/express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called Express-PC-Standalone-DB2.properties.
2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples.
3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:
   BPM_home/bin/BPMConfig -create -profile *my_environment.properties*

   The new stand-alone profile is created according to the settings provided in your properties file.
• Proceed to the Quick Start console and start the server for the stand-alone profile you created.
• To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Augmenting stand-alone profiles using the manageprofiles command-line utility:

You can use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Remember to shut down any servers associated with a profile you plan to augment.

Make sure that you are not already running the **manageprofiles** command-line utility on the same profile. If an error message is displayed when you run the command, determine if there is another profile creation or augmentation action in progress. If so, wait until it completes.

1. Determine the template that was used to create the existing profile that you want to augment. You must augment a stand-alone profile.

   Restriction: You cannot augment a stand-alone profile where the default WebSphere VMM user registry has been changed, for example, to using LDAP.
   You can determine the template by viewing the profile registry in the *installation_root*/properties/ profileRegistry.xml file. Do not modify this file; use it only to view the templates.
2. Find the appropriate template to use for the augmentation.

   Templates for each profile are located in the *installation_root*/profileTemplates/BPM directory for BPM templates. For stand-alone profiles, use the BPM/BpmServer template. This template is available with IBM BPM Express only.
3. Use the augment parameter to make changes to an existing profile with an augmentation template. The augment parameter causes the **manageprofiles** command-line utility to update or augment the

profile identified in the **-profileName** parameter using the template in the **-templatePath** parameter. The augmentation templates that you can use are determined by which IBM products and versions are installed in your environment. The file path for **-templatePath** need not be fully qualified; /profileTemplates is automatically added as a prefix.

Note: Do not manually modify the files that are located in the *installation_dir*/profileTemplates/ BPM directory.

4. Run the file from the command line. Do not supply a **-profilePath** parameter. For example:

```
manageprofiles.sh -augment -templatePath BPM/BpmServer
-profileName MyProfileName
-adminUsername celladmin -adminPassword celladmin
```

The status is written to the console window when the command completes running.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Related tasks:

Creating database tables and profiles simultaneously using the BPMConfig command
If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

Modifying and extending an existing installation

After you install and configure the runtime environment on your system in IBM Business Process Manager, you might want to customize your configuration. For example, you might want to customize settings, set up an additional security provider, set up user accounts, and change and encrypt passwords.

Installing and configuring IBM Business Process Manager on AIX for IBM Master Data Management (MDM) customers only

For IBM Master Data Management (MDM) customers only, you can install IBM Business Process Manager on AIX, and configure a stand-alone environment.

Typical installation and configuration

The Typical installation option is the simplest and quickest method for installing and configuring IBM Business Process Manager Express.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Related reference:

➡ IBM Business Process Manager Express system requirements

Installing and configuring IBM Business Process Manager Express with a DB2 database server:

You can install IBM Business Process Manager using an existing DB2 database server.

Creating DB2 databases:

You can create the required databases for IBM Business Process Manager V8.5 before you create profiles and configure your network deployment environment. Usually you require the Process database, the Performance Data Warehouse database, and the Common database. In the case of an Advanced-only deployment environment, you need only the Common database.

The Process Server and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

In an IBM Business Process Manager environment, the **createDatabase.sql** script is used to create the databases. It is available in the *BPM_HOME*/BPM/dbscripts/DB2/Create folder.

In the following example, replace *@DB_NAME@* with the name that you want to use for the created database and *@DB_USER@* with the user name that you want to use for the database.

1. If IBM Business Process Manager is installed on your machine, locate the SQL script **createDatabase.sql** to run. Otherwise, use the command line option.
2. Run the following sample script to create each database.

   BPM_HOME/BPM/dbscripts/DB2/Create/createDatabase.sql

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

   ```
   create database @DB_NAME@ automatic storage yes  using codeset UTF-8 territory US pagesize 32768;
   connect to @DB_NAME@;
   grant dbadm on database to user @DB_USER@;
   UPDATE DB CFG FOR @DB_NAME@ USING LOGFILSIZ 4096 DEFERRED;
   UPDATE DB CFG FOR @DB_NAME@ USING LOGSECOND 64 DEFERRED;
   connect reset;
   ```

   Note: If a command fails to execute from the DB2 command prompt, remove the semicolon (;) and rerun the command.

   If IBM Business Process Manager is not installed, run the following command from the command line:

   ```
   db2 -tvf createDatabase.sql
   ```

Installing and configuring Process Center with a DB2 database server:

Process Center includes a repository for all processes, services, and other assets created in the IBM Business Process Manager authoring environments. You can use the integrated Process Server within Process Center to run processes as you build them. When you are ready, you can install and run those same processes on the Process Server in your runtime environments.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty. The databases must be created with at least a 32K page size.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded both required disk images for your operating system, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   /user_home_directory/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=/launchpad_updates
   fixpack.WAS_REP=/WAS_updates
   fixpack.BPM_REP=/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   * If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

     mount_point/launchpad.sh

   * If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

        extract_directory/launchpad.sh

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Center** and click **Next**.

6. Optionally change the location information:

   * **Hostname**: This field shows the name of your machine.

     Important: If a value of localhost or 127.0.0.1 is used for the hostname, Process Server installations on a remote system will not be able to connect to the Process Center.

   * **Location**: Enter the installation location for Process Center, or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

7. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

8. Specify the **Username** and **Password** for the deployment environment administrative account. The deployment environment administrator is the primary IBM Business Process Manager administrator. A user assigned to this role has administrative access to Process Center and Process Admin Console. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This account also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.

9. Click **Next**.

10. Select **Yes** to use an existing database.

11. Specify the required database information.

Table 47. Required database configuration fields for DB2

Field	Action needed
Username	Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Enter a password to authenticate with the database.
Hostname	Accept the default value of localhost or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 50000 or enter the correct server port number.
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the name for the Process database.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the name for the Performance Data Warehouse database.

Click **Test Database Connection** to verify that you can connect to the BPM databases that are created. Only if the connections to the databases are successful, you can click **Next** to proceed.

12. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

After successfully installing the product, you can use Installation Manager to install the required fixes.

13. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

14. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

⬦ Installation Manager updates

Installing and configuring Process Server with a DB2 database server:

Process Server provides a single BPM runtime environment that can support a range of business processes for development, test, staging, or production.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty. The databases must be created with at least a 32K page size.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded both required disk images for your operating system, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   `/user_home_directory/bpm_updates.properties`

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

```
ifix.1=/bpmUpdates
fixpack.2=http://test/rep
launchpad.1=/launchpad_updates
fixpack.WAS_REP=/WAS_updates
fixpack.BPM_REP=/BPM_updates
```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

     mount_point/launchpad.sh

   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

        extract_directory/launchpad.sh

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Server** and click **Next**.

6. Specify Process Server information:

   - **Hostname**: This field shows the name of your machine.

   - **Location**: Enter the installation location for Process Server or click **Browse** to select the location.

     Note:
     - The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     - Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

   - Environment **Type**: Select how the Process Server is used:
     - Select **Development** if the server is to be used in a development capacity.
     - Select **Production** if the server is to be used in a production capacity.
     - Select **Stage** if the server is to be used as a temporary location to host changes before putting them into production.
     - Select **Test** if the server is to be used as a testing environment, for example, for load testing.

   - **Name**: Specify the name for the Process Server environment. This name is used to connect from a Process Center to this Process Server.

     Restriction: Do not mix production and non-production servers in the same cell.

   - Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also

enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

Select **Use this server offline** if this Process Server will not be connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications, but the method for deploying process applications to an offline Process Server differs from the method for deploying process applications to an online Process Server.

If you did not select **Use this server offline**, provide the following information for the Process Center that this server is to connect to:

- **Hostname**: Enter the host or virtual host that this Process Server will use to communicate with Process Center. Use a fully qualified host name. In an environment with a load balancer or proxy server between the Process Server and the Process Center services, make sure that what you designate here matches the URL for accessing the Process Center.
- **Port**: Enter the port number of the Process Center. In an environment with a load balancer or proxy server between the Process Server and the Process Center, make sure that what you designate here matches the URL for accessing the Process Center.
- **User name**: Enter the name of a Process Center user. Process Server will connect to Process Center as this user.
- **Password**: Enter the password for the Process Center user.

You can click **Test Connection** to check the connection to the Process Center.

7. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

8. Click **Next**.
9. Select **Yes** to use an existing database.
10. Specify the required database information.

Table 48. Required database configuration fields for DB2

Field	Action needed
Username	Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Enter a password to authenticate with the database.
Hostname	Accept the default value of localhost or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 50000 or enter the correct server port number.
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the name for the Process database.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the name for the Performance Data Warehouse database.

Click **Test Database Connection** to verify that you can connect to the BPM databases that are created. Only if the connections to the databases are successful, you can click **Next** to proceed.

11. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

    Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

    The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

    Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

    After successfully installing the product, you can use Installation Manager to install the required fixes.

12. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

13. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

➦ Installation Manager updates

Installing and configuring IBM Business Process Manager Express with an Oracle database server:

You can install IBM Business Process Manager using an Oracle database server.

Creating users for Oracle databases:

You can create the users for Oracle databases before you create profiles and configure your network deployment environment. Create the cell-scoped user, the deployment environment-level user, the Process Server user, and the Performance Data Warehouse user. Note: The Process Server user and the Performance Data Warehouse user are not needed for an Advanced-only deployment environment.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

You can use a single instance of Oracle for configuring BPM. The Oracle instance must exist and be available for access. Consult the Oracle documentation to create an Oracle instance. If you use a single Oracle instance, make sure that you use different user IDs for the three different BPM databases.

If IBM Business Process Manager is installed, the `BPM_HOME`/BPM/dbscripts/Oracle/Create folder contains the **createUser.sql** script that is used to create the users for Oracle databases.

In the following examples, replace @*DB_USER*@ with the user name that you want to use for the database and replace @*DB_PASSWD*@ with the password for that user.

Run the following sample script to create the database users.

`BPM_HOME/BPM/dbscripts/Oracle/Create/createUser.sql`

Optionally, or if IBM Business Process Manager is not installed, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

```
CREATE USER @DB_USER@ IDENTIFIED BY @DB_PASSWD@;
grant connect, resource, unlimited tablespace to @DB_USER@;
grant create view to @DB_USER@;
grant javauserpriv to @DB_USER@;
grant execute on dbms_lock to @DB_USER@;
```

Installing and configuring Process Center with an Oracle database server:

Process Center includes a repository for all processes, services, and other assets created in the IBM Business Process Manager authoring environments. You can use the integrated Process Server within Process Center to run processes as you build them. When you are ready, you can install and run those same processes on the Process Server in your runtime environments.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded both required disk images for your operating system, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

    Create the following file:

    `/user_home_directory/bpm_updates.properties`

    Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

    The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

```
ifix.1=/bpmUpdates
fixpack.2=http://test/rep
launchpad.1=/launchpad_updates
fixpack.WAS_REP=/WAS_updates
fixpack.BPM_REP=/BPM_updates
```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

     mount_point/launchpad.sh

   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

        extract_directory/launchpad.sh

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Center** and click **Next**.

6. Optionally change the location information:

   - **Hostname**: This field shows the name of your machine.

     Important: If a value of localhost or 127.0.0.1 is used for the hostname, Process Server installations on a remote system will not be able to connect to the Process Center.

   - **Location**: Enter the installation location for Process Center, or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

7. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

8. Specify the **Username** and **Password** for the deployment environment administrative account. The deployment environment administrator is the primary IBM Business Process Manager administrator. A user assigned to this role has administrative access to Process Center and Process Admin Console. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This account also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.

9. Click **Next**.

10. Select **Yes** to use an existing database.

11. Specify the required database information.

Table 49. Required database configuration fields for Oracle

Field	Action needed
Instance name	Enter the name of the Oracle database instance.
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1521 or enter the correct server port number.
Common database	For the deployment environment-level Common database, enter values for the following parameters: • `User name`: Enter the Common database user name. • `Password`: Enter a password to authenticate with the Common database.
Process database	For the Process database, enter values for the following parameters: • `User name`: Enter the Process database user name. • `Password`: Enter a password to authenticate with the Process database.
Performance Data Warehouse database	For the Performance Data Warehouse database, enter values for the following parameters: • `User name`: Enter the Performance Data Warehouse database user name. • `Password`: Enter a password to authenticate with the Performance Data Warehouse database.

12. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

    Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

    The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

    Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

    After successfully installing the product, you can use Installation Manager to install the required fixes.

13. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

14. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

Installation Manager updates

Installing and configuring Process Server with an Oracle database server:

Process Server provides a single BPM runtime environment that can support a range of business processes for development, test, staging, or production.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded both required disk images for your operating system, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   /user_home_directory/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=/launchpad_updates
   fixpack.WAS_REP=/WAS_updates
   fixpack.BPM_REP=/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

      mount_point/launchpad.sh

- If you are installing from images downloaded from Passport Advantage, perform the following steps:
    a. Go to the directory into which you extracted the images.
    b. Enter the following command to start the launchpad:

       extract_directory/launchpad.sh

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.
4. After starting the launchpad, click **Typical installation** on the Welcome page.
5. Select **Install Process Server** and click **Next**.
6. Specify Process Server information:
    - **Hostname**: This field shows the name of your machine.
    - **Location**: Enter the installation location for Process Server or click **Browse** to select the location.

      Note:
      – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
      – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

    - Environment **Type**: Select how the Process Server is used:
      – Select **Development** if the server is to be used in a development capacity.
      – Select **Production** if the server is to be used in a production capacity.
      – Select **Stage** if the server is to be used as a temporary location to host changes before putting them into production.
      – Select **Test** if the server is to be used as a testing environment, for example, for load testing.

    - **Name**: Specify the name for the Process Server environment. This name is used to connect from a Process Center to this Process Server.

      Restriction: Do not mix production and non-production servers in the same cell.

    - Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

   Select **Use this server offline** if this Process Server will not be connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications, but the method for deploying process applications to an offline Process Server differs from the method for deploying process applications to an online Process Server.

   If you did not select **Use this server offline**, provide the following information for the Process Center that this server is to connect to:

    - **Hostname**: Enter the host or virtual host that this Process Server will use to communicate with Process Center. Use a fully qualified host name. In an environment with a load balancer or proxy server between the Process Server and the Process Center services, make sure that what you designate here matches the URL for accessing the Process Center.

- **Port**: Enter the port number of the Process Center. In an environment with a load balancer or proxy server between the Process Server and the Process Center, make sure that what you designate here matches the URL for accessing the Process Center.
- **User name**: Enter the name of a Process Center user. Process Server will connect to Process Center as this user.
- **Password**: Enter the password for the Process Center user.

You can click **Test Connection** to check the connection to the Process Center.

7. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

8. Click **Next**.

9. Select **Yes** to use an existing database.

10. Specify the required database information.

Table 50. Required database configuration fields for Oracle

Field	Action needed
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1521 or enter the correct server port number.
Instance name	Enter the name of the Oracle database instance.
Common database	For the deployment environment-level Common database, enter values for the following parameters: • `User name`: Enter the Common database user name. • `Password`: Enter a password to authenticate with the Common database.
Process database	For the Process database, enter values for the following parameters: • `User name`: Enter the Process database user name. • `Password`: Enter a password to authenticate with the Process database.
Performance Data Warehouse database	For the Performance Data Warehouse database, enter values for the following parameters: • `User name`: Enter the Performance Data Warehouse database user name. • `Password`: Enter a password to authenticate with the Performance Data Warehouse database.

11. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

   Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

After successfully installing the product, you can use Installation Manager to install the required fixes.

12. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

13. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

 Installation Manager updates

Installing and configuring IBM Business Process Manager Express with an SQL Server database server:

You can install IBM Business Process Manager using a Microsoft SQL Server database server.

Creating and configuring SQL Server databases before typical installation:

IBM Business Process Manager requires a Process database, Performance Data Warehouse database, and Common database. The Common database contains Business Space and other components. You can install and configure the required databases before you install.

Configuring XA transactions for SQL Server:

You must configure XA transactions after the Microsoft SQL Server database is installed and before you start the server. The SQL Server JDBC driver provides support for Java Platform, Enterprise Edition/JDBC 2.0 optional distributed transactions. JDBC connections obtained from the **SQLServerXADataSource** class can participate in standard distributed transaction processing environments such as Java Platform, Enterprise Edition (Java EE) application servers.

Failure to configure the XA transactions can result in the following error when the server starts:**javax.transaction.xa.XAException: com.microsoft.sqlserver.jdbc.SQLServerException: Failed to create the XA control connection. Error: "Could not find stored procedure 'master..xp_sqljdbc_xa_init_ex'."**.

The MS DTC service should be marked Automatic in Service Manager to make sure that it is running when the SQL Server service is started.

1. To enable MS DTC for XA transactions, you must follow these steps:

   On Windows XP and Windows Server 2003:

   a. Select **Control Panel** > **Administrative Tools** > **Component Services**.

   b. Select **Component Services** > **Computers** and right-click **My Computer**, and select **Properties**.

   c. Click the **MSDTC** tab, and then click **Security Configuration**.

d. Select the **Enable XA Transactions** check box, and then click **OK**. This will cause a MS DTC service restart.

e. Click **OK** again to close the **Properties** window, and then close **Component Services**.

f. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

On Windows Vista, Windows 7, and Windows Server 2008 R2:

a. Select **Control Panel** > **Administrative Tools** > **Component Services**.

b. Select **Component Services** > **Computers** > **My Computer** > **Distributed Transaction Coordinator**.

c. Right-click **Local DTC** and then select **Properties**.

d. Click the **Security** tab on the **Local DTC Properties** window.

e. Select the **Enable XA Transactions** check box, and click **OK**. This will restart the MS DTC service.

f. Click **OK** again to close the Properties window, and then close Component Services.

g. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

2. Configure the JDBC Distributed Transaction Components:

a. If you haven't installed IBM Business Process Manager, download "Microsoft SQL Server JDBC Drive 3.0" driver from the Microsoft Site using the URL from Resources section and extract it to any folder.

b. If BPM is already installed, go to `bpm_install_root`/jdbcdrivers/SQLServer/xa to obtain the files you require in the following steps:

   • Copy the `sqljdbc_xa.dll` file from the `JDBC unarchived` directory to the `Binn` directory (for a default SQL Server install, the location is `C:/Program Files/Microsoft SQL Server/ MSSQL10_50.MSSQLSERVER/MSSQL/Binn`) of SQL Server computer. If you are using XA transactions with a 32-bit SQL Server, use the `sqljdbc_xa.dll` file in the x86 folder, even if the SQL Server is installed on a x64 processor. If you are using XA transactions with a 64-bit SQL Server on the x64 processor, use the `sqljdbc_xa.dll` file in the x64 folder.

   • Run the `xa_install.sql` database script on SQL Server. For example; from the command prompt, run **sqlcmd -i xa_install.sql**. This script installs the extended stored procedures that are called by `sqljdbc_xa.dll`. These extended stored procedures implement distributed transaction and XA support for the Microsoft SQL Server JDBC Driver. You will need to run this script as an administrator of the SQL Server instance. You can ignore errors about unable to drop procedures that don't exist.

   • Open the SQL Server Management Studio to locate the security folder under the **master** database. To grant permissions to a specific user to participate in distributed transactions with the JDBC driver, add the user to the **SqlJDBCXAUser** role in the master database (for example, for a Lombardi user add master database in User mappings and check **SqlJDBCXAUser** role).

After you configure the XA transactions and before you start the server, you must configure your TCP/IP connectivity using the below steps:

1. From Start menu, click **Microsoft SQl Server 2008 R2** > **Configuration Tools** > **SQL Server Configuration Manager**.

2. Expand **SQl Server network Configuration** > **Protocols for SQL2008**

3. Locate **TCP/IP** on the right-hand side.

4. Double click **TCP/IP** and enable it under the **Protocol** tab.

5. Click the **IP Addresses** tab to enable the TCP port for each configured IP address.

Creating SQL Server databases:

You can create the required databases for IBM Business Process Manager V8.5 before you create profiles and configure your network deployment environment. Usually you require the Process database, the Performance Data Warehouse database, and the Common database. In the case of an Advanced-only deployment environment, you need only the Common database.

• You cannot share databases across multiple installations or Deployment Environments

- The Process and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.
- Process and Performance Data Warehouse components require the databases to be case-insensitive for SQL Server
- CommonDB (and legacy WPS) components require the databases to be case-sensitive for SQL Server
- The schema name used for each component should match the user

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

If IBM Business Process Manager is installed on your machine, the **createDatabase_CaseInsensitive.sql** and **createDatabase_CaseSensitive.sql** scripts are available in the *BPM_HOME*/BPM/dbscripts/SQLServer/ Create folder.

In the following examples, replace *@DB_NAME@* with the name that you want to use for the created database

1. If IBM Business Process Manager is installed on your machine, locate the SQL scripts to run. Otherwise, use the command line option.
2. Run the scripts to create the BPMDB and PDWDB databases. Run the following sample script:

   `BPM_HOME/BPM/dbscripts/SQLServer/Create/createDatabase_CaseInsensitive.sql`

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

   `CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS;`

   If IBM Business Process Manager is not installed, run the following command from the command line:

   `sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS"`
3. Run the script to create the CommonDB database. Run the following sample script:

   `BPM_HOME/BPM/dbscripts/SQLServer/Create/createDatabase_CaseSensitive.sql`

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

   `CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS;`

   If IBM Business Process Manager is not installed, run the following command from the command line:

   `sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS"`

   Note: The letter *CI* in the **COLLATE** attribute value is applicable for the case-insensitive databases and *CS* is applicable for case-sensitive databases.

Creating users and schemas for SQL Server databases:

You must create the users and schemas after creating the SQL Server databases.

Assign the IBM Business Process Manager database user to the following three roles:

Note: The database must be created by the database administrator who can then assign these roles to the database user for IBM Business Process Manager.
- db_ddladmin
- db_datawriter
- db_datareader

For information about the permissions that are provided by these roles, see documentation from Microsoft.

Important: In Microsoft SQL server, the default schema name associated with a user must be the same as the user name. For example, if the user name for the Performance Data Warehouse database is *dbuser* then the default schema name associated with the user *dbuser* must also be named *dbuser*. You must create an ordinary database user and assign the required rights to the user instead of using a super user, such as *sa*. This is because the default schema for the super user is dbo and this cannot be changed.

You can complete the following steps if existing tables are not associated with a schema that is the same as the user name.

1. In SQL Server Management Studio Object Explorer, right-click the table name and then click **Design**.
2. From the Design view, press F4 to view the Properties window.
3. From the Properties window, update the schema name.
4. Right-click the tab and select **Close** to close the Design view.
5. Click **OK** when prompted to save. The selected table is transferred to the schema.
6. Repeat the previous steps for all the tables in the Performance Data Warehouse database.

The `createUser.sql` script is available in the *BPM_HOME*/BPM/dbscripts/SQLServer/Create folder is used to create the users and schema for the SQL Server.

1. Locate the SQL scripts to run.
2. Run the scripts to create the users and schemas for SQL Server databases. For example, run the following sample script to create the required users.

   BPM_HOME/BPM/dbscripts/SQLServer/Create/createUser.sql

   Optionally, if the above script is unavailable during configuration, an copy the contents of the above SQL file and run the commands from the command line as follows:

   ```
   USE master
   GO
   CREATE LOGIN @DB_USER@ WITH PASSWORD='@DB_PASSWD@'
   GO

   USE @DB_NAME@
   GO
   CREATE USER @DB_USER@ FOR LOGIN @DB_USER@ WITH DEFAULT_SCHEMA=@DB_USER@
   GO
   CREATE SCHEMA @DB_USER@ AUTHORIZATION @DB_USER@
   GO
   EXEC sp_addrolemember 'db_ddladmin', @DB_USER@;
   EXEC sp_addrolemember 'db_datareader', @DB_USER@;
   EXEC sp_addrolemember 'db_datawriter', @DB_USER@;
   ```

   In the above example, replace *@DB_NAME@* with the BPM database name for which you created users and schema, *@DB_USER@* with the database user you want to create, and *@DB_PASSWD@* with the password for that user.

When you create database schemas the using the generated scripts, your user ID must have the authority to create tables. When the tables are created, you must have the authority to select, insert, update, and delete information in the tables.

The following table describes the database privileges that are needed to access the data stores.

Table 51. Database privileges

Minimum privileges that are required to create objects in the database	Minimum privileges that are required to access objects in the database
The user ID ideally requires DB OWNER privileges on the data stores used for IBM Business Process Manager.	Configure the SQL Server for SQL Server and Windows authentication so that authentication to be based on an SQL server login ID and password. The user ID must be the owner of the tables, or a member of a group that has sufficient authority to issue TRUNCATE TABLE statements. See the **Detailed SQL Server database privileges** table at SQL Server database privileges.

