FUJITSU Software
Interstage Business Process Manager Analytics V12.2.1

Installation Guide

Linux

About this Manual

This section explains summary, chapter overview, abbreviations, and provides useful information.

The contents in this section are as follows:

- Purpose

- Intended Audience

- Chapter Overview

- Typographical Conventions

- Reference Materials

- Abbreviations

- Export Regulations

- Trademarks

- Requests

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Purpose

This user guide explains how to install the Interstage Business Process Manager Analytics (BPMA).

Intended Audience

This manual is intended for System Administrators. It is assumed that the end user has a working knowledge of the following topics:

- Operating system administration

- Application server administration

- Database administration

Chapter Overview

Chapter	Title	Description
1	System Configuration	Describes the Analytics components for installation
2	System Requirements	Lists the system requirements for installing Analytics
3	Considerations for Installing Analytics	Lists the various considerations for installing Analytics
4	Installing and Setting Up Analytics Server	Explains how to install the Analytics Server and set up the application environment
5	Uninstalling Analytics	Explains how to uninstall Analytics
Appendix A	Required Resources	Lists the resources required for Analytics installation
Appendix B	Required Disk Size for Database	Provides details of the disk size required for the Analytics database
Appendix C	Customizing System Table Parameters	Explains how to customize parameters of the Analytics database
Appendix D	Automatically Generated Parameter Values	Covers the default values for tables generated by the Analytics Server

Typographical Conventions

The following conventions are used throughout this manual.

Example	Meaning
Command	User input that must be typed is identified by the Courier font
screen text	- GUI options to be selected by the end user are **bold** - GUI options that are emphasized are **bold**
Reference	Reference material or related documentation is specified in *italics*
Parameter	Command parameters are identified by the Courier font

Reference Materials

The following related documentation is also available.

Release Notes

Contains an overview of the Analytics software and late-breaking information that could not be included in the manuals

Overview

Describes the architecture and features of the Analytics software

Dashboard / Output Guide

Explains how to use the Analytics Dashboard

Administration Guide

Covers administration tools and tips, message references, and troubleshooting

Analytics Studio Guide

Explains how to use the Analytics Studio to configure parameters that enforce Analytics features

Management Console Guide

Explains how to use the Management Console and Management Commands to configure key parameters, such as how to start/stop the Analytics software service or how to display the software status

Process Discovery Guide

Explains how to use Process Discovery that generates process diagrams using historical data

Migration Guide

Explains how to migrate from previous version of the product

Handbook for the Process Discovery

Explains how to operate the Process Discovery briefly

Abbreviations

The following references for BPM Analytics are also available:

Name	Abbreviation
Microsoft(R) Windows Server(R) 2008 SP2 Enterprise Edition Microsoft(R) Windows Server(R) 2008 SP2 Standard Edition Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Standard	Windows Server 2008, Windows Server
Microsoft(R) Windows Server(R) 2012 Datacenter Microsoft(R) Windows Server(R) 2012 Standard Microsoft(R) Windows Server(R) 2012 R2 Datacenter Microsoft(R) Windows Server(R) 2012 R2 Standard	Windows Server 2012, Windows Server
Microsoft(R) Windows(R) XP SP3 Professional operating system Microsoft(R) Windows(R) XP SP3 Home Edition operating system	Windows XP, Windows

Name	Abbreviation
Microsoft(R) Windows Vista(R) SP2 Ultimate Microsoft(R) Windows Vista(R) SP2 Enterprise Microsoft(R) Windows Vista(R) SP2 Business	Windows Vista, Windows
Microsoft(R) Windows(R) 7 Ultimate Microsoft(R) Windows(R) 7 Professional Microsoft(R) Windows(R) 7 Home Premium	Windows 7, Windows
Microsoft(R) Windows(R) 8 Enterprise Microsoft(R) Windows(R) 8 Pro Microsoft(R) Windows(R) 8	Windows 8, Windows
Microsoft(R) Windows(R) 8.1 Enterprise Microsoft(R) Windows(R) 8.1 Pro Microsoft(R) Windows(R) 8.1	Windows 8.1, Windows
Microsoft(R) Internet Explorer 7.0 Microsoft(R) Internet Explorer 8.0 Microsoft(R) Internet Explorer 9.0 Microsoft(R) Internet Explorer 10.0 Microsoft(R) Internet Explorer 11.0	Internet Explorer
Adobe Flash Player V11.3	Flash Player
Red Hat Enterprise Linux 5 Red Hat Enterprise Linux 6 Red Hat Enterprise Linux 7	Linux
Android 4.0.4	Android
i-OS6	iOS
Interstage Application Server Enterprise Edition Interstage Application Server Standard-J Edition	Interstage Application Server
Oracle WebLogic Server 12c	WebLogic
WebSphere Application Server Network Deployment V8.5	WebSphere
RedHat JBOSS Enterprise Application Platform 5.1.1	JBoss Enterprise Application Platform 5.1, JBoss
RedHat JBOSS Enterprise Application Platform 6.1.1	JBoss Enterprise Application Platform 6.1, JBoss
Interstage Business Process Manager	Interstage BPM
Interstage Service Integrator	ISI
Oracle Database 10g R2 Enterprise Edition Oracle Database 10g R2 Standard Edition Oracle Database 10g R2 Standard Edition One	Oracle 10g, Oracle
Oracle Database 11g R2 Enterprise Edition Oracle Database 11g R2 Standard Edition Oracle Database 11g R2 Standard Edition One	Oracle 11g, Oracle
Oracle Database 12c R1 Enterprise Edition Oracle Database 12c R1 Standard Edition Oracle Database 12c R1 Standard Edition One	Oracle 12c, Oracle
Microsoft SQL Server 2005 Enterprise Edition Microsoft SQL Server 2005 Standard Edition	SQL Server 2005, SQL Server
Microsoft SQL Server 2008 Enterprise Edition Microsoft SQL Server 2008 Standard Edition	SQL Server 2008, SQL Server

Name	Abbreviation
Microsoft SQL Server 2012 Enterprise Edition Microsoft SQL Server 2012 Standard Edition	SQL Server 2012, SQL Server
Symfoware V11 Enterprise Edition Symfoware V11 Standard Edition Symfoware V12 Standard Edition	Symfoware Server, Symfoware
PostgreSQL 9.1	PostgreSQL

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Contents

Chapter 1   System Configuration

In this chapter, the system configuration of Interstage Business Process Manager Analytics (BPMA) is described as shown in the figure below.
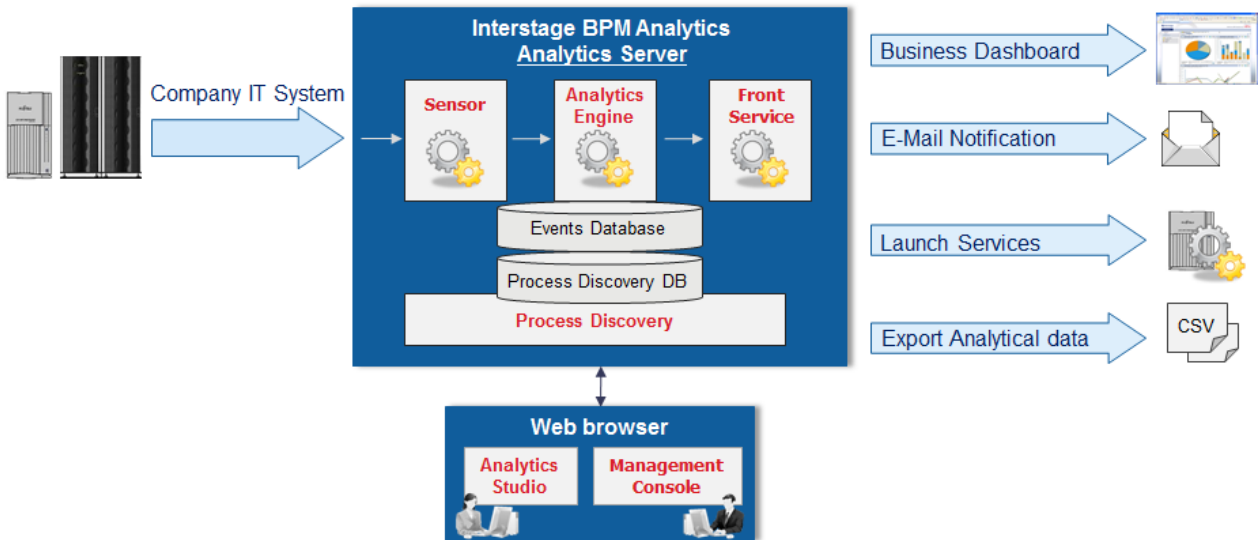
- - **Analytics Server**

    The Analytics Server is the key component of the Analytics software. It has all the required features, such as the sensors, Analytics Engine, Process Discovery, Front Service, Management Console, and Analytics Studio.

    An Application Server and RDB, necessary to run the Analytics Server, are also bundled with the Analytics software. However, there are certain considerations that restrict the use of this additional software, requiring you to procure it separately. Refer to "Chapter 3 Considerations for Installing Analytics" for details.

    In the following chapters, the bundled Application Server and RDB are called the built-in Application Server and the built-in database.

Analytics requires the Events database to manage the collected and analyzed data and Process Discovery database (optional). For the RDB types that can be used with Analytics, refer to the "Chapter 3 Considerations for Installing Analytics" or *Release Notes*.

Chapter 2 　 System Requirements

2.1 　 Hardware Requirements

System Specification

Operating System	Server Type
Microsoft Windows	Fujitsu PRIMERGY or other Intel architecture servers
Linux	Fujitsu PRIMERGY or other Intel Architecture servers

Memory

Minimum: 1 GB

Recommended: 2 GB or more

Hard Disk Drive

Recommended: 1 GB or more of free space

📑 Note

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On Windos, a free disk space (600MB) is required on temporary folder (Environment variable TEMP).

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📖 Information

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Refer to "Appendix A Required Resources" for more detailed information when installing. And, refer to "Appendix B Required Disk Size for Database" for the method to calculate the appropriate free space size during runtime.

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2.2 　 Software Requirements

For software requirements, refer to the *Release Notes*.

📑 Note

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On Red Hat Enterprise Linux 5 (Intel64), please ensure that the Compatibility Arch Support package group is installed.

On Red Hat Enterprise Linux 6 (Intel64), please ensure that the Compatibility Arch Support package group is installed.

On Red Hat Enterprise Linux 6/7 (Intel64), the following packages are required:

Package name	RPM file name (RHEL6)	RPM file name (RHEL7)
glibc.i686	glibc-2.12-1.7.el6.i686.rpm or later	glibc-2.17-55.el7.i686.rpm or later
libgcc.i686	libgcc-4.4.4-13.el6.i686.rpm or later	libgcc-4.8.2-16.el7.i686.rpm or later
libstdc++.i686	libstdc++-4.4.4-13.el6.i686.rpm or later	libstdc++-4.8.2-16.el7.i686.rpm or later
libXext.i686	libXext-1.1-3.el6.i686.rpm or later	libXext-1.3.2-2.1.el7.i686.rpm or later
libXtst.i686	libXtst-1.0.99.2-3.el6.i686.rpm or later	libXtst-1.2.2-2.1.el7.i686.rpm or later
redhat-lsb.x86_64	redhat-lsb-4.0-2.1.el6.x86_64.rpm or later	redhat-lsb-4.1-24.el7.x86_64.rpm or later
zlib.i686	zlib-1.2.3-25.el6.i686.rpm or later	zlib-1.2.7-13.el7.i686.rpm or later

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Chapter 3   Considerations for Installing Analytics

This chapter lists the considerations for installing the Interstage Business Process Manager Analytics (BPMA) components.

Analytics Server

An Application Server and RDB, necessary to run the Analytics Server, are bundled with the Analytics software. However, there are certain considerations that restrict the use of this additional software, requiring you to procure it separately. Refer to the following scenarios for the installation considerations.

- About Application Server

    - Except built-in application server

        Confirm if the Application Server is running normally.

    - When using the built-in application server

        Confirm if the port number (default is 40330) of built-in application server is free.

- When integrating with the Interstage BPM

    - Application Server

        Built-in Application Server cannot be used

        Use the same type of Application Server as used in the Interstage BPM environment

    - Configuration

        Integration with the Interstage BPM V11.2A or later is supported

- When using Process Discovery

    - Application Server

        If you need to use a functionality of saving as XPDL with Process Analyzer, Analytics Server should be configured on one of following application server lists:

        - Built-in Application server

        - Interstage JavaEE

        - WebLogic Server 12c

        - WebSphere Application Server Network Deployment 8.5

        - JBoss Enterprise Application Platform 6.1

        Otherwise, any supported application servers are available for this feature.

    - Configuration (In case of Windows)

        Installation of Microsoft .NET Framework 3.5 or later is required. You need to acquire it using Windows Update etc.

