IBM Predictive Maintenance and Quality

Installation Guide

IBM

> **Note**
> Before you use this information and the product it supports, read the information in "Notices."

Contents

Introduction

IBM® Predictive Maintenance and Quality uses data from multiple sources to give you the information that you need to make informed operational, maintenance, repair, or component replacement decisions.

IBM Predictive Maintenance and Quality provides you with operational intelligence data, which enables you to perform the following tasks:

- Understand, monitor, predict, and control product and process variability.
- Perform in-depth root cause failure analysis.
- Identify incorrect operating practices.
- Enhance equipment and process diagnostics capabilities.

It also provides you with asset performance management capabilities that help you to achieve these goals:

- Have forward visibility into equipment and process performance.
- Increase asset uptime.
- Identify safety issues.
- Identify improper maintenance procedures.
- Optimize maintenance intervals and procedures.

Audience

This document is intended to help users install Predictive Maintenance and Quality.

Finding information

To find documentation on the web, including all translated documentation, access IBM Knowledge Center (http://www.ibm.com/support/knowledgecenter).

Accessibility features

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products. Some of the components included in the IBM Predictive Maintenance and Quality solution have accessibility features. For more information, see Appendix A, "Accessibility features," on page 81.

IBM Predictive Maintenance and Quality HTML documentation has accessibility features. PDF documents are supplemental and, as such, include no added accessibility features.

Forward-looking statements

This documentation describes the current functionality of the product. References to items that are not currently available may be included. No implication of any future availability should be inferred. Any such references are not a commitment, promise, or legal obligation to deliver any material, code, or functionality. The development, release, and timing of features or functionality remain at the sole discretion of IBM.

What's new in version 2.6.2

The following new features are available in IBM Predictive Maintenance and Quality 2.6.2.

Cognos®
> IBM Cognos Business Intelligence was updated to version 11.0.12.

IBM HTTP Server for WebSphere® Application Server
> IBM HTTP Server for WebSphere Application Server was updated to version 9.0.0.9.

IBM MQ
> IBM MQ was updated to version 9.1.

SPSS® Analytics Server

> IBM SPSS Analytics Server was updated to version 3.1.1.

SPSS Collaboration and Deployment Services
> IBM SPSS Collaboration and Deployment Services were updated to version 8.1.1.

SPSS Modeler Server
> IBM SPSS Modeler Server was updated to version 18.1.1.

SPSS Statistics Server
> IBM SPSS Statistics Server was updated to version 25.0.

WebSphere Application Server Network Deployment
> WebSphere Application Server Network Deployment was updated to version 9.0.0.9.

WebSphere Application Server Network Deployment Liberty
> WebSphere Application Server Network Deployment Liberty was updated to version 18.0.0.3.

Chapter 1. Predictive Maintenance and Quality

With IBM Predictive Maintenance and Quality, you can monitor, analyze, and report on information that is gathered from devices. In addition, recommendations for actions can be generated by Predictive Maintenance and Quality.

IBM Predictive Maintenance and Quality is an integrated solution that you can use to perform the following tasks:

- Predict the failure of an instrumented asset so that you can prevent costly unexpected downtime.
- Make adjustments to predictive maintenance schedules and tasks to reduce repair costs and minimize downtime.
- Quickly mine maintenance logs to determine the most effective repair procedures and maintenance cycles.
- Identify the root cause of asset failure faster so that you can take corrective actions.
- Identify quality and reliability issues definitively and in a timely way.

Instrumented assets generate data such as device ID, timestamp, temperature, and status code. This data can be collected and used with maintenance records and other data in models that predict when an asset is likely to fail.

Examples of instrumented assets are manufacturing equipment, mining equipment, drilling equipment, farming equipment, security equipment, cars, trucks, trains, helicopters, engines, cranes, oil platforms, and wind turbines.

For example, an oil refinery is a system that combines thousands of interlocking pieces. It is critical that such a system is able to work safely and efficiently. You can use IBM Predictive Maintenance and Quality to monitor and track the lifecycle of each piece of the refinery, such as each pipe, pump, compressor, valve, furnace, turbine, tank, heat exchange unit, and boiler. Reports give you the information to ensure that you have the necessary parts available and can schedule repairs during periods of inactivity.

Predictive maintenance

In predictive maintenance, you look for patterns in the usage and environmental information for equipment that correlate with failures that take place. This information is used to create predictive models to score incoming new data. You can predict the likelihood of failure. Scores are generated from this information that give you an indication of the health of the piece of equipment. In addition, key performance indicators (KPIs) are collected, which are used for reporting. KPIs help you to identify assets that do not conform to normal patterns of behavior. You can define rules to generate recommendations when a piece of equipment is identified as having a high probability of failure. Recommendations can be fed into other systems so that people are alerted to them automatically.

Predictive quality in manufacturing

Past operations data, environmental data, and historical defect data can be used to identify the causes of elevated defect rates. This information is used in predictive models, so that when incoming data is fed into the models, you can predict the

likely defect rates. The predicted values are then used for analysis and reporting and to drive recommendations such as modification to inspection patterns, or recalibration of machinery. Scoring can be done on a near real-time basis.

Predictive Maintenance and Quality can also detect quality and reliability problems faster than traditional techniques.

Chapter 2. Single-server installation

In a single-server IBM Predictive Maintenance and Quality installation, the components for each node are installed to the same computer. Each node is configured to run on a separate WebSphere Application Server profile.

For example, the Predictive Analytics node components are installed to a WebSphere Application Server profile named **CNDSProfile** that is using port number 9082. Each profile runs on the same WebSphere Application Server instance.

The following table lists the port numbers for the WebSphere Application Server instance:

Table 1. Port numbers for WebSphere Application Servers

Component	Admin port	SSL admin port	Application port
IBM SPSS	61	41	81

Important: A single-server installation should be used only for a test or demonstration environment.

Chapter 3. Multiple-server installation

In a multiple-server installation, each IBM Predictive Maintenance and Quality node provides a specific function for the solution. Each node must be installed on a separate computer or on a separate virtual machine image from other nodes.

The following diagram shows the nodes in a multiple-server architecture.

Client computer

Predictive Maintenance and Quality nodes

Predictive Analytics node:
IBM WebSphere Application Server
SPSS products

Business Intelligence (BI) node:
IBM WebSphere Application Server
IBM HTTP Server
IBM Cognos Business Intelligence

Integration Bus node:
IBM WebSphere MQ
IBM Integration Bus

Data node*:
IBM DB2 database server

*If you choose to use an existing Oracle database server, the Data Node is not deployed.

Figure 1. Predictive Maintenance and Quality nodes

Predictive Analytics node

The Analytics node provides predictive scores and offers recommendations.

This node has the following software installed:
- IBM WebSphere Network Deployment
- IBM SPSS Collaboration and Deployment Services
- IBM SPSS Modeler Server
- IBM SPSS Modeler Solution Publisher
- IBM SPSS Modeler Server Premium
- IBM SPSS Data Access Pack
- IBM SPSS Modeler Collaboration and Deployment Services Adapter

- IBM SPSS Decision Management
- IBM SPSS Statistics Server
- IBM SPSS Statistics Collaboration and Deployment Services Adapter
- IBM DB2® Client (not installed for Oracle Database server installation type)

Business Intelligence (BI) node

The IIB node provides dashboards and reports.

This node has the following software installed:
- IBM Cognos Business Intelligence
- IBM DB2 Client

Integration Bus node

The Integration Bus node processes events, updates the content for IBM Cognos Business Intelligence, and triggers predictive scoring and decision management. It also loads master data into the solution.

This node has the following software installed:
- IBM WebSphere MQ
- IBM Integration Bus
- IBM Integration Explorer
- IBM Integration Bus ODBC Database Extender
- IBM DB2 Client
- IBM WebSphere Network Deployment
- IBM HTTP Server

Data node

The data node provides the database server that contains the databases that are used by other products in the solution. The database acts as an event store and holds calculated key performance indicators (KPIs) and profiles. It also contains supporting master data for the solution.

This node has the following software installed:
- IBM DB2 Enterprise Server Edition

If you choose to use your own Oracle Database server for your Predictive Maintenance and Quality data and reports, then your deployment does not need a separate data node computer. IBM DB2 Enterprise Server Edition is installed on the analytics node and is used for the SPSS and IBM Cognos content store databases.

Chapter 4. High-availability installation

You can choose to copy the installation programs for all of the IBM Predictive Maintenance and Quality component programs to a computer, and then manually install the components individually.

This option does not install the programs or configure them. The installation and configuration must be done manually. Use this option to deploy Predictive Maintenance and Quality if you have specific configuration requirements that are not available from the single-server or multiple-server options in the Predictive Maintenance and Quality solution installer. For information on how to install the individual components, refer to the component product documentation.

Chapter 5. Prerequisites and installation preparation

Before you install IBM Predictive Maintenance and Quality, ensure that the computers that you use meet the minimum requirements for operating systems, prerequisite software, processing, and disk space.

Important: The computers or virtual machines that you use for Predictive Maintenance and Quality nodes must not have any of the included software already installed.

Supported operating systems and hardware requirements

Review the minimum hardware and operating system requirements before you install IBM Predictive Maintenance and Quality. The requirements apply for all computers or virtual machines that you use for the installation.

For an up-to-date list of environments that are supported by Predictive Maintenance and Quality, see the IBM Software Product Compatibility Reports.

Server computers

The Predictive Maintenance and Quality server components must be installed on computers that are running the 64-bit Red Hat Enterprise Linux Server Edition version 7.2 (x86_64) operating system.

Hardware requirements for a multiple server environment

At a minimum, each computer or virtual machine that hosts a Predictive Maintenance and Quality server component, or node, must have the following hardware requirements:
- 4 processors
- 8 GB of RAM
- 500 GB of hard disk space

The computer from which you run the installation must have sufficient disk space that is allotted to the / directory. For the computer where you are running the installation, the minimum recommended disk space for the / directory is 150 GB. Each node computer should have a minimum of 100 GB of disk space that is allocated to the / directory.

Important: If you are installing from the universal serial bus (USB) hard disk drive, you must have 300 GB of disk space allocated to the / directory.

If you are expecting to store large volumes of data, you might need to increase your disk size.

Each node must be installed on a separate computer or on a separate virtual machine image.

The home directory on the database node must have a minimum of 30 GB.

The temporary location of the solution installer is `/var/chef/cache`. To accommodate the solution installer files, there must be a minimum of 100 GB on `/var`.

Hardware requirements for a single-server environment

At a minimum, the computer or virtual machine on which you install Predictive Maintenance and Quality must have the following hardware requirements:

- 4 processors
- 8 GB of RAM
- 500 GB of hard disk space

The computer from which you run the installation must have sufficient disk space that is allotted to the / directory. For the computer where you are running the installation, the minimum recommended disk space for the / directory is 400 GB.

Important: A single-server installation should be used only for a test or demonstration environment.

User requirements

You must have **root** or **sudo** access to all of the computers on which you install a Predictive Maintenance and Quality node, including the computer from which you run the installation.

Installation directory requirements

The file paths that you specify in the solution installer must not include your user home directory. For example, if you are a sudo user called "sample", your home directory is /home/sample. Do not include this path in the file paths that you specify when you are configuring the nodes in solution installer.

Oracle Database

To use Oracle Database for your Predictive Maintenance and Quality data and reports, instead of IBM DB2, ensure that you have completed the following requirements:

Install Oracle Database 12c
Install and configure Oracle Database 12c Release 1 (12.1.0.2.0) Enterprise Edition for Microsoft Windows (x64). Ensure that it is available in your network and that you can connect to it.

Install Oracle Database Client
Install Oracle Database Client on the computer that you will use as the IIB node. When you install Oracle Database Client, select the Java™ 6 option.

Client computers

The Predictive Maintenance and Quality client components must be installed on computers that run Microsoft Windows 7 or Microsoft Windows 8 operating systems.

At a minimum, the computer where you run the Deployment Wizard for the client components must have the following hardware requirements:

- 2 processors
- 4 GB of RAM
- 200 GB of hard disk space

Modifying the sudoers file for the user who runs the installation

To run the IBM Predictive Maintenance and Quality installation you must be either **root** user or have **sudo** permission on each node computer.

To install with **sudo** user permissions, you must also add the user to the sudoers file.

Procedure

1. Log in as **root** user.
2. Enter the following command to open the sudoers file for editing:

   `visudo -f /etc/sudoers`
3. At the end of the file, add the following line for your user:

   username `ALL=(ALL) ALL`
4. Press the Esc key, and enter `:wq` to save and close the file.
5. Repeat these steps on each computer on which you install a Predictive Maintenance and Quality node.

Disabling requiretty

Before you install the product, you must disable the requiretty in the /etc/sudoers file.

About this task

You disable requiretty on every node, including the staging node, in the /etc/sudoers file.

Procedure

1. Log in as root user.
2. To open the sudoers file for editing, enter the following command:

   `visudo -f /etc/sudoers`.
3. Go to the "Defaults requiretty" line and add a number sign (#) to the beginning of the line.

What to do next

Repeat these steps on each computer that you are going to install the product.

Installing required operating system packages for all nodes

Specific operating system packages must be installed on each computer or virtual machine where you install an IBM Predictive Maintenance and Quality node.

Ensure that the following packages are installed on every node in your deployment. These are the minimum versions required:

- `compat-libstdc++-33-3.2.3-72.el7.i686.rpm`
- `compat-libstdc++-33-3.2.3-72.el7.x86_64.rpm`
- `pam-1.1.8-18.el7.i686.rpm`
- `nfs-utils.rpm`
- `libaio.x86_64.rpm`
- `dos2unix.x86_64.rpm`

- `unzip.x86_64.rpm`
- `sed.x86_64.rpm`
- `openssl.x86_64.rpm`
- `libstdc++.i686.rpm`
- `libstdc++.x86_64.rpm`

You can download the packages from a site such as pkgs.org or rpm.pbone.net.

Procedure

1. Log on to the computer as the **root** user or as a user with **sudo** permissions.
2. Type the following command to verify that an operating system package is installed:

   `rpm -qi` *full_package_name*

   For example, to verify that `compat-libstdc++-33-3.2.3-69.el6.i686.rpm` is installed, type `rpm -qi compat-libstdc++-33-3.2.3-69.el6.i686`.

   Note: You might have to use `sudo` to run the command successfully. For example, enter `sudo rpm -qi` *full_package_name*.
3. Install any package that is not already installed.

   You must download any missing package, and then install the downloaded package by typing the following command:

   Note: Download the latest version if the version of the package is not specified in the packages list.

   `rpm -ihv` *full_package_name*`.rpm`

   For example, to install `ccompat-libstdc++-33-3.2.3-72.el7.i686.rpm`, type `rpm -ihv compat-libstdc++-33-3.2.3-72.el7.i686.rpm`.

   To install `pam-1.1.1-18.el7.i686.rpm`, use the following command: `rpm -ihv -force pam-1.1.8-18.el7.i686.rpm`.
4. Repeat these steps on each computer on which you install a Predictive Maintenance and Quality node.

   If you have yum repositories configured for your Linux operating system computers, you can use the following command to install all of the prerequisite RPMs:

   `yum -y install --setopt=protected_multilib=false compat-libstdc++-33.i686 compat-libstdc++-33.x86_64 pam.i686 nfs* libaio dos2unix unzip sed openssl.x86_64 libstdc++.i686 libstdc++.x86_64`
5. If there are messages that show a conflict with the x86_64 version and the i686 version for certain rpm. You must install the x86_64 version and then install the i686 version.

Installing required operating system packages on the IIB node computer

Specific operating system packages must be installed on the Linux operating system computer or virtual machine where you install the Business Intelligence (BI) node node.

For a complete list of software requirements for IBM Cognos Business Intelligence, see the Cognos Business Intelligence 10.2.2 Supported Software Environments page (www.ibm.com/support/docview.wss?uid=swg27042164).

You must ensure that the following 32-bit packages are installed. These are the minimum versions required:
- `libgcc-4.8.5-11.el7.i686.rpm`
- `libselinux-2.5-6.el7.i686.rpm`
- `cracklib-2.9.0-11.el7.i686.rpm`
- `audit-libs-2.6.5-3.el7.i686.rpm`
- `pam-1.1.8-18.el7.i686.rpm`
- `libXtst-1.2.2-2.1.el7.i686.rpm`
- `apr-util-1.5.2-6.el7.i686.rpm`

You can download the packages from a site such as pkgs.org or rpm.pbone.net.

Procedure

1. Log on to the IIB node computer as the **root** user or as a user with **sudo** permissions.
2. Type the following command to verify that an operating system package is installed:

   `rpm -qi package_name`

   For example, to verify that `libselinux` is installed and what version you have, type `rpm -qi libselinux`.

   Note: You might have to use `sudo` to run the command successfully.
   For example, enter `sudo rpm -qi full_package_name`.
3. Install any package that is not already installed.

   You must download any missing package, and then install the downloaded package by typing the following command:

   `rpm -ihv full_package_name.rpm`

   For example, to install `libselinux-2.5-6.el7.i686.rpm`, type `rpm -ihv libselinux-2.5-6.el7.i686.rpm`.

   Tip: If you have yum repositories configured for your Linux operating system computers, you can use the following command to install all of the prerequisite RPMs:

   `yum -y install --setopt=protected_multilib=false libselinux.i686 cracklib.i686 audit-libs.i686 pam.i686 libgcc.i686 libXtst.i686 apr-util.i686`

   If you can't get the pam library downloaded, then manually download the library on to the RHEL environment, and use the following command to install it: `rpm –ihv –force pam library name`.

Installing required operating system packages on the Integration Bus node computer

Specific operating system packages must be installed on the Linux operating system computer or virtual machine where you install the IBM Predictive Maintenance and Quality Integration Bus node node.

Ensure that the following 32-bit or 64-bit packages are installed. These are the minimum versions required:
- `gtk2-2.24.28-8.el7.i686.rpm`
- `libXtst-1.2.2-2.1.el7.i686.rpm`

- `libXtst-1.2.2-2.1.el7.x86_64.rpm`
- `glibc-2.17-157.el7_3.1.i686.rpm`
- `libgcc-4.8.5-11.el7.i686.rpm`
- `webkitgtk-2.4.9-1.el7.x86_64.rpm`

You can download the packages from a site such as pkgs.org or rpm.pbone.net.

Procedure

1. Log on to the computer as the **root** user or as a user with **sudo** permissions.
2. Type the following command to verify that an operating system package is installed:

   `rpm -qi package_name`

   For example, to verify that `gtk2` is installed and what version you have, type `rpm -qi gtk2`.

   Note: You might have to use `sudo` to run the command successfully. For example, enter `sudo rpm -qi full_package_name`.
3. Install any package that is not already installed.

   You must download any missing package, and then install the downloaded package by typing the following command:

   `rpm -ihv full_package_name.rpm`

   For example, to install `gtk2-2.24.28-8.el7.i686`, type `rpm --ihv gtk2-2.24.28-8.el7.i686.rpm`.

   Tip: If you have yum repositories configured for your Linux operating system computers, you can use the following command to install all of the prerequisite RPMs:

   `yum -y install --setopt=protected_multilib=false gtk2.i686 libXtst.i686 glibc.i686 libgcc.i686 webkitgtk`

Additional prerequisites for the sudo user

There are additional prerequisites if you use the `sudo` user to install IBM Predictive Maintenance and Quality.

Operating system group

Create an operating system group with the same name as the `sudo` user who installs Predictive Maintenance and Quality. For example, if `SVC_PMQAdmin` is a `sudo` user doing the installation, then you must create an operating system with name `SVC_PMQAdmin`. Use the command `sudo groupadd SVC_PMQAdmin`. A group is also created for the new user. If the group does not exist, create one using the same syntax.

Adding each node computer to the `hosts` file

To ensure that each IBM Predictive Maintenance and Quality node computer can communicate properly, you must add all node computers to the `hosts` file on each node computer.

For example, the `hosts` file on the data node computer must include the Predictive Analytics node, the Business Intelligence (BI) node and the Integration Bus node computers.

Procedure

1. On each node computer, open the `/etc/hosts` file.
2. Ensure that each node computer is listed in the file. For example, ensure that your `hosts` file contains values such as the following values:

   ```
   127.0.0.1 localhost.localdomain localhost
   ##.##.##.##  analytics_node_name.domain.com  analytics_node_name
   ##.##.##.##  iib_node_name.domain.com  iib_node_name
   ##.##.##.##  data_node_name.domain.com  data_node_name
   ##.##.##.##  integrationbus_node_name.domain.com  integrationbus_node_name
   ##.##.##.##  staging_node_name.domain.com  staging_node_name
   ```

3. For each entry, ensure that the alias matches the first part of the hostname, for example:

   ```
   9.9.9.9 hostname.example.com hostname
   ```

4. Save and close the file.

Installing Java on the Predictive Analytics node computer

You must install a Java Runtime Environment (JRE) on the computer you use as the IBM Predictive Maintenance and Quality Analytics node.

You must install Java version 1.7 or later on the Analytics node computer.

Installing Python and PyXML on the Predictive Analytics node computer (optional)

If you want to use Python, then you must install Python and PyXML on the computer you use as the IBM Predictive Maintenance and Quality Analytics node.

Install Python version 2.7.1 or later and PyXML version 0.8.4.

Procedure

1. Log in to the Analytics node computer as the **root** user or as a user with **sudo** permissions.
2. Download and install Python version 2.7.1. You can download the installer from the Python web site (https://www.python.org/download/releases/2.7.1).
3. Download and install PyXML version 0.8.4. You can download the installer from the PyXML web site (https://pypi.python.org/pypi/PyXML/0.8.4).

Installing R software on the Predictive Analytics node computer (optional)

If you want to use R, you must install R and Essentials for R software on the computer you use as the IBM Predictive Maintenance and Quality Analytics node.

For more information about R and Essentials for R software for IBM SPSS, see the IBM SPSS documentation (https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/We70df3195ec8_4f95_9773_42e448fa9029/page/Downloads%20for%20IBM%C2%AE%20SPSS%C2%AE%20Statistics).

Procedure

1. Log in to the Analytics node computer as the **root** user or as a user with **sudo** permissions.

2. Download and install R software. You can download the installer from The Comprehensive R Archive Network website (http://cran.r-project.org).