Installing and configuring Process Center with an SQL Server database server:

Process Center includes a repository for all processes, services, and other assets created in the IBM Business Process Manager authoring environments. You can use the integrated Process Server within Process Center to run processes as you build them. When you are ready, you can install and run those same processes on the Process Server in your runtime environments.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty.

Be prepared to specify the following information during installation:
* The user name and password for database authentication
* The database server host name and port
* The name of the Process database.
* The name of the Performance Data Warehouse database.
* The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded both required disk images for your operating system, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.
1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

       /user_home_directory/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

```
ifix.1=/bpmUpdates
fixpack.2=http://test/rep
launchpad.1=/launchpad_updates
fixpack.WAS_REP=/WAS_updates
fixpack.BPM_REP=/BPM_updates
```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

     mount_point/launchpad.sh

   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

        extract_directory/launchpad.sh

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Center** and click **Next**.

6. Optionally change the location information:

   - **Hostname**: This field shows the name of your machine.

     Important: If a value of localhost or 127.0.0.1 is used for the hostname, Process Server installations on a remote system will not be able to connect to the Process Center.

   - **Location**: Enter the installation location for Process Center, or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

7. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

8. Specify the **Username** and **Password** for the deployment environment administrative account. The deployment environment administrator is the primary IBM Business Process Manager administrator. A user assigned to this role has administrative access to Process Center and Process Admin Console. This role provides access to all interfaces, enabling users to alter or delete all types of available

library items and assets, including process applications and toolkits. This account also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.

9. Click **Next**.
10. Select **Yes** to use an existing database.
11. Specify the required database information.

Table 52. Required database configuration fields for SQL Server

Field	Action needed
Username	Only required if you are not using Windows authentication. Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Only required if you are not using Windows authentication. Enter a password to authenticate with the database.
Select the **Apply Windows authentication** option to indicate that you will connect to your databases using your Windows authentication information. If you select this option, the previous fields are made inactive.	
Hostname	Accept the default value of localhost or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1433 or enter the correct server port number.
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the Process database name.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the Performance Data Warehouse database name.

12. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

   Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

   The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

   Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

   After successfully installing the product, you can use Installation Manager to install the required fixes.

13. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.
14. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

⏏ Installation Manager updates

Installing and configuring Process Server with an SQL Server database server:

Process Server provides a single BPM runtime environment that can support a range of business processes for development, test, staging, or production.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty.

Be prepared to specify the following information during installation:
• The user name and password for database authentication
• The database server host name and port
• The name of the Process database.
• The name of the Performance Data Warehouse database.
• The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded both required disk images for your operating system, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest fix pack or refresh pack level and recommended interim fixes automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   /user_home_directory/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fix packs, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=/launchpad_updates
   fixpack.WAS_REP=/WAS_updates
   fixpack.BPM_REP=/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

- If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

  mount_point/launchpad.sh
- If you are installing from images downloaded from Passport Advantage, perform the following steps:
  a. Go to the directory into which you extracted the images.
  b. Enter the following command to start the launchpad:

     extract_directory/launchpad.sh

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.
4. After starting the launchpad, click **Typical installation** on the Welcome page.
5. Select **Install Process Server** and click **Next**.
6. Specify Process Server information:
   - **Hostname**: This field shows the name of your machine.
   - **Location**: Enter the installation location for Process Server or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).
   - Environment **Type**: Select how the Process Server is used:
     – Select **Development** if the server is to be used in a development capacity.
     – Select **Production** if the server is to be used in a production capacity.
     – Select **Stage** if the server is to be used as a temporary location to host changes before putting them into production.
     – Select **Test** if the server is to be used as a testing environment, for example, for load testing.
   - **Name**: Specify the name for the Process Server environment. This name is used to connect from a Process Center to this Process Server.

     Restriction: Do not mix production and non-production servers in the same cell.
   - Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

   Select **Use this server offline** if this Process Server will not be connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications, but the method for deploying process applications to an offline Process Server differs from the method for deploying process applications to an online Process Server.

   If you did not select **Use this server offline**, provide the following information for the Process Center that this server is to connect to:

- **Hostname**: Enter the host or virtual host that this Process Server will use to communicate with Process Center. Use a fully qualified host name. In an environment with a load balancer or proxy server between the Process Server and the Process Center services, make sure that what you designate here matches the URL for accessing the Process Center.

- **Port**: Enter the port number of the Process Center. In an environment with a load balancer or proxy server between the Process Server and the Process Center, make sure that what you designate here matches the URL for accessing the Process Center.

- **User name**: Enter the name of a Process Center user. Process Server will connect to Process Center as this user.

- **Password**: Enter the password for the Process Center user.

You can click **Test Connection** to check the connection to the Process Center.

7. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

8. Click **Next**.

9. Select **Yes** to use an existing database.

10. Specify the required database information.

Table 53. Required database configuration fields for SQL Server

Field	Action needed
Username	Only required if you are not using Windows authentication. Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Only required if you are not using Windows authentication. Enter a password to authenticate with the database.
Select the **Apply Windows authentication** option to indicate that you will connect to your databases using your Windows authentication information. If you select this option, the previous fields are made inactive.	
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1433 or enter the correct server port number.
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the Process database name.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the Performance Data Warehouse database name.

11. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

After successfully installing the product, you can use Installation Manager to install the required fixes.

12. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

13. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

➦ Installation Manager updates

Custom installation and configuration

Use the Custom installation option to install IBM Business Process Manager Express, if you need any installation or configuration options that are not provided by the Typical installation option or if you want to install silently.

Related reference:

➦ IBM Business Process Manager Express system requirements

Installing IBM Business Process Manager Express:

With custom installation, you can choose to install IBM Business Process Manager Express interactively or silently.

Related reference:

➦ IBM Business Process Manager Express system requirements

Installing interactively with a new installation of WebSphere Application Server:

Using custom installation, you can install IBM Business Process Manager with a new installation of WebSphere Application Server.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded both required disk images for your operating system, and extracted them to the same directory.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

- If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. Mount the disk drive if necessary. Enter the following command to start the launchpad manually:

  mount_point/launchpad.sh
- If you are installing from images downloaded from Passport Advantage, perform the following steps:
  a. Go to the directory into which you extracted the images.
  b. Enter the following command to start the launchpad:

     extract_directory/launchpad.sh

2. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically.

   If you do not have access to the Internet and want updates to the launchpad to be installed from a local directory, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install. Create the following file:

   /user_home_directory/bpm_updates.properties

   Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

   The file uses a launchpad prefix, followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for launchpad upgrades. The locations can be either local directories or URLs. For example:

   launchpad.1=/launchpad_updates

3. After starting the launchpad, click **Custom installation** on the Welcome page.

4. Click **Install as administrative user** to install as an administrative user. If you are a root user, you can install as an administrative user. If you are not a root user, or if you want to install to your own user name without root privileges, clear this check box.

5. Click **Install**. When you install IBM Business Process Manager, the required WebSphere Application Server Network Deployment is automatically installed.

   Note: IBM Business Process Manager V8.5 can be installed only on top of WebSphere Application Server Network Deployment V8.5.

6. On the Install Packages page of the Installation Manager, the **WebSphere Application Server Network Deployment**, **IBM Business Process Manager Express** package, and **IBM DB2 Express** are selected by default. Clear the selection for **IBM DB2 Express**.

7. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

   Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

   The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

   Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

   After successfully installing the product, you can use Installation Manager to install the required fixes.

8. On the Licenses page, read the license agreement. If you agree to the terms of the license agreement, click **I accept the terms in the license agreements** and click **Next**.

9. On the Location page, the **Create new package group** option is selected by default. Select a location for the shared resources directory and a location for the Installation Manager and click **Next**. You must select location for the Installation Manager only if it is not already installed. The Install Packages wizard checks your system for operating system prerequisites. If you are at a higher major release of a supported operating system, or if the operating system itself is not on the supported list, you might encounter a warning. You can continue with the installation, but the installation or product operation might not succeed until you apply maintenance.

   If you see a warning, go to the product support web pages and obtain the latest maintenance packages to apply after installation. See the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

10. On the Features page, expand the plus symbol to select the package features that you want to install. Installation Manager automatically enforces any dependencies with other features and shows the updated download size and disk space requirements for the installation.

   a. Select the translations to install. Under **Translations Supported by All Packages**, **English** is selected by default for the English version. To install other language versions, select the appropriate language under **Translations Supported by Only Some Packages**.

   b. Optional: To see the dependency relationships between features, select **Show Dependencies**.

   c. Optional: Click a feature to view its brief description under **Details**.

   d. Select one of the following features to install.
      - IBM Process Center
      - IBM Process Server **Production** (the default) to use the server in production
      - IBM Process Server **Non-production** to use the server only for test, staging, or development. Your selection is recorded in the product tag for inventory purposes.

   Restriction: Do not mix production and non-production servers in the same cell.

   When you are finished selecting features, click **Next**.

11. On the Summary page, review your choices before installing the IBM Business Process Manager Express package. If you want to change the choices that you made on previous pages, click **Back** and make your changes. When you are satisfied with your installation choices, click **Install** to install the package. A progress indicator shows the percentage of the installation completed.

12. When the installation process is complete, a message confirms the success of the process.

   a. Optional: Click **View Log File** to open the installation log file for the current session in a new window. You must close the Installation Log window to continue.

   b. If you plan to use the `BPMConfig` command-line utility to create your Deployment Environment, you do not need to use the Profile Management Tool (PMT) and select **None** to complete the installation.

   c. Click **Finish** to close the Installation Manager.

After you install IBM Business Process Manager, you must configure profiles and databases by using the `BPMConfig` command.

Related information:

 Installation Manager updates

Installing silently using the command line:

You can install IBM Business Process Manager silently using the command line. With this method, you only need to run one command to perform the installation.

If you do not have the prerequisite base products necessary for IBM Business Process Manager Express installation, you must install them as part of the silent installation. The required base products are:
- Installation Manager

- WebSphere Application Server Network Deployment, including the ejbdeploy and thinclient features.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded both required disk images for your operating system, and extracted them to the same directory.

The silent installation performs the following tasks:
- Installs Installation Manager if it is not already installed or updates it to the appropriate level if it is installed.
- Installs the required base products and IBM Business Process Manager Express.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: Run the following command to generate encrypted passwords using IBM Installation Manager to securely connect to DB2 and the administrative console.

   `extract_directory/IM/tools/imutilsc -silent -nosplash encryptString password_to_encrypt`

   Note: If you are running on a 64-bit system and do not already have 32-bit Installation Manager installed, then you must run the command from the `extract_directory/IM64/tools` directory.

2. Read and accept the license terms before installing. Adding **-acceptLicense** to the command line means that you accept all licenses.

3. Run the following command:

   Note: If you are running on a 64-bit system and do not already have 32-bit Installation Manager installed, then you must run the command from the `extract_directory/IM64/tools` directory.

   ```
   extract_directory/IM/tools/imcl install list_of_product_IDs -acceptLicense
   -installationDirectory location -repositories repository -showVerboseProgress
   -log logName.log
   ```

   where:
   - *list_of_product_IDs* is a list of the IDs for the products and features that you want to install. You must include the required features. The syntax is *productID,feature,feature*, with multiple products separated by spaces.

Table 54. Product IDs

Product	Product ID	Feature and Description
IBM BPM Express	com.ibm.bpm.EXP.v85	• **ExpressProcessCenter** • **ExpressProcessServer.NonProduction** - Test, staging, or development use. • **ExpressProcessServer.Production** - Production use.

Table 54. Product IDs (continued)

Product	Product ID	Feature and Description
WebSphere Application Server Network Deployment	com.ibm.websphere.ND.v85	• core.feature: Required. WebSphere Application Server core content. • ejbdeploy: Required. Pre-Enterprise JavaBeans (EJB) 3.0 modules. • thinclient: Required. Stand-alone thin clients and resource adapters. • embeddablecontainer: Embeddable EJB container. • samples: Sample applications feature. • com.ibm.sdk.6_32bit: 32-bit software development kit (SDK). You must specify either this feature or com.ibm.sdk.6_64bit. • com.ibm.sdk.6_64bit: 64-bit SDK This feature can only be selected on a 64-bit system. You must specify either this feature or com.ibm.sdk.6_32bit.
Installation Manager	com.ibm.cic.agent	• agent_core: Installation Manager core content. • agent_jre: Installation Manager Java Runtime Environment (JRE).

- *location* is the path to the directory where you want to install the products. If you want to install into an existing supported instance of WebSphere Application Server Network Deployment, specify its directory.
- *repository* is the path to the repository where you have extracted the files, one of the following directories:

```
extract_directory/repository/repos_32bit
extract_directory/repository/repos_64bit
```

  For more than one repository, separate the repository locations with commas.
- *key=value* is a list of the keys and values you want to pass to the installation, separated by commas. Do not put spaces between the commas. Create encrypted passwords using the IBM Installation Manager.

  Note: This table is applicable only when you install DB2 Express.

Table 55. Keys

Key	Description
user.db2.port	Port for the DB2 database. The default value is 50000.

- *logName* is the name of the log file to record messages and results.

  Running this command installs the product with the default features. If you want to install specific features or make other changes, see the reference link for the command-line arguments for imcl.

Installation Manager installs the list of products and writes a log file to the directory that you specified. The log file is empty if there are no errors or warnings.

The following example installs IBM Business Process Manager Express and WebSphere Application Server
Network Deployment on AIX.

```
imcl install com.ibm.bpm.EXP.v85,ExpressProcessCenter
com.ibm.websphere.ND.v85,core.feature,ejbdeploy,thinclient,embeddablecontainer,samples,com.ibm.sdk.6_64bit
-acceptLicense -installationDirectory /usr/IBM/BPM85
-repositories /usr/tmp/BPM/repository -showVerboseProgress -log silentinstall.log
```

After you install IBM Business Process Manager, you must configure profiles and databases by using the
BPMConfig command.

Related reference:

⬆ Command-line arguments for imcl

⬆ IBM Business Process Manager Express system requirements

Related information:

⬆ IBM WebSphere Application Server Information Center

Installing silently using a response file:

You can install IBM Business Process Manager Express silently by creating a response file and then
running a command to use that response file to install the product.

If you do not have the prerequisite base products necessary for IBM Business Process Manager Express
installation, you must install them as part of the silent installation. The required base products are:
*   Installation Manager
*   WebSphere Application Server Network Deployment, including the ejbdeploy and thinclient features.

If you are installing from images downloaded from Passport Advantage, ensure that you have
downloaded both required disk images for your operating system, and extracted them to the same
directory.

By using response files, you can simplify the silent installation and reduce error in the process because
you set up your installation options once in a saved, sharable file that can be used on one or more
machines. The installation software provides sample response files for each supported operating system
and bit version. You can use an unmodified sample response file to perform a silent installation using
default settings, or you can modify the response file to set particular values. The comments in the sample
response files provide detailed instructions and information about setting the values.

The silent installation performs the following tasks:
*   Installs Installation Manager if it is not already installed or updates it to the appropriate level if it is
    installed.
*   Installs the required base products and IBM Business Process Manager Express.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process
Manager.

1. Optional: Run the following command to generate encrypted passwords using IBM Installation
    Manager to securely connect to DB2 and the administrative console.

    extract_directory/IM/tools/imutilsc -silent -nosplash encryptString *password_to_encrypt*

    Note: If you are running on a 64-bit system and do not already have 32-bit Installation Manager
    installed, then you must run the command from the *extract_directory*/IM64/tools directory.

2. Create the response file that will install the required base products and IBM Business Process Manager Express. Copy a sample response file, suitable for your bit version and user access level, from the following directory:

    extract_directory/responsefiles/BPM/

Alternatively, you can create a response file by recording your actions in Installation Manager. When you record a response file, the selections that you make in Installation Manager are stored in an XML file. When you run Installation Manager in silent mode, Installation Manager uses the data in the XML response file to perform the installation.

3. The default values provided in the sample response files will perform a basic install, but you should review the file and its comments, and modify the parameters as needed for your environment and the access level of your user ID.

In particular, review the following parameters and values:

- For non-root user IDs, check that all location variables point to locations that the user has permissions for.
- Repository location. If you are not running directly from the *extract_directory*/responsefiles/ BPM/ directory, point to the location of your installation repository. The repository can be local or remote. If you are running from the DVD, copy the response file from the DVD and point it back at the repository on the DVD.
- Installation location (`installLocation`) where IBM Installation Manager is already installed or will be installed.
- Installation location where IBM Business Process Manager Express will be installed. If you want to install into an existing supported instance of WebSphere Application Server Network Deployment, specify its directory.
- Eclipse location (`eclipseLocation`). If you want to install into an existing supported instance of WebSphere Application Server Network Deployment, specify its Eclipse location directory.
- The list of features for the product.
- Production or non-production use.

4. Read and accept the license terms before installing. Adding **-acceptLicense** to the command line means that you accept all licenses.

5. Run the following command:

Note: If you are running on a 64-bit system and do not already have 32-bit Installation Manager installed, then you must run the command from the *extract_directory*/IM64/tools directory.

Root user:

```
extract_directory/IM/installc -acceptLicense input
  extract_directory/responsefiles/BPM/response_file_name.xml
  -log preferred_log_location/silent_install.log
```

Nonroot user:

```
extract_directory/IM/userinstc -acceptLicense input
  extract_directory/responsefiles/BPM/response_file_name.xml
  -log preferred_log_location/silent_install.log
```

Installation Manager installs any required prerequisites and IBM Business Process Manager Express, and writes a log file to the directory you specified.

After you install IBM Business Process Manager, you must configure profiles and databases by using the **BPMConfig** command.

Related tasks:

➡ Working in silent mode

➡ Recording a response file with Installation Manager

Related reference:

➦ IBM Business Process Manager Express system requirements

Granting write permission of files and directories to nonroot users for profile creation or augmentation:

If you are not the user who installed the product, you must have write permission to selected directories within the IBM Business Process Manager installation. The product installer can grant this permission or create a group with permission to create or augment profiles.

The product installer (who can be a root or nonroot user) can grant write permission to the appropriate IBM Business Process Manager files and directories to nonroot users. The nonroot users can then create profiles. Alternatively, the product installer can create a group for users who are authorized to create profiles or give individual users the authority to create profiles.

Nonroot users create their own profiles to manage their own environments. Typically, they manage environments for development purposes.

Nonroot users must store their profiles in their private directory structure, not in the *installation_root*/profiles directory of the product.

Restrictions:
- IBM Business Process Manager does not support changing ownership of existing profiles from the product installer to nonroot users. A nonroot user cannot augment profiles owned by another user.
- Mechanisms within the Profile Management Tool that suggest unique names and port values are disabled for nonroot users. The nonroot user must change the default field values in the Profile Management Tool for the profile name, node name, cell name, and port assignments. The product installer can assign nonroot users a range of values for each of the fields, and assign responsibility to the users for adhering to their assigned value ranges and for maintaining the integrity of their own definitions.

If you already created at least one profile, certain directories and files were created. You can skip the steps in this topic that create these directories and files. If no profile was previously created, you must complete the steps to create the required directories and files.

The following example task shows how to create a group that is authorized to create profiles. The terms "installer" and "product installer" refer to the user ID that installed IBM Business Process Manager. The installer can perform the following steps to create the profilers group and give the group appropriate permissions to create a profile.
1. Log on to the IBM Business Process Manager system as the product installer. The product installer can be a root or nonroot user.
2. Using operating system commands, perform the following steps:
    a. Create a group named **profilers**, which will contain all users who can create profiles.
    b. Create a user named **user1**, who can create profiles.
    c. Add users **product_installer** and **user1** to the **profilers** group.
3. Log off and log back on as the installer to pick up the new group.
4. If no profile exists, create the following directories as the installer:
    - Create the *install_root*/**logs/manageprofiles** directory:
      ```
      mkdir install_root/logs/manageprofiles
      ```
    - Create the *install_root*/**properties/fsdb** directory:
      ```
      mkdir install_root/properties/fsdb
      ```

5. If no profile exists, create the `profileRegistry.xml` file as the installer. For this example, the file path is:

    install_root`/properties/profileRegistry.xml`

    Add the following information to the `profileRegistry.xml` file. The file must be encoded as UTF-8.

    ```
    <?xml version="1.0" encoding="UTF-8"?>
    <profiles/>
    ```

6. As the product installer, use operating system tools to change directory and file permissions. The following example assumes that the variable **$WASHOME** is the IBM Business Process Manager root installation directory **/opt/IBM/WebSphere/AppServer**.

```
export WASHOME=/opt/IBM/WebSphere/AppServer
echo $WASHOME
echo "Performing chggrp/chmod per WAS directions..."
chgrp profilers $WASHOME/logs/manageprofiles
chmod g+wr  $WASHOME/logs/manageprofiles
chgrp profilers $WASHOME/properties
chmod g+wr  $WASHOME/properties
chgrp profilers $WASHOME/properties/fsdb
chmod g+wr  $WASHOME/properties/fsdb
chgrp profilers $WASHOME/properties/profileRegistry.xml
chmod g+wr  $WASHOME/properties/profileRegistry.xml
chgrp -R profilers $WASHOME/profileTemplates
```

   Issue the following additional commands:

```
chgrp profilers $WASHOME/properties/Profiles.menu
chmod  g+wr $WASHOME/properties/Profiles.menu
```

   You might have to change the permissions on additional files if the nonroot user encounters permission errors. For example, if the product installer authorizes a nonroot user to delete a profile, then the product installer might have to delete the following file:

   install_root`/properties/profileRegistry.xml_LOCK`

   Give write access to the nonroot user for the file to authorize the user to delete the file. If the nonroot user still cannot delete the profile, then the product installer can delete the profile.

The installer created the **profilers** group and gave the group the correct permissions to the directories and files required for a nonroot user to create profiles.

The nonroot user that belongs to the **profilers** group can create profiles in a directory that the nonroot user owns and to which the nonroot user has write permission. However, the nonroot user cannot create profiles in the installation root directory of the product.

The root user and the nonroot user can use the same tasks to manage profiles.

Configuring profiles and databases:

After you install the product, if you did not use typical installation, you must create or augment one or more profiles to define the runtime environment. Before starting a profile, you must have configured the databases that are to be used with the profile.

Configuring a stand-alone environment with a DB2 database server on AIX:

You can configure a stand-alone environment for a DB2 database server.

Creating DB2 databases:

You can create the required databases for IBM Business Process Manager V8.5 before you create profiles and configure your network deployment environment. Usually you require the Process database, the Performance Data Warehouse database, and the Common database. In the case of an Advanced-only deployment environment, you need only the Common database.

The Process Server and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

In an IBM Business Process Manager environment, the **createDatabase.sql** script is used to create the databases. It is available in the *BPM_HOME*/BPM/dbscripts/DB2/Create folder.

In the following example, replace *@DB_NAME@* with the name that you want to use for the created database and *@DB_USER@* with the user name that you want to use for the database.

1. If IBM Business Process Manager is installed on your machine, locate the SQL script **createDatabase.sql** to run. Otherwise, use the command line option.
2. Run the following sample script to create each database.

   BPM_HOME/BPM/dbscripts/DB2/Create/createDatabase.sql

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

   ```
   create database @DB_NAME@ automatic storage yes  using codeset UTF-8 territory US pagesize 32768;
   connect to @DB_NAME@;
   grant dbadm on database to user @DB_USER@;
   UPDATE DB CFG FOR @DB_NAME@ USING LOGFILSIZ 4096 DEFERRED;
   UPDATE DB CFG FOR @DB_NAME@ USING LOGSECOND 64 DEFERRED;
   connect reset;
   ```

   Note: If a command fails to execute from the DB2 command prompt, remove the semicolon (;) and rerun the command.

   If IBM Business Process Manager is not installed, run the following command from the command line:

   ```
   db2 -tvf createDatabase.sql
   ```

Creating the BPM database tables and configuring stand-alone profiles:

Use the **BPMConfig** command to create a stand-alone profile and to create database tables at the same time or to generate scripts for creating the database tables at a later time. Use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Creating database tables and profiles simultaneously using the BPMConfig command:

If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

To create a stand-alone profile and the database tables at the same time, complete the following steps:

1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/config/express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called Express-PC-Standalone-DB2.properties.

2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples. To have the database tables created at the same time as the profile is created, ensure that the setting for **bpm.de.deferSchemaCreation** is set to `false`.

3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:

   `BPM_home/bin/BPMConfig -create -de my_environment.properties`

   The new stand-alone profile and the database tables are created using the settings provided your properties file.

Proceed to the Quick Start console and start the server for the stand-alone profile you created.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Creating database tables and profiles separately using the BPMConfig command:

If you want your databases to exist on a different computer from your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and to generate the scripts for creating your database tables at a later time.