- When using an Interstage Application Server

    - Configuration

        Analytics Server cannot be installed on an Interstage Application Server configured as a Management Server (for managing multiple servers)

Linux Kernel Configuration

If using the built-in database on Linux, it's necessary to keep required kernel resources. Please modify parameters by editing /etc/sysctl.conf. And then please execute "sysctl -p /etc/sysctl.conf" command, or reboot Linux system.

- Shared memory resources

    - kernel.shmmax

        Set over 2684354560.

- kernel.shmall

  Add 65536 to the existing value.

- kernel.shmmni   - 4 -

  Add 1 to the existing value.

- Semaphore resources

  - kernel.sem

    Set para1, para2, para3 and para4 as follows:

  - para1

    Set over 17.

  - para2

    Add 2142 to the exiting value.

  - para3

    Keep the existing value or the OS default value.

  - para4

    Add 126 to the existing value.

Chapter 4   Installing and Setting Up Analytics Server

This chapter explains how to install and setup the Interstage Business Process Manager Analytics (BPMA) Server.

4.1 Installation Parameters

The following table lists the parameters that apply to the installation process.

Parameter	Description
Installation directory	Specify the Analytics Server installation directory The defaults are the following values: On Windows: c:/Program Files (x86)/Fujitsu/BPM-A On Linux: /opt/FJSVibpma (fixed value)
Workspace directory	Specify the workspace directory for the Analytics Server; specify the directory after ensuring that the drive has sufficient space The defaults are the following values: On Windows: c:/ProgramData/Fujitsu/BPM-A On Linux: /var/opt/FJSVibpma (fixed value)
Application Server type	Select the type of application server to be used; select the type that suits the system configuration
Administrator ID and password	Specify the Administrator ID and password for using the Analytics Management Console. Default Administrator ID is **bpmadmin**. The password is required.
Use a Built-in database	Select this if you want to use a built-in database.
Directory for a Built-in database	Specify the directory that contains the built-in database; if you are not using a built-in database, you need not configure this option. The defaults are the following values: On Windows: `c:/ProgramData/Fujitsu/BPM-A/eventdb` On Linux: `/var/opt/FJSVibpma/eventdb`
Port number for a Built-in database	Specify the port number of the built-in database; if you are not using a built-in database, you need not configure this option.
FQDN or IP address of Application Server	FQDN or IP address is automatically set if a built-in application server or the Interstage Application Server is being used If installing on another application server, specify the correct FQDN or IP address parameter for that server
Port number	Is automatically set if a built-in application server or the Interstage Application Server is being used If installing on another application server, specify the correct port number of that server

4.2 Installing Analytics

The installation procedure depends on the operating system. Refer to the following instructions for your operating system to install the Analytics Server.

4.2.1   Installation for Windows

The following procedure explains how to install the Analytics Server on a Microsoft Windows system.

1. Log in, with Administrator privileges, to the server where the Analytics Server is to be installed.

2. Insert the installation CD for Analytics into the CD-ROM drive.

3. If the installation does not begin automatically, double-click **autorun.exe** in the root directory of the installation CD-ROM. Doing this launches the installation wizard.

4. Click **Install** to begin installation.

5. On the Installation type selection screen, select **Install Server components** and click **Next**.

6. Follow the onscreen instructions to complete the installation.

4.2.2   Installation for Linux

The following procedure explains how to install the Analytics Server on a Linux system.

1. Log in to the server as root.

2. Insert the installation CD for Analytics into the CD-ROM drive.

3. Ensure that it is mounted on the following directory and change the directory to:

   # cd /media/ANALYTICS/

4. Execute installation script:

   # /bin/sh install.sh

5. Follow the onscreen instructions to complete the installation.

4.3   Post-Installation Tasks

There are certain post-installation tasks to be performed for each application server to be used and also for any security measures to be taken.

This section describes the tasks to be performed after installing Analytics.

4.3.1   When Using a Built-in Application Server

Deployment to the Application Server

The Analytics Server is automatically deployed so no further work is required.

Changing firewall setting

Before accessing to Analytics server from client machines, please confirm the firewall setting of operating system. If the port number (default value is 40330) of Analytics server is not allowed when installing, please allow the port number to access by changing firewall setting.

4.3.2   When Using an Interstage Application Server (J2EE)

Deployment to the Application Server

The Analytics Server is automatically deployed so no further work is required.

Changing access permissions to the installation folder for Interstage Application Server

It is recommended the access permission to be changed so that unauthorized users cannot access the Interstage Application Server installation folder. Refer to the *Interstage Application Server Security System Operator's Guide*, "*Common Measures*" for details.

The Interstage Application Server issetfoldersecurity command can be used to change the access permissions. Refer to *Interstage Application Server Reference Manual (Commands)*," *issetfoldersecurity*" for details.

Changing the Interstage J2EE setting

Procedure for changing the Interstage J2EE setting

1. Login to the Interstage J2EE Management Console.

   Click **Interstege Application Server > System > WorkUnit > IBPMMServer > Status** on the Interstage Management Console and **Stop** button onto relevant screen.

2. Click **Settings** tab, and show **Servlet Container Settings**.

   Set "UTF-8" to text field of **Request URI encoding**.

3. Click **Update** button to save the setting.

   Click **Status** tab, and **Start** button to start Analytics Server.

4.3.3　When Using an Interstage Application Server (Java EE)

🛈 Note
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When integrating with Interstage BPM, setup the Analytics Server according to 4.5.4 Setting up Analytics Server on Interstage Java EE as post-Installation task instead of this section. Refer to 4.5 Setup for Integration with Interstage BPM in detail.
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Procedure for deployment to Interstage Application Server (Java EE)

1. Login to the Interstage Java EE Management Console.

   Click **Application > Web Application** on the Interstage Management Console and **Deploy** button onto relevant screen.

2. Specify the location of the Analytics Server WAR file (ibpmm.war), and click **Next**.

   On Windows:

   　　C:/Program Files (x86)/Fujitsu/BPM-A/bpmm/war/ibpmm.war

   On Linux:

   　　/var/opt/FJSVibpma/war/ibpmm.war

3. Check the displayed context root and application name. These name must be "ibpmm".

4. Select appropriate "target" that HTTP listener's port number is suitable for the port number that the installation specified.

5. Click **Finish** to complete the installation.

   An installation status page appears along with a pop-up dialog box prompting you to wait while the Analytics Server is being deployed. This could take several minutes.

   When the deployment is complete, the message "Application ibpmm_war installed successfully" appears.

6. Click **Start** button from ibpmm Web application section on the Interstage Management Console.

   Analytics Servlet will be started.

4.3.4　When Using Weblogic

Procedure for deployment to WebLogic 12c

1. Create the following directory and subdirectories on your computer. The exact path and directory names will depend on which operating system you are using.

   On Windows:

   > c:/Program Files (x86)/Fujitsu/BPM-A/bpmm/ibpmm

   On Linux:

   > /var/opt/FJSVibpma/ibpmm

2. Extract the files from ibpmm.war into the ibpmm directory.
   Use the following Java command:

   On Windows:

   > jar -xvf "c:/Program Files (x86)/Fujitsu/BPM-A/bpmm/war/ibpmm.war"

   On Linux:

   > jar -xvf /opt/FJSVibpma/war/ibpmm.war

3. Start the WebLogic Server.

4. Start the server instance on which the Analytics Server will be deployed.

5. Use the following procedure to deploy the ibpmm Web Application to the WebLogic Server Instance.

   1. Login to the WebLogic Server Administration Console.

      http://host1:7001/console/

   2. Click **Deployments** > **Install** on the WebLogic Server Administration console.

   3. Specify the location of the ibpmm directory.

      On Windows:

      > c:/Program Files (x86)/Fujitsu/BPM-A/bpmm/ibpmm

      On Linux:

      > /var/opt/FJSVibpma/ibpmm

      And click **Next**. If multiple target servers are available, select one of the servers and click **Next**.

   4. Select Install this deployment as an application, and click Next.

   5. Check that the name is "ibpmm", and click **Finish**.

6. Analytics Servlet will be started.

🐸 Note
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Do not change the servlet context name "ibpmm".
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🐸 Note
. . . .
To use the Interstage BPM Console with Analytics in the same WebLogic domain after deploying the Analytics Server, check that WebLogic's security configuration in its config.xml file is correct. This check is required because the deployment process may disrupt WebLogic's security configuration.

Refer to *"Special WebLogic Server Configurations to Enable Web Service Operations"* in the *Interstage BPM Server and Console Installation Guide (WebLogic Server)* for details.
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4.3.5   When Using WebSphere

Procedure for deployment to WebSphere 8.5

1. Log in to the WebSphere Integrated Solutions Console.

2. Disable IBM JAX-WS engine.

   Select **Application servers > server1 > Process definition > Java Virtual Machine**, and the following parameter to **Generic JVM arguments**:

   -Dcom.ibm.websphere.webservices.DisableIBMJAXWSEngine=true

3. Restart WebSphere Server.

4. Log in to the WebSphere Administrative Console.

5. Select **Applications** > **New Application**.

6. Select **New Enterprise Application**.

7. Click **Browse,** and navigate to the location of the Analytics Server WAR file (ibpmm.war).,and click **Next**.

   For example:

   On Windows:

   > c:/Program Files (x86)/Fujitsu/BPM-A/bpmm/war/ibpmm.war

   On Linux:

   > /opt/FJSVibpma/war/ibpmm.war

   How do you want to install the application? page appears.

8. Accept all defaults, and click **Next**.

   Step 1: Select installation options page appears.

9. Accept all defaults, and click **Next**.

   Note: The Application Name must be "ibpmm_war" .

   The **Map modules to servers** page appears.

10. Select **ibpmm.war,** and click **Next**.

    The **Map virtual hosts for Web modules** page appears.

11. Select **ibpmm.war,** and click **Next**.

12. The **Map context roots for Web modules** page appears.

13. Enter the context root (/ibpmm) in the **Context Root** field.

    Note: The context root must be "/ibpmm".

    The **Summary** appears.

14. Click **Finish** to complete the installation.

    An installation status page appears along with a pop-up dialog box prompting you to wait while the Analytics Server is being deployed. This could take several minutes.

    When the deployment is complete, the message "Application ibpmm_war installed successfully" appears.

15. Click the **Save directly to Master Configuration** link to save your changes.

    The Analytics Server will be saved as a new Web application in the WebSphere Application Server. When saving completes, the **Preparing for the application installation** page reappears.

16. Select **Applications** > **Application Types** > **WebShere enterprise applications**.

    A list of Enterprise Applications appears. The ibpmm_war appears on the list with a red icon indicating that it has not been started.

17. Set **Class loader** order to **parent last**.

    Select **Enterprise Applications** > **ibpmm_war** > **Manage Modules** > **ibpmm.war**, and set **Class loader order** to **Classes loaded with local class loader first (parent last)**.

18. Copy mar file to WEB-INF/lib and change its file extention to jar.

    Copy three files in the following directories:

    On Windows:

    > <WebSphere Installation Directory>\AppServer\profiles\<Profile Name>\installedApps\<WebShpere Cell Name >\ibpmm_war.ear\ibpmm.war\WEB-INF\modules

    On Linux:

    > <WebSphere Installation Directory>/AppServer/profiles/<Profile Name>/installedApps/<WebShpere Cell Name>/ibpmm_war.ear/ibpmm.war/WEB-INF/modules

    Mar files to be copied:

    - addressing-1.3.mar

    - BPMECAccessCheckModule.mar

    - BPMWSAccessCheckModule.mar

    Destination directories:

    On Windows:

    > <WebSphere Installation Directory>\AppServer\profiles\<Profile Name>\installedApps\<WebShpere Cell Name>\ibpmm_war.ear\ibpmm.war\WEB-INF\lib

    On Linux:

    > <WebSphere Installation Directory>/AppServer/profiles/<Profile Name>/installedApps/<WebShpere Cell Name>/ibpmm_war.ear/ibpmm.war/WEB-INF/lib

    Change the file extentions of copied files to jar as following:

    - addressing-1.3.jar

    - BPMECAccessCheckModule.jar

    - BPMWSAccessCheckModule.jar

    These three files must be copied and then the file extensions need to be changed. Do not move the files directly.

19. Select ibpmm_war, and click **Start** to start the Analytics Server application.

    A pop-up dialog box prompting you to wait while the Analytics Server is started is displayed. This can take few minutes.

    When the Analytics Server starts, the Enterprise Applications page appears with a message informing that the Analytics Server has started.

4.3.6   When using JBoss

4.3.6.1   Procedure for deployment to JBoss Enterprise Application Platform 5.1

1. Create a directory on your computer in the JBoss installation directories. This will be your Analytics Server deployment directory.

    For example purposes, the following directory will be used:

    On Windows:

    > *<JBoss Installation Directory>*/server/default/deploy/ibpmm.war

On Linux:

> <*JBoss Installation Directory*>/server/default/deploy/ibpmm.war

2. Change the directory to your Analytics Server deployment directory, and extract the files from ibpmm.war into the deployment directory.