Setting ulimit values on nodes where WebSphere Application Server is to be installed

Before you install IBM Predictive Maintenance and Quality, you must ensure that you have appropriate ulimit values on each node where WebSphere Application Server is to be installed.

About this task

You must set ulimit values on the Business Intelligence (BI) node and the Predictive Analytics node.

Procedure

1. Log in to the Business Intelligence (BI) node computer as the **root** user or as a user with **sudo** permissions.
   a. Go to the /etc/security directory.
   b. Open the limits.conf file for editing.
   c. Add the following lines to the file:
      ```
      @root soft nofile 10000
      @root hard nofile 16384
      * soft nofile 10000
      * hard nofile 16384
      ```
   d. Save and close the file.
   e. Restart the computer for the changes to take effect.
2. Log in to the Predictive Analytics node computer as the **root** user or as a user with **sudo** permissions.
   a. Go to the /etc/security directory.
   b. Open the limits.conf file for editing.
   c. Add the following lines to the file:
      ```
      @root soft nofile 10000
      @root hard nofile 16384
      * soft nofile 10000
      * hard nofile 16384
      ```
   d. Save and close the file.
   e. Restart the computer for the changes to take effect.

Creating directories for the solution installer

You must create a directory on each computer on which you install an IBM Predictive Maintenance and Quality component.

The solution installer uses the /opt/IBM directory to copy license files and other files. This directory must exist on each node computer and on the computer on which you run the solution installer before you run the installation.

Procedure

1. Create an /opt/IBM directory on each computer on which you are going to install an IBM Predictive Maintenance and Quality component.
2. Create an /opt/IBM directory on the computer on which you are going to run the solution installer.

Mounting the USB hard disk drive

The installation files for IBM Predictive Maintenance and Quality are provided on a universal serial bus (USB) hard disk drive. You can run the installation from the USB or you can copy the files to your computer before you start the installation. Before you do either, you must mount the USB hard disk drive.

For more information about mounting USB hard disk drives, see the Red Hat Customer Portal (https://access.redhat.com/home).

Update the services file for IBM DB2 ports

You must update the `/etc/services` file before and after you install IBM Predictive Maintenance and Quality.

Fast Communications Manager (FCM) is a feature of IBM DB2 that handles communications between database partition servers. When you install the instance-owning database server on the primary computer, DB2 reserves a port range according to the specified number of logical database partition servers that are participating in the partitioned database environment. The default range is four ports in the range 60000-60003.

DB2 installation on data node fails if these port ranges are allocated to different services. Therefore, you must comment out the service entries that use this port range in the `/etc/services` file until the Predictive Maintenance and Quality installation is complete.

After the installation of Predictive Maintenance and Quality, replace the port range 60000-60003 entries in `/etc/services` file with any other available port ranges (the ports must be sequentially numbered). Uncomment the original service that uses the port range 60000-60003.

For more information about the port range, see Verifying port range availability on participating computers (Linux and UNIX) (www.ibm.com/support/knowledgecenter/SSEPGG_10.5.0/com.ibm.db2.luw.qb.server.doc/doc/t0011777.html).

Use the Bash shell

Users who run Deployment Wizard, and all other relevant application user IDs (for example, db2inst1, db2fence1, mqmuser, sudo, and root), must use the Bash shell.

To check which shell is in use by the current user ID, enter `echo $SHELL`.

To change a user ID's shell, log in as root or sudo user and use the **usermod -s** command. For example, to change the db2inst1 user ID's shell to Bash, enter `usermod -s /bin/bash db2inst1`.

Chapter 6. Install the Predictive Maintenance and Quality servers

You use the solution installer to deploy the component programs on the servers that make up the solution.

The solution installer runs on a Linux version 7 (x86_64 with update 2) operating system. It has a web interface that you use to define, validate, and install your environment.

You define your environment by identifying node computers, and dragging the component programs onto the nodes. The solution installer provides guidance for where you can add components and you can use it to validate the environment that you define.

Important: The operating system for the computer where you run the solution installer must be set to use English as the language. The solution installer does not run on other languages. The client computers must also be using English as the language.

Installation process

With the IBM Predictive Maintenance and Quality server solution installer you can select the individual computers on which each solution node is to be installed and enter configuration information for each software component.

The diagram shows the installation process being run from one server, the staging server, and the IBM Predictive Maintenance and Quality components are being installed to different computers in a multiple server deployment.

Staging server:
All installation files are located on this computer

Solution installer

Installs and configures software components on each node

Analytics Node

BI Node

Integration Bus Node

Data Node:
IBM DB2 Server

If you choose to use an existing Oracle database server, the Data Node is not deployed.
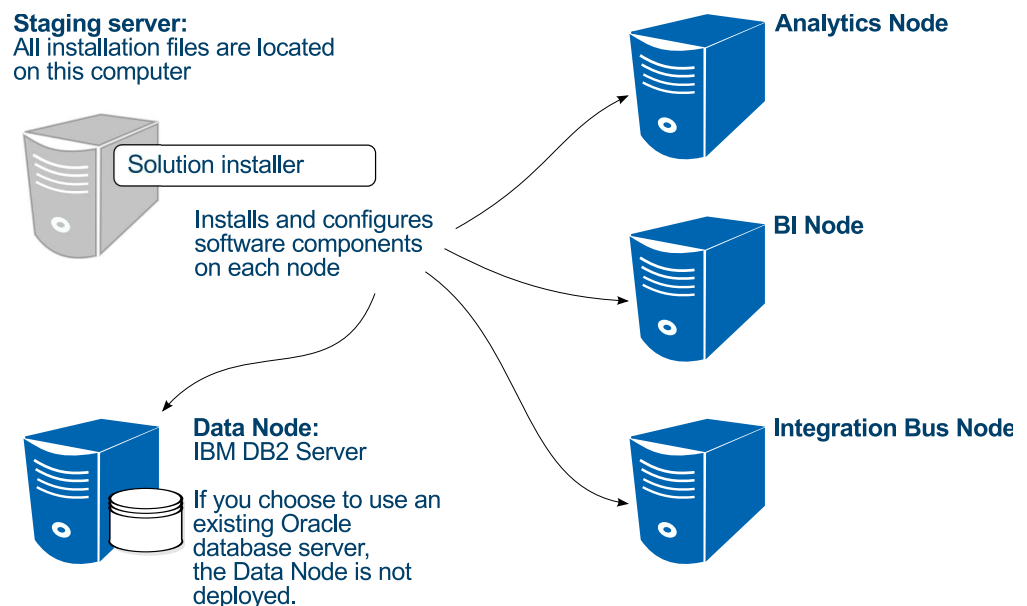
Figure 2. IBM Predictive Maintenance and Quality multiple server installation process

In the diagram, the staging server represents the computer from which you run the solution installer. In your installation, the staging server can also be used as a node computer. If you use a separate computer as the staging server, that computer must also use the same operating system as the other computers on which you install a node. It must also have the same prerequisites.

If you are installing Predictive Maintenance and Quality on a single server, you can install the components to the same computer where you are running the installation.

Downloading and decompressing the installation files

You must download the IBM Predictive Maintenance and Quality solution from IBM Passport Advantage, and then decompress the files to run the solution installer.

For more information about the files that you must download, see the download document for IBM Predictive Maintenance and Quality at www.ibm.com/support/home/.

Procedure

1. Access the IBM Passport Advantage® web site.

   Tip: If you receive an error, try using a different web browser to access Passport Advantage.
2. Sign in and navigate to the software downloads page.
3. Find the eImages for IBM Predictive Maintenance and Quality.
4. Download an eImage by selecting the check box for the name. Download all eImages for IBM Predictive Maintenance and Quality. When the download is complete, a **Download Complete** message is displayed. The location of the downloaded files is displayed in the message window.
5. You may want to copy the files to another directory for safekeeping. Make note of this directory because you will refer to it again when you install the artifacts and the client components.
6. Decompress the eImage files.
7. Decompress the pm_q_svr_installer_2.6.2_l86-64_en.tar.gz file.

   The file is decompressed to a directory that is named ServerInstallation. You must copy the server tar.gz files into the ServerInstallation/SolutionInstaller/NodeRoot/Downloads/Software directory.
8. Copy the other tar.gz files to the ServerInstallation/SolutionInstaller/NodeRoot/Downloads/Software directory.

   The tar.gz files that you need are pm_q_svr_2.6.2_1_l86-64_en.tar.gz, pm_q_svr_2.6.2_2_l86-64_en.tar.gz, pm_q_svr_2.6.2_3_l86-64_en.tar.gz, and pm_q_svr_2.6.2_4_l86-64_en.tar.gz.
9. You can manually decompress the files, or run the PMQ2.6.2_UncompressTarball.sh script to decompress the files.

   To run the script, enter sh PMQ2.6.2_UncompressTarball.sh.

   To manually decompress the files, enter tar xvf *filename*.tar.gz.

Opening firewall ports for the solution installer

You can run the `firewall.sh` script to open the ports that are required on the computer on which you are running the IBM Predictive Maintenance and Quality solution installer.

You must also open ports on the target, or client, computers on which you are installing a IBM Predictive Maintenance and Quality node. You can use the `client_firewall.sh` script to open the required ports.

The `firewall.sh` script opens the following ports on the solution installer computer:

- 8080 incoming
- 443 incoming
- 9683 incoming
- 22 outgoing

On the target, or client computers, the `client_firewall.sh` script opens the following ports:

- 8080 outgoing
- 443 incoming
- 9683 outgoing
- 22 incoming

Procedure

1. Log on to the computer that contains the solution installer node as the root user or as a user with sudo permissions.
2. Go to the directory where you decompressed the solution installer files, and run the firewall script by typing the following command: `sh firewall.sh` if you are the root user or `sudo sh firewall.sh` if you are a user with sudo permissions. For example, go to the `ServerInstallation/SolutionInstaller` directory.
3. Copy the `client_firewall.sh` file onto each computer on which you are going to install an IBM Predictive Maintenance and Quality node.
4. Log on to each computer on which you are going to install an IBM Predictive Maintenance and Quality node as the root user or as a user with sudo permissions.
5. Go to the directory where you copied the `client_firewall.sh` file, and run the script by typing the following command: `sh client_firewall.sh`.

Starting the server solution installer

You run the server solution installer on a Red Hat Enterprise Linux operating system. Use the server solution installer to define the servers in the IBM Predictive Maintenance and Quality environment. After the solution installer is running, you access the solution installer interface from another computer by using a web browser and start defining your environment.

Before you begin

In this task, you must have access to a computer that is separate from the computer that contains the installation files. This computer has the following requirements:

- Has a monitor with a screen resolution that is greater than 1024 by 760.
- The operating system uses English.
- Has Google Chrome 44 or later, or Mozilla Firefox 38 or later installed on it. The language of the installed web browser language must be English.

The installation files must be in a directory for which you have execute permissions.

Procedure

1. Log on to the computer where you decompressed the installation files as the root user or as a user with sudo permissions.
2. Go to the `ServerInstallation/SolutionInstaller` directory where you decompressed the solution installer files.
3. If you are the root user, enter the following command: `sh setup.sh`. If you are a user with sudo permissions, enter the following command: `sudo sh setup.sh`.
4. Optional: For Apple Macbook users, if an error displays that states that a cookbook failed to upload, do the following to resolve the issue.
   a. Open the terminal and run the following command: `vi ~/.bash_profile`.
   b. Add the following variables to the .bash_profile file and save the change:
      ```
      export LC_ALL=en_US.UTF-8
      export LANG=en_US.UTF-8
      ```
   c. Run the following command: `source ~/.bash_profile`.
   d. Run the `echo $LANG` command. If the result is `en_US.UTF-8`, you can continue to the next step.
5. Open a web browser on another computer, and go to the solution installer URL: `https://servername:8080/UI/index.html`.

   Important: Do not use a web browser on the computer on which you are running the solution installer or any computer on which a Predictive Maintenance and Quality component is being installed. You must use a web browser on another computer.

Results

Now you can access the solution installer from any computer in a Firefox or Chrome web browser.

Using the solution installer

You use the solution installer to define your IBM Predictive Maintenance and Quality environment you want to install.

You define the environment by identifying node computers and adding the software that you want installed on each node. You create an installation configuration for your solution by dragging nodes onto a canvas and then dragging components into the nodes.

You can save your configurations. For more information, see "Saving and opening configurations" on page 29.

You can also load predefined configurations. For more information, see "Using a predefined configuration" on page 30.

Important: The solution installer runs on Google Chrome 44 or later or Mozilla Firefox 38 or later. It does not run on Internet Explorer.

For more information about supported software, see the IBM Software Product Compatibility Reports (www.ibm.com/support/docview.wss?uid=swg27041626).

Procedure

1. Open the solution installer in a web browser.

   After the solution installer is running, you can access the URL from any computer from a Firefox or Chrome web browser.

   The URL is `https://servername:8080/UI/index.html`, where *servername* is the name of the computer where you ran the solution installer.

   Important: Do not use a web browser on the computer on which you are running the solution installer or any computer on which a Predictive Maintenance and Quality component is being installed. You must use a web browser on another computer.

   Ensure that you are using an English language web browser to access the solution installer URL.

2. On the license information page, click **Accept**.

   CAUTION:
   Declining the license allows you to uninstall the solution installer and remove all of the files from the solution installer directory.

3. Select **New Configuration**, and click **OK**.

4. From the **Mandatory Software List** pane, drag a **Node** object onto the **Configuration Editor** pane.

   If you are installing IBM Predictive Maintenance and Quality on four nodes, you must drag four **Node** objects onto the **Configuration Editor** pane.

   A visual representation of an empty node is displayed.

5. In the **Property Editor** pane, select the node object, and enter the following information.

   a. Enter a name for the node in **Name**, and press the Enter key. For example, enter `BI node`.

   b. Enter the server name in **Host Name**, and press the Enter key.

      Important: Unless you are using a single node configuration, ensure that the host names or IP addresses are for different computers. Do not use the same computer for more than one **Node** object.

   c. Enter the user who has access to install the components in **User Name**, and press the Enter key. For example, enter `root` or a user with sudo permissions.

   d. Enter the user's password in **User Password**, and press the Enter key.

   e. Repeat these steps for each node object that you add. If you are installing IBM Predictive Maintenance and Quality on four nodes, you must repeat these steps for each of the four node objects.

   Important: You must enter any mandatory information for nodes and other objects as indicated. Ensure that you review all of the properties to ensure that the values, both mandatory and optional, are valid.

   Ensure that you press the Enter key after you type a value for a property.

6. From the **Mandatory Software List** pane, create your environment by dragging each object onto the appropriate node in the **Configuration Editor** pane.

   Tip: Valid drop zones are indicated in the **Configuration Editor** pane.

   Some restrictions are built into the placement of the objects. For example, if you are adding **IBM Cognos BI Server** to a node, then you must already have **WebSphere Application Server** on that node, and the **IBM Cognos BI Server** object must be placed within the **WebSphere Application Server** object.
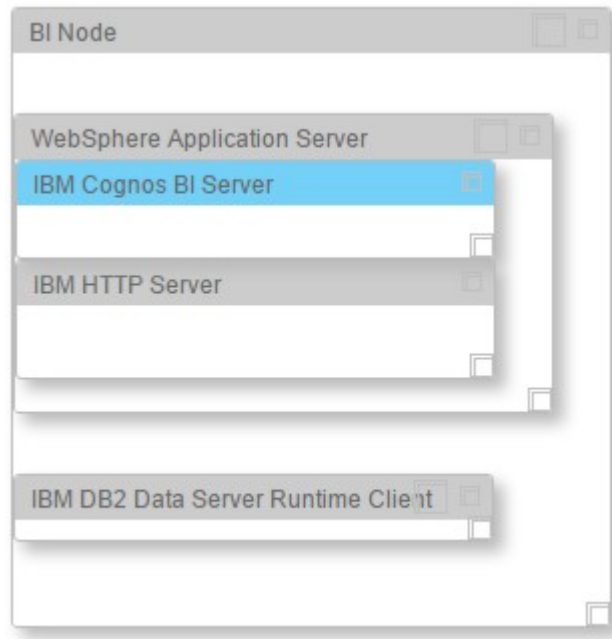
   Tip: Example environments are provided in the predefined configurations that are included with the installation files. For more information, see "Using a predefined configuration" on page 30.

   Note: If you add the **IBM DB2 Data Server Runtime Client** component to the same node as the **IBM DB2 Enterprise Server** component, the **IBM DB2 Data Server Runtime Client** component will not be installed.

7. After you add an object, select it, and modify any values in the **Property Editor** pane.

   When you add WebSphere Application Server to a node, you must provide the following information:

   - **WebSphere Install Directory** is the location where WebSphere Application Server is to be installed.
   - **WebSphere Application Port** is the port number that you want to use for WebSphere Application Server.
   - **WAS Profile Admin User Name** is the administrator user's user name for WebSphere Application Server.
   - **WAS Profile Admin Password** is the password for the administrator user.

   Important: Ensure that you press the Enter key after you type a value for a property.

8. From the **Optional Software List**, drag the objects to the node on which you want the installation files copied. The optional software is not installed by the

solution installer. You must install the software manually. The installation files are copied to the node you drag them to.

Unless you change the default path, the optional software installation files are copied to the `/opt/IBM/OptSoftware` directory on the node computer.

9. As you build your environment, click **Validate** to identify errors or incomplete information.

10. After all nodes are defined and each node is validated, click **Run**.

   Important: After you click the **Run** button, **do not close** the browser window until the installation completes. If you close the browser, you cannot re-initiate the session.

   However, the installation does proceed even with the browser closed. But you cannot monitor the progress.

   If the browser window closes, do the following steps:
   a. Do nothing until enough time elapses to allow the installation to complete. Allow the installation at least 2 hours to complete.
   b. Open a new browser window, and open the solution installer again.
   c. Re-create the configuration that you used or open the saved session that you used. You must ensure that all of the values that you entered in the fields are the same as the configuration that you used when the browser window closed.
   d. Rerun the installation. The solution installer verifies that all of the components are installed.

   After the solution installer completes, verify that the components are working. For more information, see "Test the installation" on page 35.

   Tip: If you click **Validate** before all the mandatory content is added, a message indicates that the node is not valid. For example, if you validate the BI Node before you add the **IBM DB2 Data Server Runtime Client** component, then a message indicates that the node is not yet valid.

Configuration properties for the server components

You must provide some configuration properties for each of the mandatory software components.

If you select any components from the **Optional Software List**, you must provide a deployment location for the installation files. You must manually install any item that you select from the **Optional Software List**.

IBM DB2 Enterprise Server properties

DB2 Server Install Directory
   The location where IBM DB2 is to be installed on the data node computer.

   Default: `/opt/ibm/db2/V10.5`

DB2 Database Port Number
   The port number that is used by IBM DB2.

   Default: `50000`

DB2 Server Admin User Name
   The user ID that runs the administration server.

Default: `dasusr1`

This user must not exist on the computer.

DB2 Server Admin Password
The password for the user ID that runs the administration server.

The password cannot contain more than 8 characters and it must be lowercase.

DB2 Server Admin Home Directory
The home directory for the user ID that runs the administration server. This directory is on the data node computer's file system.

Default: `/home/dasusr1`

DB2 Instance Owner User Name
The user ID that controls the DB2 processes and owns the directories that are used by the database instance.

Default: `db2inst1`

This user must not exist on the computer.

DB2 Instance Owner Password
The password for the DB2 instance owner user.

The password cannot contain more than 8 characters and it must be lowercase.

DB2 Instance Owner Home Directory
The home directory for the DB2 instance owner user. This directory is on the data node computer's file system.

Default: `/home/db2inst1`

DB2 Fenced User Name
The user ID that can run user-defined functions and store procedures.

Default: `db2fenc1`

This user must not exist on the computer.

DB2 Fenced User Password
The password for the DB2 fenced user.

The password cannot contain more than 8 characters and it must be lowercase.

DB2 Fenced User Home Directory
The home directory for the DB2 fenced user.

Default: `/home/db2fenc1`

Database: SPSS properties

SPSS Database Name
The SPSS database that is used by the components that are installed on the Predictive Analytics node computer.

This component must be contained within **IBM DB2 Enterprise Server.**

Default: `SPSSDB`

Database: BI Content Manager properties

Content Manager Database Name
> The IBM Cognos Analytics content store database.

> This component must be contained within **IBM DB2 Enterprise Server.**

> Default: `COGNOSCS`

IBM DB2 Data Server Runtime Client properties

The **IBM DB2 Data Server Runtime Client** component must be installed on each node, except for the data node computer.

If you are doing a multi node deployment, make sure all of the values in the **IBM DB2 Data Server Runtime Client** are the same on all the nodes.

Note: If you add the **IBM DB2 Data Server Runtime Client** component to the same node as the **IBM DB2 Enterprise Server** component, the **IBM DB2 Data Server Runtime Client** component will not be installed.

DB2 RTC Install Directory
> The location where the IBM DB2 client is to be installed.

> Default: `/opt/ibm/db2/V10.5`

DB2 RTC Instance User Name
> The user ID for the DB2 client.

> Default: `db2inst1`

> This user must not exist on the computer.

DB2 RTC Instance Password
> The password for the DB2 client instance owner user.

DB2 Client Instance Home Directory
> The home directory for the DB2 client instance owner user.

> Default: `/home/db2inst1`

WebSphere Application Server properties

WebSphere Application Server must be installed on the nodes where you install IBM Cognos Business Intelligence and IBM SPSS Collaboration and Deployment Services Server.

WebSphere Install Directory
> The location where the WebSphere Application Server is to be installed.

> Default: `/opt/IBM/WebSphere/AppServer`

WebSphere Application Port
> The HTTP port number that is used by the WebSphere Application Server profile.

> Default: `9080`

WAS Profile Admin User Name
> The administrative user name for the WebSphere Application Server profile.

WAS Profile Admin Password
> The password for the administrative user.

IBM HTTP Server properties

IBM HTTP Server must be installed on the computer where you install IBM Cognos Business Intelligence.

HTTP Server Install Directory
> The location where IBM HTTP Server is to be installed.
>
> Default: `/opt/IBM/HTTPServer`

HTTP Server Port Number
> The port number that is used by HTTP Server.
>
> Default: `81`

IBM Cognos BI Server

IBM Cognos BI Server must be contained within **WebSphere Application Server** in the **Configuration Editor**.