Generating DB2 database scripts using the BPMConfig command:

You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Prepare the following information:
- Information about the database configuration that you are designing. This might be a document that describes the general purpose of the database configuration supplied by the database administrator or solution architect. Alternatively, it might be a description of required parameters and properties. This information must include:
  - The location of the databases.
  - The user ID and password for authenticating to the database.
- Information about how IBM Business Process Manager and its components have been installed, the database software used, and the properties required by that type of database.
- An understanding of the profiles that you plan to create, specifically, the functional relationship between the profile types and the databases.
- Information about the topology pattern to be implemented, and an understanding of how the database design fits into the pattern that you plan to use.

To generate the database SQL scripts that you can use to create your database tables, complete the following steps:

1. On the machine where you want to create the deployment environment, locate the appropriate sample properties file *BPM_HOME*/BPM/samples/config.

2. Find the sample properties file that most closely represents your target deployment environment and make a copy of this file.

   For more information about the sample configuration files, refer to Configuration properties for the BPMConfig command.

3. Run the **BPMConfig** command with the parameter **-sqlfiles** and the name of the equivalent properties file you choose.
   - To generate the database scripts in the `dbscripts` directory of the deployment manager profile, use the following syntax:

```
BPM_HOME/bin/BPMConfig -create -sqlfiles my_environment.properties
```

> **Note:** The SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default.
> These scripts are deleted if you run the **BPMConfig** command again or configure the deployment
> environment using the Deployment Environment wizard.

- To generate the database scripts in an output directory of your choice, use the following syntax:

```
BPM_HOME/bin/BPMConfig -create -sqlfiles my_environment.properties -outputDir /MyBPMScriptDir
```

  In the above syntax, **MyBPMScriptDir** is the directory you specify.

  > **Note:** If you do not use the **-outputDir** parameter with the **BPMConfig** command, the profile is
  > generated, if it does not exist, even before the database scripts are generated.

The database SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. This
folder includes the following sub-folder:

- *deployment_environment_name* - For each Deployment Environment, this folder will contain the SQL files
  that need to be executed.

These subdirectories also contain a **createDatabase.sql** script, which you can use to run the database
scripts to create the DB2 database tables.

A default configuration for a **Standard** deployment environment with DB2 databases contains the
following sub-folders and SQL scripts:

- *deployment_environment_name*
  - DB2
    - *CMNDB*
      - createSchema_Standard.sql
      - createSchema_Messaging.sql
    - *BPMDB*
      - createSchema_Standard.sql
      - createProcedure_Standard.sql
    - *PDWDB*
      - createSchema_Standard.sql

> **Note:** The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases
> are not generated for an **Advanced-only** deployment environment.

Running the generated DB2 database scripts:

If you run the BPMConfig command with the property *bpm.de.deferSchemaCreation* set to **true**, or if you
used the Deployment Environment Wizard and cleared the Create Tables option, you must run the
generated database scripts manually to create the database tables.

Before you begin this task, you must have run the **BPMConfig** command or the Deployment Environment
Wizard to generate the correct SQL scripts.

If the property *bpm.de.deferSchemaCreation* is set to **false**, or if you used the Deployment Environment
Wizard and did not clear the Create Tables option, the SQL scripts are run during configuration of the
deployment environment.

The database SQL scripts are generated in the *profile_name*/dbscripts folder by default.

1. Locate the generated SQL scripts.

A default configuration for a **Standard** deployment environment with DB2 databases contains the following sub-folders and SQL scripts:

- *deployment_environment_name*
  - DB2
    - *CMNDB*
      - `createSchema_Standard.sql`
      - `createSchema_Messaging.sql`
    - *BPMDB*
      - `createSchema_Standard.sql`
      - `createProcedure_Standard.sql`
    - *PDWDB*
      - `createSchema_Standard.sql`

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

2. Run the scripts to apply the schema to the CMNDB.

   For example, use the following commands to run the scripts manually for a **deployment environment-level** Common database configuration:

   ```
   db2 connect to CMNDB USER username USING password
   db2 -tvf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/CMNDB/createSchema_Standard.sql
   db2 -tvf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/CMNDB/createSchema_Messaging.sql
   db2 connect reset
   ```

3. Run the scripts to apply the schema to the BPMDB.

   For example, use the following commands to run the scripts manually for Process database configuration:

   ```
   db2 -tvf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/BPMDB/createDatabase.sql
   db2 connect to BPMDB USER username USING password
   db2 -tvf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/BPMDB/createSchema_Standard.sql
   db2 -tdGO -vf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/BPMDB/createProcedure_Standard.sql
   db2 connect reset
   ```

4. Run the **bootstrapProcessServerData** command to load configuration data for the IBM BPM applications into the Process database. This data is required for the applications to run correctly.

   For example:

   Use the following command to load bootstrap data onto a server that is part of an ND environment but not part of a cluster:

   ```
   bootstrapProcessServerData.sh -nodeName node1 -serverName myServer
   ```

   Use the following command to load bootstrap data onto a cluster that hosts the Process Server or Process Center:

   ```
   bootstrapProcessServerData.sh -clusterName myAppCluster
   ```

   Additional information about running the **bootstrapProcessServerData** command is found in the topic "Loading the database with system information in a network deployment environment."

5. Run the scripts to apply the schema to the PDWDB.

   For example, use the following commands to run the scripts manually for Performance Data Warehouse database configuration:

   ```
   db2 connect to PDWDB USER username USING password
   db2 -tvf profiles/DmgrProfile/dbscripts/deployment_environment_name/DB2/PDWDB/createSchema_Standard.sql
   db2 connect reset
   ```

Related tasks:

"Generating DB2 database scripts using the BPMConfig command" on page 165
You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in

the administrative console to create the deployment environment, the scripts were generated for you.

Creating stand-alone profiles with a DB2 database server using the BPMConfig command:

You can configure a stand-alone profile using the **BPMConfig** command.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/ config/express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called Express-PC-Standalone-DB2.properties.

2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples.

3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:

   BPM_home/bin/BPMConfig -create -profile *my_environment.properties*

   The new stand-alone profile is created according to the settings provided in your properties file.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Augmenting stand-alone profiles using the manageprofiles command-line utility:

You can use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Remember to shut down any servers associated with a profile you plan to augment.

Make sure that you are not already running the **manageprofiles** command-line utility on the same profile. If an error message is displayed when you run the command, determine if there is another profile creation or augmentation action in progress. If so, wait until it completes.

1. Determine the template that was used to create the existing profile that you want to augment. You must augment a stand-alone profile.

   Restriction: You cannot augment a stand-alone profile where the default WebSphere VMM user registry has been changed, for example, to using LDAP.
   You can determine the template by viewing the profile registry in the *installation_root*/properties/ profileRegistry.xml file. Do not modify this file; use it only to view the templates.

2. Find the appropriate template to use for the augmentation.

   Templates for each profile are located in the *installation_root*/profileTemplates/BPM directory for BPM templates. For stand-alone profiles, use the BPM/BpmServer template. This template is available with IBM BPM Express only.

3. Use the augment parameter to make changes to an existing profile with an augmentation template. The augment parameter causes the **manageprofiles** command-line utility to update or augment the profile identified in the **-profileName** parameter using the template in the **-templatePath** parameter. The augmentation templates that you can use are determined by which IBM products and versions are installed in your environment. The file path for **-templatePath** need not be fully qualified; /profileTemplates is automatically added as a prefix.

   Note: Do not manually modify the files that are located in the *installation_dir*/profileTemplates/ BPM directory.

4. Run the file from the command line. Do not supply a **-profilePath** parameter. For example:

```
manageprofiles.sh -augment -templatePath BPM/BpmServer
-profileName MyProfileName
-adminUsername celladmin -adminPassword celladmin
```

The status is written to the console window when the command completes running.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Related tasks:

Creating database tables and profiles simultaneously using the BPMConfig command
If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

Configuring a stand-alone environment with an Oracle database server on AIX:

You can configure a stand-alone environment for an Oracle database server.

Creating users for Oracle databases:

You can create the users for Oracle databases before you create profiles and configure your network deployment environment. Create the cell-scoped user, the deployment environment-level user, the Process Server user, and the Performance Data Warehouse user. Note: The Process Server user and the Performance Data Warehouse user are not needed for an Advanced-only deployment environment.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

You can use a single instance of Oracle for configuring BPM. The Oracle instance must exist and be available for access. Consult the Oracle documentation to create an Oracle instance. If you use a single Oracle instance, make sure that you use different user IDs for the three different BPM databases.

If IBM Business Process Manager is installed, the *BPM_HOME*/BPM/dbscripts/Oracle/Create folder contains the **createUser.sql** script that is used to create the users for Oracle databases.

In the following examples, replace *@DB_USER@* with the user name that you want to use for the database and replace *@DB_PASSWD@* with the password for that user.

Run the following sample script to create the database users.
BPM_HOME/BPM/dbscripts/Oracle/Create/createUser.sql
Optionally, or if IBM Business Process Manager is not installed, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

```
CREATE USER @DB_USER@ IDENTIFIED BY @DB_PASSWD@;
grant connect, resource, unlimited tablespace to @DB_USER@;
grant create view to @DB_USER@;
grant javauserpriv to @DB_USER@;
grant execute on dbms_lock to @DB_USER@;
```

Creating the BPM database tables and configuring stand-alone profiles:

Use the **BPMConfig** command to create a stand-alone profile and to create database tables at the same time or to generate scripts for creating the database tables at a later time. Use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Creating database tables and profiles simultaneously using the BPMConfig command:

If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

To create a stand-alone profile and the database tables at the same time, complete the following steps:
1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/config/express. For example, the sample configuration properties file for a Process Center environment using Oracle with IBM BPM Express is called `Express-PC-Standalone-Oracle.properties`.
2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples. To have the database tables created at the same time as the profile is created, ensure that the setting for **bpm.de.deferSchemaCreation** is set to `false`.
3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:

   BPM_home/bin/BPMConfig -create -de *my_environment.properties*

   The new stand-alone profile and the database tables are created using the settings provided your properties file.

Proceed to the Quick Start console and start the server for the stand-alone profile you created.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Creating database tables and profiles separately using the BPMConfig command:

If you want your databases to exist on a different computer from your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and to generate the scripts for creating your database tables at a later time.

Generating Oracle database scripts using the BPMConfig command:

You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Prepare the following information:
* Information about the database configuration that you are designing. This might be a document that describes the general purpose of the database configuration supplied by the database administrator or solution architect. Alternatively, it might be a description of required parameters and properties. This information must include:
  – The location of the databases.
  – The user ID and password for authenticating to the database.
* Information about how IBM Business Process Manager and its components have been installed, the database software used, and the properties required by that type of database.
* An understanding of the profiles that you plan to create, specifically, the functional relationship between the profile types and the databases.
* Information about the topology pattern to be implemented, and an understanding of how the database design fits into the pattern that you plan to use.

Important: If you are using an Oracle database, you must include the database user name and password for all databases, including the optional ones.

To generate the database SQL scripts that you can use to create your database tables, complete the following steps:

1. On the machine where you want to create the deployment environment, locate the appropriate sample properties file `BPM_HOME`/BPM/samples/config.

2. Find the sample properties file that most closely represents your target deployment environment and make a copy of this file.

   For more information about the sample configuration files, refer to Configuration properties for the BPMConfig command.

3. Run the **BPMConfig** command with the parameter **-sqlfiles** and the name of the equivalent properties file you choose.

   - To generate the database scripts in the `dbscripts` directory of the deployment manager profile, use the following syntax:

     `BPM_HOME`/bin/BPMConfig -create -sqlfiles `my_environment.properties`

     Note: The SQL scripts are generated in the `STAND-ALONE_PROFILE`/dbscripts folder by default. These scripts are deleted if you run the **BPMConfig** command again or configure the deployment environment using the Deployment Environment wizard.

   - To generate the database scripts in an output directory of your choice, use the following syntax:

     `BPM_HOME`/bin/BPMConfig -create -sqlfiles `my_environment.properties` -outputDir /MyBPMScriptDir

     In the above syntax, **MyBPMScriptDir** is the directory you specify.

     Note: If you do not use the **-outputDir** parameter with the **BPMConfig** command, the profile is generated, if it does not exist, even before the database scripts are generated.

The database SQL scripts are generated in the `STAND-ALONE_PROFILE`/dbscripts folder by default. This folder includes the following sub-folder:

- *deployment_environment_name* - For each Deployment Environment, this folder will contain the SQL files that need to be executed.

These subdirectories also contain a `createDatabase.sql` script, which you can use to run the database scripts to create the Oracle database tables.

A default configuration for a **Standard** deployment environment with Oracle databases contains the following sub-folders and SQL scripts:

- *deployment_environment_name*
  - Oracle
    - *orcl*
      - *cmnuser*
        - `createSchema_Standard.sql`
        - `createSchema_Messaging.sql`
      - *psuser*
        - `createSchema_Standard.sql`
        - `createProcedure_Standard.sql`
      - *pdwuser*
        - `createSchema_Standard.sql`

In the above example, **orcl** is the Oracle instance, **cmnuser** is the **deployment environment-level** user, **psuser** is the Process Server user, and **pdwuser** is the Performance Data Warehouse user.

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

Running the generated Oracle database scripts:

If you run the BPMConfig command with the property *bpm.de.deferSchemaCreation* set to **true**, or if you used the Deployment Environment Wizard and cleared the Create Tables option, you must run the generated database scripts manually to create the database tables.

Before you begin this task, you must have run the **BPMConfig** command or the Deployment Environment Wizard to generate the correct SQL scripts.

If the property *bpm.de.deferSchemaCreation* is set to **false**, or if you used the Deployment Environment Wizard and did not clear the Create Tables option, the SQL scripts are run during configuration of the deployment environment.

The database SQL scripts are generated in the *profile_name*/dbscripts folder by default.

1. Locate the generated SQL scripts.

   A default configuration for a **Standard** deployment environment with Oracle databases contains the following sub-folders and SQL scripts:

   - *deployment_environment_name*
     - Oracle
       - *orcl*
         - *cmnuser*
           - createSchema_Standard.sql
           - createSchema_Messaging.sql
         - *psuser*
           - createSchema_Standard.sql
           - createProcedure_Standard.sql
         - *pdwuser*
           - createSchema_Standard.sql

   In the above example, **orcl** is the Oracle instance, **cmnuser** is the **deployment environment-level** user, **psuser** is the Process Server user, and **pdwuser** is the Performance Data Warehouse user.

   Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

2. Run the scripts to apply the schema to the CMNDB.

   For example, use the following commands to run the scripts manually for a **deployment environment-level** Common database configuration:

   ```
   sqlplus cmnuser/cmnpassword@orcl @BPM_HOME/profiles/DmgrProfile/dbscripts/deployment_environment_name/Oracle/orcl/cmnuse
   sqlplus cmnuser/cmnpassword@orcl @BPM_HOME/profiles/DmgrProfile/dbscripts/deployment_environment_name/Oracle/orcl/cmnuse
   ```

3. Run the scripts to apply the schema to the BPMDB.

   For example, use the following commands to run the scripts manually for the Process database configuration:

   ```
   sqlplus psuser/pspassword@orcl @BPM_HOME/profiles/DmgrProfile/dbscripts/deployment_environment_name/Oracle/orcl/psuser/
   sqlplus psuser/pspassword@orcl @BPM_HOME/profiles/DmgrProfile/dbscripts/deployment_environment_name/Oracle/orcl/psuser/
   ```

4. Run the **bootstrapProcessServerData** command to load configuration data for the IBM BPM applications into the Process database. This data is required for the applications to run correctly.

   For example:

Use the following command to load bootstrap data onto a server that is part of an ND environment but not part of a cluster:

```
bootstrapProcessServerData.sh -nodeName node1 -serverName myServer
```

Use the following command to load bootstrap data onto a cluster that hosts the Process Server or Process Center:

```
bootstrapProcessServerData.sh -clusterName myAppCluster
```

Additional information about running the **bootstrapProcessServerData** command is found in the topic "Loading the database with system information in a network deployment environment."

5. Run the scripts to apply the schema to the PDWDB.

   For example, use the following commands to run the scripts manually for the Performance Data Warehouse database configuration:

   ```
   sqlplus pdwuser/pdwpassword@orcl @BPM_HOME/profiles/DmgrProfile/dbscripts/deployment_environment_name/Oracle/orcl/pdw
   ```

Related tasks:

"Generating Oracle database scripts using the BPMConfig command" on page 170
You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Creating stand-alone profiles with an Oracle database server using the BPMConfig command:

You can configure a stand-alone profile using the **BPMConfig** command.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/config/express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called Express-PC-Standalone-DB2.properties.
2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples.
3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:

   ```
   BPM_home/bin/BPMConfig -create -profile my_environment.properties
   ```

   The new stand-alone profile is created according to the settings provided in your properties file.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Augmenting stand-alone profiles using the manageprofiles command-line utility:

You can use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Remember to shut down any servers associated with a profile you plan to augment.

Make sure that you are not already running the **manageprofiles** command-line utility on the same profile. If an error message is displayed when you run the command, determine if there is another profile creation or augmentation action in progress. If so, wait until it completes.

1. Determine the template that was used to create the existing profile that you want to augment. You must augment a stand-alone profile.

Restriction: You cannot augment a stand-alone profile where the default WebSphere VMM user registry has been changed, for example, to using LDAP.

You can determine the template by viewing the profile registry in the *installation_root*/properties/ profileRegistry.xml file. Do not modify this file; use it only to view the templates.

2. Find the appropriate template to use for the augmentation.

   Templates for each profile are located in the *installation_root*/profileTemplates/BPM directory for BPM templates. For stand-alone profiles, use the BPM/BpmServer template. This template is available with IBM BPM Express only.

3. Use the augment parameter to make changes to an existing profile with an augmentation template. The augment parameter causes the **manageprofiles** command-line utility to update or augment the profile identified in the **-profileName** parameter using the template in the **-templatePath** parameter. The augmentation templates that you can use are determined by which IBM products and versions are installed in your environment. The file path for **-templatePath** need not be fully qualified; /profileTemplates is automatically added as a prefix.

   Note: Do not manually modify the files that are located in the *installation_dir*/profileTemplates/ BPM directory.

4. Run the file from the command line. Do not supply a **-profilePath** parameter. For example:

   ```
   manageprofiles.sh -augment -templatePath BPM/BpmServer
   -profileName MyProfileName
   -adminUsername celladmin -adminPassword celladmin
   ```

   The status is written to the console window when the command completes running.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Related tasks:

Creating database tables and profiles simultaneously using the BPMConfig command
If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

Configuring a stand-alone environment with an SQL Server database server on AIX:

You can configure a stand-alone environment for a Microsoft SQL Server database server.

Creating and configuring SQL Server databases before stand-alone profile creation:

You or your database administrator can create the databases before creating or augmenting stand-alone profiles.

Configuring XA transactions for SQL Server:

You must configure XA transactions after the Microsoft SQL Server database is installed and before you start the server. The SQL Server JDBC driver provides support for Java Platform, Enterprise Edition/JDBC 2.0 optional distributed transactions. JDBC connections obtained from the **SQLServerXADataSource** class can participate in standard distributed transaction processing environments such as Java Platform, Enterprise Edition (Java EE) application servers.

Failure to configure the XA transactions can result in the following error when the server starts:**javax.transaction.xa.XAException: com.microsoft.sqlserver.jdbc.SQLServerException: Failed to create the XA control connection. Error: "Could not find stored procedure 'master..xp_sqljdbc_xa_init_ex'."**..

The MS DTC service should be marked Automatic in Service Manager to make sure that it is running when the SQL Server service is started.

1. To enable MS DTC for XA transactions, you must follow these steps:

   On Windows XP and Windows Server 2003:

   a. Select **Control Panel** > **Administrative Tools** > **Component Services**.

   b. Select **Component Services** > **Computers** and right-click **My Computer**, and select **Properties**.

   c. Click the **MSDTC** tab, and then click **Security Configuration**.

   d. Select the **Enable XA Transactions** check box, and then click **OK**. This will cause a MS DTC service restart.

   e. Click **OK** again to close the **Properties** window, and then close **Component Services**.

   f. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

   On Windows Vista, Windows 7, and Windows Server 2008 R2:

   a. Select **Control Panel** > **Administrative Tools** > **Component Services**.

   b. Select **Component Services** > **Computers** > **My Computer** > **Distributed Transaction Coordinator**.

   c. Right-click **Local DTC** and then select **Properties**.

   d. Click the **Security** tab on the **Local DTC Properties** window.

   e. Select the **Enable XA Transactions** check box, and click **OK**. This will restart the MS DTC service.

   f. Click **OK** again to close the Properties window, and then close Component Services.

   g. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

2. Configure the JDBC Distributed Transaction Components:

   a. If you haven't installed IBM Business Process Manager, download "Microsoft SQL Server JDBC Drive 3.0" driver from the Microsoft Site using the URL from Resources section and extract it to any folder.

   b. If BPM is already installed, go to *bpm_install_root*/jdbcdrivers/SQLServer/xa to obtain the files you require in the following steps:

      • Copy the `sqljdbc_xa.dll` file from the JDBC unarchived directory to the Binn directory (for a default SQL Server install, the location is `C:/Program Files/Microsoft SQL Server/MSSQL10_50.MSSQLSERVER/MSSQL/Binn`) of SQL Server computer. If you are using XA transactions with a 32-bit SQL Server, use the `sqljdbc_xa.dll` file in the x86 folder, even if the SQL Server is installed on a x64 processor. If you are using XA transactions with a 64-bit SQL Server on the x64 processor, use the `sqljdbc_xa.dll` file in the x64 folder.

      • Run the `xa_install.sql` database script on SQL Server. For example; from the command prompt, run **sqlcmd -i xa_install.sql**. This script installs the extended stored procedures that are called by `sqljdbc_xa.dll`. These extended stored procedures implement distributed transaction and XA support for the Microsoft SQL Server JDBC Driver. You will need to run this script as an administrator of the SQL Server instance. You can ignore errors about unable to drop procedures that don't exist.

      • Open the SQL Server Management Studio to locate the security folder under the **master** database. To grant permissions to a specific user to participate in distributed transactions with the JDBC driver, add the user to the **SqlJDBCXAUser** role in the master database (for example, for a Lombardi user add master database in User mappings and check **SqlJDBCXAUser** role).

After you configure the XA transactions and before you start the server, you must configure your TCP/IP connectivity using the below steps:

1. From Start menu, click **Microsoft SQl Server 2008 R2** > **Configuration Tools** > **SQL Server Configuration Manager**.

2. Expand **SQl Server network Configuration** > **Protocols for SQL2008**

3. Locate **TCP/IP** on the right-hand side.

4. Double click **TCP/IP** and enable it under the **Protocol** tab.

5. Click the **IP Addresses** tab to enable the TCP port for each configured IP address.

Creating SQL Server databases:

You can create the required databases for IBM Business Process Manager V8.5 before you create profiles and configure your network deployment environment. Usually you require the Process database, the Performance Data Warehouse database, and the Common database. In the case of an Advanced-only deployment environment, you need only the Common database.

- You cannot share databases across multiple installations or Deployment Environments
- The Process and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.
- Process and Performance Data Warehouse components require the databases to be case-insensitive for SQL Server
- CommonDB (and legacy WPS) components require the databases to be case-sensitive for SQL Server
- The schema name used for each component should match the user

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

If IBM Business Process Manager is installed on your machine, the **createDatabase_CaseInsensitive.sql** and **createDatabase_CaseSensitive.sql** scripts are available in the *BPM_HOME*/BPM/dbscripts/SQLServer/ Create folder.

In the following examples, replace @*DB_NAME*@ with the name that you want to use for the created database

1. If IBM Business Process Manager is installed on your machine, locate the SQL scripts to run. Otherwise, use the command line option.
2. Run the scripts to create the BPMDB and PDWDB databases. Run the following sample script:

   `BPM_HOME/BPM/dbscripts/SQLServer/Create/createDatabase_CaseInsensitive.sql`

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

   `CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS;`

   If IBM Business Process Manager is not installed, run the following command from the command line:

   `sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS"`
3. Run the script to create the CommonDB database. Run the following sample script:

   `BPM_HOME/BPM/dbscripts/SQLServer/Create/createDatabase_CaseSensitive.sql`

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

   `CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS;`

   If IBM Business Process Manager is not installed, run the following command from the command line:

   `sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS"`

   Note: The letter *CI* in the **COLLATE** attribute value is applicable for the case-insensitive databases and *CS* is applicable for case-sensitive databases.

Creating users and schemas for SQL Server databases:

You must create the users and schemas after creating the SQL Server databases.

Assign the IBM Business Process Manager database user to the following three roles:

Note: The database must be created by the database administrator who can then assign these roles to the database user for IBM Business Process Manager.

- db_ddladmin
- db_datawriter
- db_datareader

For information about the permissions that are provided by these roles, see documentation from Microsoft.