   Use the following Java command:

   On Windows:

   > # cd <*JBoss Installation Directory*>/server/default/deploy/ibpmm.war

   > # jar -xvf "c:/Program Files (x86)/Fujitsu/BPM-A/bpmm/war/ibpmm.war"

   On Linux:

   > # cd <*JBoss Installation Directory*>/server/default/deploy/ibpmm.war

   > # jar -xvf /opt/FJSVibpma/war/ibpmm.war

3. Change directory to deployment directory, and edit server.xml. Add parameter to following file.

   On Windows:

   > <*JBoss Installation Directory*>\server\default\deploy\jbossweb.sar\server.xml

   On Linux:

   > <*JBoss Installation Directory*>/server/default/deploy/jbossweb.sar/server.xml

   Add parameter as follows.

```
...
   <Service name="jboss.web">

      <!-- A HTTP/1.1 Connector on port 8080 -->
      <Connector protocol="HTTP/1.1" port="8080" address="${jboss.bind.address}"
             connectionTimeout="20000" redirectPort="8443"
             URIEncoding="UTF-8" />
...
```

4. Start the JBoss Application Server by using run.bat command (on Linux, use run.sh).

Note

If you start run.bat or run.sh, set the server IP address to JBoss settings to allow access.

For example, you can use the argument, -b 0.0.0.0, if you allow all clients to access JBoss.

- Windows:

  run.bat -b 0.0.0.0

- Linux:

  run.sh -b 0.0.0.0

Note

To use the same server configuration for the Analytics Server on the JBoss Application Server, the following Analytics Server deployment directory should be used.

On Windows:

> <*JBoss Installation Directory*>/server/ibpm/deploy/ibpmm.war

On Linux:

    <JBoss Installation Directory>/server/ibpm/deploy/ibpmm.war

And use the runIBPM.bat command (on Linux, use runIBPM.sh) to start JBoss.

Additionally, you need to set the IP addresses, using run.bat (as described earlier in this section), to JBoss settings to allow access from the client.

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4.3.6.2   Procedure for deployment to JBoss Enterprise Application Platform 6.1

1. Create a directory on your computer in the JBoss installation directories. This will be your Analytics Server deployment directory.

   For example purposes, the following directory will be used:

   On Windows:

       <JBoss Installation Directory>/standalone/deployments/ibpmm.war

   On Linux:

       <JBoss Installation Directory>/standalone/deployments/ibpmm.war

2. Change the directory to your Analytics Server deployment directory, and extract the files from ibpmm.war into the deployment directory.

   Use the following Java command:

   On Windows:

       # cd *<JBoss Installation Directory>*/standalone/deployments/ibpmm.war

       # jar -xvf "c:/Program Files (x86)/Fujitsu/BPM-A/bpmm/war/ibpmm.war"

       # mkdir META-INF

       # copy "c:/Program Files (x86)/Fujitsu/BPM-A/bpmm/orig/jboss6/jboss-deployment-structure.xml" META-INF

       # echo > *<JBoss Installation Directory>*/standalone/deployments/ibpmm.war.dodeploy

   On Linux:

       # cd *<JBoss Installation Directory>*/standalone/deployments/ibpmm.war

       # jar -xvf /opt/FJSVibpma/war/ibpmm.war

       # mkdir META-INF

       # cp /opt/FJSVibpma/orig/jboss6/jboss-deployment-structure.xml META-INF

       # touch *<JBoss Installation Directory>*/standalone/deployments/ibpmm.war.dodeploy

3. Change directory to **configuration** directory, and edit standalone.xml. Add parameter to following file.

   On Windows:

       <JBoss Installation Directory>/standalone/configuration/standalone.xml

   On Linux:

       <JBoss Installation Directory>/standalone/configuration/standalone.xml

   Add parameter as follows.

```
...
        <extension module="org.jboss.as.weld"/>
    </extensions>

    <system-properties>
        <property name="org.apache.catalina.connector.URI_ENCODING" value="UTF-8"/>
        <property name="org.apache.catalina.connector.USE_BODY_ENCODING_FOR_QUERY_STRING"
```

```
value="true"/>
    </system-properties>

    <management>
        <security-realms>

...
```

4. Start the JBoss Application Server by using standalone.bat command (on Linux, use standalone.sh).

📗 Note

If you start standalone.bat or standalone.sh, set the server IP address to JBoss settings to allow access.

For example, you can use the argument, -b 0.0.0.0, if you allow all clients to access JBoss.

- Windows:

   standalone.bat -b 0.0.0.0

- Linux:

   standalone.sh -b 0.0.0.0

4.3.7   Security Measures

Security measures for the installation folder (Windows only)

If the access permissions need to be changed for the installation folder, it is recommended that the permissions are changed using Windows functions.

Check the security status of the install folder using the **Properties** function in Windows Explorer. Take measures such as removing "Everyone" from the access permissions and assigning access permission to only specified users.

Changing the Management Console Password

The Administrator ID and password are created when the Analytics Server is installed. It is recommended you change this initial password.

📘 Information

Refer to the *Interstage Business Process Manager Analytics Management Console Guide* for information on how to change the password.

Note for Windows Server 2008 or 2012

In case "Internet Explorer Enhanced Security Configuration" is active on Windows Server 2008 or 2012, Management Console or Analytics Console may not work correctly since script execution is not permitted.

To avoid this, please change configuration by registering host as "Trusted site" or change configuration of IE ESC in server manager.

Note for Internet Explorer 9, 10 or 11

In case of using Internet Explorer 9/10/11 with compatibility mode, data may not be displayed correctly on Analytics tools.

To avoid this, please change configuration of compatibility mode as following.

Go to [Tools] - [Compatibility View Settings] and uncheck all the options

Note for the built-in Database

After installing with the built-in Database, **bpmapgs** user is created as an OS user in order to manage the database.

On Windows, when changing the password of **bpmapgs**, please change the password of logon account of I**nterstage BPM Analytics builtin DB** service as well.

4.4   Setting Up the Analytics Server

This section explains how to set up the application environment after you have installed Analytics.

4.4.1   Create Tablespace and Users for the Analytics Database

Create the tablespace and users on the RDB to be used for the Analytics Server. The following tablespaces need to be created:

- Events database (required)

  This database stores the events gathered from the system being monitored.

- Archive database (optional)

  This database stores data from the Events database to reduce the volume of data kept there.

- Process Discovery database (optional)

  This database is used for Process Discovery.

The procedure for creating the tablespaces and users depends on the type of RDB. Refer to the appropriate instructions below for details.

Note

Configure a dedicated tablespace for each database.

Delete the entire database space when the operation is to be stopped entirely. (Tables used by Analytics cannot be deleted individually.)

4.4.1.1   Built-in database

Creating database and user

A built-in database for Analytics is automatically created in installation so no further work is required.

4.4.1.2   Oracle

Creating a tablespace

Create a dedicated database that will be used as the Analytics database. The tablespace can be given any name. Refer to the Oracle manual for details on creating an Oracle tablespace.

The scripts provided for creating tablespaces (described in *Appendix C,* 〝*Customizing System Table Parameters*〞) indicate that the required size for tables is 60 MB or more. The actual space required, however, can be calculated by referring to *Appendix B, "Required Disk Size for Database*".

Creating a user

Create a user that will be used by the Analytics Server to access the Analytics database.

Any name can be specified as the user name. Specify the tablespace created above in "Creating a tablespace" as the default tablespace of the user. Specify "UNLIMITED" as the privilege to expand the tablespace area.

The following example shows the SQL statement that would be used to specify the user name "EVENTUSER", the password "BPMM", and the tablespace name "USERS".

Create another user for Process Discovery if necessary.

```
CREATE USER EVENTUSER IDENTIFIED BY BPMM QUOTA UNLIMITED ON USERS DEFAULT TABLESPACE USERS;
```

Grant the user, created above, specific privileges for monitoring.

Privilege	Remark
CREATE SESSION	System privileges
Privileges for expanding the area of the tablespace	"UNLIMITED TABLESPACE" system privilege, or area restriction specification in the "QUOTA" clause of the "CREATE USER", or "ALTER USER" statement (Specify "UNLIMITED" or an area size limitation)
CREATE TABLE	System privileges
CREATE SEQUENCE	System privileges

Refer to the Oracle manual for details on each privilege. A sample script is provided for creating a user and assigning privileges. Edit the following script to suit the environment in which it will be used.

On Windows:

For Events or Archive database

[*Installation directory*]/bpmm/dbscripts/oracle/bpm-user-oracle.sql

(c:/Program Files (x86)/Fujitsu/BPM-A)

For Process Discovery database

[*Installation directory*]/bpme/dbscripts/oracle/bpme-user-oracle.sql

(c:/Program Files (x86)/Fujitsu/BPM-A)

On Linux:

For Events or Archive database

[*Installation directory*]/dbscripts/oracle/bpm-user-oracle.sql

(/opt/FJSVibpma)

For Process Discovery database

[*Installation directory*]/bpme/dbscripts/oracle/bpme-user-oracle.sql

(/opt/FJSVibpma)

Refer to the *Oracle manual* for details on creating a database user.

4.4.1.3   SQL Server

Creating a database

The following tools are used to create a database.

```
SQL Server Management Studio
```

Specify SQL_Latin1_General_CP1_CS_AS as the collating sequence when creating a database.

Refer to the SQL Server manual for details on creating an SQL Server database, and *Appendix B*, "*Required Disk Size for Database*" for details on estimating database sizes.

Creating a user

Create a database user and set a login ID for the Analytics Server to access the database created in "Creating a database" above. There are no special restrictions on the names that can be specified as a login ID.

Use the following tools. Refer to the SQL Server manual for details on creating a database user.

```
SQL Server Management Studio
```

Select **SQL Server authentication mode** as the database user authentication method (the default setting is the Windows authentication mode) and set a password.

Assign the newly created database user the following privileges.

Required privileges
CONNECT
CREATE TABLE (for database)
CONTROL

Specify the user as the owner of the user's default schema.
Refer to the *SQL Server manual* for details on each privilege.

A schema must be created after a user has been created. When creating the schema, set the user as the schema owner. Also set this schema as the default schema of the user.

4.4.1.4   PostgreSQL

Creating a database

Create a database on the RDB to be used for the Analytics Server by using **createdb** command.

```
createdb (database name)
```

Creating a user

PostgreSQL user names are separate from operating system user accounts. By default, the PostgreSQL user name will be used to the same name as your current operating system account. So, there will always be a PostgreSQL user account that has the same name as the operating system user that started the PostgreSQL server. Usually, use it for the Analytics Server to access the database.

If necessary, create a database user for the Analytics server to access the database as follows:

```
createuser -U (account) -P (user name)
```

4.4.2   Setting System Parameters of the Analytics Server

To use the Analytics Server, ensure the following parameters are configured in the Management Console.

- JDBC Driver Settings

    Set the JDBC used to access the tablespace for the Analytics Server.

- Create tables in the RDB tablespace

    Create tables to be used for the Analytics Server.

- Dashboard authentication settings

    Set the authentication method for the Analytics Dashboard user.

- User registration

    Register users that can make operational settings for Analytics, for example, using the dashboard.

- Mail settings

    Enter the information for the mail server.

Logging into the Management Console

Log in to the Management Console using a Web browser. Use the given Administrator ID and password when installing.

You can access the Management Console directly using the **Start** button from the Windows taskbar as follows.

```
Programs > Interstage Business Process Manager Analytics > Management Console
```

Alternatively, you may enter the following URL in the address bar of a Web browser.

```
http://[Host]:[Port]/ibpmm/admintool/BPMAdminTool
```

Host:

    Specify the host name or IP address of the computer where the Analytics Server is installed

Port:

    Specify the port number used by the Web server. The default port number for built-in application server is 40330. Confirm and specify the port number of the application server for other application servers. If omitted, the default value of 80 is used.

 See

For more detail in this section, refer to the Interstage Business Process Manager Analytics Management Console Guide.

 Information

If you want to change the password for the Management Console, execute the following operation.

```
Analytics System > Change Password
```

In this display, set the new administration password.

4.4.2.1   Set up JDBC driver on the server

JDBC drivers are necessary to set up the Analytics database. (If you have already set up the drivers during installation, you need not do so again.)

Install the JDBC driver into the server environment

Use the Management Console to set JDBC on the Analytics Server.

Refer to the manual for your database or the JDBC manual for information on JDBC driver installation.

If a built-in RDB was installed when the Analytics Server was installed, further JDBC settings are not required. Do the following:

```
Analytics System > System Settings > Database Management > JDBC driver Settings
```

In this display, add the JDBC driver file(s) into the database environment, and then, restart the application server.

Use proper JDBC drivers which the application server can use to communicate with the database.

Database type	JDBC drivers
Oracle	ojdbc5.jar, ojdbc6.jar or ojdbc7.jar
SQL Server	sqljdbc4.jar
	(If using Interstage V10 J2EE, sqljdbc.jar)
PostgreSQL	(Not requreid)

📎 Note

....