IBM Cognos BI Server Install Directory
> The location where IBM Cognos BI is to be installed.
>
> Default: `/opt/ibm/cognos/analytics`

IBM SPSS Modeler Server properties

SPSS Modeler Server Install Directory
> The location where IBM SPSS Modeler Server is to be installed.
>
> Default: `/opt/IBM/SPSS/ModelerServer/18.1.1`

IBM SPSS Statistics Server properties

SPSS Statistics Server Install Directory
> The location where IBM SPSS Statistics Server is to be installed.
>
> Default: `/opt/IBM/SPSS/StatisticsServer25`

IBM SPSS Data Access Pack properties

SPSS Data Access Pack Install Directory
> The location where IBM SPSS Data Access Pack is to be installed.
>
> Default: `/root/SDAP712`

IBM SPSS C&DS Server (including ADM) properties

IBM SPSS C&DS Server (including ADM) must be contained within **WebSphere Application Server** in the **Configuration Editor**.

SPSS C&DS Server Install Directory
> The location where IBM SPSS Collaboration and Deployment Services Server and Analytic Decision Management are to be installed.
>
> Default: `/opt/IBM/SPSS/Deployment/8.1.1/Server`

SPSS C&DS Server Admin User Name
> The IBM SPSS Collaboration and Deployment Services administrative user.
>
> Default: `admin`

SPSS C&DS Server Admin Password
The password for the IBM SPSS Collaboration and Deployment Services administrative user.

Default: `admin`

WebSphere MQ properties

WebSphere MQ Home Directory
The WebSphere MQ home directory.

Default: `/home`

Change the home directory only if the home directory location in the `useradd` file on the Linux System has been modified.

WebSphere MQ Account User Name
The WebSphere MQ user.

Default: `mqmuser`

WebSphere MQ Account Password
The WebSphere MQ user account password.

IBM Integration Bus properties

IBM Integration Bus must be contained within **WebSphere MQ** in the **Configuration Editor**.

Integration Bus Install Directory
The location where IBM Integration Bus is to be installed.

Default: `/opt/ibm/iib-10.0.0.7`

IBM Analytical Foundation properties

In the **Configuration Editor**, IBM Analytical Foundation must be inside the **WebSphere MQ** component.

Analytical Foundation Shared Classes Directory

IBM Analytical Foundation install location.

Default: `/var/mqsi/shared-classes`

IBM Integration Bus Manufacturing Pack properties

In the **Configuration Editor**, IBM Integration Bus Manufacturing Pack must be inside the **WebSphere MQ** component.

Destination Directory

IBM Integration Bus Manufacturing Pack files location.

Default: `/opt/IBM/IIBManufactPack/`

Saving and opening configurations

You can save IBM Predictive Maintenance and Quality configurations and open existing configurations in the solution installer.

Procedure

1. To save a configuration:
   a. In the solution installer, define your configuration.
   b. Enter a name in the **Save Configuration** box, and click the **Save Configuration** icon ![icon] .
2. To open a saved configuration:
   a. Click **Open**, and browse to the saved configuration file, and click **Open**.

Using a predefined configuration

The solution installer contains predefined configurations for the most common IBM Predictive Maintenance and Quality environments. Use these predefined configurations to simplify your deployment work.

About this task

The following predefined configurations are available:

Single-Node Configuration

All of the IBM Predictive Maintenance and Quality components are installed on a single computer with IBM DB2 Enterprise Server.

Note: A single-node configuration is intended for a demonstration or testing environment. It should not be used for a production environment.
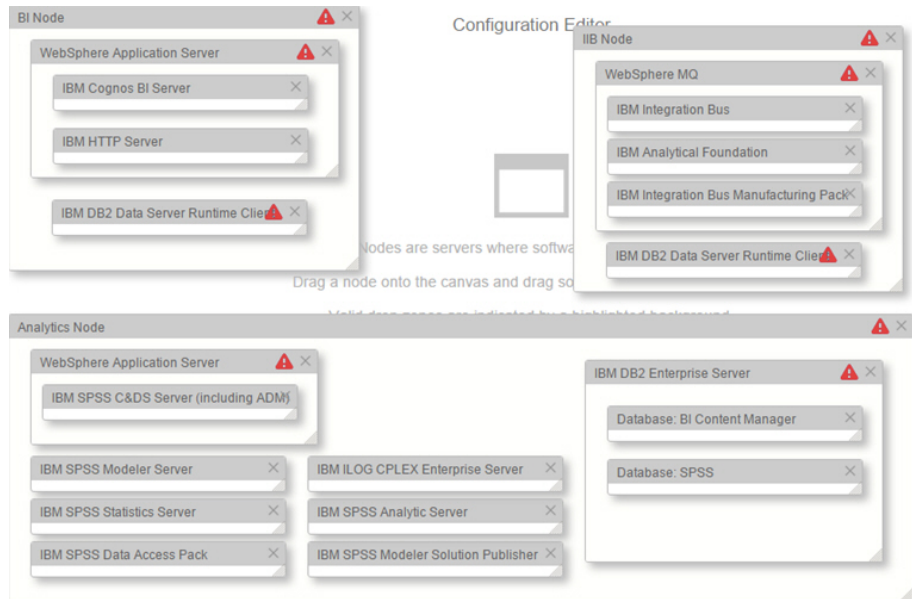
A single-node configuration contains the following components:
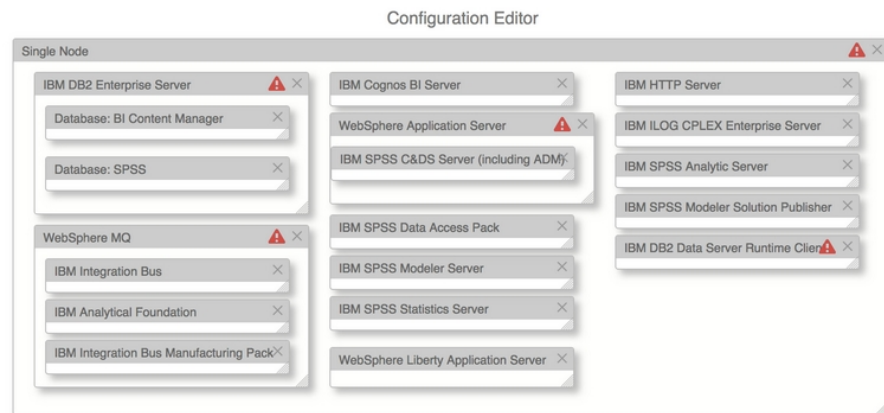
PMQ Three Node for Oracle

An IBM Predictive Maintenance and Quality environment on three nodes: a Business Intelligence node, an Analytics node, an Integration Bus node, all connected to an existing Oracle database.

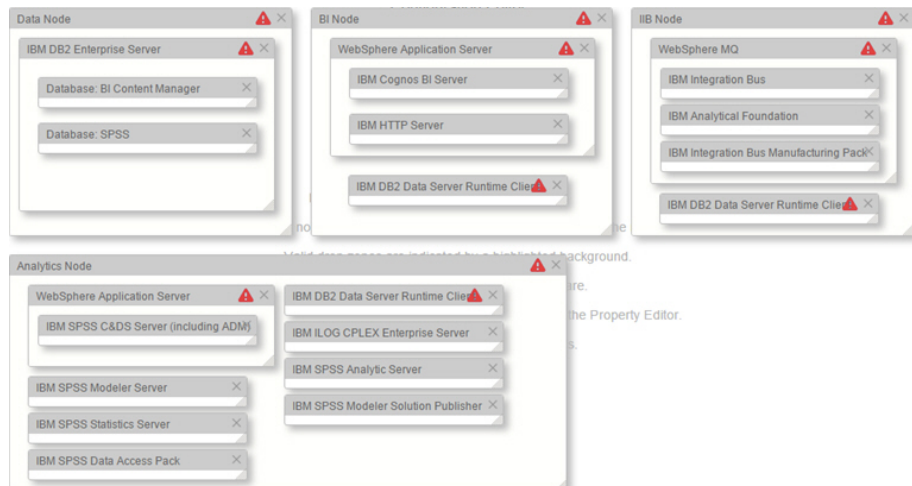A three node configuration for Oracle contains the following components:

Three node configuration for Oracle.

Four-Node Configuration

A typical IBM Predictive Maintenance and Quality environment on four nodes: a data node with IBM DB2 Enterprise Server, a Business Intelligence node, an Analytics node, and an Integration Bus node.

A four-node configuration contains the following components:

Procedure

1. Open the solution installer in a web browser.

   After the solution installer is running, you can access the URL from any computer from a Firefox or Chrome web browser.

   The URL is `https://servername:8080/UI/index.html`, where *servername* is the name of the computer where you ran the solution installer.

   Important: Do not use a web browser on the computer on which you are running the solution installer or any computer on which a Predictive Maintenance and Quality component is being installed. You must use a web browser on another computer.

Ensure that you are using an English language web browser to access the solution installer URL.

2. Select **Predefined Configurations**, and click **OK**.
3. Select the configuration that you want to install, and click **OK**.

The configuration is displayed in the **Configuration Editor** pane.

Icons appear on each component where configuration information is required. For example, where you must provide user names or passwords.
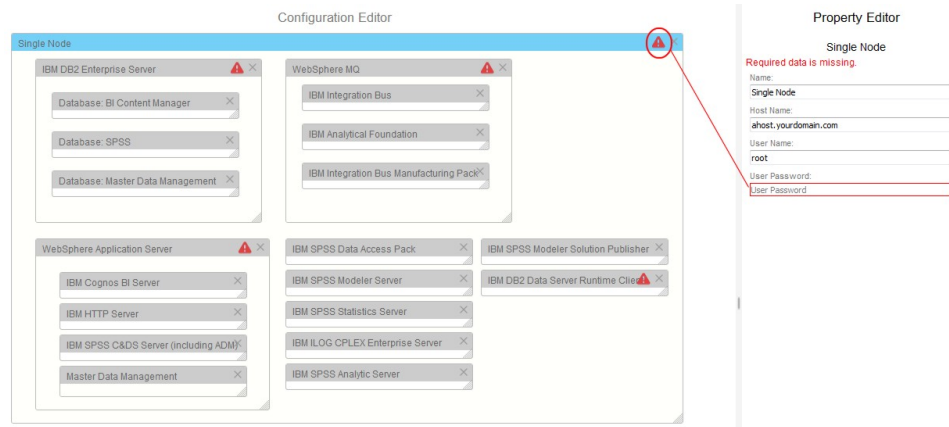
Important: Ensure that you change the server names to an actual server in your environment. Default values are provided.

4. Ensure all of the properties are valid for your environment for each of the components and the nodes in the configuration.

Starting the installation

The solution installer installs the component products on each node computer. Before you start the installation, you can validate the configuration.

Procedure

1. In the solution installer, open the configuration that you want to install.
2. Click **Validate**. If errors or messages about missing information are displayed, you must correct the error or provide the information before you can run the installation.
3. Click **Run**.

Cleaning up server residues if the server installation fails

If the Predictive Maintenance and Quality installation fails, perform these tasks to clean up files that are related to the server components.

After, you can restart the installation from the Using the solution installer topic in the IBM Knowledge Center.

Cleaning up Db2 node residues

Perform this task to clean up DB2 node residues after an installation fails.

Procedure

1. Run following commands:
   ```
   su db2inst1
   db2 list db directory
   ```

2. An entry like the following entry shows. If no entry shows, skip the `db2stop force` command in step 3.
   ```
   "
   Database 1 entry:

   Database alias = SPSSDB
   Database name = SPSSDB
   Local database directory = /home/db2inst1
   Database release level = 10.00
   Comment =
   Directory entry type = Indirect
   Catalog database partition number = 0
   Alternate server hostname =
   Alternate server port number =
   "
   ```

3. Run following commands:
   ```
   db2stop force
   exit
   su dasusr1
   db2admin stop
   exit
   ```

4. Run the following commands:
   ```
   cd /opt/ibm/db2/V10.5/instance/
   ./db2ilist
   ```

5. Use the outputted instance name as the parameter and run the following commands:
   ```
   ./db2idrop db2inst1
   ./daslist
   ./dasdrop
   cd ../install/
   ./db2_deinstall -a
   ```

6. Run the following commands:
   ```
   userdel -r dasusr1
   userdel -r db2inst1
   userdel -r db2fenc1
   groupdel dasadm1
   groupdel db2iadm1
   groupdel db2fadm1
   ```

7. Run the following commands:
   ```
   cd /opt/ibm/
   rm -rf db2/
   cd /opt/IBM/
   rm -rf PMQ_xxx/
   ```
   For example, for the Predictive Maintenance and Quality 1.0 release, the command is `rm -rf PMQ_1.0/`.

8. Open the /etc.services files with the following command and comment out any entry that contains port 60000~60005:
   ```
   vi /etc/services
   ```

   You can also refer to the Uninstalling DB2 on UNIX or Linux page for information about cleaning residues

Cleaning up Predictive Analytics node residues

Perform this task to clean up Predictive Analytics (SPSS) node residues after an installation fails.

Procedure

1. Run the following command:
   `/opt/IBM/InstallationManager/eclipse/tools/imcl listInstalledPackages`

2. If no packages show, skip cleaning up the Predictive Analytics (SPSS) node. If packages do show, run the following command to uninstall packages:
   `/opt/IBM/InstallationManager/eclipse/tools/imcl uninstallAll`

3. Run the following command:
   `cd /opt/IBM/WebSphere/AppServer/profiles/CNDSprofile/bin`

4. If the directory from step 3 does not show, skip the next command. If the directory does show, run the following command:
   `./stopServer.sh server1`

5. If under single node deployment mode, skip the next commands. If under four node deployment mode, run the following commands:
   `rm -rf /opt/ibm/`
   `rm -rf /opt/IBM/`
   `rm -rf /home/db2inst1/sqllib`

Cleaning up Integration Bus node residues

Perform this task to clean up Integration Bus (IIB) node residues after an installation fails.

Procedure

1. If under single node deployment mode, skip the next two commands. If under four node deployment mode, run the following commands:
   `/opt/IBM/InstallationManager/eclipse/tools/imcl listInstalledPackages`
   `/opt/IBM/InstallationManager/eclipse/tools/imcl uninstallAll`

2. Run the following commands:
   ``for i in `rpm -qa | grep -i mqseries | grep -i "7.5.0-4"`; do rpm -e --nodeps --noscripts $i; done``
   ``for i in `rpm -qa | grep -i mqseries`; do rpm -e --nodeps --noscripts $i; done``

3. To verify that all related packages are uninstalled, run the following command. When you run the command, nothing should show.
   `rpm -qa | grep -i mqseries`

4. If under single node deployment mode, skip the next commands. If under four node deployment mode, run the following commands:
   `rm -rf /opt/ibm/`
   `rm -rf /opt/IBM/`
   `rm -rf /home/db2inst1/sqllib`

Cleaning up Business Intelligence node residues

Perform this task to clean up Business Intelligence (BI) node residues after an installation fails.

Procedure

1. If under single node deployment mode, skip the next two commands. If under four node deployment mode, run the following commands:

```
/opt/IBM/InstallationManager/eclipse/tools/imcl listInstalledPackages
/opt/IBM/InstallationManager/eclipse/tools/imcl uninstallAll
```

2. Run the following commands:
```
rm -rf /opt/ibm/
rm -rf /opt/IBM/
rm -rf /home/db2inst1/sqllib
```

Test the installation

After the installation of the IBM Predictive Maintenance and Quality server
components is complete, you must perform some additional configuration tasks
and then test the installation.

Testing the database installation and configuration

You can test the database installation and configuration by logging in to the IBM
Predictive Maintenance and Quality data node computer and listing the databases
on the server. You can also list the databases available on each node computer
where the IBM DB2 client was installed.

Procedure

Log on to the data node computer.

1. Open a terminal window, and change to the database instance owner user. For
   example, `su - db2inst1`.
2. Enter the following command to list the databases on the computer:

   `db2 list database directory`

   The following databases are listed:
   - `COGNOSCS`
   - `SPSSDB`

Testing Cognos Business Intelligence

Verify that you can access the IBM Business Intelligence portal.

Before you begin

Make sure the IBM Predictive Maintenance and Quality solution services are
running.

Procedure

Open a web browser and enter the following URL: `http://servername:9300/bi/`
where *servername* is the name of IP address of the computer where the Predictive
Maintenance and Quality server components are installed.
If you changed the default port number to 80 for IBM HTTP Server, you can
exclude the port number from the URL.

Chapter 7. Install the Predictive Maintenance and Quality server artifacts

The server artifacts include report content and workflows for IBM Predictive Maintenance and Quality.

Before you can install the server artifacts, you must uninstall the solution installer that you used to install the servers.

You must do the following things on the computer that currently contains the solution installer:

- Uninstall the server solution installer
- Install system files that are required for the artifact solution installer
- Install the artifact solution installer
- Use the artifact solution installer to install and configure Predictive Maintenance and Quality artifacts
- Finish configuring the server components

Uninstalling the server solution installer

Before you can install the IBM Predictive Maintenance and Quality server artifacts, you must uninstall the server solution installer and then install the artifact solution installer.

When you uninstall the server solution installer, the processes that are used by the solution installer are stopped and removed from your computer. All of the files in the solution installer directory are also removed. This includes the IBM Predictive Maintenance and Quality server component and server artifact installation files that you copied into the solution installer directory. If you want to save those files, you must copy them to another directory before you uninstall the solution installer.

Also, you can run a script on each node computer where you installed an IBM Predictive Maintenance and Quality component to remove the server solution installer processes. Ensure that you copy the `cleanupClient.sh` file before you uninstall the server solution installer.

Note: Uninstalling the server solution installer does not uninstall the IBM Predictive Maintenance and Quality component applications. If you want to uninstall those components, you must use each component's uninstallation programs.

Procedure

1. To remove the server solution installer processes on the client node computers, do the following steps on each client node computer:

   a. From the installation computer, copy the `ServerInstallation/SolutionInstaller/cleanupClient.sh` file onto each computer on which you installed an IBM Predictive Maintenance and Quality component.

   b. On the client node computer, go to the directory where you copied the `cleanupClient.sh` file.

   c. Enter the following command: `sh cleanupClient.sh`.

2. To remove the server solution installer from the installation computer, do the following steps:
   a. Go to the `ServerInstallation/SolutionInstaller` directory.
   b. Enter the following command: `sh cleanup.sh`.
   c. Restart the installation computer.
   d. If under single node deployment mode, start the Predictive Maintenance and Quality services. For information about how to start the services see, "Start solution services" on page 76.

      Note: In the Start solution services topics, do all of the tasks except the Starting services on the Integration Bus node computer task. You should complete the Starting services on the Integration Bus node computer task after you complete the installation of the artifact.

What to do next

Install the artifact solution installer.

Installing and starting the artifact solution installer

Use the artifact solution installer to install the artifacts on the IBM Predictive Maintenance and Quality servers. You access the artifact solution installer interface from another computer by using a web browser.

Before you begin

You must have access to a computer that is separate from the computer that contains the installation files. This computer has the following requirements:

- Has a monitor with a screen resolution that is greater than 1024 by 760.
- The operating system uses English.
- Has Google Chrome 47, or later, or Mozilla Firefox 38 or later installed on it. The language of the installed web browser language must be English.

You must know the location of the `pm_q_art_installer_2.6.2_186-64_en.tar.gz` file that you downloaded from Passport Advantage in "Downloading and decompressing the installation files" on page 20.

The `pm_q_art_installer_2.6.2_186-64_en.tar.gz` file must be in a directory for which you have execute permissions.

Procedure

1. Log on to the computer as the root user or as a user with sudo permissions.
2. Go to the directory that contains `pm_q_art_installer_2.6.2_186-64_en.tar.gz`.
3. Decompress `pm_q_art_installer_2.6.2_186-64_en.tar.gz` by typing the following command:

   `tar xvf` *filename*`.tar.gz`
4. If you are the root user, enter the following command: `sh setup.sh`. If you are a user with sudo permissions, enter the following command: `sudo sh setup.sh`.

   After the artifact solution installer starts, open a web browser on another computer, and go to the solution installer URL: `https://`*servername*`:8080/UI/index.html`.

Important: Do not use a web browser on the computer on which you are running the solution installer or any computer on which a Predictive Maintenance and Quality component is being installed. You must use a web browser on another computer.

Checking prerequisites for Situational Awareness artifacts

You must run checks before proceeding to configure the Situational Awareness artifacts and related artifacts.

About this task

Note: For a standard artifact installation, this topic can be skipped.

Since the Situational Awareness artifacts need ports for setting up the servers, it is essential to understand which ports are used. If necessary, a new set of ports can be provided to the artifact installer when prompted.

Procedure

1. To understand which ports are in use, run the following command from the terminal as root user, and see if it returns any rows.

   ```
   netstat -an |grep 9080
   ```

2. Similarly, run the same command for different ports like the following.

   ```
   netstat -an |grep 9081
   netstat -an |grep 9082
   netstat -an |grep 9443
   netstat -an |grep 9444
   ```

3. If any of these ports are used, then you can run the same command to check additional ports. Typically, ports 9085 and 9448 are easily available.

Using predefined configurations to install server artifacts

Use the solution installer to select and configure the artifacts in your solution.

Procedure

1. Open the solution installer in a web browser.

   After the solution installer is running, you can access the URL from any computer from a Firefox or Chrome web browser.

   The URL is `https://servername:8080/UI/index.html`, where *servername* is the name of the computer where you ran the solution installer.

   Important: Do not use a web browser on the computer on which you are running the solution installer or any computer on which a Predictive Maintenance and Quality component is being installed. You must use a web browser on another computer.

   Ensure that you are using an English language web browser to access the solution installer URL.

2. On the license information page, click **Accept**.

   CAUTION:
   Declining the license allows you to uninstall the solution installer and remove all of the files from the solution installer directory.

3. Select **Predefined Configurations** and click **OK**.

4. Select one of the following node templates; **4 Node Template**, **1 Node SA Template**, or **2 Nodes SA Template**.

   For a multiple-server Predictive Maintenance and Quality standard artifact installation, select **4 Node Template**. For a single-node Situational Awareness artifact installation, select **1 Node SA Template**. For two-node Situational Awareness artifact installation, select **2 Nodes SA Template**.