Important: In Microsoft SQL server, the default schema name associated with a user must be the same as the user name. For example, if the user name for the Performance Data Warehouse database is *dbuser* then the default schema name associated with the user *dbuser* must also be named *dbuser*. You must create an ordinary database user and assign the required rights to the user instead of using a super user, such as *sa*. This is because the default schema for the super user is dbo and this cannot be changed.

You can complete the following steps if existing tables are not associated with a schema that is the same as the user name.

1. In SQL Server Management Studio Object Explorer, right-click the table name and then click **Design**.
2. From the Design view, press F4 to view the Properties window.
3. From the Properties window, update the schema name.
4. Right-click the tab and select **Close** to close the Design view.
5. Click **OK** when prompted to save. The selected table is transferred to the schema.
6. Repeat the previous steps for all the tables in the Performance Data Warehouse database.

The **createUser.sql** script is available in the *BPM_HOME*/BPM/dbscripts/SQLServer/Create folder is used to create the users and schema for the SQL Server.

1. Locate the SQL scripts to run.
2. Run the scripts to create the users and schemas for SQL Server databases. For example, run the following sample script to create the required users.

   BPM_HOME/BPM/dbscripts/SQLServer/Create/createUser.sql

   Optionally, if the above script is unavailable during configuration, an copy the contents of the above SQL file and run the commands from the command line as follows:

   ```
   USE master
   GO
   CREATE LOGIN @DB_USER@ WITH PASSWORD='@DB_PASSWD@'
   GO

   USE @DB_NAME@
   GO
   CREATE USER @DB_USER@ FOR LOGIN @DB_USER@ WITH DEFAULT_SCHEMA=@DB_USER@
   GO
   CREATE SCHEMA @DB_USER@ AUTHORIZATION @DB_USER@
   GO
   EXEC sp_addrolemember 'db_ddladmin', @DB_USER@;
   EXEC sp_addrolemember 'db_datareader', @DB_USER@;
   EXEC sp_addrolemember 'db_datawriter', @DB_USER@;
   ```

   In the above example, replace @*DB_NAME*@ with the BPM database name for which you created users and schema, @*DB_USER*@ with the database user you want to create, and @*DB_PASSWD*@ with the password for that user.

When you create database schemas the using the generated scripts, your user ID must have the authority to create tables. When the tables are created, you must have the authority to select, insert, update, and delete information in the tables.

The following table describes the database privileges that are needed to access the data stores.

Table 56. Database privileges

Minimum privileges that are required to create objects in the database	Minimum privileges that are required to access objects in the database
The user ID ideally requires DB OWNER privileges on the data stores used for IBM Business Process Manager.	Configure the SQL Server for SQL Server and Windows authentication so that authentication to be based on an SQL server login ID and password. The user ID must be the owner of the tables, or a member of a group that has sufficient authority to issue TRUNCATE TABLE statements. See the **Detailed SQL Server database privileges** table at SQL Server database privileges.

Creating the BPM database tables and configuring stand-alone profiles:

Use the **BPMConfig** command to create a stand-alone profile and to create database tables at the same time or to generate scripts for creating the database tables at a later time. Use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Creating database tables and profiles simultaneously using the BPMConfig command:

If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

To create a stand-alone profile and the database tables at the same time, complete the following steps:

1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/config/express. For example, the sample configuration properties file for a Process Center environment using SQL Server with IBM BPM Express is called Express-PC-Standalone-SQLServer.properties.

2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples. To have the database tables created at the same time as the profile is created, ensure that the setting for **bpm.de.deferSchemaCreation** is set to false.

3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:

   BPM_home/bin/BPMConfig -create -de *my_environment.properties*

   The new stand-alone profile and the database tables are created using the settings provided your properties file.

Proceed to the Quick Start console and start the server for the stand-alone profile you created.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Creating database tables and profiles separately using the BPMConfig command:

If you want your databases to exist on a different computer from your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and to generate the scripts for creating your database tables at a later time.

Generating SQL database scripts using the BPMConfig command:

You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Prepare the following information:

- Information about the database configuration that you are designing. This might be a document that describes the general purpose of the database configuration supplied by the database administrator or solution architect. Alternatively, it might be a description of required parameters and properties. This information must include:
  - The location of the databases.
  - The user ID and password for authenticating to the database.
- Information about how IBM Business Process Manager and its components have been installed, the database software used, and the properties required by that type of database.
- An understanding of the profiles that you plan to create, specifically, the functional relationship between the profile types and the databases.
- Information about the topology pattern to be implemented, and an understanding of how the database design fits into the pattern that you plan to use.

To generate the database SQL scripts that you can use to create your database tables, complete the following steps:

1. On the machine where you want to create the deployment environment, locate the appropriate sample properties file `BPM_HOME/BPM/samples/config`.
2. Find the sample properties file that most closely represents your target deployment environment and make a copy of this file.

   For more information about the sample configuration files, refer to Configuration properties for the BPMConfig command.
3. Run the **BPMConfig** command with the parameter **-sqlfiles** and the name of the equivalent properties file you choose.

   - To generate the database scripts in the `dbscripts` directory of the deployment manager profile, use the following syntax:

     `BPM_HOME/bin/BPMConfig -create -sqlfiles my_environment.properties`

     Note: The SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. These scripts are deleted if you run the **BPMConfig** command again or configure the deployment environment using the Deployment Environment wizard.

   - To generate the database scripts in an output directory of your choice, use the following syntax:

     `BPM_HOME/bin/BPMConfig -create -sqlfiles my_environment.properties -outputDir /MyBPMScriptDir`

     In the above syntax, **MyBPMScriptDir** is the directory you specify.

     Note: If you do not use the **-outputDir** parameter with the **BPMConfig** command, the profile is generated, if it does not exist, even before the database scripts are generated.

The database SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. This folder includes the following sub-folder:

- *deployment_environment_name* - For each Deployment Environment, this folder will contain the SQL files that need to be executed.

These subdirectories also contain a **createDatabase.sql** script, which you can use to run the database scripts to create the SQL Server database tables.

A default configuration for sea **Standard** deployment environment with SQL Server databases contains the following sub-folders and SQL scripts:

- *deployment_environment_name*
  - SQLServer
    - *CMNDB*
      - *schema name*
        - createSchema_Standard.sql
        - createSchema_Messaging.sql
    - *BPMDB*
      - *schema name*
        - createSchema_Standard.sql
        - createProcedure_Standard.sql
    - *PDWDB*
      - *schema name*
        - createSchema_Standard.sql

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

Running the generated SQL Server database scripts:

If you run the BPMConfig command with the property *bpm.de.deferSchemaCreation* set to **true**, or if you used the Deployment Environment Wizard and cleared the Create Tables option, you must run the generated database scripts manually to create the database tables.

Before you begin this task, you must have run the `BPMConfig` command or the Deployment Environment Wizard to generate the correct SQL scripts.

If the property *bpm.de.deferSchemaCreation* is set to **false**, or if you used the Deployment Environment Wizard and did not clear the Create Tables option, the SQL scripts are run during configuration of the deployment environment.

The database SQL scripts are generated in the `profile_name/dbscripts` folder by default.

1. Locate the generated SQL scripts.

   A default configuration for sea **Standard** deployment environment with SQL Server databases contains the following sub-folders and SQL scripts:

   - *deployment_environment_name*
     - SQLServer
       - *CMNDB*
         - *schema name*
           - createSchema_Standard.sql
           - createSchema_Messaging.sql
       - *BPMDB*
         - *schema name*
           - createSchema_Standard.sql
           - createProcedure_Standard.sql
       - *PDWDB*
         - *schema name*
           - createSchema_Standard.sql

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

2. Run the scripts to apply the schema to the CMNDB.

   For example, use the following commands to run the scripts manually for a **deployment environment-level** Common database configuration:

   ```
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d CMNDB -i profiles/DmgrProfile/dbscripts/deployment_environment_name/SQLServer/C
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d CMNDB -i profiles/DmgrProfile/dbscripts/deployment_environment_name/SQLServer/C
   ```

   In the above and following examples, **schema1** is the name of the schema used.

3. Run the scripts to apply the schema to the BPMDB.

   For example, use the following commands to run the scripts manually for the Process database configuration:

   ```
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d BPMDB -i profiles/DmgrProfile/dbscripts/deployment_environment_name/SQLServer/B
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d BPMDB -i profiles/DmgrProfile/dbscripts/deployment_environment_name/SQLServer/B
   ```

4. Run the **bootstrapProcessServerData** command to load configuration data for the IBM BPM applications into the Process database. This data is required for the applications to run correctly.

   For example:

   Use the following command to load bootstrap data onto a server that is part of an ND environment but not part of a cluster:

   ```
   bootstrapProcessServerData.sh -nodeName node1 -serverName myServer
   ```

   Use the following command to load bootstrap data onto a cluster that hosts the Process Server or Process Center:

   ```
   bootstrapProcessServerData.sh -clusterName myAppCluster
   ```

   Additional information about running the **bootstrapProcessServerData** command is found in the topic "Loading the database with system information in a network deployment environment."

5. Run the scripts to apply the schema to the PDWDB.

   For example, use the following commands to run the scripts manually for the Performance Data Warehouse database configuration. For example, use the following commands to run the scripts manually for the Performance Data Warehouse database configuration:

   ```
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d PDWDB -i profiles/DmgrProfile/dbscripts/deployment_environment_name/SQLServer/P
   ```

Creating stand-alone profiles with an SQL Server database server using the BPMConfig command:

You can configure a stand-alone profile using the **BPMConfig** command.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

1. Locate the appropriate sample properties file based on your environment in *BPM_home*/BPM/samples/ config/express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called Express-PC-Standalone-DB2.properties.

2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples.

3. Run the **BPMConfig** command, passing it the names of the properties file you created. For example:

   ```
   BPM_home/bin/BPMConfig -create -profile my_environment.properties
   ```

   The new stand-alone profile is created according to the settings provided in your properties file.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Augmenting stand-alone profiles using the manageprofiles command-line utility:

You can use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Remember to shut down any servers associated with a profile you plan to augment.

Make sure that you are not already running the **manageprofiles** command-line utility on the same profile. If an error message is displayed when you run the command, determine if there is another profile creation or augmentation action in progress. If so, wait until it completes.

1. Determine the template that was used to create the existing profile that you want to augment. You must augment a stand-alone profile.

   Restriction: You cannot augment a stand-alone profile where the default WebSphere VMM user registry has been changed, for example, to using LDAP.
   You can determine the template by viewing the profile registry in the *installation_root*/properties/ profileRegistry.xml file. Do not modify this file; use it only to view the templates.

2. Find the appropriate template to use for the augmentation.

   Templates for each profile are located in the *installation_root*/profileTemplates/BPM directory for BPM templates. For stand-alone profiles, use the BPM/BpmServer template. This template is available with IBM BPM Express only.

3. Use the augment parameter to make changes to an existing profile with an augmentation template. The augment parameter causes the **manageprofiles** command-line utility to update or augment the profile identified in the **-profileName** parameter using the template in the **-templatePath** parameter. The augmentation templates that you can use are determined by which IBM products and versions are installed in your environment. The file path for **-templatePath** need not be fully qualified; /profileTemplates is automatically added as a prefix.

   Note: Do not manually modify the files that are located in the *installation_dir*/profileTemplates/ BPM directory.

4. Run the file from the command line. Do not supply a **-profilePath** parameter. For example:

   ```
   manageprofiles.sh -augment -templatePath BPM/BpmServer
   -profileName MyProfileName
   -adminUsername celladmin -adminPassword celladmin
   ```

   The status is written to the console window when the command completes running.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Related tasks:
Creating database tables and profiles simultaneously using the BPMConfig command
If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

Modifying and extending an existing installation
After you install and configure the runtime environment on your system in IBM Business Process Manager, you might want to customize your configuration. For example, you might want to customize settings, set up an additional security provider, set up user accounts, and change and encrypt passwords.

Installing and configuring IBM Business Process Manager on Windows
Install IBM Business Process Manager on Windows and configure a stand-alone environment.

Typical installation and configuration

The Typical installation option is the simplest and quickest method for installing and configuring IBM Business Process Manager Express.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Related reference:

⬆ IBM Business Process Manager Express system requirements

Installing and configuring IBM Business Process Manager Express with a new DB2 Express database server:

The typical installation can install DB2 Express on Windows and configure the required databases and deployment environment for IBM Business Process Manager. Only select this path if you have administrative privileges (Administrator user) and do not have an existing DB2 database server on the system.

Installing and configuring Process Center with a new DB2 Express database server:

Process Center includes a repository for all processes, services, and other assets created in the IBM Business Process Manager authoring environments. You can use the integrated Process Server within Process Center to run processes as you build them. When you are ready, you can install and run those same processes on the Process Server in your runtime environments.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all three required images for Windows, and extracted them to the same directory.

The typical installation installs DB2 Express and configures the required databases for IBM Business Process Manager. Only select this path if you have administrative privileges (Administrator user) and do not have an existing DB2 database server on the system.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest refresh pack and interim fix level automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   ```
   C:/HOMEPATH/bpm_updates.properties
   ```

   where:

   On Windows XP, the HOMEPATH environment variable points to `C:/Documents and Settings/user_name`

   On Windows 7, Windows Vista, or Windows Server 2008, the HOMEPATH environment variable points to `C:/Users/user_name`

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fixpacks, and launchpad upgrades. The locations can be either local directories or URLs. For example:

```
ifix.1=C:/bpmUpdates
fixpack.2=http://test/rep
launchpad.1=C:/launchpad_updates
fixpack.WAS_REP=C:/WAS_updates
fixpack.BPM_REP=C:/BPM_updates
```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. If autorun is enabled on your workstation, the launchpad program automatically opens, and you can proceed to the next step. If autorun is not enabled on your workstation, enter the following command to start the launchpad manually:

     To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

     (from a command line) *DVD_root*/launchpad.exe

   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

        To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

        (from a command line) *extract_directory*/launchpad.exe

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Center** and click **Next**.

6. Click **Next**.

7. Optionally change the location information.

   - **Hostname**: This field shows the name of your machine.

     Important: If a value of localhost or 127.0.0.1 is used for the hostname, Process Server installations on a remote system will not be able to connect to the Process Center.

   - **Location**: Enter the installation location for Process Center, or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

Restriction: Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

8. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

9. Specify the **Username** and **Password** for the deployment environment administrative account. The deployment environment administrator is the primary IBM Business Process Manager administrator. A user assigned to this role has administrative access to Process Center and Process Admin Console. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This account also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.

10. Click **Next**.

11. Select **No. I need one installed for me.** to install DB2 Express.

12. Specify the **Username** and **Password** for the DB2 Express database.

    Restriction:
    * User names must not contain National Language Strings (NLS)
    * User names must be maximum 30 characters in length

13. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

    Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

    The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

    Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

    After successfully installing the product, you can use Installation Manager to install the required fixes.

14. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

15. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

If you used the Windows domain user ID to create a new DB2 Express database and tables, and profile creation failed, use one of the following solutions:

* Log into the Windows system as a local system user and run the Profile Management Tool to create a profile.
* Follow the steps listed in DB2 log file error: SQL1092N "USERID does not have the authority to perform the requested command or operation" and then create a profile.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

▶ Installation Manager updates

Installing and configuring Process Server with a new DB2 Express database server:

Process Server provides a single BPM runtime environment that can support a range of business processes for development, test, staging, or production.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all three required images for Windows, and extracted them to the same directory.

The typical installation installs DB2 Express and configures the required databases for IBM Business Process Manager. Only select this path if you have administrative privileges (Administrator user) and do not have an existing DB2 database server on the system.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest refresh pack and interim fix level automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   ```
   C:/HOMEPATH/bpm_updates.properties
   ```

   where:

   On Windows XP, the HOMEPATH environment variable points to `C:/Documents and Settings/user_name`

   On Windows 7, Windows Vista, or Windows Server 2008, the HOMEPATH environment variable points to `C:/Users/user_name`

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fixpacks, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=C:/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=C:/launchpad_updates
   fixpack.WAS_REP=C:/WAS_updates
   fixpack.BPM_REP=C:/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. If autorun is enabled on your workstation, the launchpad program automatically opens, and you can proceed to the next step. If autorun is not enabled on your workstation, enter the following command to start the launchpad manually:

To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

>   (from a command line) `DVD_root`/`launchpad.exe`

- If you are installing from images downloaded from Passport Advantage, perform the following steps:

  a. Go to the directory into which you extracted the images.

  b. Enter the following command to start the launchpad:

     To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

     >   (from a command line) `extract_directory`/`launchpad.exe`

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Server** and click **Next**.

6. Click **Next**.

7. Specify Process Server information:

   - **Hostname**: This field shows the name of your machine.

   - **Location**: Enter the installation location for Process Server or click **Browse** to select the location.

     Note:
     - The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     - Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

   - Environment **Type**: Select how the Process Server is used:
     - Select **Production** if the server is to be used in a production capacity.
     - Select **Stage** if the server is to be used as a temporary location to host changes before putting them into production.
     - Select **Test** if the server is to be used as a testing environment, for example, for load testing.
     - Select **Development** if the server is to be used in a development capacity.

   - **Name**: Specify the name for the Process Server environment. This name is used to connect from a Process Center to this Process Server.

     Restriction: Do not mix production and non-production servers in the same cell.

   - Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

Select **Use this server offline** if this Process Server will not be connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications, but the method for deploying process applications to an offline Process Server differs from the method for deploying process applications to an online Process Server.

If you did not select **Use this server offline**, provide the following information for the Process Center that this server is to connect to:

- **Hostname**: Enter the host or virtual host that this Process Server will use to communicate with Process Center. Use a fully qualified host name. In an environment with a load balancer or proxy server between the Process Server and the Process Center services, make sure that what you designate here matches the URL for accessing the Process Center.

- **Port**: Enter the port number of the Process Center. In an environment with a load balancer or proxy server between the Process Server and the Process Center, make sure that what you designate here matches the URL for accessing the Process Center.

- **User name**: Enter the name of a Process Center user. Process Server will connect to Process Center as this user.

- **Password**: Enter the password for the Process Center user.

You can click **Test Connection** to check the connection to the Process Center.

8. Click **Next**.
9. Select **No. I need one installed for me.** to install DB2 Express.
10. Specify the **Username** and **Password** for the DB2 Express database.

    Restriction:
    - User names must not contain National Language Strings (NLS)
    - User names must be maximum 30 characters in length

11. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

    Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

    The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

    Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

    After successfully installing the product, you can use Installation Manager to install the required fixes.

12. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

13. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

If you used the Windows domain user ID to create a new DB2 Express database and tables, and profile creation failed, use one of the following solutions:

- Log into the Windows system as a local system user and run the Profile Management Tool to create a profile.
- Follow the steps listed in DB2 log file error: SQL1092N "USERID does not have the authority to perform the requested command or operation" and then create a profile.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

➡ Installation Manager updates

Installing and configuring IBM Business Process Manager Express with a DB2 database server:

You can install IBM Business Process Manager using an existing DB2 database server.

Creating DB2 databases:

You can create the required databases for IBM Business Process Manager V8.5 before you create profiles and configure your network deployment environment. Usually you require the Process database, the Performance Data Warehouse database, and the Common database. In the case of an Advanced-only deployment environment, you need only the Common database.

The Process Server and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

In an IBM Business Process Manager environment, the **createDatabase.sql** script is used to create the databases. It is available in the *BPM_HOME*\BPM\dbscripts\DB2\Create folder.

In the following example, replace *@DB_NAME@* with the name that you want to use for the created database and *@DB_USER@* with the user name that you want to use for the database.

1. If IBM Business Process Manager is installed on your machine, locate the SQL script **createDatabase.sql** to run. Otherwise, use the command line option.
2. Run the following sample script to create each database.

   BPM_HOME\BPM\dbscripts\DB2\Create\createDatabase.sql

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

   ```
   create database @DB_NAME@ automatic storage yes  using codeset UTF-8 territory US pagesize 32768;
   connect to @DB_NAME@;
   grant dbadm on database to user @DB_USER@;
   UPDATE DB CFG FOR @DB_NAME@ USING LOGFILSIZ 4096 DEFERRED;
   UPDATE DB CFG FOR @DB_NAME@ USING LOGSECOND 64 DEFERRED;
   connect reset;
   ```

   Note: If a command fails to execute from the DB2 command prompt, remove the semicolon (;) and rerun the command.

   If IBM Business Process Manager is not installed, run the following command from the command line:

   ```
   db2 -tvf createDatabase.sql
   ```

Installing and configuring Process Center with a DB2 database server:

Process Center includes a repository for all processes, services, and other assets created in the IBM Business Process Manager authoring environments. You can use the integrated Process Server within Process Center to run processes as you build them. When you are ready, you can install and run those same processes on the Process Server in your runtime environments.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty. The databases must be created with at least a 32K page size.

Be prepared to specify the following information during installation:

- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all three required images for Windows, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest refresh pack and interim fix level automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   > C:/*HOMEPATH*/bpm_updates.properties

   where:

   > On Windows XP, the HOMEPATH environment variable points to C:/Documents and Settings/*user_name*

   > On Windows 7, Windows Vista, or Windows Server 2008, the HOMEPATH environment variable points to C:/Users/*user_name*

   Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fixpacks, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=C:/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=C:/launchpad_updates
   fixpack.WAS_REP=C:/WAS_updates
   fixpack.BPM_REP=C:/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. If autorun is enabled on your workstation, the launchpad program automatically opens, and you can proceed to the next step. If autorun is not enabled on your workstation, enter the following command to start the launchpad manually:

To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

(from a command line) `DVD_root`/`launchpad.exe`

- If you are installing from images downloaded from Passport Advantage, perform the following steps:
  a. Go to the directory into which you extracted the images.
  b. Enter the following command to start the launchpad:

     To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

     (from a command line) `extract_directory`/`launchpad.exe`

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Center** and click **Next**.

6. Click **Next**.

7. Optionally change the location information:
   - **Hostname**: This field shows the name of your machine.

     Important: If a value of localhost or 127.0.0.1 is used for the hostname, Process Server installations on a remote system will not be able to connect to the Process Center.
   - **Location**: Enter the installation location for Process Center, or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

8. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

9. Specify the **Username** and **Password** for the deployment environment administrative account. The deployment environment administrator is the primary IBM Business Process Manager administrator. A user assigned to this role has administrative access to Process Center and Process Admin Console. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This account also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.

10. Click **Next**.

11. Select **Yes** to use an existing database.

12. Specify the required database information.

Table 57. Required database configuration fields for DB2

Field	Action needed
Username	Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Enter a password to authenticate with the database.
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of `50000` or enter the correct server port number.
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the name for the Process database.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the name for the Performance Data Warehouse database.

Click **Test Database Connection** to verify that you can connect to the BPM databases that are created. Only if the connections to the databases are successful, you can click **Next** to proceed.

13. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

   Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

   The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

   Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

   After successfully installing the product, you can use Installation Manager to install the required fixes.

14. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

15. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

➦ Installation Manager updates

Installing and configuring Process Server with a DB2 database server:

Process Server provides a single BPM runtime environment that can support a range of business processes for development, test, staging, or production.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty. The databases must be created with at least a 32K page size.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all three required images for Windows, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest refresh pack and interim fix level automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   `C:/HOMEPATH/bpm_updates.properties`

   where:

   On Windows XP, the HOMEPATH environment variable points to `C:/Documents and Settings/user_name`

   On Windows 7, Windows Vista, or Windows Server 2008, the HOMEPATH environment variable points to `C:/Users/user_name`

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fixpacks, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=C:/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=C:/launchpad_updates
   fixpack.WAS_REP=C:/WAS_updates
   fixpack.BPM_REP=C:/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.
   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. If autorun is enabled on your workstation, the launchpad program automatically opens, and you can proceed to the next step. If autorun is not enabled on your workstation, enter the following command to start the launchpad manually:

To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

> (from a command line) `DVD_root`/`launchpad.exe`

- If you are installing from images downloaded from Passport Advantage, perform the following steps:
  a. Go to the directory into which you extracted the images.
  b. Enter the following command to start the launchpad:

  To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

  > (from a command line) `extract_directory`/`launchpad.exe`

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Server** and click **Next**.

6. Click **Next**.

7. Specify Process Server information:
   - **Hostname**: This field shows the name of your machine.
   - **Location**: Enter the installation location for Process Server or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

   - Environment **Type**: Select how the Process Server is used:
     – Select **Development** if the server is to be used in a development capacity.
     – Select **Production** if the server is to be used in a production capacity.
     – Select **Stage** if the server is to be used as a temporary location to host changes before putting them into production.
     – Select **Test** if the server is to be used as a testing environment, for example, for load testing.

   - **Name**: Specify the name for the Process Server environment. This name is used to connect from a Process Center to this Process Server.

     Restriction: Do not mix production and non-production servers in the same cell.

   - Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

Select **Use this server offline** if this Process Server will not be connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications, but the method for deploying process applications to an offline Process Server differs from the method for deploying process applications to an online Process Server.

If you did not select **Use this server offline**, provide the following information for the Process Center that this server is to connect to:

- **Hostname**: Enter the host or virtual host that this Process Server will use to communicate with Process Center. Use a fully qualified host name. In an environment with a load balancer or proxy server between the Process Server and the Process Center services, make sure that what you designate here matches the URL for accessing the Process Center.
- **Port**: Enter the port number of the Process Center. In an environment with a load balancer or proxy server between the Process Server and the Process Center, make sure that what you designate here matches the URL for accessing the Process Center.
- **User name**: Enter the name of a Process Center user. Process Server will connect to Process Center as this user.
- **Password**: Enter the password for the Process Center user.

You can click **Test Connection** to check the connection to the Process Center.

8. Click **Next**.
9. Select **Yes** to use an existing database.
10. Specify the required database information.

Table 58. Required database configuration fields for DB2

Field	Action needed
Username	Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Enter a password to authenticate with the database.
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of `50000` or enter the correct server port number.
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the name for the Process database.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the name for the Performance Data Warehouse database.

Click **Test Database Connection** to verify that you can connect to the BPM databases that are created. Only if the connections to the databases are successful, you can click **Next** to proceed.

11. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

After successfully installing the product, you can use Installation Manager to install the required fixes.

12. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

13. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

If you used the Windows domain user ID to create a new DB2 Express database and tables, and profile creation failed, use one of the following solutions:

- Log into the Windows system as a local system user and run the Profile Management Tool to create a profile.
- Follow the steps listed in DB2 log file error: SQL1092N "USERID does not have the authority to perform the requested command or operation" and then create a profile.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

Installation Manager updates

Installing and configuring IBM Business Process Manager Express with an Oracle database server:

You can install IBM Business Process Manager using an Oracle database server.

Creating users for Oracle databases:

You can create the users for Oracle databases before you create profiles and configure your network deployment environment. Create the cell-scoped user, the deployment environment-level user, the Process Server user, and the Performance Data Warehouse user. Note: The Process Server user and the Performance Data Warehouse user are not needed for an Advanced-only deployment environment.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

You can use a single instance of Oracle for configuring BPM. The Oracle instance must exist and be available for access. Consult the Oracle documentation to create an Oracle instance. If you use a single Oracle instance, make sure that you use different user IDs for the three different BPM databases.

If IBM Business Process Manager is installed, the `BPM_HOME\BPM\dbscripts\Oracle\Create` folder contains the `createUser.sql` script that is used to create the users for Oracle databases.

In the following examples, replace @*DB_USER*@ with the user name that you want to use for the database and replace @*DB_PASSWD*@ with the password for that user.

Run the following sample script to create the database users.
`BPM_HOME\BPM\dbscripts\Oracle\Create\createUser.sql`
Optionally, or if IBM Business Process Manager is not installed, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

```
CREATE USER @DB_USER@ IDENTIFIED BY @DB_PASSWD@;
grant connect, resource, unlimited tablespace to @DB_USER@;
grant create view to @DB_USER@;
grant javauserpriv to @DB_USER@;
grant execute on dbms_lock to @DB_USER@;
```

Installing and configuring Process Center with an Oracle database server:

Process Center includes a repository for all processes, services, and other assets created in the IBM
Business Process Manager authoring environments. You can use the integrated Process Server within
Process Center to run processes as you build them. When you are ready, you can install and run those
same processes on the Process Server in your runtime environments.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the
Process database, Performance Data Warehouse database, and Common database already exist and that
they are empty.

Be prepared to specify the following information during installation:
* The user name and password for database authentication
* The database server host name and port
* The name of the Process database.
* The name of the Performance Data Warehouse database.
* The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have
downloaded all three required images for Windows, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone
profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles**
command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process
Manager.
1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the
   latest refresh pack and interim fix level automatically. If you want these upgrades to be installed
   from a local directory instead, or if you want to specify the fix level, you can use a properties file to
   tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   > C:/*HOMEPATH*/bpm_updates.properties

   where:

   > On Windows XP, the HOMEPATH environment variable points to C:/Documents and
   > Settings/*user_name*
   >
   > On Windows 7, Windows Vista, or Windows Server 2008, the HOMEPATH environment variable
   > points to C:/Users/*user_name*

   Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties
   file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The
   part of the name after the prefix and the dot can be anything you want, which enables you to point
   to multiple locations for ifixes, fixpacks, and launchpad upgrades. The locations can be either local
   directories or URLs. For example:

```
ifix.1=C:/bpmUpdates
fixpack.2=http://test/rep
launchpad.1=C:/launchpad_updates
fixpack.WAS_REP=C:/WAS_updates
fixpack.BPM_REP=C:/BPM_updates
```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. If autorun is enabled on your workstation, the launchpad program automatically opens, and you can proceed to the next step. If autorun is not enabled on your workstation, enter the following command to start the launchpad manually:

     To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

        (from a command line) *DVD_root*/launchpad.exe

   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

        To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

           (from a command line) *extract_directory*/launchpad.exe

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Center** and click **Next**.

6. Click **Next**.

7. Optionally change the location information:

   - **Hostname**: This field shows the name of your machine.

     Important: If a value of localhost or 127.0.0.1 is used for the hostname, Process Server installations on a remote system will not be able to connect to the Process Center.

   - **Location**: Enter the installation location for Process Center, or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

8. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables

administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

9. Specify the **Username** and **Password** for the deployment environment administrative account. The deployment environment administrator is the primary IBM Business Process Manager administrator. A user assigned to this role has administrative access to Process Center and Process Admin Console. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This account also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.

10. Click **Next**.
11. Select **Yes** to use an existing database.
12. Specify the required database information.

Table 59. Required database configuration fields for Oracle

Field	Action needed
Instance name	Enter the name of the Oracle database instance.
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1521 or enter the correct server port number.
Common database	For the deployment environment-level Common database, enter values for the following parameters: • **User name**: Enter the Common database user name. • **Password**: Enter a password to authenticate with the Common database.
Process database	For the Process database, enter values for the following parameters: • **User name**: Enter the Process database user name. • **Password**: Enter a password to authenticate with the Process database.
Performance Data Warehouse database	For the Performance Data Warehouse database, enter values for the following parameters: • **User name**: Enter the Performance Data Warehouse database user name. • **Password**: Enter a password to authenticate with the Performance Data Warehouse database.

13. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

   Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

   The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

   Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

   After successfully installing the product, you can use Installation Manager to install the required fixes.

14. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

15. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

➡ Installation Manager updates

Installing and configuring Process Server with an Oracle database server:

Process Server provides a single BPM runtime environment that can support a range of business processes for development, test, staging, or production.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all three required images for Windows, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest refresh pack and interim fix level automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

       C:/*HOMEPATH*/bpm_updates.properties

   where:

   On Windows XP, the HOMEPATH environment variable points to `C:/Documents and Settings/`*user_name*

   On Windows 7, Windows Vista, or Windows Server 2008, the HOMEPATH environment variable points to `C:/Users/`*user_name*

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fixpacks, and launchpad upgrades. The locations can be either local directories or URLs. For example:

```
ifix.1=C:/bpmUpdates
fixpack.2=http://test/rep
launchpad.1=C:/launchpad_updates
fixpack.WAS_REP=C:/WAS_updates
fixpack.BPM_REP=C:/BPM_updates
```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. If autorun is enabled on your workstation, the launchpad program automatically opens, and you can proceed to the next step. If autorun is not enabled on your workstation, enter the following command to start the launchpad manually:

     To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click launchpad.exe and select **Run as administrator**.

       (from a command line) *DVD_root*/launchpad.exe

   - If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

       To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click launchpad.exe and select **Run as administrator**.

         (from a command line) *extract_directory*/launchpad.exe

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Server** and click **Next**.

6. Specify Process Server information:

   - **Hostname**: This field shows the name of your machine.

   - **Location**: Enter the installation location for Process Server or click **Browse** to select the location.

     Note:

     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.

     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

   - Environment **Type**: Select how the Process Server is used:

     – Select **Development** if the server is to be used in a development capacity.

     – Select **Production** if the server is to be used in a production capacity.

     – Select **Stage** if the server is to be used as a temporary location to host changes before putting them into production.

- Select **Test** if the server is to be used as a testing environment, for example, for load testing.
- **Name**: Specify the name for the Process Server environment. This name is used to connect from a Process Center to this Process Server.

    Restriction: Do not mix production and non-production servers in the same cell.
- Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

Select **Use this server offline** if this Process Server will not be connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications, but the method for deploying process applications to an offline Process Server differs from the method for deploying process applications to an online Process Server.

If you did not select **Use this server offline**, provide the following information for the Process Center that this server is to connect to:

- **Hostname**: Enter the host or virtual host that this Process Server will use to communicate with Process Center. Use a fully qualified host name. In an environment with a load balancer or proxy server between the Process Server and the Process Center services, make sure that what you designate here matches the URL for accessing the Process Center.
- **Port**: Enter the port number of the Process Center. In an environment with a load balancer or proxy server between the Process Server and the Process Center, make sure that what you designate here matches the URL for accessing the Process Center.
- **User name**: Enter the name of a Process Center user. Process Server will connect to Process Center as this user.
- **Password**: Enter the password for the Process Center user.

    You can click **Test Connection** to check the connection to the Process Center.

7. Click **Next**.
8. Select **Yes** to use an existing database.
9. Specify the required database information.

Table 60. Required database configuration fields for Oracle

Field	Action needed
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1521 or enter the correct server port number.
Instance name	Enter the name of the Oracle database instance.
Common database	For the deployment environment-level Common database, enter values for the following parameters: • `User name`: Enter the Common database user name. • `Password`: Enter a password to authenticate with the Common database.

Table 60. Required database configuration fields for Oracle (continued)

Field	Action needed
Process database	For the Process database, enter values for the following parameters: • **User name**: Enter the Process database user name. • **Password**: Enter a password to authenticate with the Process database.
Performance Data Warehouse database	For the Performance Data Warehouse database, enter values for the following parameters: • **User name**: Enter the Performance Data Warehouse database user name. • **Password**: Enter a password to authenticate with the Performance Data Warehouse database.

10. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

> **Note:** If you are using a local properties file, you do not need to provide your IBM ID and password.

> The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

> Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

> After successfully installing the product, you can use Installation Manager to install the required fixes.

11. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

12. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

⮕ Installation Manager updates

Installing and configuring IBM Business Process Manager Express with an SQL Server database server:

You can install IBM Business Process Manager using a Microsoft SQL Server database server.

Creating and configuring SQL Server databases before typical installation:

IBM Business Process Manager requires a Process database, Performance Data Warehouse database, and Common database. The Common database contains Business Space and other components. You can install and configure the required databases before you install.

Configuring XA transactions:

You must configure XA transactions after the Microsoft SQL Server database is installed and before you start the server. The SQL Server JDBC driver provides support for Java Platform, Enterprise Edition/JDBC 2.0 optional distributed transactions. JDBC connections obtained from the **SQLServerXADataSource** class can participate in standard distributed transaction processing environments such as Java Platform, Enterprise Edition (Java EE) application servers.

Failure to configure the XA transactions can result in the following error when the server starts:**javax.transaction.xa.XAException: com.microsoft.sqlserver.jdbc.SQLServerException: Failed to create the XA control connection. Error: "Could not find stored procedure 'master..xp_sqljdbc_xa_init_ex'."**.

The MS DTC service should be marked Automatic in Service Manager to make sure that it is running when the SQL Server service is started.

1. To enable MS DTC for XA transactions, you must follow these steps:

   On Windows XP and Windows Server 2003:

   a. Select **Control Panel** > **Administrative Tools** > **Component Services**.

   b. Select **Component Services** > **Computers** and right-click **My Computer**, and select **Properties**.

   c. Click the **MSDTC** tab, and then click **Security Configuration**.

   d. Select the **Enable XA Transactions** check box, and then click **OK**. This will cause a MS DTC service restart.

   e. Click **OK** again to close the **Properties** window, and then close **Component Services**.

   f. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

   On Windows Vista, Windows 7, and Windows Server 2008 R2:

   a. Select **Control Panel** > **Administrative Tools** > **Component Services**.

   b. Select **Component Services** > **Computers** > **My Computer** > **Distributed Transaction Coordinator**.

   c. Right-click **Local DTC** and then select **Properties**.

   d. Click the **Security** tab on the **Local DTC Properties** window.

   e. Select the **Enable XA Transactions** check box, and click **OK**. This will restart the MS DTC service.

   f. Click **OK** again to close the Properties window, and then close Component Services.

   g. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

2. Configure the JDBC Distributed Transaction Components:

   a. If you haven't installed IBM Business Process Manager, download "Microsoft SQL Server JDBC Drive 3.0" driver from the Microsoft Site using the URL from Resources section and extract it to any folder.

   b. If BPM is already installed, go to *bpm_install_root*\jdbcdrivers\SQLServer\xa to obtain the files you require in the following steps:

      - Copy the `sqljdbc_xa.dll` file from the JDBC unarchived directory to the Binn directory (for a default SQL Server install, the location is `C:\Program Files\Microsoft SQL Server\ MSSQL10_50.MSSQLSERVER\MSSQL\Binn`) of SQL Server computer. If you are using XA transactions with a 32-bit SQL Server, use the `sqljdbc_xa.dll` file in the x86 folder, even if the SQL Server is installed on a x64 processor. If you are using XA transactions with a 64-bit SQL Server on the x64 processor, use the `sqljdbc_xa.dll` file in the x64 folder.

      - Run the `xa_install.sql` database script on SQL Server. For example; from the command prompt, run **sqlcmd -i xa_install.sql**. This script installs the extended stored procedures that are called by `sqljdbc_xa.dll`. These extended stored procedures implement distributed transaction and XA support for the Microsoft SQL Server JDBC Driver. You will need to run this script as an administrator of the SQL Server instance. You can ignore errors about unable to drop procedures that don't exist.

- Open the SQL Server Management Studio to locate the security folder under the **master** database. To grant permissions to a specific user to participate in distributed transactions with the JDBC driver, add the user to the **SqlJDBCXAUser** role in the master database (for example, for a Lombardi user add master database in User mappings and check **SqlJDBCXAUser** role).

3. Follow these steps for configuring Windows authentication:

   - Locate **sqljdbc_auth.dll**. If you haven't installed IBM Business Process Manager, go to the `BPM_install_root`\jdbcdrivers\SQLServer\auth to obtain the file. If you haven't installed BPM, locate the dll file in the Microsoft JDBC driver package that you downloaded.

   - Copy the `sqljdbc_auth.dll` file to the `Binn` directory (for a default SQL Server install, the location is `C:/Program Files/Microsoft SQL Server/MSSQL10_50.MSSQLSERVER/MSSQL/Binn`) of SQL Server computer. If your JRE is 32-bit , use the **sqljdbc_auth.dll** file in the x86 folder, even if the SQL Server is installed on a x64 processor. If your JRE 64-bit, use the **sqljdbc_auth.dll** file in the x64 folder.

After you configure the XA transactions and before you start the server, you must configure your TCP/IP connectivity using the below steps:

1. From Start menu, click **Microsoft SQl Server 2008 R2** > **Configuration Tools** > **SQL Server Configuration Manager**.
2. Expand **SQl Server network Configuration** > **Protocols for SQL2008**
3. Locate **TCP/IP** on the right-hand side.
4. Double click **TCP/IP** and enable it under the **Protocol** tab.
5. Click the **IP Addresses** tab to enable the TCP port for each configured IP address.

Creating SQL Server databases:

IBM Business Process Manager requires a Process database, Performance Data Warehouse database, and Common database. The Common database contains Business Space and other components. You must create the databases before network deployment.

- You cannot share databases across multiple installations or Deployment Environments
- The Process and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.
- Process and Performance Data Warehouse components require the databases to be case-insensitive for SQL Server
- CommonDB (and legacy WPS) components require the databases to be case-sensitive for SQL Server
- The schema name used for each component should match the user

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

If IBM Business Process Manager is installed on your machine, the **createDatabase_CaseInsensitive.sql** and **createDatabase_CaseSensitive.sql** scripts are available in the *BPM_HOME*\BPM\dbscripts\SQLServer\ `Create` folder.

In the following examples, replace *@DB_NAME@* with the name that you want to use for the created database

1. If IBM Business Process Manager is installed on your machine, locate the SQL scripts to run. Otherwise, use the command line option.
2. Run the scripts to create the BPMDB and PDWDB databases. Run the following sample script:

   `BPM_HOME\BPM\dbscripts\SQLServer\Create\createDatabase_CaseInsensitive.sql`

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

   `CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS;`

If IBM Business Process Manager is not installed, run the following command from the command line:

```
sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS"
```

3. Run the script to create the CommonDB database. Run the following sample script:

```
BPM_HOME\BPM\dbscripts\SQLServer\Create\createDatabase_CaseSensitive.sql
```

   Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

```
CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS;
```

   If IBM Business Process Manager is not installed, run the following command from the command line:

```
sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS"
```

   Note: The letter *CI* in the **COLLATE** attribute value is applicable for the case-insensitive databases and *CS* is applicable for case-sensitive databases.

Creating users and schemas for SQL Server databases:

You must create the users and schemas after creating the SQL Server databases.

Assign the IBM Business Process Manager database user to the following three roles:

Note: The database must be created by the database administrator who can then assign these roles to the database user for IBM Business Process Manager.

- db_ddladmin
- db_datawriter
- db_datareader

For information about the permissions that are provided by these roles, see documentation from Microsoft.

Important: In Microsoft SQL server, the default schema name associated with a user must be the same as the user name. For example, if the user name for the Performance Data Warehouse database is *dbuser* then the default schema name associated with the user *dbuser* must also be named *dbuser*. You must create an ordinary database user and assign the required rights to the user instead of using a super user, such as *sa*. This is because the default schema for the super user is dbo and this cannot be changed.

You can complete the following steps if existing tables are not associated with a schema that is the same as the user name.

1. In SQL Server Management Studio Object Explorer, right-click the table name and then click **Design**.
2. From the Design view, press F4 to view the Properties window.
3. From the Properties window, update the schema name.
4. Right-click the tab and select **Close** to close the Design view.
5. Click **OK** when prompted to save. The selected table is transferred to the schema.
6. Repeat the previous steps for all the tables in the Performance Data Warehouse database.

When using Windows authentication, you must ensure that the domain account is added to the SQL Sever login. You must login as the SQL Server administrator and follow the below steps to create users and schemas for Windows authentication.

1. Create the SQL Server login account for your Windows machine using the login information for the machine. For example, if **user1** is the user name and **password** is password for your Windows machine, use the following command syntax:

```
USE [master]
GO
CREATE LOGIN [user1\password] FROM WINDOWS WITH DEFAULT_DATABASE=[master]
GO
```

Note: The SQL Server login that is created must not have SYSADMIN privileges. If the login user has SYSADMIN privileges, the specified schema value is ignored for database connections by SQL Server since the **sysadmin** user's default schema is always *dbo*.

2. Update the master database to grant permission for XA transactions for the Windows user. Use the following command syntax:

```
USE [master];
CREATE USER [sqluser] FOR LOGIN [user1\password];
USE [master];
EXEC sp_addrolemember N'SqlJDBCXAUser', N'sqluser';
```

3. For each database that you create, you must set the default schema for the SQL Server login. Use the following command syntax for the BPMDB (Process Server) database:

```
CREATE DATABASE BPMDB COLLATE SQL_Latin1_General_CP1_CI_AS
GO
USE [BPMDB]
GO
CREATE USER [sqluser] FOR LOGIN [user1\password] WITH DEFAULT_SCHEMA=[BPMPS00]
GO
CREATE SCHEMA [BPMPS00] AUTHORIZATION [sqluser]
GO
EXEC sp_addrolemember 'db_ddladmin', 'sqluser';
EXEC sp_addrolemember 'db_datareader', 'sqluser';
EXEC sp_addrolemember 'db_datawriter', 'sqluser';
```

   Note:
   - The BPMDB and PDWDB databases must be created as case-insensitive. Use the command **COLLATE SQL_Latin1_General_CP1_CI_AS**, where **CI** is the **COLLATE** attribute value that is applicable for the case-insensitive databases.
   - The CommonDB database must be created as case-sensitive. Use the command **COLLATE SQL_Latin1_General_CP1_CS_AS**, where **CS** is the **COLLATE** attribute value that is applicable for the case-sensitive databases.

When you create database schemas the using the generated scripts, your user ID must have the authority to create tables. When the tables are created, you must have the authority to select, insert, update, and delete information in the tables.

The following table describes the database privileges that are needed to access the data stores.

Table 61. Database privileges

Minimum privileges that are required to create objects in the database	Minimum privileges that are required to access objects in the database
The user ID ideally requires DB OWNER privileges on the data stores used for IBM Business Process Manager.	Configure the SQL Server for SQL Server and Windows authentication so that authentication to be based on an SQL server login ID and password. The user ID must be the owner of the tables, or a member of a group that has sufficient authority to issue TRUNCATE TABLE statements. See the **Detailed SQL Server database privileges** table at SQL Server database privileges.

Installing and configuring Process Center with an SQL Server database server:

Process Center includes a repository for all processes, services, and other assets created in the IBM Business Process Manager authoring environments. You can use the integrated Process Server within Process Center to run processes as you build them. When you are ready, you can install and run those same processes on the Process Server in your runtime environments.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all three required images for Windows, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest refresh pack and interim fix level automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   > `C:/`*HOMEPATH*`/bpm_updates.properties`

   where:

   > On Windows XP, the HOMEPATH environment variable points to `C:/Documents and Settings/`*user_name*

   > On Windows 7, Windows Vista, or Windows Server 2008, the HOMEPATH environment variable points to `C:/Users/`*user_name*

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fixpacks, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=C:/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=C:/launchpad_updates
   fixpack.WAS_REP=C:/WAS_updates
   fixpack.BPM_REP=C:/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.
   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. If autorun is enabled on your workstation, the launchpad program automatically opens, and you can proceed to the next step. If autorun is not enabled on your workstation, enter the following command to start the launchpad manually:

To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

> (from a command line) `DVD_root/launchpad.exe`

- If you are installing from images downloaded from Passport Advantage, perform the following steps:

  a. Go to the directory into which you extracted the images.

  b. Enter the following command to start the launchpad:

     To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

     > (from a command line) `extract_directory/launchpad.exe`

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Center** and click **Next**.

6. Click **Next**.

7. Optionally change the location information:

   - **Hostname**: This field shows the name of your machine.

     Important: If a value of localhost or 127.0.0.1 is used for the hostname, Process Server installations on a remote system will not be able to connect to the Process Center.

   - **Location**: Enter the installation location for Process Center, or click **Browse** to select the location.

     Note:
     – The installation location must either be an empty directory or a directory that does not exist and is created during installation.
     – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

8. Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

9. Specify the **Username** and **Password** for the deployment environment administrative account. The deployment environment administrator is the primary IBM Business Process Manager administrator. A user assigned to this role has administrative access to Process Center and Process Admin Console. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This account also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.

10. Click **Next**.

11. Select **Yes** to use an existing database.

12. Specify the required database information.

Table 62. Required database configuration fields for SQL Server

Field	Action needed
Username	Only required if you are not using Windows authentication. Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Only required if you are not using Windows authentication. Enter a password to authenticate with the database.
Select the **Apply Windows authentication** option to indicate that you will connect to your databases using your Windows authentication information. If you select this option, the previous fields are made inactive.	
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1433 or enter the correct server port number.
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the Process database name.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the Performance Data Warehouse database name.

13. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

    Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

    The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

    Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

    After successfully installing the product, you can use Installation Manager to install the required fixes.

14. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

15. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

 Installation Manager updates

Installing and configuring Process Server with an SQL Server database server:

Process Server provides a single BPM runtime environment that can support a range of business processes for development, test, staging, or production.

To install IBM Business Process Manager Express using the typical installation, you must confirm that the Process database, Performance Data Warehouse database, and Common database already exist and that they are empty.

Be prepared to specify the following information during installation:
- The user name and password for database authentication
- The database server host name and port
- The name of the Process database.
- The name of the Performance Data Warehouse database.
- The name of the Common database.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all three required images for Windows, and extracted them to the same directory.

Using the product launchpad, the typical installation installs the software and configures a stand-alone profile. You do not need to create a profile later using the Profile Management Tool or **manageprofiles** command.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Optional: If you are connected to the Internet, the typical installation upgrades your product to the latest refresh pack and interim fix level automatically. If you want these upgrades to be installed from a local directory instead, or if you want to specify the fix level, you can use a properties file to tell the Installation Manager where to find the upgrades and which upgrades to install.