Please refer to *Interstage Business Process Manager Analytics Management Guide* to restart the built-in Application Server.

....

4.4.2.2   Create tables in RDB tablespace

A separate tab is displayed in the Management Console for each tablespace used to create a table. Open the tablespace and set the parameters required to connect to the database.

An Events database is automatically created when a built-in database is selected during the Analytics Server installation. Therefore, this step is not required.

- Events database (required)

```
Analytics System > System Settings > Database Management > Events DB
```

- Archive database (required only if using the Archive database)

```
Analytics System > System Settings > Database Management > Archive DB
```

- Process Discovery database (required only if using Process Discovery)

```
Analytics System > System Settings > Database Management > Process Discovery DB
```

Set the following connection information for each RDB tablespace.

Parameter	Events database connection
JDBC driver	- Required - Select the item to be used from the drop-down menu
JDBC connection URL	Required
Tablespace name	Set this parameter when using Oracle
User name	- Required - Specified user must have appropriate privileges to access the schemas and database - If not, grant the user these privileges before creating the tables
Password	- Required - Always select the **Set password** check box.

To create tables in the RDB tablespace, execute the following operation.

```
Analytics System > System Settings > Database Management > Table Management
```

In this display, click **Create Table** in each Analytics database.

Ensure the status changes to "**Created**".

(Apply the same operation in the Archive database, if required.)

Refer to *Appendix B, "Required Disk Size for Database"* for more information about the parameter values required for creating a system table. The parameters for the database tables automatically generated from the Management Console are listed in *Appendix D, "Automatically Generated Parameter Values"*.

4.4.2.3　Configure authentication type for the dashboard

Modify the authentication type for the Analytics Dashboard using the following operations, if required.

```
Analytics System > System Settings > User Management > Authentication Type > User Authentication
```

In the display, select the item to be used from the drop-down menu, and click **Modify**.

There are the following authentication types.

Authentication type	Description
Built-in Authentication	Only use the Interstage Business Process Manager Analytics authentication function, without using an authentication server.
Do not authenticate	Operate without performing login authentication. The **User ID** is required only.
LDAP	Authenticate by linking to an LDAP server.
Active Directory Service	- Authenticate by linking to Active Directory Service.
Interstage SSO	- Authenticate by linking to Interstage SSO.
Interstage BPM	- Authenticate by linking to SSO Authentication of Interstage BPM

Next, restart the Analytics Server to apply the changes.

Point

This procedure is not required if the user accepts the default authentication type.

In case you select authentication type other than "Built-in Authentication" or "Do not authenticate", user will be authenticated as guest group user when you login to Dashboard. To use Dashboard Group other than guest group, registering user with same user ID as the user for specified authentication type to Analytics is required.

Please refer to "Interstage Business Process Manager Analytics Overview" for detail.

4.4.2.4　Register Analytics Studio users who configure Analytics parameters

At least one Analytics Studio user is required to configure parameters of this software.

Create new Analytics Studio users by the following operations.

```
Analytics System > System Settings > User Management > User > Create User
```

In this display, enter the parameters (User ID, Password, and Description, User Name, Assigned Groups, Email Address) and click **Create**.

Next, confirm the user ID that was just created using the following operations.

The following groups are provided. Choose an appropriate group for the user. Create a new group if one needs to be customized.

Group	Description
Administrator User	Users in this group have permissions to change any settings and may perform any operation in the Analytics Studio, Management Console and Dashboard except starting/stopping Analytics Server.
Dashboard User	Users in this group have permissions to operate the Analytics Dashboard but may not change settings in the Analytics Studio.
Data Analyst	Users in this group have permissions to change settings related to the processing of data (collection and alerts) in the Analytics Studio.
Presentation Designer	Users in this group have permissions to set presentations (charts and layouts) in the Analytics Studio.
Process Analyzer User	Users in this group have permissions to operate Process Discovery.
Process Analyzer Power User	In addition to Process Discovery user permissions, users in this group also have permissions to set KPIs using Process Discovery.
Publisher	Users in this group have permissions to publish definitions created in the Analytics Studio.
Process Generator User	Users in this group have permission to operate the Process Generate feature from Dashboard.
Studio Super User	Users in this group have permissions to perform any operation in the Analytics Studio.

4.4.2.5   Configure e-mail notification

Set the mail parameters for notifications from the Analytics Server, if needed:

```
Analytics System > System Settings > Mail > SMTP Server
Analytics System > System Settings > Mail > SMTP Authentication
Analytics System > System Settings > Mail > POP before SMTP Authentication
```

After configuring, the application server having the Analytics Server must be restarted to work the new parameters.

4.5 Setup for Integration with Interstage BPM

Integrating with Interstage BPM allows user to analyze BPM Server's process in BPM Console.

4.5.1   Steps to integrate with Interstage BPM

You can integrate with Interstage BPM by following steps:

Preparation:

1. Check prerequisites

   📖 Information

   ....
   Refer to "When integrating with the Interstage BPM" at Chapter 3 Considerations for Installing Analytics to check available combination.
   ....

2. Setup BPM Server

   Refer to Interstage BPM Server and Console Installation Guide and complete BPM Server setup.

3. Create target Tenant and Process Definition

    - Create target Tenant

      Refer to Interstage BPM Server Administration Guide to create Tenant.

      Refer to Tenant Management Console Help Contents for how to control Tenant Management Console.

    - Create Process Definition

      Refer to Interstage BPM Studio User's Guide to create Process Definition and upload it to target Tenant.

4. Setup Analytics Server

    - Except Interstage Java EE

      Refer to Chapter 4 Installing and Setting Up Analytics Server and complete setup till section 4.4.1 Create Tablespace and Users for the Analytics Database.

    - When using Interstage Java EE

      Refer to Chapter 4 Installing and Setting Up Analytics Server and complete setup till section 4.4.1 Create Tablespace and Users for the Analytics Database but 4.3.3 When Using an Interstage Application Server (Java EE). Setup the Analytics Server according to 4.5.4 Setting up Analytics Server on Interstage Java EE as post-Installation task instead of 4.3.3 When Using an Interstage Application Server (Java EE).

5. After setup, please start BPM Server, BPM Console and Analytics Server.

Steps on BPM Server Machine:

1. Setup User Defined Attributes

2. Setup Tenant Property

3. Copy integration JAR files

4. Setup Analytics integration

Steps on Analytics Server Machine:

1. Setup BPM Console integration (Only when BPM Server and Analytics Server were using different hostname or port number)

2. Setup Model API client

3. Setup integration modules

4. Setup BPMFlow Sensor

5. Setup user for BPM integration

    If using SSO authentication in Interstage BPM environment: Setup SSO authentication

    If not using SSO authentication: Create BPM Process analyst user

6. Create Studio elements

Figure 4.1 Interstage BPM and Interstage BPM Analytics integration (Remote configuration)
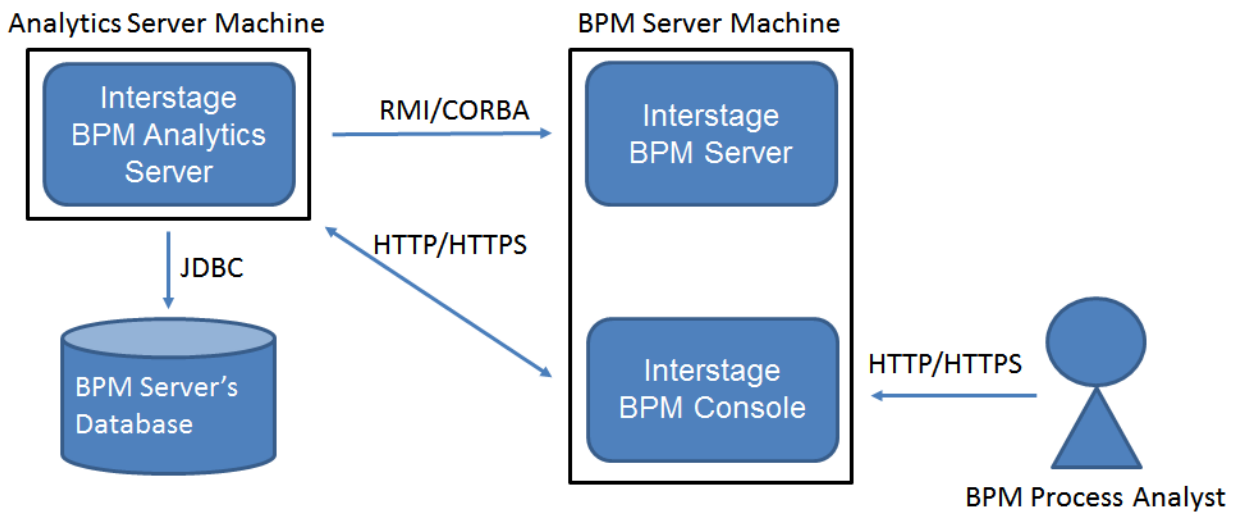
> **P** Point
> ··
> When BPM Server and Analytics Server are installed on different machine, please allow following network communication between these servers.
>
> - HTTP/HTTPS request between BPM Server and Analytics Server for both side
>
> - RMI/CORBA request from Analytics Server to BPM Server
>
> - JDBC request from Analytics Server to BPM Server's Database
> ··

4.5.2   How to setup

For the Interstage BPM link, you need to set up the following procedures in addition to the basic setup.

Steps on BPM Server Machine:

- Setup User Defined Attributes

- Setup Tenant Property

- Copy integration JAR files

- Setup Analytics integration

Steps on Analytics Server Machine:

- Setup BPM Console integration

- Setup Model API client

- Setup integration modules

- Setup BPMFlow Sensor

- Setup SSO authentication (Optional)

- Create BPM Process analyst user

- Create Studio elements

Integration setup example:

- If you were using Windows machine and your application server was JBoss, you can setup BPM integration by using following steps.

4.5.2.1　Setup User Defined Attributes

To analyze changes of User Defined Attributes, please make target attributes **Trackable**.

Information
···
To change User Defined Attributes, please refer to following document.

- Interstage BPM Studio User's Guide

    - 6.12 Specifying User Defined Attributes
···

4.5.2.2　Setup Tenant Property

When linking to the Interstage BPM, the "SendAnalyticEvents" configuration parameter of "Interstage BPM" must be set to "true" on every tenant.

Information
···
To configure this parameter, refer to the following chapter of the *Interstage BPM Administration Guide*:

- 3.6 Configuring Interstage BPM for Interstage Analytics
···

Note
···
When you add a new tenant, the initial value of this configuration parameter is "false".

Change this parameter setting to "true" with Interstage BPM Tenant Management Console.
···

4.5.2.3　Copy integration JAR files (Except Interstage Java EE)

Please copy following JAR files from BPM Server Machine to Analytics Server Machine. If you were using same machine for BPM Server and Analytics Server, this step can be skipped.

- iFlow.jar

    On Windows:

        <Interstage BPM Server Installation Directory>/client/lib/iFlow.jar

    On Linux:

        /var/opt/FJSVibpm/client/lib/iFlow.jar

    On Solaris:

        /var/opt/FJSVibpm/client/lib/iFlow.jar

- fujitsu-ibpm-engine-ejb_jar_client.jar (If your application server was Interstage J2EE)

    On Windows:

        <Interstage Application Server Installation Directory>/J2EE/var/deployment/ijserver/<Work Unit Name of the Interstage BPM Server>/distribute/fujitsu-ibpm-engine.ear/fujitsu-ibpm-engine-ejb.jar/fujitsu-ibpm-engine-ejb_jar_client.jar

    On Linux:

        /var/opt/FJSVj2ee/deployment/ijserver/<Work Unit Name of the Interstage BPM Server>/distribute/fujitsu-ibpm-engine.ear/fujitsu-ibpm-engine-ejb.jar/fujitsu-ibpm-engine-ejb_jar_client.jar

On Solaris:

/var/opt/FJSVj2ee/deployment/ijserver/<*Work Unit Name of the Interstage BPM Server*>/distribute/fujitsu-ibpm-engine.ear/
fujitsu-ibpm-engine-ejb.jar/fujitsu-ibpm-engine-ejb_jar_client.jar

4.5.2.4   Setup Analytics integration

To display the Analytics Dashboard for process monitoring, the Interstage BPM console is used.

📖 Information

For configuring this environment, refer to the following chapters of the *Interstage Business Process Manager Server and Console Installation Guide* that correspond to the type of application server that is installed:

- Interstage BPM Server and Console Installation Guide (Interstage Application Server)

  - 6.2 Configuring Interstage BPM Console to work with Interstage Analytics

- Interstage BPM Server and Console Installation Guide (JBoss Application Server)

  - 6 Configuring Interstage BPM Console to work with Interstage Analytics

- Interstage BPM Server and Console Installation Guide (Oracle WebLogic Server)

  - 6 Configuring Interstage BPM Console to work with Interstage Analytics

- Interstage BPM Server and Console Installation Guide (WebSphere Application Server)

  - 6 Configuring Interstage BPM Console to work with Interstage Analytics

4.5.2.5   Setup BPM Console integration (Only when BPM Server and Analytics Server were using different hostname or port number)

📌 Note

When you need to change Host name, Port number and Protocol, like integrating Analytics Server and Interstage BPM Console indifferent machines, Host name (or FQDN) and Port number of Interstage BPM Console need to be added to the parameters of dashboardConfig.properties below.