   Use **1 Node SA Template** to install based on a previous one node server installation. Use **4 Node Template** and **2 Nodes SA Template** to install based on a previous four node server installation.

   Note: Due to Chef limitations, there is no **1 Node Template** for a standard artifact installation. However, you can manually install the needed components. Refer to the four node template to get all of the needed components.

5. Click all the boxes that have a red warning icon and complete the mandatory fields in the **Property Editor**. For more information, refer to the Parameters for the standard artifact installation section and the Parameters for the Situational Awareness artifact installation section.

6. After all mandatory fields are completed, click **Validate**.

   Note: To install Predictive Maintenance and Quality artifacts on one node, you must install artifacts one at a time in following sequence:
   • Predictive Maintenance and Quality Db2 Artifact
   • Predictive Maintenance and Quality IBM Integration Bus Artifact for Db2
   • Predictive Maintenance and Quality Analytic Artifact for Db2
   • Predictive Maintenance and Quality Business Intelligence Artifact for Db2
   • PMQUI Artifact for Db2
   • Data Access API

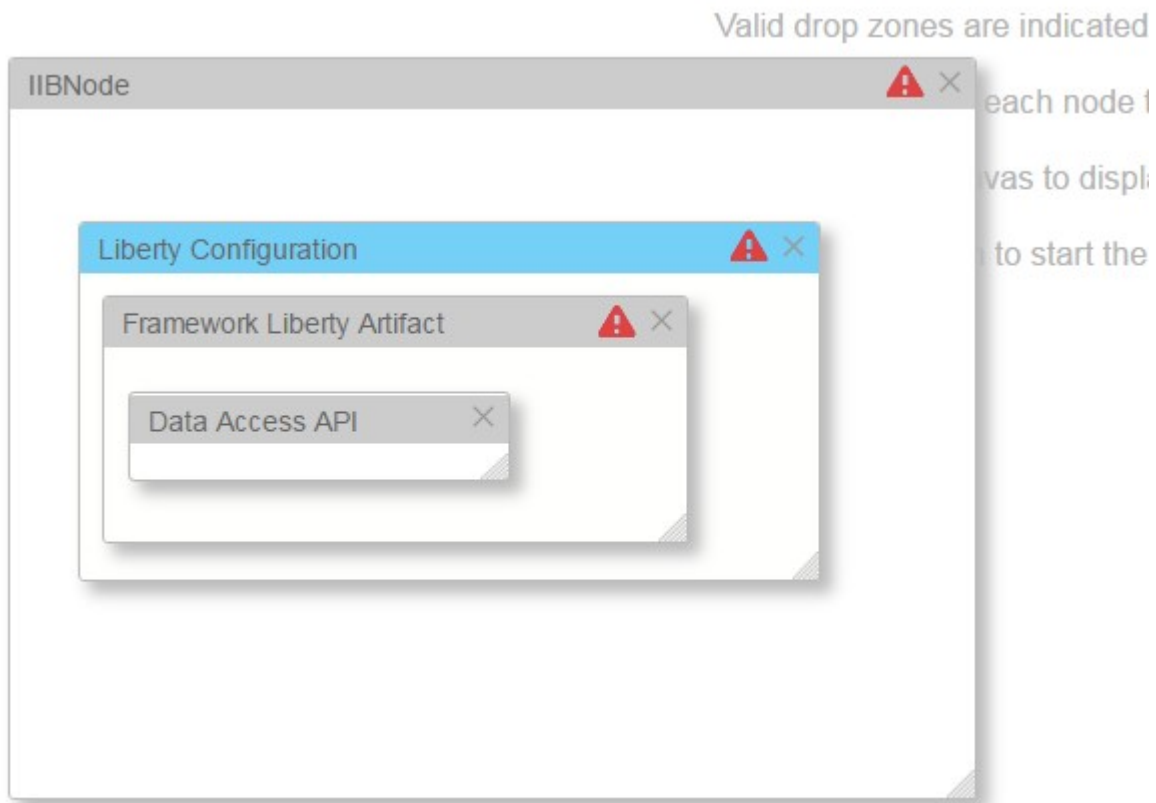   For the Data Access API artifact, refer to the following diagram to install:

Figure 3. Data Access API Installation

7. After all nodes are defined, click **Run**.

   Important: After you click the **Run** button, **do not close** the browser window until the installation completes. If you close the browser, you cannot re-initiate the session.

   The installation continues even if you close the browser.

   If the browser window closes, do the following steps:
   a. Do nothing until enough time elapses to allow the installation to complete. Allow the installation at least 2 hours to complete.
   b. Open a new browser window, and open the solution installer again.
   c. Re-create the configuration that you used or open the saved session that you used. You must ensure that all of the values that you entered in the fields are the same as the configuration that you used when the browser window closed.
   d. Rerun the installation. The solution installer verifies that all of the components are installed.

      After the solution installer completes, test the solution to verify that the components are working.

Parameters for the standard artifact installation

Configure parameters for the standard artifacts that you are installing.

Use the information in the following tables to configure parameters for the artifacts. The **Property Editor** displays some default values for each component. You can accept the default values or change them to suit your environment.

Table 2. Parameters for IBM DB2

Field	Default or example value	Description
Data Deployment Location	`/opt/IBM/PMQ/Data`	The location where the server artifacts are to be copied on the data node computer.
DB2 Instance Home	`/home/db2inst1`	The home directory of the database instance owner.
DB Database Instance User Name	`db2inst1`	The user ID for the IBM Cognos content store database.
DB Database Instance Password	This field does not have a default value.	The password for the database instance owner user.

Table 3. Integration bus parameters for IBM DB2

Field	Default or example value	Description
Install location of IIB	`/opt/IBM/IIB`	The location where IBM Integration Bus is installed. This directory is on the Integration Bus node computer's file system.
DB2 Client install Location	`/opt/ibm/db2/v10.5`	The IP address of the Analytics nodecomputer.
Analytics Node IP	There is no default for this field.	The IP address of the Predictive Analytics node computer.
Analytics Node HTTP Transport Port	9080	The WebSphere Application Server port number that is used on the Analytics node computer.
DB2 Port Number	50000	The port number that is used by the IBM DB2 server on the data node computer.
Database Node IP	There is no default for this field.	The IP address of the data node computer.
DB2 Username	`db2inst1`	The user ID that controls the database processes and owns the directories that are used by the database instance.
Message Queue Username	mqmuser	User ID created by installing the message queue.
DB2 Database Server Instance Password	There is no default for this field.	Password of **DB2 Username**.

Table 4. Business Intelligence parameters for IBM DB2

Field	Default or example value	Description
Business Intelligence Deployment Location	`/opt/IBM/PMQ/ Business_Intelligence`	The location where the server artifacts are to be installed on the IIB node computer.
Cognos Install Location	`/opt/ibm/cognos/analytics`	The location where IBM Cognos BI is installed. This directory is on the IIB node computer's file system.
WebSphere Install Location	`/opt/IBM/WebSphere/ AppServer`	The location where WebSphere is installed. This directory is on the IIB node computer's file system.
DB2 Instance Home Directory	`/home/db2inst1`	The home directory of the database instance owner.
DB2 Client Install Location	`/opt/ibm/db2/v10.5`	The location where the DB2 client is installed on the IIB node computer.
Cognos BI Dispatcher URI	`http://localhost:9300/ p2pd/servlet/dispatch`	The URL to the IBM Cognos BI dispatcher, where *iib_node_name* is the name or IP address of the IIB node computer.
DB2 Instance User Name	`db2inst1`	The user ID for the IBM Cognos content store database.
DB2 Instance Password	There is no default value for this field.	Password for the database instance owner user.
DB2 Database Port Number	50000	The port number for the DB2 server.
Database Node IP	There is no default value for this field.	The IP address of the Analytics node computer.
Integration Bus Node IP	There is no default value for this field.	The IP address of the Integration Bus node computer.
WebSphere Application Server PMQUI Profile Administrative Username	`admin`	The administrative user name for the WebSphere Application Server profile that is used for the dashboard application.
WebSphere Application Server PMQUI Profile Administrative Password	There is no default value for this field.	The password for the administrative user for the WebSphere Application Server profile that is used for the dashboard application.
WebSphere Application Server Cognos Profile Administrative Username	`admin`	The administrative user name for the WebSphere Application Server profile that is used for IBM Cognos Business Intelligence.

Table 4. Business Intelligence parameters for IBM DB2 (continued)

Field	Default or example value	Description
WebSphere Application Server Cognos Profile Administrative Password	There is no default value for this field.	The password for the administrative user for the WebSphere Application Server profile that is used for IBM Cognos Business Intelligence.
Business Intelligence Node IP	There is no default value for this field.	The IP address of the Business Intelligence node.

Table 5. Analytics parameters for IBM DB2

Field	Default or example value	Description
Analytics Deployment Location	/opt/IBM/PMQ/Analytics	The location where the server artifacts are to be installed on the Analytics node computer.
SPSS Modeler Server Install Location	/opt/IBM/SPSS/ ModelerServer/18.1.1	The location where the Modeler Server is installed.
SPSS Data Pack Installation Location	/root/SDAP712	The directory where the IBM SPSS Data Access Pack is installed. This directory is on the Analytics node computer.
SPSS CNDS Install Location	/opt/IBM/SPSS/Deployment/ 8.1.1	The location where IBM SPSS Collaboration and Deployment Services is installed. This location is on the Analytics node computer.
Integration Bus Node IP	There is no default value for this field.	The IP address of the Integration Bus node computer.
Database Node IP	There is no default value for this field.	The IP address of the data node computer.
Database Username	db2inst1	The user ID for the IBM Cognos content store database.
Database Password	There is no default value for this field.	The password for the database instance owner user.
Database Port	50000	The port number for the database server.

Table 6. Oracle Database parameters

Field	Default or example value	Description
Data Deployment Location	/opt/IBM/PMQ/Data	The location where the server artifacts are to be installed on the data node computer.
Oracle Install Location	/home/oracle/app/oracle/ product/12.1.0/dbhome_1	The user ID that controls the database processes and owns the directories that are used by the database instance.

Table 6. Oracle Database parameters (continued)

Field	Default or example value	Description
Oracle Installed User Account Home Directory	/home/oracle	The password for the database instance owner user. **Note:** Ensure that you use the same password that you provided during the server installation.
Oracle Port	1521	The port number used to install Oracle.
Enter the Oracle Login DB Username	Oracle	Oracle installed username.
Enter Sys Password	There is no default value for this field.	Sys password used when you installed Oracle.
Enter System Password	There is no default value for this field.	Current system password.
pmqsch user password		Default user ID for accessing the IBMPMQ database.
Oracle Installed Hostname	There is no default value for this field.	Host name of the computer that has Oracle installed.

Table 7. Integration bus parameters for Oracle Database

Field	Default or example value	Description
Install Location of IIB	/opt/ibm/iib-10.0.0.7	The location where IBM Integration Bus is installed. This directory is on the Integration Bus node computer's file system.
Message Queue Username	mqmuser	User ID created by installing the message queue.
Analytics Node IP	There is no default for this field.	The IP address of the Analytics nodecomputer.
Analytics Node HTTP Transport Port	9080	The WebSphere Application Server port number that is used on the Analytics node computer.
Database Port Number	1521	The port number for the Oracle Database server.
Database Node IP	There is no default for this field.	The IP address of the data node computer.
Database Username	pmqsch	The user ID that controls the database processes and owns the directories that are used by the database instance.
Database Password	There is no default for this field.	The user ID that controls the database processes and owns the directories that are used by the database instance.

Table 8. Business Intelligence parameters for Oracle Database

Field	Default or example value	Description
Business Intelligence Deployment Location	`/opt/IBM/PMQ/BI`*dateandtime*	The location where the server artifacts are to be installed on the IIB node computer. The artifacts are deployed to the location in a directory with a date and time stamp.
Cognos Install Location	`/opt/ibm/cognos/analytics`	The location where IBM Cognos BI is installed. This directory is on the IIB node computer's file system.
WebSphere Install Location	`/opt/IBM/WebSphere/AppServer`	The location where WebSphere is installed. This directory is on the IIB node computer's file system.
Oracle Client Install Location	`/home/oracle/app/oracle/product/12.1.0/client_1`	The location where the Oracle Database client is installed on the IIB node computer.
Cognos BI Dispatcher URI	`http://localhost:9300/p2pd/servlet/dispatch`	The URL to the IBM Cognos BI dispatcher, where *iib_node_name* is the name or IP address of the IIB node computer.
Database User Name	`pmqsch`	The user ID for the IBM Cognos content store database.
Database Password	There is no default value for this field.	The password for the database instance owner user.
Database Port Number	`1521`	The port number for the Oracle Database server.
Database Node IP	There is no default value for this field.	The IP address of the Analytics node computer.
Integration Bus Node IP	There is no default value for this field.	The IP address of the Integration Bus node computer.
WebSphere Application Server PMQUI Profile Administrative Username	`admin`	The administrative user name for the WebSphere Application Server profile that is used for the dashboard application.
WebSphere Application Server PMQUI Profile Administrative Password	There is no default value for this field.	The password for the administrative user for the WebSphere Application Server profile that is used for the dashboard application.

Table 8. Business Intelligence parameters for Oracle Database (continued)

Field	Default or example value	Description
WebSphere Application Server Cognos Profile Administrative Username	`admin`	The administrative user name for the WebSphere Application Server profile that is used for IBM Cognos Business Intelligence.
WebSphere Application Server Cognos Profile Administrative Password	There is no default value for this field.	The password for the administrative user for the WebSphere Application Server profile that is used for IBM Cognos Business Intelligence.
Business Intelligence Node IP	There is no default value for this field.	The IP address of the Business Intelligence node.

Table 9. Analytics parameters for Oracle Database

Field	Default or example value	Description
Analytics Deployment Location	`/opt/IBM/PMQ/Analytics`	The location where the server artifacts are to be installed on the Analytics node computer.
SPSS Modeler Server Install Location	`/opt/IBM/SPSS/ ModelerServer/18.1`	The location where the Modeler Server is installed.
SPSS Data Pack Installation Location	`/root/SDAP712`	The directory where the IBM SPSS Data Access Pack is installed. This directory is on the Analytics node computer.
SPSS CNDS Install Location	`/opt/IBM/SPSS/Deployment/ 8.1/Server`	The location where IBM SPSS Collaboration and Deployment Services is installed. This location is on the Analytics node computer.
Integration Bus Node IP	There is no default value for this field.	The IP address of the Integration Bus node computer.
Database Node IP	There is no default value for this field.	The IP address of the data node computer.
Database Username	`pmqsch`	The user ID for the IBM Cognos content store database.
Database Password	There is no default value for this field.	The password for the database instance owner user.
Database Port Number	`1521`	The port number for the database server.

Predefined templates for the server artifact installation

The artifact solution installer contains predefined configurations to install server artifacts. You use the predefined configurations to simplify your deployment work.

All of the Predictive Maintenance and Quality artifacts are installed on a single computer. The following predefined configurations are available:

Four-Node Template

A typical Predictive Maintenance and Quality artifacts deployment environment on four nodes contains the following nodes: a data node with IBM Db2 Enterprise Server, a Business Intelligence node, an Analytics node, and an Integration Bus node.

A four-node configuration contains the following components:
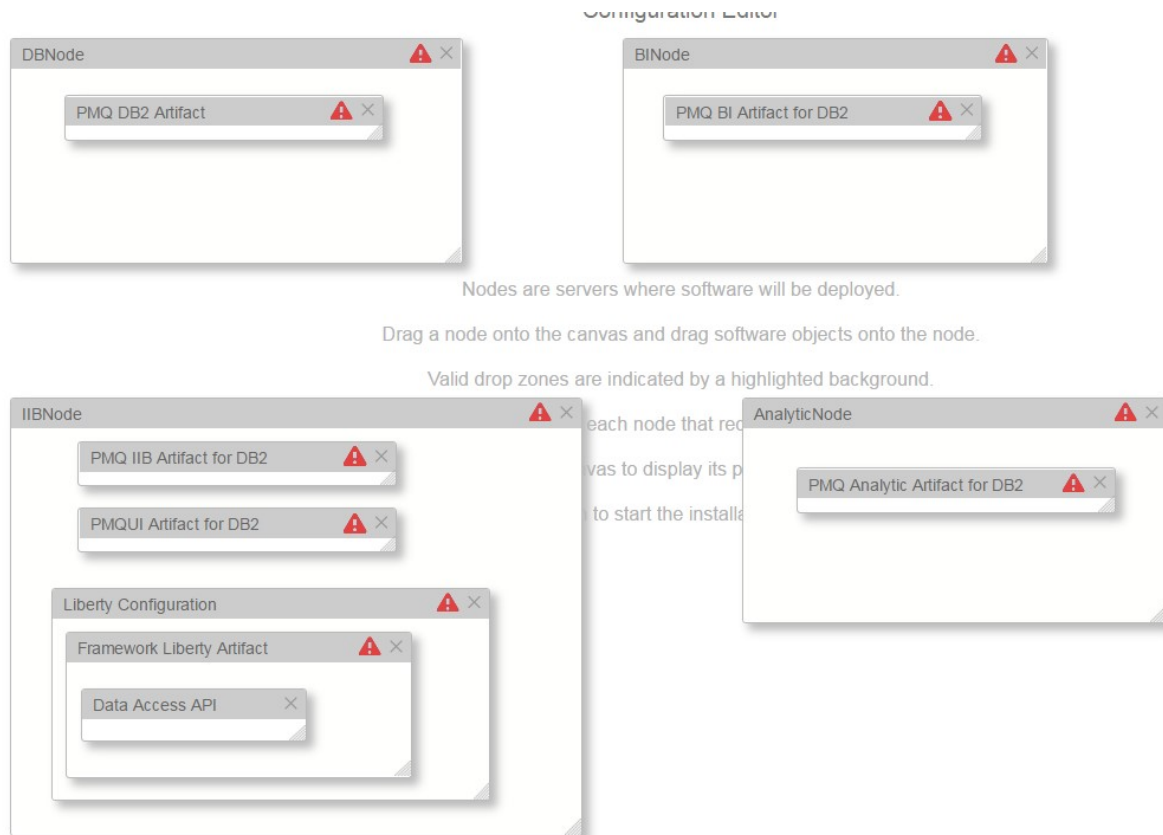
Figure 4. Four-Node Template

Single-Node Situational Awareness Template

All of the Situational Awareness artifacts are installed on a single computer.

Note: A single-node configuration is intended for a demonstration or testing environment. It should not be used for a production environment.

A single-node Situational Awareness configuration contains the following components:
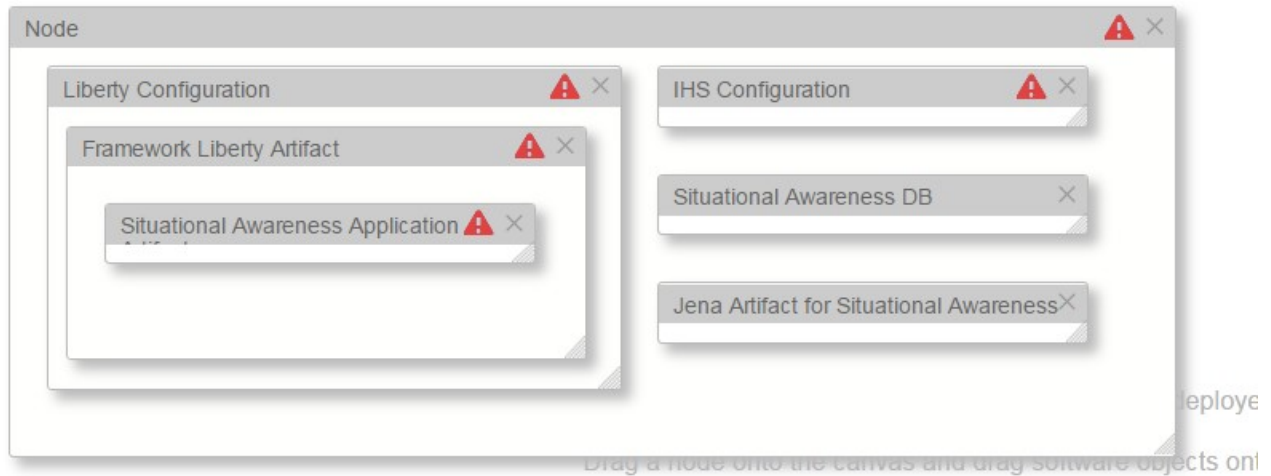
Figure 5. Single-Node Situational Awareness Template

Two-Node Situational Awareness Template

A typical Situational Awareness artifact topology on two nodes contains the following nodes: a data node with IBM Db2 Enterprise Server and an Integration Bus node.

A two node Situational Awareness configuration contains the following components:

Figure 6. Two-Node Situational Awareness Template

> **Note:** Install the Framework and Situational Awareness components on the IBM Integration Bus (IIB) node and the database node. Oracle is not supported.
>
> The Situational Awareness Application Artifact depends on the Framework Liberty Artifact, and the Framework Liberty Artifact depends on the Liberty Configuration. IHS Configuration should be dragged on the node where the HTTP Server located. By default, this is the IIB node. See the following figure.
>
> These components must be installed at the same time.

Parameters for the Situational Awareness artifact installation

Configure parameters for the Situational Awareness artifacts that you are installing.

Use the information in the following tables to configure parameters for the artifacts. The **Property Editor** displays some default values for each component. You can accept the default values or change them to suit your environment.

Table 10. Parameters for Liberty Configuration

Field	Default or example value	Description
Liberty Install Location	/opt/IBM/WebSphere/ Liberty	The location where WebSphere Liberty application server is installed. This is generally on an IIB node.
IBM Installation Manager Location	/opt/IBM/ InstallationManager	The location where the IBM Installation Manager is installed in an IIB node.
Liberty Controller Server HTTP Port	9085	The HTTP port number of the Liberty controller server. Ensure that this port is not in use.
Liberty Controller Server HTTPS Port	9448	The HTTPS port number of the Liberty controller server. Ensure that this port is not in use.
Liberty Framework Server HTTP Port	9086	The HTTP port number to be used for the Framework server. Ensure that this port is not in use.
Liberty Framework Server HTTPS Port	9449	The HTTPS port number for the Framework server. Ensure that this port is not in use.
Liberty KeyStore Password	Not applicable	The password to be set for the keystore for plugin configuration.
Liberty Admin user password	Not applicable	The password to be set for the administrative user.
IBM HTTP Server Plugin Install Location	/opt/IBM/WebSphere/ Plugins	The installation location of IBM HTTP server.
IBM HTTP Server Node Name	iib.ibm.com	The node name where IBM HTTP Server is installed.
IBM HTTP Server Node SSH Port	22	The SSH port of the node that has IBM HTTP Server installed on it.
IBM HTTP Server VM / Node User name	root	The OS-level administrative user of the node that has IBM HTTP Server installed on it.
IBM HTTP Server VM / Node password for the provided user	Not applicable	The password of the OS-level administrative user of the node that has IBM HTTP Server installed on it.