   Create the following file:

   > `C:/`*HOMEPATH*`/bpm_updates.properties`

   where:

   > On Windows XP, the HOMEPATH environment variable points to `C:/Documents and Settings/`*user_name*
   >
   > On Windows 7, Windows Vista, or Windows Server 2008, the HOMEPATH environment variable points to `C:/Users/`*user_name*

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

   The file uses three prefixes: ifix, fixpack, and launchpad. Each prefix must be followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for ifixes, fixpacks, and launchpad upgrades. The locations can be either local directories or URLs. For example:

   ```
   ifix.1=C:/bpmUpdates
   fixpack.2=http://test/rep
   launchpad.1=C:/launchpad_updates
   fixpack.WAS_REP=C:/WAS_updates
   fixpack.BPM_REP=C:/BPM_updates
   ```

2. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   - If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. If autorun is enabled on your workstation, the launchpad

program automatically opens, and you can proceed to the next step. If autorun is not enabled on your workstation, enter the following command to start the launchpad manually:

To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

(from a command line) `DVD_root`/`launchpad.exe`

- If you are installing from images downloaded from Passport Advantage, perform the following steps:

    a. Go to the directory into which you extracted the images.

    b. Enter the following command to start the launchpad:

    To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

    (from a command line) `extract_directory`/`launchpad.exe`

3. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically. If you do not have access to the Internet and want the updates to be installed from a local directory, you can use a properties file with the appropriate launchpad prefix as described in step 1 to tell the Installation Manager where to find the upgrades and which upgrades to install.

4. After starting the launchpad, click **Typical installation** on the Welcome page.

5. Select **Install Process Server** and click **Next**.

6. Specify Process Server information:

    - **Hostname**: This field shows the name of your machine.

    - **Location**: Enter the installation location for Process Server or click **Browse** to select the location.

        Note:

        – The installation location must either be an empty directory or a directory that does not exist and is created during installation.

        – Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

    - Environment **Type**: Select how the Process Server is used:

        – Select **Development** if the server is to be used in a development capacity.

        – Select **Production** if the server is to be used in a production capacity.

        – Select **Stage** if the server is to be used as a temporary location to host changes before putting them into production.

        – Select **Test** if the server is to be used as a testing environment, for example, for load testing.

    - **Name**: Specify the name for the Process Server environment. This name is used to connect from a Process Center to this Process Server.

        Restriction: Do not mix production and non-production servers in the same cell.

    - Specify the **Username** and **Password** for the cell administrative account. The cell administrator is the primary WebSphere Application Server administrator. A user assigned to this role can assign other administrator roles, and is responsible for the administration of the cell and topology. A user assigned to this role is not responsible for the administration of the IBM Business Process Manager components. This role provides access to all interfaces, enabling users to alter or delete all types of available library items and assets, including process applications and toolkits. This role also

enables administration of Process Servers, Performance Data Warehouses, and internal users and groups. You must be a user assigned to this role to deploy Process Applications on the Process Center server.

Select **Use this server offline** if this Process Server will not be connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications, but the method for deploying process applications to an offline Process Server differs from the method for deploying process applications to an online Process Server.

If you did not select **Use this server offline**, provide the following information for the Process Center that this server is to connect to:

- **Hostname**: Enter the host or virtual host that this Process Server will use to communicate with Process Center. Use a fully qualified host name. In an environment with a load balancer or proxy server between the Process Server and the Process Center services, make sure that what you designate here matches the URL for accessing the Process Center.
- **Port**: Enter the port number of the Process Center. In an environment with a load balancer or proxy server between the Process Server and the Process Center, make sure that what you designate here matches the URL for accessing the Process Center.
- **User name**: Enter the name of a Process Center user. Process Server will connect to Process Center as this user.
- **Password**: Enter the password for the Process Center user.

You can click **Test Connection** to check the connection to the Process Center.

7. Click **Next**.
8. Select **Yes** to use an existing database.
9. Specify the required database information.

Table 63. Required database configuration fields for SQL Server

Field	Action needed
Username	Only required if you are not using Windows authentication. Enter the user name to authenticate with the database. **Restriction:** User names must not contain National Language Strings (NLS).
Password	Only required if you are not using Windows authentication. Enter a password to authenticate with the database.
Select the **Apply Windows authentication** option to indicate that you will connect to your databases using your Windows authentication information. If you select this option, the previous fields are made inactive.	
Hostname	Accept the default value of `localhost` or enter the correct database server host name. For example, the IP address.
Port	Accept the default value of 1433 or enter the correct server port number.
Common database name	Accept the default value of CMNDB, or enter the name for the Common database.
Process database name	Accept the default value of BPMDB, or enter the Process database name.
Performance Data Warehouse database name	Accept the default value of PDWDB, or enter the Performance Data Warehouse database name.

10. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

After successfully installing the product, you can use Installation Manager to install the required fixes.

11. On the Installation summary page, verify the installation options and read the license agreements. If you agree to the terms of the license agreements, click **I have read and accepted the license agreement and notices**.

12. Click **Install Software**.

After a successful installation, the Quick Start console will start automatically.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Related information:

➠ Installation Manager updates

Custom installation and configuration

Use the Custom installation option to install IBM Business Process Manager Express, if you need any installation or configuration options that are not provided by the Typical installation option or if you want to install silently.

Related reference:

➠ IBM Business Process Manager Express system requirements

Installing IBM Business Process Manager Express:

With custom installation, you can choose to install IBM Business Process Manager Express interactively or silently.

Related reference:

➠ IBM Business Process Manager Express system requirements

Installing interactively with a new installation of WebSphere Application Server:

Using custom installation, you can install IBM Business Process Manager with a new installation of WebSphere Application Server.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all three required images for Windows, and extracted them to the same directory.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

- If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. If autorun is enabled on your workstation, the launchpad program automatically opens, and you can proceed to the next step. If autorun is not enabled on your workstation, enter the following command to start the launchpad manually:

  To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

  (from a command line) `DVD_root/launchpad.exe`

- If you are installing from images downloaded from Passport Advantage, perform the following steps:

  a. Go to the directory into which you extracted the images.

  b. Enter the following command to start the launchpad:

  To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

  (from a command line) `extract_directory/launchpad.exe`

2. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically.

   If you do not have access to the Internet and want updates to the launchpad to be installed from a local directory, you can use a properties file to tell the Installation Manager where to find the updates. Create the following file:

   `C:/HOMEPATH/bpm_updates.properties`

   where:

   On Windows XP, the HOMEPATH environment variable points to `C:/Documents and Settings/user_name`

   On Windows 7, Windows Vista, or Windows Server 2008, the HOMEPATH environment variable points to `C:/Users/user_name`

   Note: Ensure that you have read/write access to the folders specified in the `bpm_updates.properties` file.

   The file uses a launchpad prefix, followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for launchpad upgrades. The locations can be either local directories or URLs. For example:

   `launchpad.1=C:/launchpad_updates`

3. After starting the launchpad, click **Custom installation** on the Welcome page.

4. Click **Install as administrative user** to install as an administrative user. If you are in the Administrators group, you can install as an administrative user. If you are not an administrative user, or if you want to install to your own user name without administrative privileges, clear this check box.

5. Click **Install**. When you install IBM Business Process Manager, the required WebSphere Application Server Network Deployment is automatically installed.

   Note: IBM Business Process Manager V8.5 can be installed only on top of WebSphere Application Server Network Deployment V8.5.

6. On the Install Packages page of the Installation Manager, the **WebSphere Application Server Network Deployment**, **IBM Business Process Manager Express** package, and **IBM DB2 Express** are selected by default. Clear the selection for **IBM DB2 Express**.

7. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

After successfully installing the product, you can use Installation Manager to install the required fixes.

8. On the Licenses page, read the license agreement. If you agree to the terms of the license agreement, click **I accept the terms in the license agreements** and click **Next**.

9. On the Location page, the **Create new package group** option is selected by default. Select a location for the shared resources directory and a location for the Installation Manager and click **Next**. You must select location for the Installation Manager only if it is not already installed.

   Tip: Keep the installation path as short as possible. Otherwise, you might run into problems later when the paths of other components, when added to this path, exceed the 255-character path limit. The Install Packages wizard checks your system for operating system prerequisites. If you are at a higher major release of a supported operating system, or if the operating system itself is not on the supported list, you might encounter a warning. You can continue with the installation, but the installation or product operation might not succeed until you apply maintenance.

   If you see a warning, go to the product support web pages and obtain the latest maintenance packages to apply after installation. See the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

10. On the Features page, expand the plus symbol to select the package features that you want to install. Installation Manager automatically enforces any dependencies with other features and shows the updated download size and disk space requirements for the installation.

    a. Select the translations to install. Under **Translations Supported by All Packages**, **English** is selected by default for the English version. To install other language versions, select the appropriate language under **Translations Supported by Only Some Packages**.

    b. Optional: To see the dependency relationships between features, select **Show Dependencies**.

    c. Optional: Click a feature to view its brief description under **Details**.

    d. Select one of the following features to install.

       - IBM Process Center
       - IBM Process Server **Production** (the default) to use the server in production
       - IBM Process Server **Non-production** to use the server only for test, staging, or development. Your selection is recorded in the product tag for inventory purposes.

       Restriction: Do not mix production and non-production servers in the same cell.

    When you are finished selecting features, click **Next**.

11. On the Summary page, review your choices before installing the IBM Business Process Manager Express package. If you want to change the choices that you made on previous pages, click **Back** and make your changes. When you are satisfied with your installation choices, click **Install** to install the package. A progress indicator shows the percentage of the installation completed.

12. When the installation process is complete, a message confirms the success of the process.

    a. Optional: Click **View Log File** to open the installation log file for the current session in a new window. You must close the Installation Log window to continue.

b. If you plan to use the **BPMConfig** command-line utility to create your Deployment Environment, you do not need to use the Profile Management Tool (PMT) and select **None** to complete the installation.

   c. Click **Finish** to close the Installation Manager.

After you install IBM Business Process Manager, you must configure profiles and databases by using the **BPMConfig** command.

Related information:

➡ Installation Manager updates

Installing interactively with a new DB2 Express database and a new installation of WebSphere Application Server:

The custom installation can install DB2 Express on Windows and configure the required databases for IBM Business Process Manager. Only select this path if you have administrative privileges (Administrator user) and do not have an existing DB2 database server on the system.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all three required images for Windows, and extracted them to the same directory.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Access the media in one of the following ways, depending on whether you are installing from the product DVD or from images downloaded from Passport Advantage. You can run only one launchpad at a time.

   • If you are installing from the product DVD, insert the product disk labeled IBM Business Process Manager Express into the disk drive. If autorun is enabled on your workstation, the launchpad program automatically opens, and you can proceed to the next step. If autorun is not enabled on your workstation, enter the following command to start the launchpad manually:

     To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

        (from a command line) `DVD_root`/launchpad.exe

   • If you are installing from images downloaded from Passport Advantage, perform the following steps:

     a. Go to the directory into which you extracted the images.

     b. Enter the following command to start the launchpad:

        To install or run IBM Business Process Manager Express on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges. Whether you are an administrative user or a non-administrative user, right-click `launchpad.exe` and select **Run as administrator**.

           (from a command line) `extract_directory`/launchpad.exe

2. Optional: If you see a message that prompts you to update the launchpad, click **Update** to receive the latest updates. The updates are installed and your launchpad is restarted automatically.

   If you do not have access to the Internet and want updates to the launchpad to be installed from a local directory, you can use a properties file to tell the Installation Manager where to find the updates. Create the following file:

      `C:/HOMEPATH/bpm_updates.properties`

   where:

      On Windows XP, the HOMEPATH environment variable points to `C:/Documents and Settings/user_name`

On Windows 7, Windows Vista, or Windows Server 2008, the HOMEPATH environment variable points to C:/Users/*user_name*

Note: Ensure that you have read/write access to the folders specified in the bpm_updates.properties file.

The file uses a launchpad prefix, followed by a dot. The part of the name after the prefix and the dot can be anything you want, which enables you to point to multiple locations for launchpad upgrades. The locations can be either local directories or URLs. For example:

launchpad.1=C:/launchpad_updates

3. After starting the launchpad, click **Custom installation** on the Welcome page.

4. Click **Install as administrative user** to install as an administrative user. If you are in the Administrators group, you can install as an administrative user. If you are not an administrative user, or if you want to install to your own user name without administrative privileges, clear this check box.

5. Click **Install**. When you install IBM Business Process Manager, the required WebSphere Application Server Network Deployment is automatically installed.

   Note: IBM Business Process Manager V8.5 can be installed only on top of WebSphere Application Server Network Deployment V8.5.

6. On the Install Packages page of the Installation Manager, the **WebSphere Application Server Network Deployment**, **IBM Business Process Manager Express** package, and **IBM DB2 Express** are selected by default.

7. Click **Next** to continue. You are prompted to provide your IBM ID and password to connect to the IBM service repositories.

   Note: If you are using a local properties file, you do not need to provide your IBM ID and password.

   The connection to the service repositories is required to download and install any fix packs and required interim fixes from the Internet, including fixes for WebSphere Application Server and IBM Business Process Manager. An IBM ID and password can be obtained by registering at http://www.ibm.com.

   Click **Cancel** to continue installing without downloading the required fixes from the Internet or clear the **Use your support account to include updates with the installation** option on the Installation summary page.

   After successfully installing the product, you can use Installation Manager to install the required fixes.

8. On the Licenses page, read the license agreement. If you agree to the terms of the license agreement, click **I accept the terms in the license agreements** and click **Next**.

9. On the Location page, the **Create new package group** option is selected by default. Select a location for the shared resources directory and a location for the Installation Manager and click **Next**.

   Tip: Keep the installation path as short as possible. Otherwise, you might run into problems later when the paths of other components, when added to this path, exceed the 255-character path limit. The Install Packages wizard checks your system for operating system prerequisites. If you are at a higher major release of a supported operating system, or if the operating system itself is not on the supported list, you might encounter a warning. You can continue with the installation, but the installation or product operation might not succeed until you apply maintenance.

   If you see a warning, go to the product support web pages and obtain the latest maintenance packages to apply after installation. See the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

   Attention: Because you are installing DB2 Express, your installation location cannot contain National Language Strings (NLS).

10. On the Features page, expand the plus symbol to select the package features that you want to install. Installation Manager automatically enforces any dependencies with other features and shows the updated download size and disk space requirements for the installation.

   a. Select the translations to install. Under **Translations Supported by All Packages**, **English** is selected by default for the English version. To install other language versions, select the appropriate language under **Translations Supported by Only Some Packages**.

   b. Optional: To see the dependency relationships between features, select **Show Dependencies**.

   c. Optional: Click a feature to view its brief description under **Details**.

   d. Select one of the following features to install.

      • IBM Process Center

      • IBM Process Server **Production** (the default) to use the server in production

      • IBM Process Server **Non-production** to use the server only for test, staging, or development. Your selection is recorded in the product tag for inventory purposes.

      Restriction: Do not mix production and non-production servers in the same cell.

   When you are finished selecting features, click **Next**.

11. Optional: Specify the DB2 administrative **User name** and **Password** on the Common Configurations page. Choose a password that complies with the password policy of your system (for example, Windows 2008).

   Click **Re-Validate** to confirm that your choices are correct.

   Restriction: User names must not contain National Language Strings (NLS).

12. On the Summary page, review your choices before installing the IBM Business Process Manager Express package. If you want to change the choices that you made on previous pages, click **Back** and make your changes. When you are satisfied with your installation choices, click **Install** to install the package. A progress indicator shows the percentage of the installation completed.

13. When the installation process is complete, a message confirms the success of the process.

   a. Optional: Click **View Log File** to open the installation log file for the current session in a new window. You must close the Installation Log window to continue.

   b. If you plan to use the `BPMConfig` command-line utility to create your Deployment Environment, you do not need to use the Profile Management Tool (PMT) and select **None** to complete the installation.

   c. Click **Finish** to close the Installation Manager.

After you install IBM Business Process Manager, you must configure profiles and databases by using the `BPMConfig` command.

If you used the Windows domain user ID to create a new DB2 Express database and tables, and profile creation failed, use one of the following solutions:

• Log into the Windows system as a local system user and run the Profile Management Tool to create a profile.

• Follow the steps listed in DB2 log file error: SQL1092N "USERID does not have the authority to perform the requested command or operation" and then create a profile.

Related information:

➡ Installation Manager updates

Installing silently using the command line:

You can install IBM Business Process Manager silently using the command line. With this method, you only need to run one command to perform the installation.

If you do not have the prerequisite base products necessary for IBM Business Process Manager Express installation, you must install them as part of the silent installation. The required base products are:

- Installation Manager
- WebSphere Application Server Network Deployment, including the ejbdeploy and thinclient features.

The silent installation performs the following tasks:

- Installs Installation Manager if it is not already installed or updates it to the appropriate level if it is installed.
- Installs the required base products and IBM Business Process Manager Express.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Run the following command to generate encrypted passwords using IBM Installation Manager to securely connect to DB2 and the administrative console.

   Important: If you are running Windows 7, Windows Vista, or Windows Server 2008, start your command prompt by right-clicking and selecting **Run as administrator**.

   ```
   extract_directory/IM/tools/imutilsc -silent -nosplash encryptString password_to_encrypt
   ```

   Note: If you are running on a 64-bit system and do not already have 32-bit Installation Manager installed, then you must run the command from the *extract_directory*/IM64/tools directory.

2. Read and accept the license terms before installing. Adding **-acceptLicense** to the command line means that you accept all licenses.

3. Run the following command:

   Important: If you are running Windows 7, Windows Vista, or Windows Server 2008, start your command prompt by right-clicking and selecting **Run as administrator**.

   ```
   extract_directory/IM/tools/imcl install list_of_product_IDs -acceptLicense
   -installationDirectory location -repositories repository
   -properties key=value,key=value -showVerboseProgress -log logName.log
   ```

   where:

   - *list_of_product_IDs* is a list of the IDs for the products and features that you want to install. You must include the required features. The syntax is *productID,feature,feature*, with multiple products separated by spaces.

Table 64. Product IDs

Product	Product ID	Feature and Description
IBM BPM Express	com.ibm.bpm.EXP.v85	• **ExpressProcessCenter** • **ExpressProcessServer.NonProduction** - Test, staging, or development use. • **ExpressProcessServer.Production** - Production use.

Table 64. Product IDs (continued)

Product	Product ID	Feature and Description
WebSphere Application Server Network Deployment	com.ibm.websphere.ND.v85	• core.feature: Required. WebSphere Application Server core content. • ejbdeploy: Required. Pre-Enterprise JavaBeans (EJB) 3.0 modules. • thinclient: Required. Stand-alone thin clients and resource adapters. • embeddablecontainer: Embeddable EJB container. • samples: Sample applications feature. • com.ibm.sdk.6_32bit: 32-bit software development kit (SDK). You must specify either this feature or com.ibm.sdk.6_64bit. • com.ibm.sdk.6_64bit: 64-bit SDK This feature can only be selected on a 64-bit system. You must specify either this feature or com.ibm.sdk.6_32bit.
Installation Manager	com.ibm.cic.agent	• agent_core: Installation Manager core content. • agent_jre: Installation Manager Java Runtime Environment (JRE).
DB2 Express for Windows 32-bit	com.ibm.ws.DB2EXP.winia32	• n/a: DB2 must match the operating system and bitness.
DB2 Express for Windows 64-bit	com.ibm.ws.DB2EXP.winia64	• n/a: DB2 must match the operating system and bitness.

- *location* is the path to the directory where you want to install the products. If you want to install into an existing supported instance of WebSphere Application Server Network Deployment, specify its directory.

  Tip: Keep the installation path as short as possible. Otherwise, you might run into problems later when the paths of other components, when added to this path, exceed the 255-character path limit.
- *repository* is the path to the repository where you have extracted the files, one of the following directories:

  ```
  extract_directory/repository/repos_32bit
  extract_directory/repository/repos_64bit
  ```

  For more than one repository, separate the repository locations with commas.
- *key=value* is a list of the keys and values you want to pass to the installation, separated by commas. Do not put spaces between the commas. Create encrypted passwords using the IBM Installation Manager.

  Note: This table is applicable only when you install DB2 Express.

Table 65. Keys

Key	Description
user.db2.admin.username	User name with authority to access the DB2 database.

Table 65. Keys (continued)

Key	Description
user.db2.admin.password	Encrypted password for the user name with authority to access the DB2 database. Choose a password that complies with the password policy of your system (for example, Windows 2008).
user.db2.port	Port for the DB2 database. The default value is 50000.

- *logName* is the name of the log file to record messages and results.

  Running this command installs the product with the default features. If you want to install any specific features or make other changes, see the reference link for the command-line arguments for imcl.

Installation Manager installs the list of products and writes a log file to the directory that you specified. The log file is empty if there are no errors or warnings.

The following example installs IBM Business Process Manager Express, WebSphere Application Server Network Deployment, and DB2 Express on Windows.

```
imcl install com.ibm.bpm.EXP.v85,ExpressProcessCenter
com.ibm.websphere.ND.v85,core.feature,ejbdeploy,
thinclient,embeddablecontainer,samples,com.ibm.sdk.6_64bit
com.ibm.ws.DB2EXP10.winia64 -acceptLicense -installationDirectory C:/IBM/BPM85
-repositories D:/temp/BPM/repository
-properties user.db2.admin.username=bpmadmin,user.db2.admin.password=Vvrs88V/a9BUdxwodz0nUg==
-showVerboseProgress -log silentinstall.log
```

After you install IBM Business Process Manager, you must configure profiles and databases by using the **BPMConfig** command.

Related reference:

⯈ Command-line arguments for imcl

⯈ IBM Business Process Manager Express system requirements

Related information:

⯈ IBM WebSphere Application Server Information Center

Installing silently using a response file:

You can install IBM Business Process Manager Express silently by creating a response file and then running a command to use that response file to install the product.

If you do not have the prerequisite base products necessary for IBM Business Process Manager Express installation, you must install them as part of the silent installation. The required base products are:

- Installation Manager
- WebSphere Application Server Network Deployment, including the ejbdeploy and thinclient features.

If you are installing from images downloaded from Passport Advantage, ensure that you have downloaded all three required images for Windows, and extracted them to the same directory.

By using response files, you can simplify the silent installation and reduce error in the process because you set up your installation options once in a saved, sharable file that can be used on one or more machines. The installation software provides sample response files for each supported operating system and bit version. You can use an unmodified sample response file to perform a silent installation using

default settings, or you can modify the response file to set particular values. The comments in the sample response files provide detailed instructions and information about setting the values.

The silent installation performs the following tasks:

- Installs Installation Manager if it is not already installed or updates it to the appropriate level if it is installed.
- Installs the required base products and IBM Business Process Manager Express.

Only one IBM Installation Manager is required to install multiple instances of IBM Business Process Manager.

1. Run the following command to generate encrypted passwords using IBM Installation Manager to securely connect to DB2 and the administrative console.

   Important: If you are running Windows 7, Windows Vista, or Windows Server 2008, start your command prompt by right-clicking and selecting **Run as administrator**.

   `extract_directory/IM/tools/imutilsc -silent -nosplash encryptString password_to_encrypt`

   Note: If you are running on a 64-bit system and do not already have 32-bit Installation Manager installed, then you must run the command from the `extract_directory/IM64/tools` directory.

2. Create the response file that will install the required base products and IBM Business Process Manager Express. Copy a sample response file, suitable for your bit version and user access level, from the following directory:

   `extract_directory/responsefiles/BPM/`

   Alternatively, you can create a response file by recording your actions in Installation Manager. When you record a response file, the selections that you make in Installation Manager are stored in an XML file. When you run Installation Manager in silent mode, Installation Manager uses the data in the XML response file to perform the installation.

3. The default values provided in the sample response files will perform a basic install, but you should review the file and its comments, and modify the parameters as needed for your environment and the access level of your user ID.

   In particular, review the following parameters and values:

   - For non-Administrator user IDs, check that all location variables point to locations that the user has permissions for.
   - Repository location. If you are not running directly from the `extract_directory/responsefiles/BPM/` directory, point to the location of your installation repository. The repository can be local or remote. If you are running from the DVD, copy the response file from the DVD and point it back at the repository on the DVD.
   - Installation location (`installLocation`) where IBM Installation Manager is already installed or will be installed.
   - Installation location where IBM Business Process Manager Express will be installed. If you want to install into an existing supported instance of WebSphere Application Server Network Deployment, specify its directory.

     Tip: Keep the installation path as short as possible. Otherwise, you might run into problems later when the paths of other components, when added to this path, exceed the 255-character path limit.
   - Eclipse location (`eclipseLocation`). If you want to install into an existing supported instance of WebSphere Application Server Network Deployment, specify its Eclipse location directory.
   - The list of features for the product.
   - Production or non-production use.
   - If you are installing DB2 Express, follow the instructions in the response file for providing the necessary user IDs and passwords. Use the instructions in step 1 for generating the encrypted passwords to include.