- [Deployment directory of Analytics Server]/ibpmm.war/conf/dashboardConfig.properties

  - dashboard.process.consoleHostName

  - dashboard.process.consolePort

  - dashboard.process.consoleProtocol

And please change configuration by registering host which Analytics is installed as "Trusted site" or change configuration of IE ESC in server manager.

4.5.2.6   Setup Model API client

To refer to information of Interstage BPM by using the Model API, the Analytics Server requires Interstage BPM client settings.

(The Model API is an application interface for controlling the Interstage BPM.)

Model API client settings

See the *Interstage BPM Developers Guide.* In particular, following chapters should be checked:

- When the Interstage BPM is configured on a local computer:

  - 4.1.1 Specifying Configuration Settings for Interstage Application Server J2EE (Local)

- 4.1.4 Specifying Configuration Settings for Interstage Application Server JavaEE for developing Client JavaEE Applications

📙 Note

· ·

When using Interstage Java EE, you don't setup Model API client here because Model API client setup has been already completed in 4.5.4 Setting up Analytics Server on Interstage Java EE.

· ·

- 4.1.5 Specifying Configuration Settings for WebSphere Application Server for developing Standalone Applications (Local)

- 4.1.6 Specifying Configuration Settings for WebSphere Application Server for Deploying Client J2EE Application (Local)

- 4.1.9 Specifying Configuration Settings for WebLogic

- 4.1.10 Specifying Configuration Settings for JBoss

- When the Interstage BPM is configured on a remote computer:

- 4.1.2 Specifying Configuration Settings for Interstage Application Server J2EE (Remote)

- 4.1.4 Specifying Configuration Settings for Interstage Application Server JavaEE for developing Client JavaEE Applications

📙 Note

· ·

When using Interstage Java EE, you don't setup Model API client here because Model API client setup has been already completed in 4.5.4 Setting up Analytics Server on Interstage Java EE.

· ·

- 4.1.7 Specifying Configuration Settings for WebSphere Application Server for developing Standalone Applications (Remote)

- 4.1.8 Specifying Configuration Settings for WebSphere Application Server for Deploying Client J2EE Application (Remote)

- 4.1.9 Specifying Configuration Settings for WebLogic

- 4.1.10 Specifying Configuration Settings for JBoss

1. Login to the Management Console.

```
Programs > Interstage Business Process Manager Analytics > Management Console
```

2. Set the jar files

```
Analytics System > System Settings > Integration Module Management
```

In this display, add jar files, and restart the based J2EE container on the application server.

- Application Server settings (for Interstage Application Server only)

- JMS settings

Use the Interstage Management Console to ensure that the "JMS Settings" is set to "Yes".

```
Interstage > Interstage Application Server > System > Update System Settings > Detailed
Settings > Event Service Settings ( or JMS Settings)
```

If the setting is "No", change it to "Yes".

- Naming service settings for remote host

If the Interstage BPM Server is configured on a remote computer, use the Interstage Management Console to set the remote server hostname.

```
Interstage > Interstage Application Server > System > Update System Settings > Detailed
Settings > Naming Service Settings
```

4.5.2.7 Setup integration modules

- JDBC driver

  If the databases for the Analytics Server and Interstage BPM are different types, set up a JDBC driver for the Interstage BPM database on the Analytics Server.

  Configure the JDBC driver in the following Management Console window:

  ```
  Analytics System > System Settings > Integration Module Management
  ```

  Add the JDBC driver file and restart the application server.

  Use proper JDBC drivers which the application server of the Analytics Server can use to communicate with the Interstage BPM database.

Database	JDBC Driver name
Oracle	ojdbc5.jar, ojdbc6.jar or ojdbc7.jar
SQL Server	sqljdbc4.jar (If using Interstage V10 J2EE, sqljdbc.jar)

- iFlow.jar(Except Interstage Java EE)

  Please add the JAR file which was copied at the step 4.5.2.3 Copy integration JAR files (Except Interstage Java EE).

- fujitsu-ibpm-engine-ejb_jar_client.jar (If your application server was Interstage J2EE)

  Please add the JAR file which was copied at the step 4.5.2.3 Copy integration JAR files (Except Interstage Java EE).

- jboss-messaging-client.jar and jboss-remoting.jar (If your application server was JBoss)

  - <JBoss Installation Directory>/jboss-as/client/jboss-messaging-client.jar

  - <JBoss Installation Directory>/jboss-as/client/jboss-remoting.jar

1. Log on to the Management Console.

   ```
   Programs > Interstage Business Process Manager Analytics > Management Console
   ```

2. Set the jar files

   ```
   Analytics System > System Settings > Integration Module Management
   ```

4.5.2.8 Setup BPMFlow Sensor

BPMFlow Sensor needs to be configured to collect BPM Server's process data to Analytics Server.

Please refer to following document to setup BPMFlow Sensor.

- Interstage Analytics Management Console Guide

  - 4.4.1 BPMFlow

4.5.2.9 Setup SSO authentication (optional)

By using the SSO authentication of Interstage BPM, a user logs in once and gain access to Interstage BPM console and Analytics console. In addition, the user is automatically assigned to the dashboard groups which are the same name of Interstage BPM groups which the user belongs to.

Pre-requisites:

- Setup of Interstage BPM Server and Console is completed.

- Setup of SSO Authentication for Interstage BPM Console is completed.

- Setup of Interstage BPM for Interstage Analytics is completed.

- When using SSO Authentication, the SaaS mode of Interstage BPM is not supported. It's necessary to set the target tenant (Default) to BPMA.

Set the parameters of SSO authentication to BPMConnection

1. Log on to the Management Console.

2. Open the BPMConnection via Connection Status page in Sensor Management menu.

3. Set the valid parameters to **SSO Authentication**.

The parameters are as follows:

Name	Description
Use SSO Authentication	When using SSO Authentication, check the check box.
OpenID Provider Endpoint URL	Set the OpenID Provider Endpoint URL provided by Interstage BPM. For example: http[s]://<hostname>:<port number>/openid/id/
OpenID format	Set the OpenID format provided by Interstage BPM. For example: http[s]://<hostname>:<port number>/openid/id/{id}
Tenant	Set the name of target tenant of Interstage BPM. For example: Default

Set the authentication type to Interstage BPM

1. Set the authentication type of BPMA to **Interstage BPM** using the Management Console.

2. Click **Modify** button.

Setting of the java archive files

Please set the following java archive files using the Management Console.

- ssofi-client.jar

- httpclient-.4.2.2.jar

- httpcore-4.2.2.jar

- nekohtml-1.9.14.jar

- openid4java-0.9.7.jar

- guice-2.0.jar

1. Log on to the Management Console.

```
Programs > Interstage Business Process Manager Analytics > Management Console
```

2. Set the jar files

```
Analytics System > System Settings > Integration Module Management
```

Note

Please get the required java archive files from the following folders:

On Windows:

Interstage J2EE:

<Interstage installation Directory>\J2EE\var\deployment\ijserver\IBPMConsoleWU\apps\console.war\WEB-INF\lib

Interstage JavaEE:

<Interstage installation Directory>\F3FMisjee\var\domains\interstage\applications\j2ee-apps\InterstageBPMConsole\console_war\WEB-INF\lib

JBoss:

<JBoss Installation Directory>\server\ibpm\deploy\console.war\WEB-INF\lib

WebLogic:

<Interstage BPM Deployment Directory>\client\console\WEB-INF\lib

WebSphere:

<Interstage BPM Deployment Directory>\client\InterstageBPMConsole.ear\console.war\WEB-INF\lib

On Linux:

Interstage J2EE:

<Interstage installation Directory>/J2EE/var/deployment/ijserver/IBPMConsoleWU/apps/console.war/WEB-INF/lib

Interstage JavaEE:

<Interstage installation Directory>/F3FMisjee/var/domains/interstage/applications/j2ee-apps/InterstageBPMConsole/console_war/WEB-INF/lib

JBoss:

<JBoss Installation Directory>/server/ibpm/deploy/console.war/WEB-INF/lib

WebLogic:

<Interstage BPM Deployment Directory>/client/console/WEB-INF/lib

WebSphere:

<Interstage BPM Deployment Directory>/client/InterstageBPMConsole.ear/console.war/WEB-INF/lib

On Solaris:

Interstage J2EE:

<Interstage installation Directory>/J2EE/var/deployment/ijserver/IBPMConsoleWU/apps/console.war/WEB-INF/lib

Interstage JavaEE:

<Interstage installation Directory>/F3FMisjee/var/domains/interstage/applications/j2ee-apps/InterstageBPMConsole/console_war/WEB-INF/lib

JBoss:

<JBoss Installation Directory>/server/ibpm/deploy/console.war/WEB-INF/lib

WebLogic:

<Interstage BPM Deployment Directory>/client/console/WEB-INF/lib

WebSphere:

<Interstage BPM Deployment Directory>/client/InterstageBPMConsole.ear/console.war/WEB-INF/lib

Restart the application server

To reflect the settings, restart the application server.

4.5.2.10   Create BPM Process analyst user

If you are not using SSO authentication in **Interstage BPM** environment, please create BPM Process analyst user in Analytics Server.

Please refer to following section's note to create user.

- Interstage BPM Analytics Management Console Guide

    - 5.2.1.2 Creating Users (Note section)

If using SSO authentication, BPM Process analyst user doesn't have to be created. But, if using functions like Analytics Stduio other than Dashboard function, please create the same user ID as Interstage BPM user ID in Analytics Server by using Management Console, and please assign the proper groups to it.

4.5.2.11   Create Studio elements

Please create Analytics Studio elements to define how you want to see BPM process data.

Please refer to following document to create Studio elements.

- Interstage BPM Analytics Studio Guide

    - Chapter 3 Using the Analytics Studio

4.5.3   Integration steps for RedHat JBoss Enterprise Application Platform

This chapter explains how to setup BPM integration when you were using following configuration.

Table 4.1 Configuration example

Items	Configuration
OS	Windows
BPM version	V11.3.1
Analytics version	V12.2
Application Server	JBoss 5.1.1
Integration type (Remote/Local)	Remote
Database	BPM: Oracle 11g
	Analytics: Built-in database
SSO authentication	Don't use

4.5.3.1   Steps on BPM Server Machine

This chapter is assuming that your BPM Server installation directory was **C:\InterstageBPM**.

And, your JBoss installation directory was **C:\JBoss** and Analytics Server's profile was **default**.

Setup User Defined Attributes

To enable analysis of BPM Server's User Defined Attributes, please make them **Trackable**.

Steps:

1. Start BPM Studio and open Process Definition which you want to analyze its process.

2. Click User Defined Attributes in the Properties tab.

3. Check target User Defined Attributes' Trackable checkbox.

4. Save and upload modified Process Definition to BPM Server.

Setup Tenant Property

Please set **SendAnalyticEvents** Tenant Property to **true**.

Steps:

1. Login to BPM's Tenant Management Console.

2. Select target Tenant and click Properties tab.

3. Search SendAnalyticEvents property and change its value to true.

4. Click Save button at bottom of the page.

5. Right click at target Tenant and select De-activate, then, right click Tenant again and select Activate.

Copy integration JAR files

- Please copy iFlow.jar file from BPM Server Machine to Analytics Server Machine.

   File location:

```
C:\InterstageBPM\client\lib
```

- Please copy following JAR directory from Analytics Server Machine to BPM Server Machine.

```
C:\JBoss\jboss-as\server\default\deploy\ibpmm.war\WEB-INF\lib
```

Setup Analytics integration

1. Update setup.config

   File location:

```
C:\InterstageBPM\server
```

   Table 4.2 Parameters

Parameter	Value
execution_mode_selection	3
db_ibpm_user_name	BPM Server's Database user name
analytics_home	JAR directory which is copied from Analytics Server Machine.
analytics_host	Analytics Server's hostname or IP address
analytics_port	Analytics Server's port number

2. Run setup.bat

   - Validate setup file

```
setup.bat -configFilePath C:\InterstageBPM\server\setup.config -onlyValidation
db_ibpm_password=password
```

   If the message "Validations successful." was prompted, configuration file is correct.

   Location of log file:

```
C:\InterstageBPM\server\deployment\logs\deployment.log
```

   - Run setup script

```
setup.bat -configFilePath C:\InterstageBPM\server\setup.config db_ibpm_password=password
```

If the message "Setup successful." was prompted, setup was succeeded.

Information
....
Please refer to following document for the details of setup script.

- Interstage BPM Server and Console Guide (JBoss Application Server)

    - 5.2 Overview of the Setup Procedure
....