Table 11. Parameters for the Framework Liberty Artifact

Field	Default or example value	Description
Data Node Host Name	data.ibm.com	The node or VM that has database server installed.

Table 11. Parameters for the Framework Liberty Artifact (continued)

Field	Default or example value	Description
Password of Database instance owner - db2inst1	Not applicable	The user password provided for the db2 instance owner (db2inst1 or xxxx)
Password for framework application admin user (Bob)	Not applicable	The user password provided for the framework application administrative user Bob.
Password for framework application sample user1	Not applicable	The user password provided for the framework application user – sample user 1.
Password for framework application sample user2	Not applicable	The user password provided for the framework application user – sample user 2.

Table 12. Parameters for the Situational Awareness Application Artifact

Field	Default or example value	Description
Password of framework administrative user (Bob)	Not applicable	The OS-level user password provided for the framework application administrative user Bob.
Jena Server OS / VM Node hostname	data.ibm.com	The host name of the VM or Node which has the Jena server installed and configured.
Jena Server OS / VM Node user	root	The OS-level administrative user of the VM or node on which the Jena server is installed and configured.
Jena Server OS / VM Node user password	Not applicable	The password for the OS-level administrative user of the VM or node on which the Jena server is installed and configured.

Table 13. Parameters for the Situational Awareness Database Artifact

Field	Default or example value	Description
DB2 Server Install Location Directory	/opt/ibm/db2/V10.5	The path where the DB2 database enterprise server is installed.

Table 14. Parameters for the IBM HTTP Server Configuration Artifact

Field	Default or example value	Description
IBM HTTP Server Install Location Directory	/opt/IBM/HTTPServer	The location where the IBM HTTP server is installed.
IHS Plugin Install Location Directory	/opt/IBM/WebSphere/ Plugins	The location where the IBM HTTP Server plugin is installed.

Field	Default or example value	Description
Liberty Keystore Password	Not applicable	The password for the Liberty keystore.

Cleaning up artifact files if the Situational Awareness artifact installation fails

If the Situational Awareness artifact installation fails, perform these tasks to clean up files related to the Framework and Situational Awareness artifacts. After, run the Situational Awareness installation again.

Cleaning up DB2 files

Perform this task to clean up DB2 files after an installation fails.

Procedure

1. Log in to the database node computer as root.
2. Run following command:
   `/opt/Jena/stopJena_Linux.sh`
3. Run following command:
   `rm -rf /opt/Jena/`
4. Run following command:
   `su - db2inst1 -c "db2stop force; db2start; db2 drop database IFEDB"`

Cleaning up IBM Integration Bus files

Perform this task to clean up IBM Integration Bus (IIB) files after an installation fails.

Procedure

1. Log in to the node where the HTTP server is installed. By default, this is the IIB node.
2. Run the following command:
   `rm -rf /opt/IBM/WebSphere/Plugins/config/ihsserver1`
3. Run the following command:
   `rm -rf /opt/IBM/HTTPServer/cert/`
4. Run the following command:
   `/opt/IBM/WebSphere/Liberty/bin/server stop framework_server`
5. Run the following command:
   `/opt/IBM/WebSphere/Liberty/bin/server stop controller_server`
6. Run the following command:
   `rm -rf /opt/IBM/WebSphere/Liberty/usr/servers/`
7. Run the following command:
   `rm -rf /opt/IBM/energy/`
8. Open the `/opt/IBM/HTTPServer/conf/httpd.conf` file in a text editor.
9. Locate the following lines in the file. Delete these lines as well as the content between the lines.
   `LoadModule was_ap22_module /opt/IBM/WebSphere/Plugins/bin/64bits/`
   `mod_was_ap22_http.so`

```
...
WebSpherePluginConfig /opt/IBM/WebSphere/Plugins/config/ihsserver1/
plugin-cfg.xml
```

Cleaning up artifact residues if the standard artifact installer fails

If the standard artifact installer fails during the artifact installation process, you
must perform certain steps to clean up the artifact residues. After, run the standard
installation again.

About this task

If the BI or SPSS artifact fails during the installation process, no cleanup activity is
necessary. The BI and SPSS artifacts are written to rewrite or redeploy the
configuration without any manual steps. If the DB2, IIB, or PMQUI artifact fails
during the installation process, perform the following manual steps.

Procedure

1. **Cleaning up the DB2 residue.** If the DB2 artifact fails at some intermediate
   point during installation, perform the following steps to clean up the artifact
   residue and rerun the DB2 artifact installer.

   a. Login as db2inst1 or db instance user, and run the following command.

      ```
      db2 list db directory
      ```

      Running this command displays a list of databases that were created in that
      host within the instance. Check to see if the IBMPMQ database is in that
      list.

   b. If the IBMPMQ database is not found, then you can rerun the DB2 artifact
      installer.

   c. If the IBMPMQ database is found, then run the following command to drop
      that database.

      ```
      db2 drop db IBMPMQ
      ```

      Wait for a successful message that the database is dropped. Now, you can
      rerun the DB2 artifact installer.

2. **Cleaning up the IIB residue.** If the IIB artifact fails at some intermediate point
   during installation, perform the following steps to clean up the artifact residue
   and rerun the IIB artifact installer.

   a. Login as mqmuser. To check if pmqbroker is created and running, run the
      following command.

      ```
      mqsilist
      ```

   b. If the response shows no broker, then you can rerun the IIB artifact installer.

   c. If the response shows that pmqbroker is created, then run the following
      commands in sequence to stop and delete that broker.

      ```
      mqsistop pmqbroker
      ```

      Wait for a successful response that the pmqbroker is stopped. Then run the
      following delete command.

      ```
      mqsideletebroker pmqbroker
      ```

   d. Run the following commands to stop and remove the MQ Manager.

      ```
      su - mqmuser
      /opt/mqm/bin/endmqm pmqmanager
      /opt/mqm/bin/dltmqm pmqmanager
      ```

Wait for a successful response that the pmqbroker is deleted.

3. **Cleaning up the PMQUI residue.** If the PMQUI/PMQDashboard artifact fails at some intermediate point during installation, perform the following steps to clean up the artifact residue and rerun the PMQUI artifact installer.

   a. Login as root user. Otherwise, login as sudo user and switch to root user.

   b. Go to the WebSphere install location (for example, `/opt/IBM/WebSphere/AppServer/profiles`) by running the following command.

   ```
   cd /opt/IBM/WebSphere/AppServer/profiles
   ```

   c. To check if PMQUIProfile or a related PMQUI profile name is created, run the `ls` (list) command.

   d. If the `ls` command shows no PMQUIProfile or related PMQUI profile name, then you can rerun the PMQUI artifact installer.

   e. If the `ls` command shows that PMQUIProfile or a related PMQUI profile name is created, then run the following commands in sequence to stop the server and delete that profile. For example, to check if server1 within the PMQUIProfile is running, run the following command.

   ```
   /opt/IBM/WebSphere/AppServer/profiles/PMQUIProfile/bin/serverStatus.sh
   server1
   ```

   If server1 is running, then run the following command to stop that server.

   ```
   /opt/IBM/WebSphere/AppServer/profiles/PMQUIProfile/bin/StopServer.sh
   server1
   ```

   Wait for a successful response that the server is stopped. Then run the following delete command.

   ```
   /opt/IBM/WebSphere/AppServer/bin/manageprofiles.sh -delete -profileName
   PMQUIProfile
   ```

   The **profileName** parameter can be a related PMQUI profile name, if not PMQUIProfile. Wait for a successful response that PMQUIProfile or a related PMQUI profile name is deleted. Then run the following command to delete the profile directory structure.

   ```
   rm -fr /opt/IBM/WebSphere/AppServer/profiles/PMQUIProfile
   ```

   Wait for a successful response that the directory is deleted. Now, you can rerun the PMQUI artifact installer.

Complete the configuration of the server components

After you have installed the IBM Predictive Maintenance and Quality server artifacts, you can complete the configuration of the server components.

Verifying the configuration of IBM SPSS Collaboration and Deployment Services

To complete the configuration of IBM SPSS Collaboration and Deployment Services Server, you must verify the **URL Prefix** value for your environment.

Procedure

1. Open a web browser.
2. In the address bar, type the address for the Collaboration and Deployment administration console.

The address is `http://`*`analytics_node_name`*`:9080/config`, where *`analytics_node_name`* is the name or IP address for the Predictive Analytics node computer.

Important: If you are using a single node installation of Predictive Maintenance and Quality, the port number is 9080. For example, the address is `http://`*`analytics_node_name`*`:9080/config`.

3. Enter the **Login name** and **Password** for the administrator user, and click **Login**.

   The default **Login name** is `admin`, and the default **Password** is `admin`.

4. On the **Configuration** panel, under **Setup**, click **URL Prefix**.

5. In the **URL Prefix** box, verify that the address is `http://`*`analytics_node_name`*`:9080`, where *`analytics_node_name`* is the name or IP address of the Analytics node computer.

6. If the value is correct, you do not have to complete the remaining steps in this task.

7. If the value is not correct, enter the name or IP address of the Analytics node computer, and click **Set**.

8. Open the WebSphere **Administrative Console** in your web browser.

   The address is `https://`*`analytics_node_name`*`:9043/ibm/console`, where *`analytics_node_name`* is the name or IP address for the Analytics node computer. Port number 9043 is the default port for the WebSphere **Administrative Console**.

9. Enter `admin` for both the **User ID** and **Password**, and click **Log in**.

10. Under **Applications** > **Application Types** > **WebSphere Enterprise Applications**, select **IBM_SPSS_Collaboration_and_Deployment_Services_8.1.1**, and click **Stop**.

11. Select **IBM_SPSS_Collaboration_and_Deployment_Services_8.1.1**, and click **Start** to restart the application and apply the changes.

Configure the Integration Bus node components

To configure the Integration Bus node components, you must enable remote access for the queue manager.

Configuring the WSJPA persistence provider

You must configure the WebSphere Application Server persistence provider (WSJPA).

Procedure

1. In a web browser, open the WebSphere administrative console. The address is `http://`*`iib_node_name`*`:9060/ibm/console` where *iib_node_name* is the name or IP address for the IIB node computer and 9060 is the default port number for the WebSphere administrative console.

2. In the administrative console, click **Servers** > **Server Types** > **WebSphere application servers** > *server_name* > **Container Services** > **Default Java Persistence API settings**.

3. Set the Java Persistence API (JPA) specification level to 2.0.

4. Set the default persistence provider to `org.apache.openjpa.persistence.PersistenceProviderImpl`.

5. Click **Apply** and save the configuration.

6. Run following commands to restart the PMQUIProfile on the IIB node.
   ```
   cd /opt/IBM/WebSphere/AppServer/profiles/PMQUIProfile/bin
   ./stopServer.sh server1
   ./startServer.sh server1
   ```

Updating the software tag file

For IBM Predictive Maintenance and Quality, you must copy the `swidtag` software tag file in the `/var/PMQ/iso-swid` folder.

Procedure

1. Go to the `/opt/IBM/PMQ/Integration_Bus/ISOSWID_TAG/` folder. You will find the `ISOSWID_NonProduction_Tag` and `ISOSWID_Production_Tag` folders that contain the non-production and production tags, respectively.
2. Copy the relevant non-production or production `swidtag` file and replace the existing file in the `/var/PMQ/iso-swid` folder.

   For example, if the Predictive Maintenance and Quality product is used in production mode, copy the production `swidtag` file from the `ISOSWID_Production_Tag` folder.

Enabling remote access for the queue manager

For IBM Predictive Maintenance and Quality, you must start the queue manager command line processor to enable remote access to the queue manager.

Procedure

1. In a terminal window, go to the *installation_location*/iib-10.0.0.7/server/bin directory. For example, if you installed to the default location, go to the /opt/ibm/iib-10.0.0.7/server/bin directory.
2. Change to the mqmuser. For example, `su mqmuser`.
3. Enter the following command to load the profile that is needed for the mqm user, and press Enter:

   `. ~/.bash_profile`
4. As the mqm user, enter the following command to start the queue manager:

   `runmqsc queue_manager_name`

   For example, to use the default queue manager named pmqmanager, enter:

   `runmqsc pmqmanager`
5. Enter the following lines, and press Enter after each line:
   ```
   START LISTENER
   ALTER QMGR CHLAUTH(ENABLED)
   SET CHLAUTH(SYSTEM.BKR.CONFIG) TYPE(ADDRESSMAP) ADDRESS('*')
   MCAUSER('mqmuser')
   SET CHLAUTH(SYSTEM.BKR.CONFIG) TYPE(BLOCKUSER) USERLIST('*NOACCESS')
   END
   ```

   Important: The `ADDRESS('*')` value in the command allows connections from any IP address. Consider restricting the access to a single computer. For more information about these values, see the WebSphere MQ documentation.

Enabling IBM Maximo Asset Management integration

To enable IBM Maximo® Asset Management integration with IBM Predictive Maintenance and Quality, you must manually modify configuration files and deploy the `PMQMaximoIntegration.bar` file.

Procedure

1. Log on to the Integration Bus node computer as the `mqmuser`.
2. Go to the `/var/mqsi/shared-classes/orchestrations` directory.
3. To enable IBM Maximo work order creation:
   a. Open `PMQ_orchestration_definition_measurement.xml` in a text editor.
   b. Uncomment the second `service_invocation_configuration` element in the service adapter section.
   c. Save and close the file.
4. To enable IBM Maximo work order updating:
   a. Open `PMQ_orchestration_definition_maintenance.xml` in a text editor.
   b. Uncomment the last `step` element in the file.
   c. Save and close the file.
5. Restart the pmqbroker.
   a. Go to the `/opt/ibm/iib-10.0.0.7/server/bin` directory.
   b. Enter the following command to stop the broker:
      `./mqsistop pmqbroker`
   c. Enter the following command to restart the broker:
      `./mqsistart pmqbroker`
6. Set the URL for IBM Maximo.
   a. Go to the `/var/PMQ/MQSIFileInput/properties` directory.
   b. Open the `PMQMaximoIntegration.properties` file in a text editor.
   c. Enter the IP address of the IBM Maximo host computer in the `webServiceURL`. For example, change `localhost` to the IBM Maximo host IP address.
   d. Save and close the file.
7. Update the `PMQMaximoIntegration.bar` file.
   a. Go to the `/opt/ibm/iib-10.0.0.7/server/bin` directory.
   b. Enter the following command:
      `./mqsiapplybaroverride -b /var/PMQ/MQSIFileInput/server/ PMQMaximoIntegration.bar -k PMQMaximoIntegration -p /var/PMQ/MQSIFileInput/properties/PMQMaximoIntegration.properties`
8. Deploy the `PMQMaximoIntegration.bar` file.
   a. Go to the `/opt/ibm/iib-10.0.0.7/server/bin` directory.
   b. Enter the following command:
      `./mqsideploy pmqbroker -e pmqgroup1 -a /var/PMQ/MQSIFileInput/server/ PMQMaximoIntegration.bar`

Starting the Predictive Maintenance and Quality dashboard application

The Predictive Maintenance and Quality dashboard application provides a single interface where users can access IBM Cognos Business Intelligence reports, access the IBM Analytics Solutions Foundation, and view live profile values for a particular resource.

About this task

The Predictive Maintenance and Quality dashboard application contains the following tabs:

Dashboard
Create and manage dashboards.

Reports
Access the IBM Cognos Business Intelligence reports.

Foundation
Configure Predictive Maintenance and Quality. This tab is visible to users in the Administrator group only.

For the Predictive Maintenance and Quality dashboard application to work properly, master data must be loaded into Predictive Maintenance and Quality.

Procedure

Access the Predictive Maintenance and Quality dashboard application by typing the following URL:
`http://iib_node_name:port_number/PMQDashboard/pmqui`
iib_node_name is the name or IP address for the IIB node computer.

Configuring the Analytics node

You must install and configure IBM SPSS Collaboration and Deployment Services Deployment Manager on the Analytics node.

Procedure

1. Install IBM SPSS Collaboration and Deployment Services Deployment Manager on the Predictive Analytics node. See "Installing IBM SPSS Collaboration and Deployment Services Deployment Manager" on page 66.
2. Add a content server connection. See "Adding a content server connection for IBM SPSS Collaboration and Deployment Services" on page 67.
3. Import the resource definitions. See "Importing the resource definitions into IBM SPSS Collaboration and Deployment Services" on page 69.
4. Add server and resource definitions. See "Adding server and resource definitions to IBM SPSS Collaboration and Deployment Services" on page 70.
5. Perform "Updating database credentials and changing table names"

Updating database credentials and changing table names

If you specified a user ID other than the default for the IBM Cognos content store database, then you must update the credentials for the jobs in Deployment Manager.

Procedure

1. Start **Deployment Manager** and select the **Context Explorer** tab.
2. Expand the **Content Repository** folder.
3. Right-click a job and select **Open**.
4. Select a stream on the job and click the **ODBC Data Sources** tab.
5. To change a database table name:
   a. Click an entry under **ODBC DSN** and click the ellipsis.
   b. Select either **Use ODBC DSN** or **Create New ODBC**.
   c. Change the table name or create a new one and then save the job.
6. To update database credentials:

a. Click an entry under **Credentials** and click the ellipsis.

b. Select either **Use Existing Credential** or **Create New Credential**.

c. Change the credentials or create a new one and then save the job.

Exporting solution and orchestration definitions

Use the export utility **PMQExportUtility** to export the solution and orchestration XML files to the **Foundation Web UI** application.

About this task

PMQExportUtility is at `/opt/IBM/PMQ/Business_Intelligence/PMQExportUtility`.

Procedure

1. Create a directory that is named `/root/migrate_files` on the IIB node and put the solution XML files to be migrated into this directory. The default solution XML file is in `var/mqsi/shared-classes/`.

2. Create a directory that is named `/root/migrate_files/orchestrations` on the IIB node and put one of the orchestration XML files to be migrated into this directory. The default orchestration XML files are in the IIB node in the `var/mqsi/shared-classes/orchestration` directory.

3. Update the `pmq_export.properties` file to connect to the report database and IBM WebSphere Application Server.

   The following code shows examples for Oracle Database and IBM DB2.

   ```
   #----------------------------------------#
   #Properties for data source
   #----------------------------------------#
   #Example For Oracle: oracle.jdbc.OracleDriver
   #Example For DB2: com.ibm.db2.jcc.DB2Driverpmq_migration_jdbc_driver=
   com.ibm.db2.jcc.DB2Driver
   #Example For Oracle: <path>/ojdbc7.jar
   #Example For DB2: <path>/db2jcc4.jarpmq_migration_jdbc_driver_path=
   /opt/ibm/db2/V10.5/java/db2jcc4.jar
   #Example For Oracle: jdbc:oracle:thin:@<dbHost>:<dbPort>/<dbName>
   #Example For DB2:
   jdbc:db2://<dbHost>:<dbPort>/<dbName>:currentSchema=<dbCurentSchema>;
   pmq_migration_jdbc_url=jdbc:db2://9.120.120.120:50000/IBMPMQ:currentSchema=PMQSCH;
   pmq_migration_jdbc_username=db2inst1pmq_migration_jdbc_password=db2inst1
   #----------------------------------------#
   #Properties for WebSphere Application Server
   #----------------------------------------#
   pmq_migration_was_root=/opt/IBM/WebSphere/AppServer
   pmq_migration_was_profile_name=PMQUIProfile
   pmq_migration_was_server_name=server1
   ```

4. For a four node installation, copy the `ExportUtility` directory from the BI node and put it in the IIB node. Run the following commands to migrate and export the foundation configuration content to the **Foundation Web UI** application.

   ```
   chmod 744 pmq_export.sh
   .pmq_export.sh
   ```

Results

You can access the foundation configuration files from `http://host:port/PMQDashboard/pmqui`.

Chapter 8. Artifact installation for a deployment that contains Oracle Database

For an Oracle Database installation, you must configure IBM Predictive Maintenance and Quality to access the Oracle Database that contains your Predictive Maintenance and Quality data and reports.

Prerequisites

Before you install the artifacts to support Oracle Database, you must perform some tasks on the Predictive Maintenance and Quality nodes.

You must have Oracle Database 12c Release 1 (12.1.0.2.0) Enterprise Edition for Microsoft Windows (x64) installed and configured. Ensure that it is available in your network and that you can connect to it.

Perform the following tasks on the Business Intelligence (BI) node:
- Install Oracle 12.1.0 32 bit client with an **Installation Type** of Runtime.
- Copy ojdbc6.jar and ojdbc7.jar files from *oracle_home*/jdbc/lib to *cognos_home*/webapps/p2pd/web-inf/lib.

Installing the JDBC driver

You must install the Oracle JDBC driver on the Integration Bus node.

Procedure

1. Log on to the Integration Bus node computer as the **mqm** user.
2. Type the following command:

   mkdir -p /var/PMQ/JDBC_jar/
3. Copy the Oracle JDBCojdbc7.jar file to /var/PMQ/JDBC_jar/ Use the **mqm** ID and **755** permissions. The ojdbc7.jar file is available from the Oracle web site or your Oracle installation location.

Configuring Cognos Business Intelligence

You must configure Cognos Business Intelligence on the IIB node to point to your Oracle Database server.