4. Read and accept the license terms before installing. Adding **-acceptLicense** to the command line means that you accept all licenses.
5. Run the following command:

   Important: If you are running Windows 7, Windows Vista, or Windows Server 2008, start your command prompt by right-clicking and selecting **Run as administrator**.

   Administrator:

   ```
   extract_directory/IM/installc.exe -acceptLicense input
     extract_directory/responsefiles/BPM/response_file_name.xml
     -log preferred_log_location/silent_install.log
   ```

   Nonadministrator:

Installation Manager installs any required prerequisites and IBM Business Process Manager Express, and writes a log file to the directory you specified.

After you install IBM Business Process Manager, you must configure profiles and databases by using the **BPMConfig** command.

Related tasks:

➡ Working in silent mode

➡ Recording a response file with Installation Manager

Related reference:

➡ IBM Business Process Manager Express system requirements

Granting write permission of files and directories to nonadministrative users for profile creation or augmentation:

If you are not the user who installed the product, you must have write permission to selected directories within the IBM Business Process Manager installation. The product installer can grant this permission or create a group with permission to create or augment profiles.

The product installer (who can be an administrative or nonadministrative user) can grant write permission to the appropriate IBM Business Process Manager files and directories to nonadministrative users. The nonadministrative users can then create profiles. Alternatively, the product installer can create a group for users who are authorized to create profiles or give individual users the authority to create profiles.

Nonadministrative users create their own profiles to manage their own environments. Typically, they manage environments for development purposes.

Nonadministrative users must store their profiles in their private directory structure, not in the *installation_root*\profiles directory of the product.

Restrictions:
- IBM Business Process Manager does not support changing ownership of existing profiles from the product installer to nonadministrative users. A nonadministrative user cannot augment profiles owned by another user.
- Mechanisms within the Profile Management Tool that suggest unique names and port values are disabled for nonadministrative users. The nonadministrative user must change the default field values in the Profile Management Tool for the profile name, node name, cell name, and port assignments. The product installer can assign nonadministrative users a range of values for each of the fields, and assign responsibility to the users for adhering to their assigned value ranges and for maintaining the integrity of their own definitions.

If you already created at least one profile, certain directories and files were created. You can skip the steps in this topic that create these directories and files. If no profile was previously created, you must complete the steps to create the required directories and files.

The following example task shows how to create a group that is authorized to create profiles. The terms "installer" and "product installer" refer to the user ID that installed IBM Business Process Manager. The installer can perform the following steps to create the `profilers` group and give the group appropriate permissions to create a profile.

1. Log on to the IBM Business Process Manager system as the product installer. The product installer can be a administrative or nonadministrative user.
2. Using operating system commands, perform the following steps:
   a. Create a group named **profilers**, which will contain all users who can create profiles.
   b. Create a user named **user1**, who can create profiles.
   c. Add users **product_installer** and **user1** to the **profilers** group.
3. Log off and log back on as the installer to pick up the new group.
4. If no profile exists, create the following directories as the installer:
   - Create the *install_root***logs****manageprofiles** directory by following instructions in the Windows documentation. For this example procedure, the directory is:

     `install_root\logs\manageprofiles`

   - Create the *install_root***properties****fsdb** directory by following instructions in the Windows documentation. For this example procedure, the directory is:

     `install_root\properties\fsdb`

5. If no profile exists, create the `profileRegistry.xml` file as the installer. For this example, the file path is:

   `install_root\properties\profileRegistry.xml`

   Add the following information to the `profileRegistry.xml` file. The file must be encoded as UTF-8.

   ```
   <?xml version="1.0" encoding="UTF-8"?>
   <profiles/>
   ```

6. As the product installer, use operating system tools to change directory and file permissions. The following example assumes that the variable **$WASHOME** is the IBM Business Process Manager root installation directory **C:\Program Files\IBM\WebSphere\AppServer**. Follow instructions in the Windows documentation to give the **profilers** group read and write permission to the following directories and their files:

   ```
   @WASHOME\logs\manageprofiles
   @WASHOME\properties
   @WASHOME\properties\fsdb
   @WASHOME\properties\profileRegistry.xml
   ```

   You might have to change the permissions on additional files if the nonadministrative user encounters permission errors. For example, if the product installer authorizes a nonadministrative user to delete a profile, then the product installer might have to delete the following file:

   `install_root\properties\profileRegistry.xml_LOCK`

   Give write access to the nonadministrative user for the file to authorize the user to delete the file. If the nonadministrative user still cannot delete the profile, then the product installer can delete the profile.

The installer created the **profilers** group and gave the group the correct permissions to the directories and files required for a nonadministrative user to create profiles.

The nonadministrative user that belongs to the **profilers** group can create profiles in a directory that the nonadministrative user owns and to which the nonadministrative user has write permission. However, the nonadministrative user cannot create profiles in the installation root directory of the product.

The administrative user and the nonadministrative user can use the same tasks to manage profiles.

Configuring profiles and databases:

After you install the product, if you did not use typical installation, you must create or augment one or more profiles to define the runtime environment. Before starting a profile, you must have configured the databases that are to be used with the profile.

Configuring a stand-alone environment with a DB2 database server on Windows:

You can configure a stand-alone environment for a DB2 database server.

Creating DB2 databases:

You can create the required databases for IBM Business Process Manager V8.5 before you create profiles and configure your network deployment environment. Usually you require the Process database, the Performance Data Warehouse database, and the Common database. In the case of an Advanced-only deployment environment, you need only the Common database.

The Process Server and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

In an IBM Business Process Manager environment, the **createDatabase.sql** script is used to create the databases. It is available in the *BPM_HOME*\BPM\dbscripts\DB2\Create folder.

In the following example, replace *@DB_NAME@* with the name that you want to use for the created database and *@DB_USER@* with the user name that you want to use for the database.

1. If IBM Business Process Manager is installed on your machine, locate the SQL script **createDatabase.sql** to run. Otherwise, use the command line option.
2. Run the following sample script to create each database.

    BPM_HOME\BPM\dbscripts\DB2\Create\createDatabase.sql

    Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

    ```
    create database @DB_NAME@ automatic storage yes  using codeset UTF-8 territory US pagesize 32768;
    connect to @DB_NAME@;
    grant dbadm on database to user @DB_USER@;
    UPDATE DB CFG FOR @DB_NAME@ USING LOGFILSIZ 4096 DEFERRED;
    UPDATE DB CFG FOR @DB_NAME@ USING LOGSECOND 64 DEFERRED;
    connect reset;
    ```

    Note: If a command fails to execute from the DB2 command prompt, remove the semicolon (;) and rerun the command.

    If IBM Business Process Manager is not installed, run the following command from the command line:

    ```
    db2 -tvf createDatabase.sql
    ```

Creating the BPM database tables and configuring stand-alone profiles:

Use the **BPMConfig** command to create a stand-alone profile and to create database tables at the same time or to generate scripts for creating the database tables at a later time. Use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Creating database tables and profiles simultaneously using the BPMConfig command:

If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

To create a stand-alone profile and the database tables at the same time, complete the following steps:
1. Locate the appropriate sample properties file based on your environment in *BPM_home*\BPM\samples\ config\express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called Express-PC-Standalone-DB2.properties.
2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples. To have the database tables created at the same time as the profile is created, ensure that the setting for **bpm.de.deferSchemaCreation** is set to false.
3. Run the **BPMConfig** command, passing it the names of the properties file you created.

   BPM_home\bin\BPMConfig -create -de *my_environment.properties*

   The new stand-alone profile and the database tables are created using the settings provided your properties file.

Proceed to the Quick Start console and start the server for the stand-alone profile you created.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Creating database tables and profiles separately using the BPMConfig command:

If you want your databases to exist on a different computer from your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and to generate the scripts for creating your database tables at a later time.

Generating DB2 database scripts using the BPMConfig command:

You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Prepare the following information:
- Information about the database configuration that you are designing. This might be a document that describes the general purpose of the database configuration supplied by the database administrator or solution architect. Alternatively, it might be a description of required parameters and properties. This information must include:
  - The location of the databases.
  - The user ID and password for authenticating to the database.
- Information about how IBM Business Process Manager and its components have been installed, the database software used, and the properties required by that type of database.

- An understanding of the profiles that you plan to create, specifically, the functional relationship between the profile types and the databases.
- Information about the topology pattern to be implemented, and an understanding of how the database design fits into the pattern that you plan to use.

To generate the database SQL scripts that you can use to create your database tables, complete the following steps:

1. On the machine where you created the databases, locate the appropriate sample properties file *BPM_HOME*\BPM\samples\config.
2. Find the sample properties file that most closely represents your target deployment environment and make a copy of this file.

   For more information about the sample configuration files, refer to Configuration properties for the BPMConfig command.
3. Run the **BPMConfig** command with the parameter **-sqlfiles** and the name of the equivalent properties file you choose.
   - To generate the database scripts in the dbscripts directory of the deployment manager profile, use the following syntax:

     BPM_HOME\bin\BPMConfig -create -sqlfiles *my_environment.properties*

     Note: The SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. These scripts are deleted if you run the **BPMConfig** command again or configure the deployment environment using the Deployment Environment wizard.
   - To generate the database scripts in an output directory of your choice, use the following syntax:

     BPM_HOME\bin\BPMConfig -create -sqlfiles *my_environment.properties* -outputDir \MyBPMScriptDir

     Note: If you do not use the **-outputDir** parameter with the **BPMConfig** command, the profile is generated, if it does not exist, even before the database scripts are generated.

The database SQL scripts are generated in the *STAND-ALONE_PROFILE*\dbscripts folder by default. This folder includes the following sub-folders:

- *deployment_environment_name* - For each Deployment Environment, this folder will contain the SQL files that need to be executed.

These subdirectories also contain a **createDatabase.sql** script, which you can use to run the database scripts to create the DB2 database tables.

A default configuration for a **Standard** deployment environment with DB2 databases contains the following sub-folders and SQL scripts:

- *deployment_environment_name*
  - DB2
    - *CMNDB*
      - createSchema_Standard.sql
      - createSchema_Messaging.sql
    - *BPMDB*
      - createSchema_Standard.sql
      - createProcedure_Standard.sql
    - *PDWDB*
      - createSchema_Standard.sql

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

Running the generated DB2 database scripts:

If you run the BPMConfig command with the property *bpm.de.deferSchemaCreation* set to **true**, or if you used the Deployment Environment Wizard and cleared the Create Tables option, you must run the generated database scripts manually to create the database tables.

Before you begin this task, you must have run the **BPMConfig** command or the Deployment Environment Wizard to generate the correct SQL scripts.

If the property *bpm.de.deferSchemaCreation* is set to **false**, or if you used the Deployment Environment Wizard and did not clear the Create Tables option, the SQL scripts are run during configuration of the deployment environment.

The database SQL scripts are generated in the *profile_name*\dbscripts folder by default.

1. Locate the generated SQL scripts.

   A default configuration for a **Standard** deployment environment with DB2 databases contains the following sub-folders and SQL scripts:

   - *deployment_environment_name*
     - DB2
       - *CMNDB*
         - createSchema_Standard.sql
         - createSchema_Messaging.sql
       - *BPMDB*
         - createSchema_Standard.sql
         - createProcedure_Standard.sql
       - *PDWDB*
         - createSchema_Standard.sql

   Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

2. Run the scripts to apply the schema to the CMNDB.

   For example, use the following commands to run the scripts manually for a **deployment environment-level** Common database configuration:

   ```
   db2 connect to CMNDB USER username USING password
   db2 -tvf profiles\DmgrProfile\dbscripts\deployment_environment_name\DB2\CMNDB\createSchema_Standard.sql
   db2 -tvf profiles\DmgrProfile\dbscripts\deployment_environment_name\DB2\CMNDB\createSchema_Messaging.sql
   db2 connect reset
   ```

3. Run the scripts to apply the schema to the BPMDB.

   For example, use the following commands to run the scripts manually for Process database configuration:

   ```
   db2 -tvf profiles\DmgrProfile\dbscripts\deployment_environment_name\DB2\BPMDB\createDatabase.sql
   db2 connect to BPMDB USER username USING password
   db2 -tvf profiles\DmgrProfile\dbscripts\deployment_environment_name\DB2\BPMDB\createSchema_Standard.sql
   db2 -tdGO -vf profiles\DmgrProfile\dbscripts\deployment_environment_name\DB2\BPMDB\createProcedure_Standard.sql
   db2 connect reset
   ```

4. Run the **bootstrapProcessServerData** command to load configuration data for the IBM BPM applications into the Process database. This data is required for the applications to run correctly.

   For example:

   Use the following command to load bootstrap data onto a server that is part of an ND environment but not part of a cluster:

   ```
   bootstrapProcessServerData.bat -nodeName node1 -serverName myServer
   ```

Use the following command to load bootstrap data onto a cluster that hosts the Process Server or Process Center:

```
bootstrapProcessServerData.bat -clusterName myAppCluster
```

Additional information about running the **bootstrapProcessServerData** command is found in the topic "Loading the database with system information in a network deployment environment."

5. Run the scripts to apply the schema to the PDWDB.

For example, use the following commands to run the scripts manually for Performance Data Warehouse database configuration:

```
db2 connect to PDWDB USER username USING password
db2 -tvf profiles\DmgrProfile\dbscripts\deployment_environment_name\DB2\PDWDB\createSchema_Standard.sql
db2 connect reset
```

Related tasks:

"Generating DB2 database scripts using the BPMConfig command" on page 227
You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Creating stand-alone profiles with a DB2 database server using the BPMConfig command:

You can configure a stand-alone profile using the **BPMConfig** command.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

1. Locate the appropriate sample properties file based on your environment in *BPM_home*\BPM\samples\ config\express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called Express-PC-Standalone-DB2.properties.

2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples.

3. Run the **BPMConfig** command, passing it the names of the properties file you created.

```
BPM_home\bin\BPMConfig -create -profile my_environment.properties
```

The new stand-alone profile is created according to the settings provided in your properties file.

• Proceed to the Quick Start console and start the server for the stand-alone profile you created.
• To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Augmenting stand-alone profiles using the manageprofiles command-line utility:

You can use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Remember to shut down any servers associated with a profile you plan to augment.

Make sure that you are not already running the **manageprofiles** command-line utility on the same profile. If an error message is displayed when you run the command, determine if there is another profile creation or augmentation action in progress. If so, wait until it completes.

Restriction: To run the **manageprofiles** command on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges using the **runas** command. Remember to put double quotation marks around the **manageprofiles** command and all parameters. For example, the following command can be run from the *installation_root*\bin directory:

```
runas /env /user:MyAdminName "manageprofiles.bat"
```

Non-administrative users are prompted for the administrator password.

If you installed BPM in a Windows domain controller environment and installed DB2 Express as part of installation, profile creation will fail because you cannot use the domain user ID to create a new database and tables. Before creating a profile, use one of the following solutions:

- Log into the Windows system as a local system user to create a profile.
- Follow the steps listed in DB2 log file error: SQL1092N "USERID does not have the authority to perform the requested command or operation" before creating a profile.

1. Determine the template that was used to create the existing profile that you want to augment. You must augment a stand-alone profile.

   Restriction: You cannot augment a stand-alone profile where the default WebSphere VMM user registry has been changed, for example, to using LDAP.
   You can determine the template by viewing the profile registry in the *installation_root*\properties\ profileRegistry.xml file. Do not modify this file; use it only to view the templates.

2. Find the appropriate template to use for the augmentation.

   Templates for each profile are located in the *installation_root*\profileTemplates\BPM directory for BPM templates. For stand-alone profiles, use the BPM/BpmServer template. This template is available with IBM BPM Express only.

3. Use the augment parameter to make changes to an existing profile with an augmentation template. The augment parameter causes the **manageprofiles** command-line utility to update or augment the profile identified in the **-profileName** parameter using the template in the **-templatePath** parameter. The augmentation templates that you can use are determined by which IBM products and versions are installed in your environment. The file path for **-templatePath** need not be fully qualified; /profileTemplates is automatically added as a prefix.

   Note: Do not manually modify the files that are located in the *installation_dir*/profileTemplates/ BPM directory.

4. Run the file from the command line. Do not supply a **-profilePath** parameter. For example:

   ```
   manageprofiles.bat -augment -templatePath BPM/BpmServer
   -profileName MyProfileName
   -adminUsername celladmin -adminPassword celladmin
   ```

   The status is written to the console window when the command completes running.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Related tasks:
Creating database tables and profiles simultaneously using the BPMConfig command
If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

Configuring a stand-alone environment with an Oracle database server on Windows:

You can configure a stand-alone environment for an Oracle database server.

Creating users for Oracle databases:

You can create the users for Oracle databases before you create profiles and configure your network deployment environment. Create the cell-scoped user, the deployment environment-level user, the Process Server user, and the Performance Data Warehouse user. Note: The Process Server user and the Performance Data Warehouse user are not needed for an Advanced-only deployment environment.

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

You can use a single instance of Oracle for configuring BPM. The Oracle instance must exist and be available for access. Consult the Oracle documentation to create an Oracle instance. If you use a single Oracle instance, make sure that you use different user IDs for the three different BPM databases.

If IBM Business Process Manager is installed, the *BPM_HOME*\BPM\dbscripts\Oracle\Create folder contains the **createUser.sql** script that is used to create the users for Oracle databases.

In the following examples, replace *@DB_USER@* with the user name that you want to use for the database and replace *@DB_PASSWD@* with the password for that user.

Run the following sample script to create the database users.
BPM_HOME\BPM\dbscripts\Oracle\Create\createUser.sql
Optionally, or if IBM Business Process Manager is not installed, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

```
CREATE USER @DB_USER@ IDENTIFIED BY @DB_PASSWD@;
grant connect, resource, unlimited tablespace to @DB_USER@;
grant create view to @DB_USER@;
grant javauserpriv to @DB_USER@;
grant execute on dbms_lock to @DB_USER@;
```

Creating the BPM database tables and configuring stand-alone profiles:

Use the **BPMConfig** command to create a stand-alone profile and to create database tables at the same time or to generate scripts for creating the database tables at a later time. Use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Creating database tables and profiles simultaneously using the BPMConfig command:

If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

To create a stand-alone profile and the database tables at the same time, complete the following steps:
1. Locate the appropriate sample properties file based on your environment in *BPM_home*\BPM\samples\ config\express. For example, the sample configuration properties file for a Process Center environment using Oracle with IBM BPM Express is called Express-PC-Standalone-Oracle.properties.
2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples. To have the database tables created at the same time as the profile is created, ensure that the setting for **bpm.de.deferSchemaCreation** is set to false.
3. Run the **BPMConfig** command, passing it the names of the properties file you created.
   BPM_home\bin\BPMConfig -create -de *my_environment.properties*
   The new stand-alone profile and the database tables are created using the settings provided your properties file.

Proceed to the Quick Start console and start the server for the stand-alone profile you created.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Creating database tables and profiles separately using the BPMConfig command:

If you want your databases to exist on a different computer from your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and to generate the scripts for creating your database tables at a later time.

Generating Oracle database scripts using the BPMConfig command:

You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Prepare the following information:
- Information about the database configuration that you are designing. This might be a document that describes the general purpose of the database configuration supplied by the database administrator or solution architect. Alternatively, it might be a description of required parameters and properties. This information must include:
  - The location of the databases.
  - The user ID and password for authenticating to the database.
- Information about how IBM Business Process Manager and its components have been installed, the database software used, and the properties required by that type of database.
- An understanding of the profiles that you plan to create, specifically, the functional relationship between the profile types and the databases.
- Information about the topology pattern to be implemented, and an understanding of how the database design fits into the pattern that you plan to use.

Important: If you are using an Oracle database, you must include the database user name and password for all databases, including the optional ones.

To generate the database SQL scripts that you can use to create your database tables, complete the following steps:
1. On the machine where you created the databases, locate the appropriate sample properties file *BPM_HOME*\BPM\samples\config.
2. Find the sample properties file that most closely represents your target deployment environment and make a copy of this file.

   For more information about the sample configuration files, refer to Configuration properties for the BPMConfig command.
3. Run the **BPMConfig** command with the parameter **-sqlfiles** and the name of the equivalent properties file you choose.
   - To generate the database scripts in the dbscripts directory of the deployment manager profile, use the following syntax:

     BPM_HOME\bin\BPMConfig -create -sqlfiles *my_environment.properties*

     Note: The SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. These scripts are deleted if you run the **BPMConfig** command again or configure the deployment environment using the Deployment Environment wizard.
   - To generate the database scripts in an output directory of your choice, use the following syntax:

     BPM_HOME\bin\BPMConfig -create -sqlfiles *my_environment.properties* -outputDir \MyBPMScriptDir

Note: If you do not use the **-outputDir** parameter with the **BPMConfig** command, the profile is generated, if it does not exist, even before the database scripts are generated.

The database SQL scripts are generated in the *STAND-ALONE_PROFILE*\dbscripts folder by default. This folder includes the following sub-folders:

- *deployment_environment_name* - For each Deployment Environment, this folder will contain the SQL files that need to be executed.

These subdirectories also contain a **createDatabase.sql** script, which you can use to run the database scripts to create the Oracle database tables.

A default configuration for a **Standard** deployment environment with Oracle databases contains the following sub-folders and SQL scripts:

- *deployment_environment_name*
  - Oracle
    - *orcl*
      - *cmnuser*
        - createSchema_Standard.sql
        - createSchema_Messaging.sql
      - *psuser*
        - createSchema_Standard.sql
        - createProcedure_Standard.sql
      - *pdwuser*
        - createSchema_Standard.sql

In the above example, **orcl** is the Oracle instance, **cmnuser** is the **deployment environment-level** user, **psuser** is the Process Server user, and **pdwuser** is the Performance Data Warehouse user.

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

Running the generated Oracle database scripts:

If you run the BPMConfig command with the property *bpm.de.deferSchemaCreation* set to **true**, or if you used the Deployment Environment Wizard and cleared the Create Tables option, you must run the generated database scripts manually to create the database tables.

Before you begin this task, you must have run the **BPMConfig** command or the Deployment Environment Wizard to generate the correct SQL scripts.

If the property *bpm.de.deferSchemaCreation* is set to **false**, or if you used the Deployment Environment Wizard and did not clear the Create Tables option, the SQL scripts are run during configuration of the deployment environment.

The database SQL scripts are generated in the *profile_name*\dbscripts folder by default.

1. Locate the generated SQL scripts.

   A default configuration for a **Standard** deployment environment with Oracle databases contains the following sub-folders and SQL scripts:

   - *deployment_environment_name*
     - Oracle
       - *orcl*
         - *cmnuser*

- – `createSchema_Standard.sql`
- – `createSchema_Messaging.sql`
- *psuser*
  - – `createSchema_Standard.sql`
  - – `createProcedure_Standard.sql`
- *pdwuser*
  - – `createSchema_Standard.sql`

In the above example, **orcl** is the Oracle instance, **cmnuser** is the **deployment environment-level** user, **psuser** is the Process Server user, and **pdwuser** is the Performance Data Warehouse user.

> **Note:** The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

2. Run the scripts to apply the schema to the CMNDB.

   For example, use the following commands to run the scripts manually for a **deployment environment-level** Common database configuration:

   `sqlplus cmnuser/cmnpassword@orcl @BPM_HOME\profiles\DmgrProfile\dbscripts\deployment_environment_name\Oracle\orcl\cmn`

   `sqlplus cmnuser/cmnpassword@orcl @BPM_HOME\profiles\DmgrProfile\dbscripts\deployment_environment_name\Oracle\orcl\cmn`

3. Run the scripts to apply the schema to the BPMDB.

   For example, use the following commands to run the scripts manually for the Process database configuration:

   `sqlplus psuser/pspassword@orcl @BPM_HOME\profiles\DmgrProfile\dbscripts\deployment_environment_name\Oracle\orcl\psuse`

   `sqlplus psuser/pspassword@orcl @BPM_HOME\profiles\DmgrProfile\dbscripts\deployment_environment_name\Oracle\orcl\psuse`

4. Run the **bootstrapProcessServerData** command to load configuration data for the IBM BPM applications into the Process database. This data is required for the applications to run correctly.

   For example:

   Use the following command to load bootstrap data onto a server that is part of an ND environment but not part of a cluster:

   `bootstrapProcessServerData.bat -nodeName node1 -serverName myServer`

   Use the following command to load bootstrap data onto a cluster that hosts the Process Server or Process Center:

   `bootstrapProcessServerData.bat -clusterName myAppCluster`

   Additional information about running the **bootstrapProcessServerData** command is found in the topic "Loading the database with system information in a network deployment environment."