Confirmation

To confirm setup steps above, login to target Tenant by using BPM Console and check if there are **Analytics** tab in tab bar. Also, in Dashboard tab, **"Status Overview"** will be shown under tab bar. And, in Dashboard tab, My Reports, My KPIs and My Alerts will be shown.

If not shown these displays, please try followings:

- Check if SendAnalyticEvents property is true.

- Deactivate and Activate the Tenant.

- Restart BPM Server and BPM Console

Point
....
At the first time when BPM Console tried to get Analytics Server's data, sometimes the page will be blocked for the security reasons. At that case, please add Analytics Server to Trusted sites zone. By doing this, the page will not be blocked from next time.
....

4.5.3.2   Steps on Analytics Server Machine

This chapter is assuming that your JBoss installation directory was **C:\JBoss** and Analytics Server's profile was **default**.

Setup BPM Console integration (Only when BPM Server and Analytics Server were using different hostname or port number)

Please update dashboardConfig.properties.

File location:

```
C:\JBoss\jboss-as\server\default\deploy\ibpmm.war\conf
```

Table 4.3 Parameters

Parameter	Value
dashboard.process.consoleHostName	BPM Server's hostname or IP address
dashboard.process.consolePort	BPM Server's port number
dashboard.process.consoleProtocol	BPM Server's protocol (http/https)

Setup Model API client

No need to configure at this step if your application server was JBoss.

Setup integration modules

Please setup integration JAR files to Analytics Server.

1. Login to the Management Console of Analytics Server. And open Integration Module Management page.

```
Analytics System > System Settings > Integration Module Management
```

2. Add iFlow.jar which was copied from BPM Server machine.

3. Add JDBC driver to connect to BPM Server's database.

```
ojdbc6.jar
```

4. Add JBoss' JAR.

```
C:\JBoss\jboss-as\client\jboss-client.jar (If BPM Server was different machine)
C:\JBoss\jboss-as\client\jboss-ha-legacy-client.jar (If BPM Server was different machine)
C:\JBoss\jboss-as\client\jboss-messaging-client.jar
C:\JBoss\jboss-as\client\jboss-remoting.jar
```

5. Restart JBoss.

Setup BPMFlow Sensor

Please setup BPMFlow Sensor.

1. Open the Management Console of Analytics' modify BPMConnection page.

   Analytics System > Sensor Management > <Sensor name> > BPMConnection

2. Configure as follows.

Parameter	Value
Server Host Name	BPM Server's hostname (IP address isn't allowed to connect to remote machine's JBoss)
Super user name/password	BPM Server's super user ID and password
Naming Service Vendor	JBoss application server
DB type	Oracle
URL	BPM Server's database access JDBC URL
Username/Password	BPM Server's database user name and password
JMS Connection URL	jnp://<BPM Server's hostname>:1100
Naming Service Connection URL	jnp://<BPM Server's hostname>:1100
Username/Password	Don't change
Use SSO authentication	Don't change
OpenID Provider Endpoint URL	Don't change
OpenID format	Don't change
Tenant	Don't change
Pushing Event Intervals (secs)	Don't change

3. Click Test Connection button. If test was success, click Modify button. (If test was failed, click Modify button anyway. By doing so, the changes can be reused at the next time)

4. Check BPMFlow's checkbox and click Start button.

Confirmation

If BPMFlow Sensor's Test Connection was succeeded, integration settings are correct so far.

Create BPM Process analyst user

Please create users for BPM process analyst.

1. Open Management Console of Analytics' Create User page.

```
Analytics System > System Settings > User Management > Create User
```

2. Set User ID as following format.

```
<Tenant User ID>@<Tenant Name>
```

   For example: ibpm_server1@Default

3. Set following groups.

    - Dashboard User (to get Analytics Server's information from BPM Console)

    - Studio Super User (to create Studio Elements at Analytics Studio)

4. Click Create button.

Create Studio elements

To define how process data to be shown in BPM Console, please login to Analytics Console and open Analytics Studio. Then, please create/modify following elements.

Define a Collection Rule:

Right click at BPM Collection Rule in the elements tree and select Edit. Then, edit the element as follows:

Details	Change if needed.
Data Collection	1. Click data source icon. 2. Expand process tree and select it. 3. Click Collect Data button.
Event Mapping	1. Select Process definition. 2. Click New Event button. 3. Enter Event name. Then, click OK.
Timing	Change if needed.

Click the Save button. Then, Click Publish button and select OK. (Saving this element may take a while since related elements are being created in background)

Define an Alert:

Right click at Alerts in the elements tree and select Create New. Then, edit the element as follows:

Create Alert dialog	Name: Any name Rule type: Check parameters (workflow Event)
Details	Change if needed.
Condition	1. Select created Event from Event drop down list. 2. Move mouse cursor over the "Condition" in the Condition area. Then, click "()". 3. Move mouse cursor over the "()" which was created just now. Then, click "Edit". 4. Configure the alert condition and click OK.

Actions	Change if needed.

Click the Save button. Then, Click Publish button and select OK.

Define an Alert Filter:

Right click at Alert Filters in the elements tree and select Create New. Then, edit the element as follows:

Create Alert Filter dialog	Name: Any name
Details	Select created Alert.

Click the Save button, and go to next step.

 Note

··

This element cannot be published alone.

··

Define a Chart:

Right click at Chats in the elements tree and select Create New. Then, edit the element as follows:

Create Chart dialog	Name: Any name
Details	1. At Selected Event area's Event type, select BPM process Event.
	2. For Dimension, select Process instance.
	3. For **Event/Process**, select created Event.
	4. Scroll up and select Event table.
	5. At Active Attribute (for Event table), select all attributes.
Data Range	Change if needed.
Chart Settings	Change if needed.
Sub-Graph Settings	Change if needed.
Options	Change if needed.

Click the Save button. Then, Click Publish button and select OK.

Define a Layout:

Right click at Layouts in the element tree and select Create New. Then, edit the element as follows:

Create Layout dialog	Name: Any name
Details	Drag created Chart from Charts area to Layout Area 1.

Click the Save button, and go to next step.

 Note

··

This element cannot be published alone.

··

Define a Dashboard Profile:

Right click at Dashboard Profiles in the element tree and select Create New. Then, edit the element as follows:

Create Dashboard Profile dialog	Name: Any name
Details	1. Select created Layout at Layout(s) area. 2. Select created Alert Filter at Alert Filter(s) area. 3. Select Event at Process Scope of View area for Scope drop down list. The, select created Event.
Direct Display URLs	Change if needed.
Process Performance Parameters	1. Select created Layout for Layout for monitor. 2. Select created Layout for Layout for analysis.
Process Search Parameters	1. At Search Key Attributes area, click created Event. Then, select all attributes. 2. At Displayed Attributes as Process Contents, click created Event. Then, select all attributes.

Click the Save button. Then, Click Publish button and select OK. (By doing this, the Alert Filter and the Layout which created previous steps are also be published)

Define a Dashboard Group:

Right click at Guest Group in the elements tree and select Edit. Then, edit the element as follows:

Details	Select created Dashboard Profile at Profile(s) area.

Click the Save button. Then, Click Publish button and select OK.

Confirmation

If configuration was correct, you can analyze BPM process at Analytics tab in the BPM Console's Tenant page. Please confirm following points.

🅿 Point
. . . .

Before confirming the configuration, you may want to start some processes in the BPM Console. This makes easy to confirm the configuration because chart and alert will show process data.

. . . .

- Confirm Dashboard

   1. Click Edit Dashboard. Then, click "Save and Next" button till the Report panel.

   2. Select the chart which created in Analytics Studio. Then, click "Save and Next" button.

   3. Select the chart at KPI panel as well. Then, click "Save and Next" button.

   4. Select created Alert Filter at Alert panel. Then, click "Save and Next" button.

   5. Please confirm if Report, KPI and Alert can show process data.

- Confirm Alert

   Click created Alert Filter from Alert tree and show alert list.

   Please confirm if alerts were generated.

   Alerts will be generated when BPMFlow Sensor collected new event. So, if alerts weren't shown, please check sensor status, collection timing and generate new event.

- Confirm Business Reports

    Click created Layout from Business Reports tree and show report.

    Please confirm if process instance list will be shown.

    If process data wasn't shown, please check sensor status and collection timing.

- Confirm Process Performance

    - Monitor

        Check if active process instance status will be shown.

        If process was selected from process list, Processes status will be shown in the button area of the page.

        The processes status will be calculated by every hour. So, calculation may not done yet if BPMFlow Sensor was just started or event data was just collected. In that case, please wait until the calculation timing.

    - Analysis

        This display will show non-active and active process instance status.

        The processes status for this display will be calculated by every midnight. So, the data won't be shown the day you integrated. Please wait next day to check the result.

- Search Processes

    Click Processes from Search tree.

    Select created Event from Process list box and click Search button.

    Please confirm if your process will be found.

4.5.4   Setting up Analytics Server on Interstage Java EE

This chapter explains how to setup the Analytics Server on Interstage Java EE integrated with Interstge BPM.

When setting up the Analytics Server on Interstage Java EE integrated with Interstge BPM, the steps are different from "Post-Installation Tasks". Please setup the Analytics Server as follows:

1. Create the cluster-config and the cluster:

    Execute following command to create the cluster-config and the cluster after opening command prompt.

    ```
    asadmin copy-config default-config analyticswu-config
    ```

    ```
    asadmin create-cluster --config analyticswu-config --newinstances analytics analyticswu
    ```

2. Setup the JNDI:

    Execute following command to configure the naming service.

    ```
    asadmin set analyticswu.jndi-service.naming-service-url=<hostname>:<IIOP listener port>
    ```

    - hostname, is machine name/IP on which Interstage BPM Server is setup.

    - IIOP listener port is the port number configured for IIOP listener. This value is unique for each server instances in the machine. To view the port number for Interstage BPM Server instance:

        1. In the Interstage JavaEE Management console, select Cluster > Cluster Name > Instance Name > Property. A list of properties for that instance appears.

        2. Use the value of IIOP_LISTENER_PORT property.

3. Setup the JMS:

    - In case setup Analytics Server to the same server machine of BPM Server

        Execute following command to configure the JMS settings:

        ```
        asadmin create-resource-ref --target analyticswu jms/QueueConnectionFactory
        ```

```
asadmin create-resource-ref --target analyticswu jms/TopicConnectionFactory
```

```
asadmin create-resource-ref --target analyticswu jms/NotificationTopic
```

```
asadmin create-resource-ref --target analyticswu jms/SQNotificationTopic
```

- In case setup Analytics Server to the different server machine of BPM Server

    Execute following command to configure the JMS settings:

```
asadmin create-jms-resource --restype javax.jms.QueueConnectionFactory --target analyticswu
jms/QueueConnectionFactory
```

```
asadmin create-jms-resource --restype javax.jms.TopicConnectionFactory --target analyticswu
jms/TopicConnectionFactory
```

```
asadmin create-jms-resource --restype javax.jms.Topic --target analyticswu jms/
NotificationTopic
```

```
asadmin create-jms-resource --restype javax.jms.Topic --target analyticswu jms/
SQNotificationTopic
```

4. Setup the JMS host:

    Execute following command to configure the JMS host settings:

```
asadmin set analyticswu.jms-service.jms-host.default_JMS_host.host=<hostname>
```

```
asadmin set analyticswu.jms-service.jms-host.default_JMS_host.port=<port>
```

- hostname is machine name/IP on which the message broker.

- port is port number of the message broker. The default value is 7676.

5. Create EAR file:

    Add the jar-files of Model API to ibpmm.war which is the web application archive of Analytics Server.

    Execute following command to add the jar-files:

    On Windows:

```
cd "<BPM-A installation directory>\bpmm\war"
```

```
mkdir WEB-INF\lib
```

```
copy <Interstage BPM engine directory>\client\lib\iFlow.jar WEB-INF\lib
```

```
copy <Interstage BPM engine directory>\client\lib\js.jar WEB-INF\lib
```

```
jar -uf ibpmm.war WEB-INF/lib/iFlow.jar WEB-INF/lib/js.jar
```

The default value of <BPM-A installation directory> is C:\Program files (x86)\Fujitsu\BPM-A.

On Linux:

```
cd /opt/FJSVibpma/war
```

```
mkdir WEB-INF/lib
```

```
cp <Interstage BPM engine directory>/client/lib/iFlow.jar WEB-INF/lib
```

```
cp <Interstage BPM engine directory>/client/lib/js.jar WEB-INF/lib
```

```
jar -uf ibpmm.war WEB-INF/lib/iFlow.jar WEB-INF/lib/js.jar
```

Then, create an EAR file.