Procedure

1. Edit the ~/.bash_profile file and add the following environment variables:

Table 15. Environment Variables

Name	Value
ORACLE_HOME	/home/oracle/app/oracle/product/12.1.0/client_1
LD_LIBRARY_PATH	$LD_LIBRARY_PATH:/home/oracle/app/oracle/product/12.1.0/ client_1/bin/:/home/oracle/app/oracle/product/12.1.0/ client_1/lib/
TNS_ADMIN	/home/oracle/app/oracle/product/12.1.0/client_1/network/ admin/
PATH	$PATH:$ORACLE_HOME/bin

2. Run the following command:
   `source ~/.bash_profile`

Configuring the PMQ UI server

You must configure the PMQ UI to point to your Oracle Database.

Procedure

1. In a web browser, open the WebSphere Administrative Console. The address is `http://iib_node_name:9060/ibm/console`, where *iib_node_name* is the name or IP address for the IIB node computer. 9060 is the default port number for the WebSphere Administrative Console.
2. Enter admin for both the `User ID` and `Password`, and click **Log in**.
3. Select **Resources** > **Data sources** and click **New**.
4. Enter a value in the **Data source name** field, enter dbc/tenx in the **JNDI name** field, and click **Next**.
5. Click **Create new JDBC provider** and click **Next**.
6. Select values for the following fields and then click **Next**:

Table 16. Database values

Field name	Value
Database type	Oracle
Provider_type	Oracle JDBC driver
Implementation type	XA data source

7. Enter the database driver class path information and click **Next**.

   The `ojdbc7.jar` file must be in the path that you enter.
8. Enter the following **URL** for the data source and click **Next**.

   `jdbc:oracle:thin:@DB_IP_Address:DB_PORT_NUMBER:IBMPMQ`

   Contact your database administrator for the values for *DB_IP_Address* and *DB_PORT_NUMBER*.
9. Click **Next** to temporarily ignore the security alias setup. You'll configure the security settings later in this procedure.
10. Click **Finish** and save your changes. The PMQ UI data source displays in the **Data sources** window.
11. Click the PMQ UI data source name and then click **JAAS - J2C authentication data**.
12. Click **New**, type values for **Alias**, **User ID**, and **Password** that are used to connect to Oracle Database and then click **OK**.
13. Go back to the Data sources window and click the PMQ UI data source name.
14. Scroll down to the **Security settings** section.
15. Select the authentication values that you entered in the **JAAS - J2C authentication data** window and click **OK**. Select these values for all fields except **Mapping-configuration alias**.
16. Save the configuration.
17. Click **Test connection** to validate the connection to the data source.

Configuring PMQExportUtility

You must update `pmq_export.properties` so that you can use PMQExportUtility for Oracle Database.

Procedure

Open the `pmq_export.properties` file and make the following changes to it:

1. Update the JDBC driver value.
   `pmq_migration_jdbc_driver=oracle.jdbc.OracleDriver`
2. Update the JDBC driver path value. `pmq_migration_jdbc_driver_path=./lib/ojdbc7.jar`

   Copy the `ojdbc7.jar` into the `/lib` folder of PMQExportUtility.
3. Update the JDBC URL value to point to the location of the Oracle Database.
   `pmq_migration_jdbc_url=jdbc:oracle:thin:@`*dbHost*`:`*dbPort*`/IBMPMQ`

   Contact your database administrator for the values of *dbHost* and *dbPort*.
4. Update the JDBC user name and password values with Oracle Database credentials.

   `pmq_migration_jdbc_username=pmqsch`
   `pmq_migration_jdbc_password=<schema_password>`

Chapter 9. Client component installation

There are several client components that are included with IBM Predictive Maintenance and Quality. You can install the components as you require.

Important: The client components must be installed on computers running the Microsoft Windows 7 or Microsoft Windows 8 32 or 64-bit operating system.

Important: Install the client components only after you successfully install the server components.

Client components

Client components for IBM Predictive Maintenance and Quality are available to be installed.

For more information about installing and using the client components, see the documentation provided with the component.

Important: After the client installation files are copied to your computer, some paths for the compressed files can be long. You might need to use a decompression utility other than the one provided by Microsoft Windows to decompress the files.

Database connectivity

Install IBM Data Server Runtime Client to enable connectivity to the databases. In a multinode deployment, you must use the same configuration values for every instance of IBM Data Server Runtime Client that you install. The configuration values include the installation directory, instance name, instance password, and instance home directory.

Predictive modeling and decision management

Install the following components so that you can modify or create predictive models and so that you can perform decision management tasks:
- IBM SPSS Collaboration and Deployment Services Deployment Manager
- IBM SPSS Modeler Client Premium

Optionally, install the following components:
- IBM SPSS Statistics Client
- IBM SPSS Collaboration and Deployment Services Documentation
- IBM Analytical Decision Management Documentation
- IBM SPSS Modeler Premium Documentation

Business intelligence

Install IBM Cognos Framework Manager so that you can modify the reporting model metadata.

Framework Manager is a 32-bit application so it requires the 32-bit IBM Data Server Runtime Client. Before you use IBM Cognos Framework Manager:

1. Install IBM Data Server Runtime Client
2. Restart the computer
3. Catalog the databases

Optionally, install the following components:
- IBM Cognos Dynamic Query Analyzer
- IBM Cognos for Microsoft Office
- IBM Cognos Software Development Kit

Integration Bus

Install the following components:
- Integration Bus Toolkit
- WebSphere MQ for Windows

Use the Integration Bus Toolkit to create, manage, deploy, and delete message flows and associated resources in a development environment.

Installing the client components

After you download the client package, install the client component installation programs to a Microsoft Windows computer. You must run the installation programs individually after they are copied to your computer.

Tip: You might need to adjust your Windows User Access Control (UAC) settings so that you can run the client component installation programs.

Procedure

1. Extract the Client package on a Microsoft Windows computer.
2. In the extracted folder, open the `disk1` folder.
3. Right-click `launchpad64.exe` (in 64-bit Windows) or `launchpad.exe` (in 32-bit Windows), and click **Run as administrator**.
4. On the **Welcome** screen, click **Next**.
5. If you accept the terms in the license agreement, click **I accept the terms in the license agreement**, and click **Next**.
6. Optional: Click **Online Knowledge Center** to review the documentation and release notes. Click **Next**.
7. Review the list of included components, and click **Next**.
8. In the **Destination Location** box, type a valid path. Click **Copy Installers** to copy the installers to the target location.
9. After the installers are copied, click **Next**, and click **Finish**.
10. Open the target location and extract `IBMPMQ_Client_262.zip` to get the client component installation programs.

Installing IBM SPSS Collaboration and Deployment Services Deployment Manager

You must install IBM SPSS Collaboration and Deployment Services Deployment Manager to complete the configuration of IBM Predictive Maintenance and Quality.

Install IBM SPSS Collaboration and Deployment Services Deployment Manager on a computer that has the Microsoft Windows 7 or Microsoft Windows 8 operating systems installed.

Procedure

1. Go to the `install_location\IBMPMQ_Client_262\64 bit\ SPSS_CNDS_DeploymentManager` or `install_location\IBMPMQ_Client_262\32 bit\SPSS_CNDS_DeploymentManager_No` directory.
2. Decompress the installation package.
3. In the folder containing the installation files, double-click `DeploymentManager_win64.exe` to start the IBM SPSS Collaboration and Deployment Services Deployment Manager installation.
4. Follow the steps in the wizard to install the client component.

   For more information about the installation of Deployment Manager, see the IBM SPSS Collaboration and Deployment Services Deployment Manager7 Installation (www.ibm.com/support/knowledgecenter/SS69YH_7.0.0/ cads_manager_install_ddita/model_management/thick/ thick_install_overview.html).

Adding a content server connection for IBM SPSS Collaboration and Deployment Services

You must add a connection to your IBM SPSS Collaboration and Deployment Services repository in the IBM SPSS Collaboration and Deployment Services Deployment Manager client.

After you add the connection, the server folder displays in the **Content Explorer**, and you can log in to the server.

Procedure

1. On your Microsoft Windows computer, start IBM SPSS Collaboration and Deployment Services Deployment Manager. For example, click **Start** > **Deployment Manager**.
2. Click **File** > **New** > **Content Server Connection**.
3. In the **Connection Name** box, enter a name for your Collaboration and Deployment Services repository.
4. In the **Host** box, enter the name or IP address of the Predictive Analytics node computer.
5. In the **Port** box, enter 9080.

   The default port number that is used by the WebSphere Application Server instance is 9080.

   Important: If you are using a single node installation of Predictive Maintenance and Quality, the port number is 9082.

   Note: If you are using Oracle Database, the default port number is 80.
6. Click **Finish**.
7. Click the connection name that you created.
8. In the **User ID** and **Password** boxes, enter the credentials for the CNDS server.
9. Click **OK**.

Adding users and groups to IBM SPSS Collaboration and Deployment Services

You use IBM SPSS Collaboration and Deployment Services Deployment Manager to manage users and groups. You must add an administrator user for IBM Predictive Maintenance and Quality.

Procedure

1. In Deployment Manager, click **Tools** > **Server Administration**.
2. Click **Click here to define a new administrative server connection**.
3. In the **Name** box, enter a name for your server, and click **Next**.
4. In the **Host** box, enter the name or IP address of Predictive Analytics node computer.
5. In the **Port** box, enter the port number of for the WebSphere instance. The default value is 9080.

   Important: If you are using a single node installation of Predictive Maintenance and Quality, the port number is 9082.
6. Click **Finish**.
7. Double-click the connection name that you created.
8. In the **User ID** box, enter admin.
9. In the **Password** box, enter admin.
10. Click **OK**.
11. Expand **Users and Groups**, and double-click **Local User Repository**.
12. Select **Show all available users/groups**.
13. Click **New Group**.
    a. Enter administrator.
    b. Select **Show all available users**.
    c. Under **Available users**, move the **admin** user to **Groups contains users**.
    d. Click **OK**.
14. Click **New Group**.
    a. Enter DM Administrator.
    b. Select **Show all available users**.
    c. Under **Available users**, move the **admin** user to **Groups contains users**.
    d. Click **OK**.
15. Click **New Group**.
    a. Enter DM Users.
    b. Select **Show all available users**.
    c. Under **Available users**, move the **admin** user to **Groups contains users**.
    d. Click **OK**.
16. Double-click **Roles**.
17. Click **New Role**.
    a. In the **Role Name** box, enter DM Administrator.
    b. Click **Select All** to add all actions for this user role.
    c. Click **OK**.
    d. Select the **DM Administrator** role, and click **Edit Users and Groups**.
    e. Click **Show all available users/groups**.

f.   Under **Available users**, move the **DM Administrator** group to **Users/Groups Assigned to Role**.

g.   Click **OK**.

18.   Click **New Role**.

a.   In the **Role Name** box, enter DM User.

b.   Click **Select All** to add all actions for this user role.

c.   Click **OK**.

d.   Select the **DM User** role, and click **Edit Users and Groups**.

e.   Click **Show all available users/groups**.

f.   Under **Available users**, move the **DM Users** group to **Users/Groups Assigned to Role**.

g.   Click **OK**.

Importing the resource definitions into IBM SPSS Collaboration and Deployment Services

Predictive Maintenance and Quality resource definitions include credential definitions, data source definitions, message domains, promotion policies, server definitions, and server cluster specifications. These resources are required for running jobs.

You must import these resource definitions into IBM SPSS Collaboration and Deployment Services Deployment Manager.

The resource files are installed onto the Predictive Analytics node computer by the Server Artifact installer. You must copy the content files from the Analytics node to the computer where you installed Deployment Manager.

Procedure

1.   Copy the Analytics node contents to your Windows-based computer by using either an FTP client or by using a shared directory.

The contents files are installed to /opt/IBM/PMQ by default on the Analytics node computer.

2.   Start Deployment Manager, and select the **Content Explorer** tab.

3.   Right-click **Content Repository**, and click **Import**.

4.   Browse to and select the pes files from the Analytics node server artifacts.

The artifacts include the following files:

- IBMPMQ_ARMOR_ANALYTICS.pes
- IBMPMQ_INTEGRATED_FEATURE_BASED_ANALYTICS.pes
- IBMPMQ_MAINTENANCE_ANALYTICS.pes
- IBMPMQ_SENSOR_ANALYTICS.pes
- IBMPMQ_SENSOR_FEATURE_BASED_ANALYTICS.pes
- IBMPMQ_TOP_FAILURE_PREDICTORS.pes
- IBMPMQ_WARRANTY.pes

5.   Click **Open**.

6.   Accept the default options in the **Import** window, and click **OK**.

7.   Repeat the previous steps to import each pes file.

Adding credential definitions to IBM SPSS Collaboration and Deployment Services

You must add user credential definitions in IBM SPSS Collaboration and Deployment Services Deployment Manager. You must add the credentials for your IBM SPSS admin user, the database instance owner, and the root user on the Predictive Analytics node computer.

About this task

If any of the users already exist, then you must update the user passwords as described in this procedure.

Procedure

1. In Deployment Manager, click **Content Explorer**.
2. Expand **Resource Definitions** > **Credentials**.
3. Right-click **Credentials**, and click **New** > **Credentials Definition**.
   a. In the **Name** box, enter admin, and click **Next**.
   b. In the **User ID** box, enter admin.
   c. In the **Password** box, enter the password you entered for the **WebSphere Application Server Profile Administrative User Name**.
   d. In the **Security Provider** box, select **Local User Repository**.
   e. Click **Finish**.
4. Right-click **Credentials**, and click **New** > **Credentials Definition**.
   a. In the **Name** box, enter db2inst1, and click **Next**.
   b. In the **User ID** box, enter db2inst1.
   c. In the **Password** box, enter the password for your **db2inst1** user.
   d. Leave the **Security Provider** box blank.
   e. Click **Finish**.
5. Right-click **Credentials**, and click **New** > **Credentials Definition**.
   a. In the **Name** box, enter modeler, and click **Next**.
   b. In the **User ID** box, enter root.
   c. In the **Password** box, enter the password for the **root** user on the Analytics node computer.
   d. Leave the **Security Provider** box blank.
   e. Click **Finish**.

Adding server and resource definitions to IBM SPSS Collaboration and Deployment Services

You must add server and resource definitions in Deployment Manager.

If you are not using a computer that is running Microsoft Windows 7 or Microsoft Windows 8 operating systems, some entries, such as server types, might not display correctly.

Procedure

1.

Important: If any of the servers exist, then you must update their properties as described in this procedure.
In Deployment Manager, click **Content Explorer**.

2. Expand **Resource Definitions**.
3. Perform the following steps to add server definitions:
   a. Double-click **localhost**.
   b. In the **Server URL** field, type the IP address and HTTP Transport port of the Analytics node. For example, `http://analytics_node_name:Http_port_number/` .
   c. Click **Back** and verify that the **Name** is `localhost` and the **Type** is `Content Repository Service`.
   d. Click **Finish**.
   e. Double-click **modeler**.
   f. Click **Back** and verify that the **Name** is `modeler` and the **Type** is `Modeler Service`.
   g. Click **Next**.
   h. Type the host name in the **Host** field, `28057` in the **Port** field, and the SPSS Modeler Server installation location the **Default data path** field.

      The default SPSS Modeler Server installation path is `/opt/IBM/SPSS/ModelerServer/18.1.1/demos`.
   i. Click **Finish**.
4. Perform the following steps to add resource definitions:
   a. Expand the **Credentials** folder.
   b. Double-click **admin**.
   c. If you changed CADS credentials, update them, and click **Finish**. In the **Security Provider** field, select **Local User Repository**.
   d. Double-click **IBMPMQ**, enter the credentials for your Database, and click **Finish**.
   e. Double-click **modeler**, enter the credentials of the target system, and click **Finish**.

Installation of the Integration Bus clients

For IBM Predictive Maintenance and Quality, you must install MQ Explorer, Integration Toolkit, and Integration Explorer.

Installing MQ Explorer

IBM Integration Explorer client application requires that MQ Explorer is installed on the same computer.

Procedure

1. Go to the `install_location\IBMPMQ_Client_262\64 bit\IBM_Integration_Bus_Toolkit\IBM_INTEGRATION_BUS_V10.0_WIND_64` directory.
2. Decompress the installation file that is named `9.1.0.0-IBM-MQC-Win64.zip`.
3. In the decompressed directory, go to the `MQServer` directory, and double-click `MQLaunch.exe`.
4. Click **Software Requirements**, and ensure that you are using a supported operating system.
5. Click **Network Configuration**, and select **No** for **Configuring WebSphere MQ for Windows domain users**.

6. Click **IBM MQ Installation**, and click **Launch IBM MQ Installer**.
7. On the **Setup Type** page, select **Custom**, and click **Next**.
8. On the **Features** page, select only **MQ Explorer** to be installed.

   Ensure that all other features are set to **Do not install this feature**.
9. Click **Next**.
10. Click **Install**, and click **Finish**.

Installing the Integration Bus client applications

Install the IBM Predictive Maintenance and Quality Integration Bus client applications. The applications include IBM Integration Toolkit and IBM Integration Explorer.

Before you begin

Ensure that MQ Explorer is already installed.

Procedure

1. Go to the `install_location\IBMPMQ_Client_262\64 bit\ IB_Integration_Bus_Toolkit\IBM_INTEGRATION_BUS_V10.0_WIND_64` directory.
2. Decompress the `IIB_V10.0.0.7_WINDOWS_X86-64.zip` installation file.
3. In the decompressed directory, in the `IIB_V10.0.0.7_WINDOWS_X86-64\ EAsmbl_image` directory, double-click `IIBSetup10.0.0.7.exe`.
4. Accept the license and click **Install**.
5. Follow the steps to install IBM Integration Toolkit.

Connecting to your WebSphere MQ broker

Connect to the queue manager you created on the IBM Predictive Maintenance and Quality Integration Bus node computer.

Procedure

1. In a terminal window in the iib node, login as a mqmuser, and type the following command (all on one line):

   `setmqaut -m pmqmanager -t queue -n SYSTEM.MQEXPLORER.REPLY.MODEL -g mqm`

   `+browse -get +put`
2. Go to the `/opt/ibm/iib-10.0.0.7/server/sample/wmq` directory and run the following command:

   `./iib_createqueues.sh pmqmanager mqmuser`
3. From the **Start** menu, click **All Programs** > **IBM MQ** > **MQ Explorer**.

   The first time that you start WebSphere MQ Explorer, you are prompted for a workspace location.
4. In the **MQ Explorer - Navigator**, under **IBM MQ**, right-click **Queue Managers**, and select **Add Remote Queue Manager**.
5. Enter the name of your queue manager, select **Connect directly**, and click **Next**. For example, enter `pmqmanager`.
6. In the **Connection details** section, enter the following information, and click **Next**.

   a. In the **Host name or IP address** box, enter the information for your Integration Bus node computer.

   b. In the **Port number** box, enter the listener port number. The default is 1414.

      c. In the **Server-connection channel** box, enter `SYSTEM.BKR.CONFIG`

7. On the **Specify user identification details** page, select **Enable user identification**.

8. In the **Userid** box, enter `mqm`.

9. The first time that you add a user, you must enable password saving. Click **Passwords Preferences Page**, and then select **Save passwords to file** to enable the feature, and click **OK**.

10. Click **Enter password**.

11. Enter the user's password, and click **OK**.

12. Click **Finish**. The queue manager appears in the list, and the status appears as running.

Installing Framework Manager for IBM Predictive Maintenance and Quality

Install IBM Cognos Framework Manager to create or edit models and publish packages for IBM Cognos Business Intelligence.

Procedure

1. Go to the *install_location*`\IBMPMQ_Client_262\64 bit\CognosAnalytics\Framework_Manager` directory.

2. Double-click the `ca_model_win32_11.0.12.exe` file.

3. Follow the steps in the wizard to install the product.

4. Start the IBM Cognos Configuration.

5. In IBM Cognos Configuration, in the **Explorer** panel, select **Environment**.

6. In the **Gateway URI** value, change `localhost` to the name or IP address of the Business Intelligence (BI) node computer.

7. In the **Dispatcher URI for external applications** value, change `localhost` to the name or IP address of the Business Intelligence (BI) node computer.

8. In the **Dispatcher URI for external applications** value, change `9300` to `9080`. 9080 is the port number that is used by WebSphere Application Server for IBM Cognos Business Intelligence.

9. Click **File** > **Save**.

Copying the license files to each client computer

After you install the IBM Predictive Maintenance and Quality client components, you must copy the `swidtag` file and `license` folder from where you installed the artifacts to the computers on which you install an IBM Predictive Maintenance and Quality client.

Important: Do not rename the folders or files.

Procedure

1. Copy the `swidtag` file from the `iso-swid` folder where you installed the artifacts to each computer on which you install a client.

   For example, copy the file so that you have a `C:\IBM\PMQ2.6.2\iso-swid` folder that contains a `swidtag` file.

2. Copy the `license` folder from the folder where you installed the artifacts to each computer on which you install a client.

For example, copy the folder and contents so that you have a
`C:\IBM\PMQ2.6.2\license` folder that contains the license files.

Chapter 10. Stop and start solution software services

IBM Predictive Maintenance and Quality is an integrated solution that includes many products. If you must stop the services, you must do so in the correct order. The product services must also be started in the correct order.

Stop solution services

You must stop the IBM Predictive Maintenance and Quality node services in a specific order.

Stop the node services in the following order:
1. Business Intelligence (BI) node
2. Integration Bus node
3. Predictive Analytics node
4. data node

Stopping services on the IIB node computer

You must stop the IBM Cognos Business Intelligence services and IBM HTTP Server on the IBM Predictive Maintenance and Quality Business Intelligence (BI) node computer.

You stop the IBM Cognos BI services by stopping the WebSphere Application Server profile where IBM Cognos BI is running.

About this task

Use the following steps to stop IBM Cognos in silent mode.

Procedure

1. Go to the `cognos_install_location/bin64` directory. For example, go to the `/opt/ibm/cognos/analytics/bin64` directory.
2. Enter the following command:

   ```
   export JAVA_HOME=/opt/ibm/cognos/analytics/jre/
   ./cogconfig.sh -stop
   ```

Stopping services on the Integration Bus node computer

You must stop the IBM Integration Bus services on the IBM Predictive Maintenance and Quality Integration Bus node computer.