5. Run the scripts to apply the schema to the PDWDB.

   For example, use the following commands to run the scripts manually for the Performance Data Warehouse database configuration:

   `sqlplus pdwuser/pdwpassword@orcl @BPM_HOME\profiles\DmgrProfile\dbscripts\deployment_environment_name\Oracle\orcl\pdw`

Related tasks:

"Generating Oracle database scripts using the BPMConfig command" on page 233
You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Creating stand-alone profiles with an Oracle database server using the BPMConfig command:

You can configure a stand-alone profile using the **BPMConfig** command.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

1. Locate the appropriate sample properties file based on your environment in *BPM_home*\BPM\samples\ config\express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called `Express-PC-Standalone-DB2.properties`.

2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples.

3. Run the **BPMConfig** command, passing it the names of the properties file you created.

   BPM_home\bin\BPMConfig -create -profile *my_environment.properties*

   The new stand-alone profile is created according to the settings provided in your properties file.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Augmenting stand-alone profiles using the manageprofiles command-line utility:

You can use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Remember to shut down any servers associated with a profile you plan to augment.

Make sure that you are not already running the **manageprofiles** command-line utility on the same profile. If an error message is displayed when you run the command, determine if there is another profile creation or augmentation action in progress. If so, wait until it completes.

Restriction: To run the **manageprofiles** command on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges using the **runas** command. Remember to put double quotation marks around the **manageprofiles** command and all parameters. For example, the following command can be run from the *installation_root*\bin directory:

```
runas /env /user:MyAdminName "manageprofiles.bat"
```

Non-administrative users are prompted for the administrator password.

1. Determine the template that was used to create the existing profile that you want to augment. You must augment a stand-alone profile.

   Restriction: You cannot augment a stand-alone profile where the default WebSphere VMM user registry has been changed, for example, to using LDAP.
   You can determine the template by viewing the profile registry in the *installation_root*\properties\ profileRegistry.xml file. Do not modify this file; use it only to view the templates.

2. Find the appropriate template to use for the augmentation.

   Templates for each profile are located in the *installation_root*\profileTemplates\BPM directory for BPM templates. For stand-alone profiles, use the BPM/BpmServer template. This template is available with IBM BPM Express only.

3. Use the augment parameter to make changes to an existing profile with an augmentation template. The augment parameter causes the **manageprofiles** command-line utility to update or augment the profile identified in the **-profileName** parameter using the template in the **-templatePath** parameter. The augmentation templates that you can use are determined by which IBM products and versions are installed in your environment. The file path for **-templatePath** need not be fully qualified; /profileTemplates is automatically added as a prefix.

   Note: Do not manually modify the files that are located in the *installation_dir*/profileTemplates/ BPM directory.

4. Run the file from the command line. Do not supply a **-profilePath** parameter. For example:

```
manageprofiles.bat -augment -templatePath BPM/BpmServer
-profileName MyProfileName
-adminUsername celladmin -adminPassword celladmin
```

The status is written to the console window when the command completes running.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Related tasks:

Creating database tables and profiles simultaneously using the BPMConfig command
If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

Configuring a stand-alone environment with an SQL Server database server on Windows:

You can configure a stand-alone environment for a Microsoft SQL Server database server.

Creating and configuring SQL Server databases before stand-alone profile creation:

You or your database administrator can create the databases before creating or augmenting stand-alone profiles.

Configuring XA transactions:

You must configure XA transactions after the Microsoft SQL Server database is installed and before you start the server. The SQL Server JDBC driver provides support for Java Platform, Enterprise Edition/JDBC 2.0 optional distributed transactions. JDBC connections obtained from the **SQLServerXADataSource** class can participate in standard distributed transaction processing environments such as Java Platform, Enterprise Edition (Java EE) application servers.

Failure to configure the XA transactions can result in the following error when the server starts:**javax.transaction.xa.XAException: com.microsoft.sqlserver.jdbc.SQLServerException: Failed to create the XA control connection. Error: "Could not find stored procedure 'master..xp_sqljdbc_xa_init_ex'."**..

The MS DTC service should be marked Automatic in Service Manager to make sure that it is running when the SQL Server service is started.

1. To enable MS DTC for XA transactions, you must follow these steps:

   On Windows XP and Windows Server 2003:

   a. Select **Control Panel** > **Administrative Tools** > **Component Services**.

   b. Select **Component Services** > **Computers** and right-click **My Computer**, and select **Properties**.

   c. Click the **MSDTC** tab, and then click **Security Configuration**.

   d. Select the **Enable XA Transactions** check box, and then click **OK**. This will cause a MS DTC service restart.

   e. Click **OK** again to close the **Properties** window, and then close **Component Services**.

   f. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

   On Windows Vista, Windows 7, and Windows Server 2008 R2:

   a. Select **Control Panel** > **Administrative Tools** > **Component Services**.

   b. Select **Component Services** > **Computers** > **My Computer** > **Distributed Transaction Coordinator**.

   c. Right-click **Local DTC** and then select **Properties**.

   d. Click the **Security** tab on the **Local DTC Properties** window.

   e. Select the **Enable XA Transactions** check box, and click **OK**. This will restart the MS DTC service.

f. Click **OK** again to close the Properties window, and then close Component Services.

   g. Restart SQL Server to ensure that it syncs up with the MS DTC changes.

2. Configure the JDBC Distributed Transaction Components:

   a. If you haven't installed IBM Business Process Manager, download "Microsoft SQL Server JDBC Drive 3.0" driver from the Microsoft Site using the URL from Resources section and extract it to any folder.

   b. If BPM is already installed, go to *bpm_install_root*\jdbcdrivers\SQLServer\xa to obtain the files you require in the following steps:

      • Copy the `sqljdbc_xa.dll` file from the `JDBC unarchived` directory to the `Binn` directory (for a default SQL Server install, the location is `C:\Program Files\Microsoft SQL Server\ MSSQL10_50.MSSQLSERVER\MSSQL\Binn`) of SQL Server computer. If you are using XA transactions with a 32-bit SQL Server, use the `sqljdbc_xa.dll` file in the x86 folder, even if the SQL Server is installed on a x64 processor. If you are using XA transactions with a 64-bit SQL Server on the x64 processor, use the `sqljdbc_xa.dll` file in the x64 folder.

      • Run the `xa_install.sql` database script on SQL Server. For example; from the command prompt, run **sqlcmd -i xa_install.sql**. This script installs the extended stored procedures that are called by `sqljdbc_xa.dll`. These extended stored procedures implement distributed transaction and XA support for the Microsoft SQL Server JDBC Driver. You will need to run this script as an administrator of the SQL Server instance. You can ignore errors about unable to drop procedures that don't exist.

      • Open the SQL Server Management Studio to locate the security folder under the **master** database. To grant permissions to a specific user to participate in distributed transactions with the JDBC driver, add the user to the **SqlJDBCXAUser** role in the master database (for example, for a Lombardi user add master database in User mappings and check **SqlJDBCXAUser** role).

3. Follow these steps for configuring Windows authentication:

   • Locate **sqljdbc_auth.dll**. If you haven't installed IBM Business Process Manager, go to the *BPM_install_root*\jdbcdrivers\SQLServer\auth to obtain the file. If you haven't installed BPM, locate the dll file in the Microsoft JDBC driver package that you downloaded.

   • Copy the `sqljdbc_auth.dll` file to the `Binn` directory (for a default SQL Server install, the location is `C:/Program Files/Microsoft SQL Server/MSSQL10_50.MSSQLSERVER/MSSQL/Binn`) of SQL Server computer. If your JRE is 32-bit , use the **sqljdbc_auth.dll** file in the x86 folder, even if the SQL Server is installed on a x64 processor. If your JRE 64-bit, use the **sqljdbc_auth.dll** file in the x64 folder.

After you configure the XA transactions and before you start the server, you must configure your TCP/IP connectivity using the below steps:

1. From Start menu, click **Microsoft SQl Server 2008 R2** > **Configuration Tools** > **SQL Server Configuration Manager**.

2. Expand **SQl Server network Configuration** > **Protocols for SQL2008**

3. Locate **TCP/IP** on the right-hand side.

4. Double click **TCP/IP** and enable it under the **Protocol** tab.

5. Click the **IP Addresses** tab to enable the TCP port for each configured IP address.

Creating SQL Server databases:

IBM Business Process Manager requires a Process database, Performance Data Warehouse database, and Common database. The Common database contains Business Space and other components. You must create the databases before network deployment.

• You cannot share databases across multiple installations or Deployment Environments

• The Process and Performance Data Warehouse require their own separate databases and cannot be configured on the same database as the other BPM components.

- Process and Performance Data Warehouse components require the databases to be case-insensitive for SQL Server
- CommonDB (and legacy WPS) components require the databases to be case-sensitive for SQL Server
- The schema name used for each component should match the user

The default database names are BPMDB for the Process database, PDWDB for the Performance Data Warehouse database, and CMNDB for the Common database.

If IBM Business Process Manager is installed on your machine, the **createDatabase_CaseInsensitive.sql** and **createDatabase_CaseSensitive.sql** scripts are available in the *BPM_HOME*\BPM\dbscripts\SQLServer\ Create folder.

In the following examples, replace *@DB_NAME@* with the name that you want to use for the created database
1. If IBM Business Process Manager is installed on your machine, locate the SQL scripts to run. Otherwise, use the command line option.
2. Run the scripts to create the BPMDB and PDWDB databases. Run the following sample script:

    `BPM_HOME\BPM\dbscripts\SQLServer\Create\createDatabase_CaseInsensitive.sql`

    Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

    `CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS;`

    If IBM Business Process Manager is not installed, run the following command from the command line:

    `sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CI_AS"`
3. Run the script to create the CommonDB database. Run the following sample script:

    `BPM_HOME\BPM\dbscripts\SQLServer\Create\createDatabase_CaseSensitive.sql`

    Optionally, you can copy the contents of the above SQL file in a command editor and run the commands as follows:

    `CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS;`

    If IBM Business Process Manager is not installed, run the following command from the command line:

    `sqlcmd -Q "CREATE DATABASE @DB_NAME@ COLLATE SQL_Latin1_General_CP1_CS_AS"`

    Note: The letter *CI* in the **COLLATE** attribute value is applicable for the case-insensitive databases and *CS* is applicable for case-sensitive databases.

Creating users and schemas for SQL Server databases:

You must create the users and schemas after creating the SQL Server databases.

Assign the IBM Business Process Manager database user to the following three roles:

Note: The database must be created by the database administrator who can then assign these roles to the database user for IBM Business Process Manager.
- db_ddladmin
- db_datawriter
- db_datareader

For information about the permissions that are provided by these roles, see documentation from Microsoft.

Important: In Microsoft SQL server, the default schema name associated with a user must be the same as the user name. For example, if the user name for the Performance Data Warehouse database is *dbuser* then the default schema name associated with the user *dbuser* must also be named *dbuser*. You must

create an ordinary database user and assign the required rights to the user instead of using a super user, such as *sa*. This is because the default schema for the super user is dbo and this cannot be changed.

You can complete the following steps if existing tables are not associated with a schema that is the same as the user name.

1. In SQL Server Management Studio Object Explorer, right-click the table name and then click **Design**.
2. From the Design view, press F4 to view the Properties window.
3. From the Properties window, update the schema name.
4. Right-click the tab and select **Close** to close the Design view.
5. Click **OK** when prompted to save. The selected table is transferred to the schema.
6. Repeat the previous steps for all the tables in the Performance Data Warehouse database.

When using Windows authentication, you must ensure that the domain account is added to the SQL Sever login. You must login as the SQL Server administrator and follow the below steps to create users and schemas for Windows authentication.

1. Create the SQL Server login account for your Windows machine using the login information for the machine. For example, if **user1** is the user name and **password** is password for your Windows machine, use the following command syntax:

```
USE [master]
GO
CREATE LOGIN [user1\password] FROM WINDOWS WITH DEFAULT_DATABASE=[master]
GO
```

Note: The SQL Server login that is created must not have SYSADMIN privileges. If the login user has SYSADMIN privileges, the specified schema value is ignored for database connections by SQL Server since the **sysadmin** user's default schema is always *dbo*.

2. Update the master database to grant permission for XA transactions for the Windows user. Use the following command syntax:

```
USE [master];
CREATE USER [sqluser] FOR LOGIN [user1\password];
USE [master];
EXEC sp_addrolemember N'SqlJDBCXAUser', N'sqluser';
```

3. For each database that you create, you must set the default schema for the SQL Server login. Use the following command syntax for the BPMDB (Process Server) database:

```
CREATE DATABASE BPMDB COLLATE SQL_Latin1_General_CP1_CI_AS
GO
USE [BPMDB]
GO
CREATE USER [sqluser] FOR LOGIN [user1\password] WITH DEFAULT_SCHEMA=[BPMPS00]
GO
CREATE SCHEMA [BPMPS00] AUTHORIZATION [sqluser]
GO
EXEC sp_addrolemember 'db_ddladmin', 'sqluser';
EXEC sp_addrolemember 'db_datareader', 'sqluser';
EXEC sp_addrolemember 'db_datawriter', 'sqluser';
```

Note:

- The BPMDB and PDWDB databases must be created as case-insensitive. Use the command **COLLATE SQL_Latin1_General_CP1_CI_AS**, where **CI** is the **COLLATE** attribute value that is applicable for the case-insensitive databases.
- The CommonDB database must be created as case-sensitive. Use the command **COLLATE SQL_Latin1_General_CP1_CS_AS**, where **CS** is the **COLLATE** attribute value that is applicable for the case-sensitive databases.

When you create database schemas the using the generated scripts, your user ID must have the authority to create tables. When the tables are created, you must have the authority to select, insert, update, and delete information in the tables.

The following table describes the database privileges that are needed to access the data stores.

Table 66. Database privileges

Minimum privileges that are required to create objects in the database	Minimum privileges that are required to access objects in the database
The user ID ideally requires DB OWNER privileges on the data stores used for IBM Business Process Manager.	Configure the SQL Server for SQL Server and Windows authentication so that authentication to be based on an SQL server login ID and password. The user ID must be the owner of the tables, or a member of a group that has sufficient authority to issue TRUNCATE TABLE statements. See the **Detailed SQL Server database privileges** table at SQL Server database privileges.

Creating the BPM database tables and configuring stand-alone profiles:

Use the **BPMConfig** command to create a stand-alone profile and to create database tables at the same time or to generate scripts for creating the database tables at a later time. Use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Creating database tables and profiles simultaneously using the BPMConfig command:

If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

To create a stand-alone profile and the database tables at the same time, complete the following steps:
1. Locate the appropriate sample properties file based on your environment in *BPM_home*\BPM\samples\config\express. For example, the sample configuration properties file for a Process Center environment using SQL Server with IBM BPM Express is called `Express-PC-Standalone-SQLServer.properties`.
2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples. To have the database tables created at the same time as the profile is created, ensure that the setting for **bpm.de.deferSchemaCreation** is set to `false`.
3. Run the **BPMConfig** command, passing it the names of the properties file you created.

   BPM_home\bin\BPMConfig -create -de *my_environment.properties*

   The new stand-alone profile and the database tables are created using the settings provided your properties file.

Proceed to the Quick Start console and start the server for the stand-alone profile you created.

To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications.

Creating database tables and profiles separately using the BPMConfig command:

If you want your databases to exist on a different computer from your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and to generate the scripts for creating your database tables at a later time.

Generating SQL database scripts using the BPMConfig command:

You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Prepare the following information:
- Information about the database configuration that you are designing. This might be a document that describes the general purpose of the database configuration supplied by the database administrator or solution architect. Alternatively, it might be a description of required parameters and properties. This information must include:
  - The location of the databases.
  - The user ID and password for authenticating to the database.
- Information about how IBM Business Process Manager and its components have been installed, the database software used, and the properties required by that type of database.
- An understanding of the profiles that you plan to create, specifically, the functional relationship between the profile types and the databases.
- Information about the topology pattern to be implemented, and an understanding of how the database design fits into the pattern that you plan to use.

To generate the database SQL scripts that you can use to create your database tables, complete the following steps:
1. On the machine where you created the databases, locate the appropriate sample properties file `BPM_HOME`\BPM\samples\config.
2. Find the sample properties file that most closely represents your target deployment environment and make a copy of this file.

   For more information about the sample configuration files, refer to Configuration properties for the BPMConfig command.
3. Run the **BPMConfig** command with the parameter **-sqlfiles** and the name of the equivalent properties file you choose.
   - To generate the database scripts in the dbscripts directory of the deployment manager profile, use the following syntax:

     `BPM_HOME`\bin\BPMConfig -create -sqlfiles *my_environment.properties*

     Note: The SQL scripts are generated in the *STAND-ALONE_PROFILE*/dbscripts folder by default. These scripts are deleted if you run the **BPMConfig** command again or configure the deployment environment using the Deployment Environment wizard.
   - To generate the database scripts in an output directory of your choice, use the following syntax:

     `BPM_HOME`\bin\BPMConfig -create -sqlfiles *my_environment.properties* -outputDir \MyBPMScriptDir

     Note: If you do not use the **-outputDir** parameter with the **BPMConfig** command, the profile is generated, if it does not exist, even before the database scripts are generated.

The database SQL scripts are generated in the *STAND-ALONE_PROFILE*\dbscripts folder by default. This folder includes the following sub-folders:

- *deployment_environment_name* - For each Deployment Environment, this folder will contain the SQL files that need to be executed.

These subdirectories also contain a `createDatabase.sql` script, which you can use to run the database scripts to create the SQL Server database tables.

A default configuration for sea **Standard** deployment environment with SQL Server databases contains the following sub-folders and SQL scripts:

- *deployment_environment_name*
  - SQLServer
    - *CMNDB*
      - *schema name*
        - `createSchema_Standard.sql`
        - `createSchema_Messaging.sql`
    - *BPMDB*
      - *schema name*
        - `createSchema_Standard.sql`
        - `createProcedure_Standard.sql`
    - *PDWDB*
      - *schema name*
        - `createSchema_Standard.sql`

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

Running the generated SQL Server database scripts:

If you run the BPMConfig command with the property *bpm.de.deferSchemaCreation* set to **true**, or if you used the Deployment Environment Wizard and cleared the Create Tables option, you must run the generated database scripts manually to create the database tables.

Before you begin this task, you must have run the `BPMConfig` command or the Deployment Environment Wizard to generate the correct SQL scripts.

If the property *bpm.de.deferSchemaCreation* is set to **false**, or if you used the Deployment Environment Wizard and did not clear the Create Tables option, the SQL scripts are run during configuration of the deployment environment.

The database SQL scripts are generated in the `profile_name`\dbscripts folder by default.

1. Locate the generated SQL scripts.

   A default configuration for sea **Standard** deployment environment with SQL Server databases contains the following sub-folders and SQL scripts:

   - *deployment_environment_name*
     - SQLServer
       - *CMNDB*
         - *schema name*
           - `createSchema_Standard.sql`
           - `createSchema_Messaging.sql`
       - *BPMDB*
         - *schema name*

- – createSchema_Standard.sql
- – createProcedure_Standard.sql
  - *PDWDB*
    - • *schema name*
      - – createSchema_Standard.sql

Note: The *BPMDB* and *PDWDB* folders for Process Server and Performance Data Warehouse databases are not generated for an **Advanced-only** deployment environment.

2. Run the scripts to apply the schema to the CMNDB.

   For example, use the following commands to run the scripts manually for a **deployment environment-level** Common database configuration:

   ```
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d CMNDB -i profiles\DmgrProfile\dbscripts\deployment_environment_name\SQLServer\CMNI
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d CMNDB -i profiles\DmgrProfile\dbscripts\deployment_environment_name\SQLServer\CMNI
   ```

   In the above and following examples, **schema1** is the name of the schema used.

3. Run the scripts to apply the schema to the BPMDB.

   For example, use the following commands to run the scripts manually for the Process database configuration:

   ```
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d BPMDB -i profiles\DmgrProfile\dbscripts\deployment_environment_name\SQLServer\BPMI
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d BPMDB -i profiles\DmgrProfile\dbscripts\deployment_environment_name\SQLServer\BPMI
   ```

4. Run the **bootstrapProcessServerData** command to load configuration data for the IBM BPM applications into the Process database. This data is required for the applications to run correctly.

   For example:

   Use the following command to load bootstrap data onto a server that is part of an ND environment but not part of a cluster:

   ```
   bootstrapProcessServerData.bat -nodeName node1 -serverName myServer
   ```

   Use the following command to load bootstrap data onto a cluster that hosts the Process Server or Process Center:

   ```
   bootstrapProcessServerData.bat -clusterName myAppCluster
   ```

   Additional information about running the **bootstrapProcessServerData** command is found in the topic "Loading the database with system information in a network deployment environment."

5. Run the scripts to apply the schema to the PDWDB.

   For example, use the following commands to run the scripts manually for the Performance Data Warehouse database configuration:

   ```
   sqlcmd -U @DB_USER@ -P @DB_PASSWD@ -d PDWDB -i profiles\DmgrProfile\dbscripts\deployment_environment_name\SQLServer\PDWI
   ```

Related tasks:

You can use the **BPMConfig** command to generate the database scripts that are used to create your database tables. If you used the **BPMConfig** command or the network deployment environment wizard in the administrative console to create the deployment environment, the scripts were generated for you.

Creating stand-alone profiles with an SQL Server database server using the BPMConfig command:

You can configure a stand-alone profile using the **BPMConfig** command.

If you have an existing WebSphere Application Server profile that you want to augment, you must use the **manageprofiles** command-line utility instead.

1. Locate the appropriate sample properties file based on your environment in *BPM_home*\BPM\samples\ config\express. For example, the sample configuration properties file for a Process Center environment using DB2 with IBM BPM Express is called Express-PC-Standalone-DB2.properties.

2. Modify your version of the properties file so that the values correspond to your own configuration. When you save your file, ensure that it uses UTF-8 encoding. For information about the available properties, read the comments in the sample files, or see the **BPMConfig** command reference and the examples.

3. Run the **BPMConfig** command, passing it the names of the properties file you created.

   BPM_home\bin\BPMConfig -create -profile *my_environment.properties*

   The new stand-alone profile is created according to the settings provided in your properties file.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Augmenting stand-alone profiles using the manageprofiles command-line utility:

You can use the **manageprofiles** command-line utility to augment existing WebSphere Application Server stand-alone profiles.

Remember to shut down any servers associated with a profile you plan to augment.

Make sure that you are not already running the **manageprofiles** command-line utility on the same profile. If an error message is displayed when you run the command, determine if there is another profile creation or augmentation action in progress. If so, wait until it completes.

Restriction: To run the **manageprofiles** command on Windows 7, Windows Vista, or Windows Server 2008, you must elevate your Microsoft Windows user account privileges using the **runas** command. Remember to put double quotation marks around the **manageprofiles** command and all parameters. For example, the following command can be run from the *installation_root*\bin directory:

runas /env /user:MyAdminName **"manageprofiles.bat"**

Non-administrative users are prompted for the administrator password.

1. Determine the template that was used to create the existing profile that you want to augment. You must augment a stand-alone profile.

   Restriction: You cannot augment a stand-alone profile where the default WebSphere VMM user registry has been changed, for example, to using LDAP.
   You can determine the template by viewing the profile registry in the *installation_root*\properties\ profileRegistry.xml file. Do not modify this file; use it only to view the templates.

2. Find the appropriate template to use for the augmentation.

   Templates for each profile are located in the *installation_root*\profileTemplates\BPM directory for BPM templates. For stand-alone profiles, use the BPM/BpmServer template. This template is available with IBM BPM Express only.

3. Use the augment parameter to make changes to an existing profile with an augmentation template. The augment parameter causes the **manageprofiles** command-line utility to update or augment the profile identified in the **-profileName** parameter using the template in the **-templatePath** parameter. The augmentation templates that you can use are determined by which IBM products and versions are installed in your environment. The file path for **-templatePath** need not be fully qualified; /profileTemplates is automatically added as a prefix.

   Note: Do not manually modify the files that are located in the *installation_dir*/profileTemplates/ BPM directory.

4. Run the file from the command line. Do not supply a **-profilePath** parameter. For example:

   manageprofiles.bat -augment -templatePath BPM/BpmServer
   -profileName MyProfileName
   -adminUsername celladmin -adminPassword celladmin

The status is written to the console window when the command completes running.

- Proceed to the Quick Start console and start the server for the stand-alone profile you created.
- To learn about security for the environment and applications, see Securing IBM Business Process Manager and applications

Related tasks:

Creating database tables and profiles simultaneously using the BPMConfig command
If you are running your databases on the same computer as your deployment environment, you can use the **BPMConfig** command to create a stand-alone profile and the database tables simultaneously.

Modifying and extending an existing installation

After you install and configure the runtime environment on your system in IBM Business Process Manager, you might want to customize your configuration. For example, you might want to customize settings, set up an additional security provider, set up user accounts, and change and encrypt passwords.