On Windows:

```
copy <Interstage BPM engine directory>\client\lib\fujitsu-ibpm-engine-model-ejb.jar .
```

```
jar cf analytics.ear fujitsu-ibpm-engine-model-ejb.jar ibpmm.war
```

On Linux:

```
cp <Interstage BPM engine directory>/client/lib/fujitsu-ibpm-engine-model-ejb.jar .
```

```
jar cf analytics.ear fujitsu-ibpm-engine-model-ejb.jar ibpmm.war
```

6. Deploy EAR file:

Execute following command to deploy analytics.ear to Interstage Java EE.

```
asadmin deploy --name analytics --target analyticswu analytics.ear
```

7. Start the cluster:

Execute following command to start the Analytics Server:

```
asadmin start-cluster analyticswu
```

Chapter 5   Uninstalling Analytics

This chapter explains how to uninstall Interstage Business Process Manager Analytics (BPMA).

5.1 Prerequisites for Uninstalling Analytics

This section covers the key tasks that must be performed before you uninstall Analytics.

5.1.1   Deleting Analytics Server

If you use Interstage JavaEE, WebLogic, WebSphere or JBoss as the Application Server, first delete the Analytics Server from Application Server, and then, uninstall the Analytics software. Next, delete the deployment directory, ibpmm.war, if it exists.

5.2 Uninstalling Analytics from Windows

Use the following procedure for removing Analytics from a Windows Server system.

1. Log in, with Administrator privileges, to the computer on which you will be performing the uninstallation.

2. From the taskbar, click **Start** > **Control Panel** to display the Control Panel window.

3. Click **Uninstall a program** to display the Uninstall or change a program window. This window lists the software currently installed on the computer.

4. From the given list, select **Interstage Business Process Manager Analytics** and click **Uninstall**. Doing this will launch the uninstallation wizard.

5. Follow the onscreen instructions to remove Analytics.

5.3 Uninstalling Analytics from Linux

Use the following procedure for removing Analytics from a Linux-based system.

1. Log in, with root privileges, to the computer on which you will be performing the uninstallation.

2. Mount the CD-ROM to the system.

3. Move to the following directory:

   # cd /media/ANALYTICS/

4. Execute the uninstall script:

   # /bin/sh uninstall.sh

5. Follow the prompts on the screen to remove Analytics.

5.4 Post-Uninstallation Tasks

This section describes the tasks that must be performed after you have removed the Analytics software from the server.

5.4.1   Deleting the Analytics Databases

Delete the following databases after the Analytics software has been removed.

- Events database

- Archive database

- Process Discovery database

Deleting the Events database

Delete each of the following areas that were prepared when the Events Database was created.

Database	Special-purpose areas prepared
Oracle	Tablespace (table area)
SQL Server	Database
PostgreSQL	Database

Perform the deletion procedures described in the respective database manuals.

See

Refer to *"Deleting the built-in database"* to remove built-in database from Analytics Server.

Note

- For Oracle, check whether or not the tablespace is used as the default table area by other users. If a table space was used as a default table area by another user is deleted, an error will occur when the user creates a table.

- If the Events Database was not created in a special-purpose area, the above areas cannot be deleted. In this case, if you want to delete the data, each of the tables generated by the Analytics Server's operations must be deleted individually.

Deleting the Archive database

Delete the areas prepared as special-purpose areas in the same way as for the Events Database.

Note

If the Archive database was not created in a special-purpose area, the above areas cannot be deleted. In this case, if you want to delete the data, each of the tables generated by the Analytics Server's operations must be deleted individually.

Deleting the Process Discovery database

Delete the areas prepared as special-purpose areas in the same way as for the Events Database.

Note

If the Process Discovery database was not created in a special-purpose area, the above areas cannot be deleted. In this case, if you want to delete the data, each of the tables generated by the Analytics Server's operations must be deleted individually.

5.4.2 Deleting the built-in database

In case you have selected built-in database during Analytics Server install, remove resources of built-in database as necessary.

On Windows:

Following resources may exist after uninstall. Please delete all the resources if exists.

- Database space store directory
  c:/ProgramData/Fujitsu/BPM-A/eventdb

- OS user for the built-in database (bpmapgs)
  Following user home directory may exist after uninstall. Please delete all the directories if exists.
  c:/Users/bpmapgs

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On Linux:

Following resources may exist after uninstall. Please delete all the resources if exists.

- Database space store directory
  /var/opt/FJSVibpma/eventdb

- OS user for the built-in database (bpmapgs)

Note

If migrating from V12.0 according to the *Migration Guide*, please delete the built-in database following the former manual (Refer to "6.5.2 Deleting the built-in database" in the *Interstage Business Process Manager Analytics V12.0 Installation Guide*).

Appendix A Required Resources

This appendix lists the resources required for installing the Interstage Business Process Manager Analytics (BPMA) and how to estimate these resources.

A.1 Disk Space Required at Installation

The following table shows the free space required at the time of installation.

Functions being installed	Free space required for installation
Server function	600 MB

A.2 Save Area for Monitoring Settings Data

The following table shows the amount of free space required as a save area for the monitoring settings data managed by the Analytics Server.

Save area for monitoring settings data	Required free space
On the Analytics Server	10 MB

A.3 Work Areas

Work areas are for temporary storage of events collected by the sensor and for holding settings information. They are not stored in databases.

This section describes how to estimate the work areas specified during installation of the Analytics Server and the sensor.

A.3.1 Overview(RDB Sensor, Text File Sensor)

When these sensors transfer a lot of event to the Analytics Server at the same time, these events, which are waiting state of being inserted to internal database, are written to the work area as pooled events.

If the process of storing the pooled events in the Events database fails, events may be output to the work area as error files. They will remain there till they are successfully re-registered manually.

For these sensors, allocate the "server work area" estimated size.

A.3.2 Overview(BPM Sensor, ISI Sensor)

When these sensors transfer events to the Analytics Server, it transfers multiple events together. This reduces processing costs between the sensor and Analytics Server and improves performance. To achieve this, the sensor collects events and transfers them at fixed intervals. This interval is called the "*Event transfer interval*" and is set from the Management Console.

The server side receives event notifications from the sensor and stores them in the Events database. The Events database storage is asynchronous to the reception of the event notification from the sensor. Therefore, after the notification, events are written to the work area as pooled events till they are stored in the Events database. When the process of storing the events in the Events data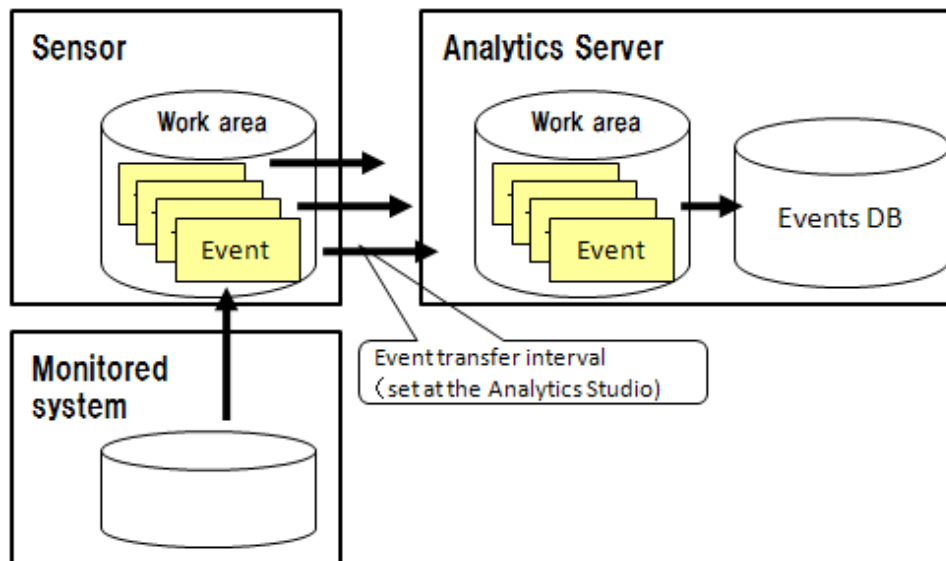base is attempted, events are deleted. If the process of storing the pooled events in the Events database fails, events may be output to the work area as error files. They will remain there till they are successfully re-registered manually.

For these sensors, allocate the work area size to be the total size of the estimates for the "*server work area*" and "sensor work area".

A.3.3　Estimating the Sensor Work Area

Use the following formula to calculate the size of the work area.

```
Required area size = Total of the work area sizes required for one event transfer interval from each
sensor
```

Work area size required for one event transfer interval

Use the following formula to calculate the work area size required for one event transfer interval.

```
Work area size required for one event transfer interval =
 average number of events * event transfer interval * average event size * 1.5
```

1.5: Safety coefficient (because collection is also performed during transfer, a value with a margin for error must be estimated)

Average number of events

This is the average number of events collected by the sensor in one minute. This value is used as the "*total of the average number of events collected for the task per minute*" and is calculated using the following formula.

```
Average number of events collected for the task per minute = Number of events collected from one
execution / execution interval (minutes)
```

Event transfer interval

This is the interval at which pooled events are transferred from the sensor to the Analytics Server. The event transfer interval is set separately for each sensor from the Management Console. The unit is "seconds".

Average event size

This is the area used by one pooled event.
The data type of attributes must be taken into account when calculating the average event size.

The following table shows the attribute length for each data type.

Data type	Attribute length (bytes) (data length + appended information)
Character string	Length of character string data in UTF-8 encoding + 50

Data type	Attribute length (bytes) (data length + appended information)
Integer	Depends on the number of digits in the value + 50
Real number	Depends on the value + 50
Boolean	50
Date and time	80
Date	60
Time	60

Example of calculating the required area size

An example of calculating the required area size is shown below.

Average event size

Use the following formula to calculate the average event size.

```
Average event size = Task name (*1) + event name (*1) + total of average attribute length of each
attribute + 270 (bytes)
```

*1: Length in UTF-8 encoding

This example assumes the following attributes.

Attribute	Length
Task name	36 bytes
Event name	36 bytes
Average attribute length of character string type attribute A	150 bytes
Average attribute length of character string type attribute B	200 bytes
Average attribute length of character string type attribute C	250 bytes
Average attribute length of integer type attribute D	60 bytes
Average attribute length of integer type attribute E	60 bytes
Average attribute length of date and time type attribute F	60 bytes
Attribute name length	Uniformly 30 bytes

The formula is as follows.

```
Average event size
= Task name (36) + event name (36) + total of each attribute length (attribute name length (30) * 6
+ 780) + 270
= 1302 bytes = approx 1.31 Kbyte
```

Average number of events

The average number of events that the sensor collects each minute is the "*total of the average number of events collected for the task each minute*". In this example, the following tasks are set for Sensor A.

Task	Execution schedule	Average number of items collected	Average number of events collected per minute
Task A	Collected at 2 minute intervals	Average of 100 items collected each time	50 events
Task B	Collected at 5 minute intervals	Average of 50 items collected each time	10 events
Task C	Collected at 4 minute intervals	Average of 80 items collected each time	30 events

The average number of events that the sensor collects each minute is as follows.

```
Average number of events
= 50 + 10 + 30
= 90 (events)
```

Work area size required for one event transfer interval

The following table shows the requirements for various transfer intervals.

Event transfer interval	Formula	Required work area size
2 minutes	Average number of events (90) * transfer interval (2) * average size (1.31) * safety coefficient (1.5) = 353.7	About 354 (Kbytes)
5 minutes	Average number of events (90) * transfer interval (5) * average size (1.31) * safety coefficient (1.5) = 884.35	About 885 (Kbytes)
60 minutes	Average number of events (90) * transfer interval (60) * average size (1.31) * safety coefficient (1.5) = 10611	About 10.4 (Mbytes)
8 hours	Average number of events (90) * transfer interval (8 * 60) * average size (1.31) * safety coefficient (1.5) = 84888	About 82.9 (Mbytes)
24 hours	Average number of events (90) * transfer interval (24 * 60) * average size (1.31) * safety coefficient (1.5) = 254664	About 248.7 (Mbytes)

Example of calculation assuming operation when communication with the server is not possible

In the above example, it is assumed that server operations are stopped one hour for maintenance, from 02:00 to 03:00. In this case, the area used by Sensor A (event transfer interval: 2 minutes) for pooled events at night is as follows.

```
Size of required work area (354 Kbyte) * server stopped duration (1 * 60)
= 21240 (Kbyte) = approx 2.1 (Mbyte)
```

📓 Note
. . . .
If the Analytics Server is stopped for a long time, stop the sensor as well. When only the sensor is running, events are pooled in the work area directory and a resource shortage may occur.
. . . .

A.3.4   Estimating the Server Work Area

Event notifications from the sensor are implemented in accordance with the event transfer interval of each sensor. Therefore, use the following formula to calculate the size for the work area.

```
Required area size(BPM Sensor, ISI Sensor) = Sum of maximum event capacity * safety coefficient
```

```
Required area size(RDB Sensor, Text File Sensor) =  Max event count(1000000)* total of each attribute
length *safety coefficient
```

Maximum event capacity

The maximum event capacity indicates the maximum case of "*number of events notified * average event size*". This value can be calculated by adding the value for each sensor.