Procedure

1. Log in to the Integration Bus node computer as **root**.
2. Change to the **mqmuser**. For example, enter the following command:

   ```
   su - mqmuser
   ```
3. Go to the IBM Integration Bus `bin` directory. For example, go to `/opt/ibm/iib-10.0.0.7/server/bin`.
4. Enter the following command:

   ```
   ./mqsistop pmqbroker -i
   ```

5. Enter the following command to verify that the services are stopped:

   `./mqsilist pmqbroker`

6. Go to the Liberty installation location, for example, /opt/IBM/WebSphere/Liberty/, and stop the Liberty servers using the following commands:

   `bin/server stop framework_server`
   `bin/server stop controller_server`

Stopping services on the Analytics node computer

You must stop the IBM SPSS services on the IBM Predictive Maintenance and Quality Predictive Analytics node computer.

Procedure

1. Log in to the Analytics node computer as **root**.
2. Go to the WebSphere Application Server `CNDSprofile/bin` directory. For example, go to `/opt/IBM/WebSphere/AppServer/profiles/CNDSprofile/bin`.
3. Enter the following command:

   `./stopServer.sh server1`

4. Go to the IBM SPSS Modeler Server directory. For example, go to `/opt/IBM/SPSS/ModelerServer/18.1.1`.
5. Enter the following command:

   `./modelersrv.sh stop`

6. To verify whether any services are still running enter the following command:

   `ps -ef | grep statisticsd`

7. To stop any services that are still running enter the following command:

   `kill -9 'cat statisticsd.pid'`

Stopping services on the data node computer

You must stop the IBM DB2 instance on the IBM Predictive Maintenance and Quality data node computer.

Procedure

1. Log in to the data node computer as **root**.
2. In a terminal window, type the following command to change the DB2 instance owner:

   `su - db2inst1`

3. Enter the following command to stop the DB2 administration server:

   `db2stop`

4. For a Situational Awareness artifact installation, stop Jena on the data node computer:

   `/opt/Jena/stopJena_Linux.sh`

Start solution services

You must start the IBM Predictive Maintenance and Quality node services in a specific order.

Start the node services in the following order:

1. data node
2. Predictive Analytics node

3. Integration Bus node
4. Business Intelligence (BI) node

Starting services on the data node computer

You must start the IBM DB2 instance on the IBM Predictive Maintenance and Quality data node computer.

Procedure

1. Log in to the data node computer as **root**.
2. In a terminal window, type the following command to change the DB2 instance owner:

   `su - db2inst1`
3. Enter the following command to start the DB2 administration server:

   `db2start`
4. For a situational awareness artifact installation, start Jena on the data node computer:
   `/opt/Jena/startJena_Linux.sh`

Starting services on the Analytics node computer

You must start the IBM SPSS services on the IBM Predictive Maintenance and Quality Predictive Analytics node computer.

Procedure

1. Log in to the Analytics node computer as **root**.
2. Go to the WebSphere Application Server `CNDSprofile/bin` directory. For example, go to `/opt/IBM/WebSphere/AppServer/profiles/CNDSprofile/bin`.
3. Enter the following command:

   `./startServer.sh server1`
4. Go to the IBM SPSS Modeler Server directory. For example, go to `/opt/IBM/SPSS/ModelerServer/18.1.1`.
5. Enter the following command:

   `./modelersrv.sh start`

Starting services on the Integration Bus node computer

You must start the IBM Integration Bus services on the IBM Predictive Maintenance and Quality Integration Bus node computer.

Procedure

1. Log in to the Integration Bus node computer as **root**.
2. Change to the **mqmuser**. For example, enter the following command:

   `su - mqmuser`
3. Go to the `mq bin` directory. For example, go to `/opt/mqm/bin`.
4. To load the profile for the mqm user, enter the following command and press enter:

   `.~/.bash_profile`
5. To start the queue manager, enter the following command:

   `strmqm queue_manager_name`

   For example, to start the default broker that is named pmqmanager enter the following command:

```
strmqm pmqmanager
```

6. Go to the IBM Integration Bus bin directory. For example, go to
   `/opt/ibm/iib-10.0.0.7/server/bin`.
7. Enter the following command:

   `./mqsistart pmqbroker`

8. To verify that the services started, enter one of the following commands:

   `./mqsilist pmqbroker` or `./mqsilist pmqbroker -e pmqgroup1`. The
   `./mqsilist pmqbroker -e pmqgroup1` command lists all entries that are
   running under pmqgroup1.

9. Enter the following commands:

   ```
   runmqsc pmqmanager
   START LISTENER
   END
   ```

10. Exit the **mqmuser** account and return to the **root** or **sudo** user account.
11. Start the Liberty servers. Go to the Liberty installation location, for example,
    `/opt/IBM/WebSphere/Liberty/`, and run the following commands:
    ```
    bin/server start controller_server
    bin/server start framework_server
    ```

Starting services on the IIB node computer

You must start the IBM Cognos Business Intelligence services and IBM HTTP
Server on the IBM Predictive Maintenance and Quality Business Intelligence (BI)
node computer.

You start the IBM Cognos BI services by starting the WebSphere Application Server
profile where IBM Cognos BI is running.

About this task

Use the following steps to start IBM Cognos in silent mode.

Procedure

1. Go to the `cognos_install_location/bin64` directory. For example, go to the
   `/opt/ibm/cognos/analytics/bin64` directory.
2. Enter the following command:

   ```
   export JAVA_HOME=/opt/ibm/cognos/analytics/jre/
   ./cogconfig.sh -s
   ```

Chapter 11. Product license files

After you manually install IBM Predictive Maintenance and Quality, you must ensure that the appropriate `swidtag` file and `license` directory exists on each computer on which you installed an Predictive Maintenance and Quality component.

License files

The `swidtag` file and `license` directory must exist on the Predictive Maintenance and Quality node computer.

Note: Do not rename the directory or files.

If you installed on a Red Hat Enterprise Linux operating system by using the solution installer, the license files are automatically copied to /opt/IBM/PMQ_2.6.2/license and the swidtag files are automatically copied to /opt/IBM/PMQ_2.6.2/iso-swid on the Predictive Maintenance and Quality node.

Updating your software tag file if you change product usage

If you change your usage of IBM Predictive Maintenance and Quality, such as to a non-production environment from a production environment, you must switch the software tags for your installation.

You must copy the appropriate software tag file to each computer on which an Predictive Maintenance and Quality server or client component is installed.

Procedure
1. On the computer where you decompressed the artifact files, go to the `iso-swid` or `iso-swid_NonProduction` directory, and decompress the file, if applicable.
2. Copy the `swidtag` file to each computer on which you installed an Predictive Maintenance and Quality component and replace the existing file.

   For example, on Microsoft Windows operating systems, copy the file so that you have a `C:\IBM\PMQ2.6.2\iso-swid` directory that contains a `swidtag` file. On Linux operating systems, you would have an `/opt/IBM/PMQ2.6.2/iso-swid` directory that contains a `swidtag` file.

Application licensing and the slmtag file

A licensing application runs on the Predictive Maintenance and Quality Integration Bus node. The application periodically logs the number of assets that are deployed on the Predictive Maintenance and Quality system into a file with the `.slmtag` extension in the `/var/PMQ/MQSIFileInput/properties` folder.

Here is a sample `slmtag` file with the following code.

```
<SchemaVersion>2.1.1</SchemaVersion>
<SoftwareIdentity>
 <PersistentId>21af3d147b26433690f5f2cf8d46a8a3</PersistentId>
 <Name>IBM Predictive Maintenance and Quality</Name>
 <InstanceId>/var/PMQ/MQSIFileInput</InstanceId>
</SoftwareIdentity>
<Metric logTime="2016-09-23T06:37:00+08:00">
```

```
<Type>ASSET</Type>
<SubType>NO_ASSETS</SubType>
<Value>0</Value>
<Period>
 <StartTime>2016-09-23T06:37:00+08:00</StartTime>
 <EndTime>2016-09-24T06:37:00+08:00</EndTime>
</Period>
</Metric>
```

The created `slmtag` file captures information, such as the log time and number of assets that are deployed on the Predictive Maintenance and Quality system when the snapshot is taken.

Appendix A. Accessibility features

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products.

For information about the commitment that IBM has to accessibility, see the IBM Accessibility Center (www.ibm.com/able).

IBM Cognos HTML documentation has accessibility features. PDF documents are supplemental and, as such, include no added accessibility features.

Report output

In IBM Cognos Administration, you can enable system-wide settings to create accessible report output. For more information, see the *IBM Cognos Business Intelligence Administration and Security Guide*. In IBM Cognos Report Studio, you can enable settings to create accessible output for individual reports. For more information, see the *IBM Cognos Report Studio User Guide*. You can access the previously mentioned documents at IBM Knowledge Center (http://www.ibm.com/support/knowledgecenter).

Appendix B. Troubleshooting

This section contains troubleshooting information for the IBM Predictive Maintenance and Quality installation.

Cannot open the user interface for the installer in Firefox

The user interface for the installer does not open in Firefox when you use the following link: `https://hostname:8080/UI/index.html`

About this task

Complete the following steps to remove the `cert8.db` file from Firefox and to try to open the user interface for the installer again.

Procedure

1. In Firefox, select **Open menu**.
2. Select **Help** > **Troubleshooting Information**.
3. Select **Open Folder**.
4. Delete the `cert8.db` file.
5. Use the following link to reopen the user interface for the installer: `https://hostname:8080/UI/index.html`

Progress bar shows `null%` as value

During the installation, the progress bar in the **Run Progress** box shows `null%`.

A value of `null%` in the progress bar does not indicate that the installation stopped. Allow the installation to proceed. The correct value is displayed when the installation is complete.

Installation stops abruptly

During the installation, an error is displayed in the solution installer and the log file appears to have also ended abruptly.

This problem can occur because the underlying Chef server is overloaded with roles and is unable to process any new requests.

To resolve this problem, do the following steps:

1. On the computer where you are running the solution installer, go to the `<solution_installer_path>/ServerInstallation/SolutionInstaller/NodeRoot/Mapper/roles` directory.
2. List the files in the directory. For example, enter `ls`.

   Note the full name of the `db2node#.json` file. The # part of the file name is a number.
3. Go to the `/root/chef-repo` directory.
4. Enter the following command:

   `knife role from file <solution_installer_path>/ServerInstallation/SolutionInstaller/NodeRoot/Mapper/roles/db2node#.json`

Ensure that you use correct # part of the file name.

After the command has completed, you should see a message that says:

`Updated Role db2node#!`

5. Go back to the solution installer, and run the installation again.

Run Progress box shows more nodes than are in your configuration

The **Run Progress** box shows the installation progress. It might show more nodes than you are using in your configuration.

Allow the installation to proceed, and wait to ensure that each of the nodes that are shown in the **Run Progress** box indicate that the installation is complete.

JAVA_HOME not set when starting IBM Cognos Configuration

After you install IBM Predictive Maintenance and Quality as a **sudo** user, you receive a message that the `JAVA_HOME` environment variable is not set.

You can resolve this be setting the `JAVA_HOME` environment variable. You must use the JRE that is provided with the WebSphere Application Server installation.

Procedure

1. On the Business Intelligence (BI) node computer, in terminal window, enter the following command:

   `export JAVA_HOME=/Cognos_install_location/analytics/jre`

2. Go to the `/opt/ibm/cognos/analytics/bin64` directory.

3. Type the following command:

   `./cogconfig.sh`

   IBM Cognos Configuration starts.

4. If you want to save this setting for future session, add the command to the user's `.bash_profile` file.

"CONFIGURATION ERROR:Specified config file /etc/opscode/pivotal.rb does not exist" error

You have reinstalled the solution installer after you used the `cleanup.sh` script, and when you run the solution installer you get an error message like the following:

`ERROR: CONFIGURATION ERROR:Specified config file /etc/opscode/pivotal.rb does not existCould not find organisation solinst`

`ERROR: CONFIGURATION ERROR:Specified config file /etc/opscode/pivotal.rb does not existCould not find`

These messages occur because one of the services that is used by the solution installer is still running and a port is still in use.

To resolve this error, restart you machine, and then run the `setup.sh` script again.

Solution installer indicates successful completion but progress bars are not complete

During the installation, a message in the solution installer indicates that the installation has completed successfully, but the **Run Progress** box shows that some installation tasks are not yet complete.

In this situation, you can check the log file to determine whether the installation is completed or not.

1. On the computer where you are running the solution installer, go to the *<solution_installer_path>*/ServerInstallation/SolutionInstaller/NodeRoot/ Downloads/Logs directory or the *<solution_installer_path>*/ ArtifactsInstallation/SolutionInstaller/NodeRoot/Downloads/Logsdirectory.

2. Enter the following command to view the log file:

   tail -f LOG_FILE_*<timestamp>*.log

3. If messages are still being written to the log file, that means that the installation is still in progress. In this case, you must wait until no further messages are written to the log file.

4. After no further messages are written to the log file, you can continue with installation by testing the products.

No Server Connection when you view log details from solution installer

While you are running an installation, you click **Get Details** and you get a No Server Connection page in your web browser. This error can occur if the server is not properly registered in the domain controller or the DHCP server.

To get the log file, you can log in to the computer where you are running the solution installer, and go to the *<solution_installer_path>*/ServerInstallation/ SolutionInstaller/NodeRoot/Downloads/Logs directory or the *<solution_installer_path>*/ArtifactsInstallation/SolutionInstaller/NodeRoot/ Downloads/Logsdirectory.

Modeler Server type not displaying in resource definitions

In IBM Predictive Maintenance and Quality, if the **Modeler Server** type does not display in resource definitions in IBM SPSS Collaboration and Deployment Services Deployment Manager, try closing Deployment Manager and opening it again.

Error installing IBM Cognos BI

The IBM Cognos Business Intelligence installer requires a specific library file in order to run.

If you encounter this error installing IBM Predictive Maintenance and Quality, see the IBM support page (http://www.ibm.com/support/ docview.wss?uid=swg21612290) for information on how to correct the error.

Restarting the queue manager and broker

After a IBM Predictive Maintenance and Quality Integration Bus node server restart, you might need to restart the queue manager and broker.

Procedure

1. Log on to the Integration Bus node computer.

2. In a terminal window, go to the `installation_location/mqm/bin` directory. For example, if you installed to the default location, go to the `/opt/mqm/bin` directory.

3. Change to the mqm user. For example, `su mqmuser`.

4. To load the profile for the mqm user, enter the following command and press enter:
   `.~/.bash_profile`

5. To start the queue manager, enter the following command:
   `strmqm queue_manager_name`
   For example, to start the queue manager that is named pmqmanager, enter the following command:
   `strmgm pmqmanager`

6. Go to the IBM Integration Bus bin directory. For example, go to `/opt/ibm/iib-10.0.0.7/server/bin`.

7. To start the broker, enter the following command:
   `mqsistart broker_name`
   For example, to start the default broker that is named pmqbroker, enter the following command:
   `mqsistart pmqbroker`

"Subscription to live feed failed" error in Dashboard

When you subscribe to a dashboard, you receive the following error message: "Subscription to live feed failed. Please connect to administrator."

This issue can occur if the broker on the Integration Bus node computer is not running.

For more information about starting services on the Integration Bus node computer, see "Starting services on the Integration Bus node computer" on page 77.

Error loading shared libraries: libImbCmdLib.so

An error message that states `libImbCmdLib.so: cannot open shared object file: No such file or directory` can indicate that environment variables are not correct.

Verify the environment variables, specifically ones that are related to the IBM Integration Bus broker.

Also, ensure that the link inside `/opt/ibm/mqsi/9.0.0.2/lib/headless` is removed.

Errors deploying Cognos BI server artifacts

While you are deploying the IBM Cognos BI server artifacts, you receive error messages in the master log. This issue can be caused by entering the incorrect value for the IBM Cognos BI dispatcher URI in the Deployment Wizard.

The following error message appears in the master log:

```
[exec] java.net.MalformedURLException: For input string: "<port>"
[exec]     at java.net.URL.<init>(URL.java:613)
[exec]     at java.net.URL.<init>(URL.java:476)
```

```
[exec]    at java.net.URL.<init>(URL.java:425)
[exec]    at Import_Partial_Whole.connectToReportServer
          (Import_Partial_Whole.java:353)
[exec]    at Import_Partial_Whole.main(Import_Partial_Whole.java:137)
[exec] Exception in thread "main" java.lang.NullPointerException
[exec]    at Import_Partial_Whole.addArchive(Import_Partial_Whole.java:396)
[exec]    at Import_Partial_Whole.deployContent(Import_Partial_Whole.java:238)
[exec]    at Import_Partial_Whole.main(Import_Partial_Whole.java:149)
```

To resolve this problem, you must enter the host name and the port number for the IBM Cognos Dispatcher URI in the Deployment Wizard. For example, `http://hostname:port/p2pd/servlet/dispatch`.

You must enter the correct *hostname* value and port number. The default port number is 9080.

Improving performance for IBM Cognos reports

To improve the performance of IBM Cognos Business Intelligence reports, you can run a cron job that is created by the installation.

The cron job is run every hour by default. However, you can modify that interval.

The cron job is automatically created on the data node computer, in the `/home/db2inst1` directory and is named `mycron`.

If you want to change the interval for running the job, you must update the cron job by using the following command:

```
Vi crontab -e
```

IBM Integration Bus related nodes are missing after migration

After you migrate IBM Predictive Maintenance and Quality, you open MQ Explorer and IBM Integration Bus related nodes are missing.

You can resolve this issue by forcing the program to reinitialize the MBExplorer plugin.

Procedure

1. On the Integration Bus node computer, go to the *MQExplorer_Installation*/`eclipse/links` directory. For example, go to the `/opt/mqm/mqexplorer/eclipse/links` directory.
2. Make a copy of `com.ibm.wmadmin.broker.explorer.link` as a backup. You will copy this file back to this directory later.
3. Delete `com.ibm.wmadmin.broker.explorer.link`.
4. Go to the `/opt/mqm/bin` directory.
5. Enter the following command to start MQ Explorer:
   ```
   ./strmqcfg -c
   ```
6. After MQ Explorer is fully loaded, close the program.
7. Go back to the `/opt/mqm/mqexplorer/eclipse/links` directory.
8. Replace `com.ibm.wmadmin.broker.explorer.link` from your backup.
9. Go back to the `/opt/mqm/bin` directory.
10. Restart MQ Explorer using the following command:

```
        ./strmqcfg -c
```

Error configuring NFS mount settings

You are configuring network file system (NFS) mounts on the Integration Bus node and the Predictive Analytics node computers to allow file transfers between these nodes. When you restart the Linux services, an error occurs.

You enter the `service portmap restart` command and receive the following error:

```
portmap: unrecognized service
```

To resolve the problem, restart the operating system and then reissue the command.

Initialization error when configuring IBM SPSS Collaboration and Deployment Services

In IBM Predictive Maintenance and Quality, if the task for configuring the IBM SPSS Collaboration and Deployment Services displays a database initialization error, run the `traceroute` command to ensure communication between the Predictive Analytics node and the data node.

Procedure

1. On the Analytics node computer, enter the following command:

   `traceroute data_node_name`

   Where *data_node_name* is the name or IP address of the data node computer.
2. Try the task again.

Error starting IBM HTTP Server

You receive the following error when you start the IBM HTTP Server: `error while loading shared libraries: libexpat.so.0: cannot open shared object file: No such file or directory.`

The problem might be because you are trying to start IBM HTTP Server outside of a WebSphere Application Server environment in which required libraries are not found. To resolve the problem, see Troubleshooting IBM HTTP Server startup (www.ibm.com/support/knowledgecenter/SSZH4A_6.2.0/com.ibm.worklight.installconfig.doc/admin/t_troubleshooting_ihs_startup.html).

Error executing action run on resource execute[extract_zip]

When you start the artifacts solution installer after using it previously to install the artifacts, you get "Error executing action run on resource execute[extract_zip]".

Procedure

1. On each node where you have installed artifacts, delete the directory that contains the artifacts. For example, on the data node computer, delete the `/opt/IBM/PMQ/Data` directory.
2. Open the artifacts solution installer in a web browser.
3. Click **Run**.

System error when you log in to the Predictive Maintenance and Quality dashboard application

You are logging in to the Predictive Maintenance and Quality dashboard application and you receive a system error. This error can occur if data was not loaded into the database.

To resolve this error, load the Predictive Maintenance and Quality sample data into the database.

After the data is loaded, you can access the Predictive Maintenance and Quality dashboard application.

Error Forever Node.js module is not running

You try to access the Forever log file using the `forever list` command and receive an error Forever Node.js module is not running.

About this task

Perform this task to install the Forever module so that you can access the Forever log file.

Procedure

1. On the computer that contains the solution installer, make sure the Forever module is not installed. Open a terminal window and enter the following command: `npm uninstall forever -g`
2. Install the Forever module. Go to the `/SolutionInstaller/NodeJS/` directory and enter the following command: `npm install forever-0.14.1.tgz -g` The Forever module is installed and starts.

Results

You can now access the Forever log file.

Error running setup.sh

You run setup.sh but receive the following error: `ERROR: ArgumentError: invalid byte sequence in US-ASCII`.

About this task

This error occurs because the system from which you run the command is not using the en_US.UTF-8 language. Perform this task to confirure your system to use en_US.UTF-8.

Procedure

1. Run the following command:
   `vi ~/.bash_profile`
2. Add the following lines to the file:
   `export LC_ALL=en_US.UTF-8`
   `export LANG=en_US.UTF-8`
3. Save the file.

4. Run the following command:
   source ~/.bash_profile
5. Run the following command:
   echo $LANG

   If the result is en_US.UTF-8, then the issue is resolved.

Error for yum command on BI node

After you install a standard configuration, when you run a yum command on the Business Intelligence node, you get an error message.

About this task

The error is similar to the following:

```
There was a problem importing one of the Python modules required to run yum.
The error leading to this problem was:
/usr/lib64/libxml2.so.2: symbol gzopen64, version ZLIB_1.2.3.3 not defined in
file libz.so.1 with link time reference
Please install a package which provides this module, or
verify that the module is installed correctly.
```

This error occurs if the /opt/ibm/cognos/analytics/bin64 directory is included in the LD_LIBRARY_PATH system variable.

Procedure

1. Check the LD_LIBRARY_PATH system variable:
   echo $LD_LIBRARY_PATH
2. If the /opt/ibm/cognos/analytics/bin64 is present, remove it from the LD_LIBRARY_PATH system variable:
   a. Edit /root/.bash_profile:
      vi /root/.bash_profile
   b. Comment out or remove the /opt/ibm/cognos/analytics/bin64 directory from the line export LD_LIBRARY_PATH=/opt/ibm/cognos/analytics/bin64
   c. Save and exit.
   d. Run the following command:
      source /root/.bash_profile

Appendix C. Samples

Sample data is provided so that you can see the IBM Predictive Maintenance and Quality solution work end-to-end.

Loading the sample data

Sample data is installed as part of the IBM Predictive Maintenance and Quality server artifact installation. You can load the sample data to see an example of the Predictive Maintenance and Quality solution from end-to-end.

The sample data is provided in different languages. If you want to change the language of the data, you must ensure that the Predictive Maintenance and Quality data store content is deleted, and that you restart your brokers.

Tip: You can verify that the data was loaded by using commands to check the Predictive Maintenance and Quality queues. You can check the queues by running the following commands:

```
runmqsc pmqmanager
Display q(PMQ.*) WHERE(CURDEPTH NE 0)
```

Procedure

1. Log in to the Integration Bus node computer as the **mqmuser**.

   Important: The user must be the **mqmuser** or a member of the **mqm** group. If you copy the files as another user, they might not be processed by the Integration Bus node components.

2. Load the master data.

   a. Go to the `/var/PMQ/MQSIFileInput/PMQSampleData/Set1-MasterData/ <language>/Set1/` directory.

   b. Copy the contents of that directory to the `/var/PMQ/MQSIFileInput/ masterdatain` directory one file at a time.

   WebSphere Message Broker automatically loads the files from that directory. The files are automatically removed after they are loaded.

   Important: The files must be copied one at a time.

   c. Go to the `/var/PMQ/MQSIFileInput/PMQSampleData/Set1-MasterData/ <language>/Set2/` directory.

   d. Copy the contents of that directory to the `/var/PMQ/MQSIFileInput/ masterdatain` directory one file at a time.

   e. Go to the `/var/PMQ/MQSIFileInput/PMQSampleData/Set1-MasterData/ <language>/Set3/` directory.

   f. Copy the contents of that directory to the `/var/PMQ/MQSIFileInput/ masterdatain` directory one file at a time.

   g. Go to the `/var/PMQ/MQSIFileInput/PMQSampleData/Set1-MasterData/ <language>/Set4/` directory.

   h. Copy the contents of that directory to the `/var/PMQ/MQSIFileInput/ masterdatain` directory one file at a time.

3. Load the event data.

a. Go to the /var/PMQ/MQSIFileInput/PMQSampleData/Set2-EventData directory.

b. Copy the contents of that directory to the /var/PMQ/MQSIFileInput/
   eventdatain directory one file at a time.

c. Go to the /var/PMQ/MQSIFileInput/PMQSampleData/Set3-EventData directory.

d. Copy the contents of that directory to the /var/PMQ/MQSIFileInput/
   eventdatain directory one file at a time.

4. Set the appropriate time triggers in the
   PMQ_orchestration_definition_batch.xml file.

   a. Go to the /var/PMQ/MQSIFileInput/properties directory.

   b. Open PMQ_orchestration_definition_batch.xml in a text editor.

   c. Locate each of the following sections, and set the *<scheduled_time>* value to
      an appropriate time.

Table 17. Predictive Maintenance and Quality feature and identifier value

Feature	*<Identifer>* **value**
TopNFailure	TopN
Maintenance	Maintenance
Sensor Analytics Training	HSTrigger
Feature Based Analytics Training	FHSTrigger
Integrated Analytics Training	IHSTrigger

   d. Use the following command to stop AutoTrigger.msgflow in the
      PMQBatchIntegration application:

      mqsistopmsgflow pmqbroker -e pmqgroup1 -k PMQBatchIntegration -m
      AutoTrigger

   e. Use the following command to restart AutoTrigger.msgflow in the
      PMQBatchIntegration application:

      mqsistartmsgflow pmqbroker -e pmqgroup1 -k PMQBatchIntegration -m
      AutoTrigger

5. Load the event data for scoring.

   a. Go to the /var/PMQ/MQSIFileInput/PMQSampleData/Set4-EventData directory.

   b. Copy the contents of that directory to the /var/PMQ/MQSIFileInput/
      eventdatain directory one file at a time.

6. Load the batch data for Inspection, Warranty, and Parametric.

   a. Go to the /var/PMQ/MQSIFileInput/PMQSampleData/Set5-BatchData directory.

   b. Copy the contents of that directory to the /var/PMQ/MQSIFileInput/
      batchdatain directory one file at a time.

Loading the ENU sample data

ENU Sample data is installed as part of the IBM Predictive Maintenance and
Quality server artifact installation. The data covers examples for substations,
distribution transformers, and poles and cables.

The sample data is provided in different languages. If you want to change the
language of the data, you must ensure that the Predictive Maintenance and Quality
data store content is deleted, and that you restart your brokers.

Tip: You can verify that the data was loaded by using commands to check the Predictive Maintenance and Quality queues. You can check the queues by running the following commands:

```
runmqsc pmqmanager
Display q(PMQ.*) WHERE(CURDEPTH NE 0)
```

Procedure

1. Log in to the Integration Bus node computer as the **mqmuser**.

   Important: The user must be the **mqmuser** or a member of the **mqm** group. If you copy the files as another user, they might not be processed by the Integration Bus node components.

2. Load the data.

   a. Go to the `/var/PMQ/MQSIFileInput/PMQSampleData/Set6-EventData_ENU` directory.

   b. Copy the following files, in sequence, to the `/var/PMQ/MQSIFileInput/eventdatain` directory one file at a time.

      1) `event_observation_parameter*.csv`—Loads parameter data.

      2) `event_observation_*_training.csv`—Loads training data.

      3) `event_observation_pole_inspection.csv`—Loads pole data.

3. Set the appropriate time triggers in the `PMQ_orchestration_definition_batch.xml` file.

   a. Go to the `/var/PMQ/MQSIFileInput/properties` directory.

   b. Open `PMQ_orchestration_definition_batch.xml` in a text editor.

   c. Locate each of the following sections, and set the *<scheduled_time>* value to an appropriate time.

Table 18. Predictive Maintenance and Quality feature and identifier value

Feature	*<Identifer>* **value**
Distribution transformer Current ageing	DTCA
Distribution transformer Projected ageing	DTPA
Feature Based Analytics Training	FHSTrigger
Integrated Analytics Training	IHSTrigger
Feature Based Analytics for Poles	POLEFBA

   d. Use the following command to stop AutoTrigger.msgflow in the PMQBatchIntegration application:

   ```
   mqsistopmsgflow pmqbroker -e pmqgroup1 -k PMQBatchIntegration -m
   AutoTrigger
   ```

   e. Use the following command to restart AutoTrigger.msgflow in the PMQBatchIntegration application:

   ```
   mqsistartmsgflow pmqbroker -e pmqgroup1 -k PMQBatchIntegration -m
   AutoTrigger
   ```

4. Load the event data for scoring.

   a. Go to the `/var/PMQ/MQSIFileInput/PMQSampleData/Set6-EventData_ENU` directory.

   b. Copy the contents of that directory to the `/var/PMQ/MQSIFileInput/eventdatain` directory one file at a time. For example, copy `event_observation_feature_*_scoring.csv`.

5. Reset the time triggers in the `PMQ_orchestration_definition_batch.xml` file.

a. Go to the `/var/PMQ/MQSIFileInput` directory.

b. Open `PMQ_orchestration_definition_batch.xml` in a text editor.

c. Locate each of the following sections, and set the *<sequence_time>* value to an appropriate time.

Table 19. Predictive Maintenance and Quality feature and identifier value

Feature	*<Identifer>* **value**
Distribution transformer Current aging	DTCA
Distribution transformer Projected aging	DTPA

Note: If you are resetting the scheduler of any batch feature that is set to run for a duration_in_days that is greater than 1 day, then you must restart AutoTrigger.msgflow in the PMQBatchIntegration application to see the changes immediately.

d. Use the following command to stop AutoTrigger.msgflow in the PMQBatchIntegration application:

```
mqsistopmsgflow pmqbroker -e pmqgroup1 -k PMQBatchIntegration -m
AutoTrigger
```

e. Use the following command to restart AutoTrigger.msgflow in the PMQBatchIntegration application:

```
mqsistartmsgflow pmqbroker -e pmqgroup1 -k PMQBatchIntegration -m
AutoTrigger
```

Modify master data references for blank entries

Some master data, which is not mandatory from a business aspect, are required due to foreign key relationships within the IBM Predictive Maintenance and Quality data model. To overcome this, Predictive Maintenance and Quality uses the concept of an NA (not applicable) master data row entry. As a result, whenever such master data references have a blank value, Predictive Maintenance and Quality uses the -NA- business key code row reference. You must configure the master data tables that require the -NA- entries.

The following table provides the table names that require the -NA- entries and samples master data files that you can use to reference which tables require the entries.

Table 20. Tables that require -NA- entries, and sample files you can reference

Table name	Sample master data file
MASTER_GROUP_DIM	group_dim_upsert.csv
MASTER_LOCATION	location_upsert.csv
MASTER_MATERIAL_TYPE	material_type_upsert.csv
MASTER_PROCESS	process_upsert.csv
MASTER_PRODUCT	product_upsert.csv
MASTER_SOURCE_SYSTEM	source_system_upsert.csv
MASTER_SUPPLIER	supplier_upsert.csv
MASTER_MATERIAL	material_upsert.csv
MASTER_PRODUCTION_BATCH	production_batch_upsert.csv
MASTER_RESOURCE	resource_upsert.csv

Verifying that the sample data was loaded correctly

You can verify that the IBM Predictive Maintenance and Quality sample data was loaded by checking the `error` and `log` directories and viewing reports.

Procedure

1. Check the `error` directory on the Integration Bus node computer to ensure that there were no errors when the data was loaded.
2. Check the status of the IBM SPSS jobs by reviewing the following files in the Integration Bus node `log` directory of the ESB node:
   - `TopNFailureLog.txt`
   - `MaintenanceLog.txt`
   - `Training_HS_in.csv`
   - `Training_FBA_in.csv`
   - `Training_IHS_in.csv`

   Note: If the sample data was loaded correctly, then the previously listed files are not created.
3. The following reports are populated with the sample data:

Table 21. Sample data and reports

Data	Report or dashboard
Master data	Audit Reports
Resource	Site Overview dashboard
	Equipment dashboard
	Advance KPI Trend reports
Process and material	Product Quality dashboard and
	Material Usage by Production batch report
SPC	SPC - Histogram
	SPC - X bar R/S chart
QEWS	QEWS Inspection
	QEWSL Warranty
Maintenance, sensor health score, and integrated health score	Maintenance Overview dashboard
	Maintenance Health and Failure Detail report
	Maintenance Advance Sorting report
TopNFailure	Top N Failure Analysis report

4. If you are using the ENU sample data, check the status of the SPSS jobs by reviewing the following log files:
   - `dt_currentageing_in.csv`
   - `dt_projectedageing_in.csv`

Removing sample data from the database

Before you load live production data in IBM Predictive Maintenance and Quality, all sample data must be removed from the database.

This procedure deletes all the contents of the event and master data tables. Its scope is not limited to the supplied sample data and so any additional content that is loaded is also deleted.

Before you begin

If test events were loaded from the sample master data, the test events must also be removed. For more information, see the *IBM Predictive Maintenance and Quality Solution Guide*.

Procedure

1. Do one of the following steps to connect to the IBMPMQ database:
   a. If the IBMPMQ database is in IBM DB2, type the following command:

      ```
      db2 connect to IBMPMQ user user_name using password
      ```
   b. If the IBMPMQ database is in Oracle Database, then connect to it using the appropriate Oracle command.
2. To remove the sample data from an IBM DB2 database, do the following steps:
   a. Enter the following SQL statements to remove the sample data:

      ```
      DELETE FROM PMQSCH.PARAMETRIC_KPI;
      DELETE FROM PMQSCH.PARAMETRIC_PROFILE;
      DELETE PMQSCH.LIFETIME_KPI;
      DELETE PMQSCH.LIFETIME_PROFILE;
      DELETE PMQSCH.PRODUCT_PROFILE;
      DELETE PMQSCH.PRODUCT_KPI;
      DELETE PMQSCH.RESOURCE_PROFILE;
      DELETE PMQSCH.RESOURCE_KPI;
      DELETE PMQSCH.MATERIAL_PROFILE;
      DELETE PMQSCH.PROCESS_KPI;
      DELETE PMQSCH.PROCESS_PROFILE;
      DELETE PMQSCH.PROFILE_PARAMETER;
      DELETE FROM PMQSCH.EVENT_PROFILE;
      DELETE PMQSCH.EVENT_OBSERVATION;
      DELETE PMQSCH.EVENT;
      DELETE PMQSCH.MASTER_RESOURCE_CONNECTION;
      DELETE PMQSCH.MASTER_PROFILE_MAPPING;
      DELETE PMQSCH.MASTER_RESOURCE_PRODUCTION_BATCH;
      DELETE PMQSCH.MASTER_PRODUCTION_BATCH;
      DELETE PMQSCH.SERVICE;
      DELETE PMQSCH.MASTER_PRODUCT_HIERARCHY;
      DELETE PMQSCH.MASTER_PRODUCT;
      DELETE PMQSCH.MASTER_RESOURCE_HIERARCHY;
      DELETE PMQSCH.MASTER_RESOURCE;
      DELETE PMQSCH.MASTER_PROFILE_VARIABLE;
      DELETE PMQSCH.MASTER_MATERIAL;
      DELETE PMQSCH.MASTER_MATERIAL_TYPE;
      DELETE PMQSCH.MASTER_PROFILE_CALCULATION;
      DELETE PMQSCH.MASTER_RESOURCE_TYPE;
      DELETE PMQSCH.MASTER_MEASUREMENT_TYPE;
      DELETE PMQSCH.MASTER_VALUE_TYPE;
      DELETE PMQSCH.MASTER_SUPPLIER;
      DELETE PMQSCH.MASTER_SOURCE_SYSTEM;
      DELETE PMQSCH.MASTER_PROCESS_HIERARCHY;
      DELETE PMQSCH.MASTER_PROCESS;
      DELETE PMQSCH.MASTER_LOCATION;
      DELETE PMQPMQSCH.MASTER_GROUP_DIM;
      ```

```
DELETE PMQSCH.MASTER_EVENT_TYPE;
DELETE PMQSCH.MASTER_EVENT_CODE;
DELETE PMQSCH.MASTER_OBSERVATION_LOOKUP;
DELETE PMQSCH.MAINTENANCE_TRENDS;
DELETE PMQSCH.MAINTENANCE_DAILY;
DELETE PMQSCH.MAINTENANCE_ADM_RECOMMENDATIONS;
DELETE PMQSCH.TOPN_PREDICTORS;
DELETE PMQSCH.KEY_LOOKUP;
DELETE PMQSCH.LANGUAGE;
DELETE PMQSCH.TENANT;
DELETE PMQSCH.PMQ_USER;
DELETE PMQSCH.PMQ_CHART_CONFIG;
```

   b. Enter the following SQL statements to alter tables:

```
ALTER TABLE "PMQSCH"."EVENT" ALTER COLUMN "EVENT_ID" RESTART WITH 1;
ALTER TABLE "PMQSCH"."LANGUAGE" ALTER COLUMN "LANGUAGE_ID" RESTART WITH 1;
ALTER TABLE "PMQSCH"."TENANT" ALTER COLUMN "TENANT_ID" RESTART WITH 1;
ALTER TABLE "PMQSCH"."KEY_LOOKUP" ALTER COLUMN "KEY_LOOKUP_ID" RESTART WITH 1;
ALTER TABLE "PMQSCH"."MASTER_PROFILE_CALCULATION" ALTER COLUMN
"MASTER_PROFILE_CALCULATION_ID" RESTART WITH 1;
```

3. Do one of the following steps to disconnect from the IBMPMQ database:

   a. If the IBMPMQ database is in IBM DB2, type the following command:

```
db2 connect reset
```

4. Restart the pmqgroup1 integration server (in previous versions, called an execution group).

For more information, see the IBM Integration Bus documentation.

Appendix D. Supporting programs licensed with Predictive Maintenance and Quality

The following supporting programs are licensed with Predictive Maintenance and Quality.

Supporting programs

IBM Cognos Analytics Administrator

IBM Cognos Analytics Software Development Kit

IBM Cognos Framework Manager

IBM Cognos Analytics Samples

IBM Cognos Lifecycle Manager

IBM Cognos for Microsoft Office

IBM Cognos Cube Designer

IBM Cognos Dynamic Query Analyzer

IBM SPSS Analytical Decision Management

IBM SPSS Analytical Decision Management Application

IBM SPSS Collaboration and Deployment Services

IBM SPSS Collaboration and Deployment Services Deployment Manager

IBM SPSS Collaboration and Deployment Services Deployment Portal

IBM SPSS Modeler Premium Keyless

IBM SPSS Modeler Premium Server

IBM SPSS Modeler Solution Publisher

IBM SPSS Statistics Standard

IBM SPSS Statistics Server Standard

IBM SPSS Statistics Client/Developer Documentation

IBM SPSS Statistics - Essentials for Python

IBM SPSS Collaboration and Deployment Services Adapters for Statistics

IBM SPSS Data Access Pack

IBM SPSS Concurrent Licensing Tools

IBM DB2 Enterprise Server Edition

IBM WebSphere Application Server Network Deployment

IBM WebSphere Application Server Liberty Profile

IBM MQ

IBM Integration Bus

IBM Installation Manager and Packaging Utility for the Rational® Software Development Platform

IBM SPSS Analytic Server

IBM ILOG® CPLEX® Optimization Studio

IBM ILOG CPLEX Enterprise Server

IBM Integration Bus Manufacturing Pack for Enterprise

Appendix E. Programs not authorized by the Predictive Maintenance and Quality license

The following programs are not authorized with Predictive Maintenance and Quality, and the use of these programs is not authorized by the Predictive Maintenance and Quality license.

IBM Cognos Analysis for Microsoft Excel (of IBM Cognos Analytics Administrator)

IBM Cognos Analysis Studio (of IBM Cognos Analytics Administrator)

IBM Cognos Business Intelligence Transformer (of IBM Cognos Analytics Administrator)

IBM Cognos Connection Installer for IBM Cognos Insight® (of IBM Cognos Analytics Administrator)

IIBM Cognos Data Manager Connector (of IBM Cognos Analytics Administrator)

IBM Cognos Insight (of IBM Cognos Analytics Administrator)

IBM Cognos Metric Designer (of IBM Cognos Analytics Administrator)

IBM Cognos Metric Studio (of IBM Cognos Analytics Administrator)

IBM Cognos Metrics Manager (of IBM Cognos Analytics Administrator)

IBM Cognos Query Studio (of IBM Cognos Analytics Administrator)

IBM Cognos TM1® Package Connector (of IBM Cognos Analytics Administrator)

IBM DB2 Advanced Workgroup Server Edition (of IBM Cognos Analytics Administrator and IBM SPSS Analytic Server)

IBM Tivoli® Directory Integrator Identity Edition (of IBM Cognos Analytics Administrator)

IBM Cognos Business Intelligence Pattern (of IBM Cognos Analytics Administrator)

IBM Cognos Real-time Monitoring (of IBM Cognos Analytics Administrator)

IBM Data Studio (of IBM DB2 Enterprise Server Edition)

pureScale® Feature (of IBM DB2 Enterprise Server Edition)

IBM Mobile Database (of IBM DB2 Enterprise Server Edition Version)

IBM Mobile Database Sync (of IBM DB2 Enterprise Server Edition)

IBM Tivoli Storage Flashcopy Manager (of IBM DB2 Enterprise Server Edition)

IBM InfoSphere® Change Data Capture (of IBM DB2 Enterprise Server Edition)

IBM DB2 Connect™ 10.5 (component) (of IBM DB2 Enterprise Server Edition)

IBM Spectrum Scale™ for AIX® 4.1.1 (of IBM DB2 Enterprise Server Edition)

IBM Spectrum Scale for Linux Multiplatform 4.1.1 (of IBM DB2 Enterprise Server Edition)

J2SE Rule Execution Server (of IBM Integration Bus)

IBM Integration Bus Manufacturing Pack for Factory

IBM WebSphere Application Server Developer Tools for Eclipse (of IBM WebSphere Application Server Network Deployment)

IBM DB2 Advanced Workgroup Server V11.1 (of IBM WebSphere Application Server Network Deployment)

IBM WebSphere eXtreme Scale (of IBM WebSphere Application Server Network Deployment)

IBM WebSphere Application Server (of IBM SPSS Analytic Server)

Appendix F. Administration tool and product portal reference

The administrative tools and portals for IBM Predictive Maintenance and Quality are in several locations.

The following table shows you access information for the tools and portals. Unless otherwise noted, the information applies to single or multinode configurations of IBM Predictive Maintenance and Quality.

Table 22. Administration tool and product portal reference

Administration tool or portal and description	URL or location
BI node: WebSphere Application Server Administrative Console The WebSphere Application Server Administrative Console is the administration tool for WebSphere. The WebSphere Application Server Administrative Console runs on each node computer where WebSphere is installed. Use the console to start and stop applications.	`http://server_node_name:9043/ibm/console` Where *server_node_name* is the name or IP address of a node computer where WebSphere is installed.
IBM Cognos Business Intelligence Use **IBM Cognos Connection** to access reports. Use **IBM Cognos Administration** to configure IBM Cognos BI. For example, add data source connections or set security.	`http://iib_node_name:9300/bi/` Where *iib_node_name* is the name or IP address of IIB node computer.
SPSS Node: WebSphere Application Server Administrative Console Use IBM SPSS Collaboration and Deployment Services Deployment Manager to configure IBM SPSS server settings.	`https://analytics_node_name:9043/ibm/console` Where *analytics_node_name* is the name or IP address of Predictive Analytics node computer.
SPSS Collaborative & Deployment Service Configuration	`http://analytics_node_name:9080/config` Where *analytics_node_name* is the name or IP address of Predictive Analytics node computer.

Table 22. Administration tool and product portal reference (continued)

Administration tool or portal and description	URL or location
SPSS Collaborative & Deployment Service peb	`http://`*`analytics_node_name`*`:9080/peb` Where *analytics_node_name* is the name or IP address of Predictive Analytics node computer.

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