Safety coefficient

The safety coefficient takes into account the possibility of subsequent events being notified before all the previously notified events are stored. Therefore, a safety coefficient value of 2 or more is recommended.

Example of calculating the required area size(BPM Sensor, ISI Sensor)

The required work area size can be calculated by multiplying the total amount of space used for events at each of the sensors by the safety coefficient. Refer to Section A.3.2, "A.3.3 Estimating the Sensor Work Area", for the formula to calculate the amount of space used for events at the sensor.

Each required area size are as follows.

```
Required area size (BPM Sensor, ISI Sensor)
= Total of maximum event capacity for events notified by each sensor (2.1 Mbyte * 4) * safety
coefficient (2)
= 16.8 (Mbyte) = approx17 (Mbyte)
```

```
Required area size (RDB Sensor, Text File Sensor)
= Max event count(1000000)* total of each attribute length(180byte) *safety coefficient(2)
= approx360 (Mbyte)
```

Example of calculating an estimate if an error is assumed

An example of calculating an estimate when the following types of errors are assumed is described below.

- Data value error (for example, the maximum length of a character string in a database column is exceeded)

- Event definition does not exist (for example, event definition was deleted or a different event name was notified)

Normally, these cases do not occur, but if an "*Event definition does not exist*" error does occur, pooled events continue to accumulate till the task is ended to resolve the error. It is recommended that you prepare an amount of free space that takes into account the amount of time till the task is ended to resolve the error.

If the definition was accidentally deleted for an event collected by a sensor and if the error continues for one day, the following area is required.

```
Required area size
= Work area size required for one event transfer interval (354 Kbyte) * duration of error (24 * 60)/
event transfer interval (2)
= 254880 (Kbyte) = approx 249 (Mbyte)
```

A.4   Work Area for Process Discovery functionalities

Process Discovery disposes cache data for prompt access and copy of CSV files in work area. Due to this behavior, Analytics Server is required to prepare enough vacant space in work area.

Comparing with size of CSV files which is specified at Process Generator tool, more than ten times of that is recommended.

Appendix B   Required Disk Size for Database

This appendix covers the disk size requirements for the Interstage Business Process Manager Analytics (BPMA) database.

Please refer to B.1 Summary of Disk Size (Common for all Databases) to confirm approximate amount of volume of disk which database requires, refer to B.2 Database Size for each Operation Pattern (Common for all Databases) to confirm actual amount of volume from some of the typical examples.

B.1   Summary of Disk Size (Common for all Databases)

This section provides an estimate of the disk size required for configuring the Analytics database in a sample business environment with the following specification.

Target systems	Database (2 tables) + Workflow (10 flows)
Alert rules	10 rules
Statistic rules	10 rules
Data incidence	100 events a day
Data maintenance period	3 years (600,000 events)

Required disk size: 10-50 GB

B.2   Database Size for each Operation Pattern (Common for all Databases)

This section covers the disk size requirement for each operation pattern.

B.2.1   Pattern 1 : Small-Scale Database Monitoring

Target systems	Database (1 table)
Data incidence	1000 events a day
Data maintenance period	1 year (365,000 events)
Alert rules	10 rules (assumed alert rate: 0.1%, non escalation)
Statistic rules	1 rule
Frequency of execution a statistic rule	one time a day
Number of sections	3
Number of commodities	100
Average number of business data	5
Average number of statistic data	5

[monitoring policy]

- Delete from the Archive database after a year has passed.

- Data maintenance period of statistics event is one year.

Required disk size: 5-6 GB (if the data maintenance period is 3 years: 5-8 GB)

B.2.2   Pattern 2 : Large-Scale Database Monitoring

Target systems	Database (5 tables)
Data incidence	300,000 events a day
Data maintenance period	3 years (100,000,000 events)
Alert rules	20 rules (assumed alert rate: 0.5%, action rate to occurred alerts: 10%)
Statistic rules	5 rules
Frequency of execution a statistic rule	two times a day
Number of sections	10
Number of commodity division *	100 (number of commodities: 10,000)
Average number of business data	20
Average number of statistic data	5

[monitoring policy]

- Delete from the Archive database after half a year has passed.

- Data maintenance period of statistics event is 3 years.

Required disk size: 5-10 GB

Required disk size (when * is 1000): 40-50 GB

Required disk size (when * is 10000): 150─200 GB

B.2.3   Pattern 3 : Small-Scale Workflow System Monitoring

Target systems	workflow (2 flows)
Number of process	100 a day
Data maintenance period	1 year
Alert rules	10 rules (assumed alert rate: 0.5%, non escalation)
Number of activities	10
Average number of attributes	5

[monitoring policy]

- Data maintenance period of statistics event is one year.

Required disk size: 5-6 GB (if the data maintenance period is 3 years: 5-8 GB)

B.2.4   Pattern 4 : Large-Scale Workflow System Monitoring

Target systems	workflow (10 flows)
Number of process	10,000 a day
Data maintenance period	3 year
Alert rules	20 rules

Number of activities	20
Number of applications	2
Average number of attributes	20 (assumed alert rate: 0.5%, action rate to occurred alerts: 10%)

[monitoring policy]

- Data maintenance period of statistics event is 3 year.

Required disk size: 500—700 GB

B.2.5　Pattern5 : Business Analysis using Process Discovery

Number of CSV terms	10
Number of lines in CSV files (Number of Events)	100,000
Number of Event Name Items	1
Number of Timestamp Items	1
Number of Property Items for Analysis	3
Size of CSV file	10MB

Required disk size: 100MB

Appendix C   Customizing System Table Parameters

This appendix explains how to customize the parameters of the Interstage Business Process Manager Analytics (BPMA) database.

Table creation scripts are installed in the following folder:

On Windows:

[*Installation directory*]/bpmm/dbscripts/oracle/bpm-user-oracle.sql

(c:/Program Files (x86)/Fujitsu/BPM-A)

On Linux:

[*Installation directory*]/dbscripts/oracle/bpm-user-oracle.sql

(/opt/FJSVibpma)

C.1   Using Oracle

C.1.1   Preparing the Events Database

To create a table in the Events database, execute the sample script, as shown below.

Tables must be created in the default schema of the user who accesses the database. Log on to the database, and execute the sample script. For details about the type of user who can log into the database, refer to "Creating a user (Oracle)" in Chapter 4, "Installing and Setting Up Analytics".

The sample script uses the tablespace name "USERS". Before executing the script, open the script in a text editor and edit the tablespace name, as described in "Creating a tablespace" in Chapter 4, "Installing and Setting Up Analytics".

Sample script (bpm-schema-oracle.sql)

To change the tablespace name or size, modify the underlined portions of the following sample script for each table and index.

```
-- Event DB table creation script for Oracle
--
--Adjust the TABLESPACE specification and the data area size as necessary.
-- COPYRIGHT FUJITSU LIMITED 2011

CREATE TABLE B_Version (
) TABLESPACE USERS(*1);

CREATE TABLE B_IdHolder (
) TABLESPACE USERS(*1);

CREATE TABLE B_Alert (
) TABLESPACE USERS(*1) PCTFREE 10 PCTUSED 20 STORAGE(INITIAL 10M(*2) NEXT 10M(*3));

CREATE TABLE B_EscResult (
) TABLESPACE USERS(*1) PCTFREE 10 PCTUSED 20 STORAGE(INITIAL 10M(*2) NEXT 10M(*3));

CREATE UNIQUE INDEX B_Alert_key1 ON B_Alert (AlertId) TABLESPACE USERS(*1);
CREATE INDEX B_Alert_key2 ON B_Alert (RuleId) TABLESPACE USERS(*1);

CREATE UNIQUE INDEX B_EscResult_Key1 ON B_EscResult (Id) TABLESPACE USERS(*1);
CREATE INDEX B_EscResult_Key2 ON B_EscResult (AlertId) TABLESPACE USERS(*1);

INSERT INTO B_Version(Version, CreationTime, LastUpdateTime)
  VALUES('9.0.0.0', CURRENT_TIMESTAMP, CURRENT_TIMESTAMP);

COMMIT;
```

*1: Tablespace name

*2: Default tablespace size

*3: Extended tablespace size

C.1.2   Preparing the Process Discovery Database

Script for creating Process Discovery Database is stored in the following directory.

On Windows:

[*Installation directory*]/bpme/dbscripts/oracle/bpme-schema_create.sql

(c:/Program Files (x86)/Fujitsu/BPM-A)

On Linux:

[*Installation directory*]/bpme/dbscripts/oracle/bpme-schema_create.sql

(/opt/FJSVibpma)

Refer to C.1.1 Preparing the Events Database for modification of this script.

C.2   Using SQL Server

C.2.1   Preparing the Events Database

For SQL Server 2008/2012

Use the SQL Server Management Studio to create tables within the Events database as described in the following procedure.

Create tables using the same user privileges as described in "Creating a user (SQL Server)" in Chapter 4, "Installing and Setting Up Analytics".

1. Start the SQL Server Management Studio.

2. Click **File** > **Open**, and then, open the "bpm-schema-sqlserver.sql" file.

3. Connect to the database engine by entering the server name and authentication information in the **Connect to Database Engine** dialog box.

4. Select the database from which tables for the Events database will be created.

5. Click **Query** > **Run** to execute the table creation process. Then, the message "**Command terminated normally**" displays.

6. Click **View** > **Object Explorer**, and verify that the table has been created.

C.3   Using PostgreSQL

C.3.1   Preparing the Events Database

To create a table in the Events database, execute the sample script, as shown below. The sample script should be executed by the operating system user that started the PostgreSQL server.

To execute the sample script, use **psql** command as follows:

```
Psql dabasename < bpm-schema-postgresql.sql
```

C.3.2   Preparing the Process Discovery Database

Script for creating Process Discovery Database is stored in the following directory.

On Windows:

[*Installation directory*]/bpme/dbscripts/postgresql/bpme-schema_create.sql

(C:/Program Files (x86)/Fujitsu/BPM-A)

On Linux:

[*Installation directory*]/bpme/dbscripts/postresqlbpme-schema_create.sql

(/opt/FJSVibpma)

C.4　Preparing the Archive Database

For the Archive database, imitate the sample script of the Events database.

🍄 Note
....
Do not use the same schema or the same user for the Events and Archive database.
....

Appendix D   Automatically Generated Parameter Values

D.1   Parameter Values for Oracle

Create Location

Parameter	Description
Tablespace name	Tablespace name specified in the Management Console; if omitted, the default tablespace name for the user is used
Schema	User name specified by the database connection information

Parameter Values Automatically Set for Tables

Parameter	Default Value for Oracle	Value Specified in a Script
Data block size	8192 bytes	Not specified
First extent size	5 data blocks	10M
Second extent size	5 data blocks	10M
Increasing rate compared to the immediately preceding extent	50%	Not specified
PCTUSER	This parameter is ignored if the automatic segment space management for the tablespace is enabled. (*1)	20%
PCTFREE	10%	10%

*1: By default, the automatic segment space management for tablespaces is enabled.

Parameter Values Automatically Set for Indexes

Parameter	Default Value for Oracle	Value Specified in a Script
Data block size	8192 bytes	Not specified
First extent size	5 data blocks	10M
Second extent size	5 data blocks	10M
Increasing rate compared to the immediately preceding extent	50%	Not specified
PCTUSER	This parameter is ignored if the automatic segment space management for the tablespace is enabled. (*1)	Not specified
PCTFREE	10%	Not specified

*1: By default, the automatic segment space management for tablespaces is enabled.

D.2   Parameter Values for SQL Server

Creation Location

Parameter	Description
Database space	Parameter is stored in the data file specified in the JDBC URL
Schema	Default schema specified for the JDBC connection user is used; this is "dbo" unless changed

Parameter Values Automatically Set for Tables

Parameter	Default Value for Oracle	Value Specified in a Script
Storage structure	Heap structure	Not specified
Page length for the data part	8K (cannot be changed)	Not specified

Parameter Values Automatically Set for Indexes

Parameter	Default Value for Oracle	Value Specified in a Script
Storage structure	Heap structure	Not specified
Page length for the data part	8K (cannot be changed)	Not specified

D.3   Parameter Values for PostgreSQL

Creation Location

Parameter	Description
Tablespace name	pg_default (If creating a database with a tablespace, the given tablesapce will be used.)
Schema	public

Parameter Values Automatically Set for Tables

Parameter	Default Value for Oracle	Value Specified in a Script
FILLFACTOR	100	Not specified
DEFERRABLE NOT DEFERRABLE	NOT DEFERRABLE	Not specified
INITIALLY IMMEDIATE INITIALLY DEFERRED	INITIALLY IMMEDIATE	Not specified
WITH (OIDS) WITH (OIDS=FALSE)	OIDS=FALSE (relys on **default_with_oids** setting parameter)	Not specified

Parameter Values Automatically Set for Indexes

Parameter	Default Value for Oracle	Value Specified in a Script
Access method	BTREE	Not specified