IBM Service Management Unite V1.1.4 - Installation and Configuration Guide

Contents

Chapter 1. New in this release

This information contains an overview of the major changes to Service Management Unite for Version 1.1.4 and Version 1.1.3.

IBM® Service Management Unite V1.1.5 provides the following key new features:

- Added 'Storage Overview', 'Storage Group Details', and 'Volume Details' dashboards to monitor the storage metrics based on OMEGAMON for Storage.
- Added the 'Ask Watson' dashboard as an open beta feature to provide a cognitive document search tool.
- Simplified installation process by providing a prebuilt Docker image to allow you to install Service Management Unite with Docker. See "Installing Service Management Unite with Docker" on page 25.
- Added support to set up Service Management Unite with high availability to ensure a reliable system. See Chapter 8, "Setting up Service Management Unite with High Availability," on page 109.
- Added support to automate applications that run on non-z/OS systems with Universal Automation Adapters (with APAR OA55386 installed in System Automation for z/OS V4.1). See the concept of Universal Automation Adapter in "Service Management Unite architecture" on page 9.
- Enhanced SA operations experience:
  - For a stop, start, or suspend request, you can choose the new **REMOVE=SYSGONE** option to automatically remove the request when the system where the selected resource runs, leaves the sysplex.
  - The resource status of a system is now represented as the worst compound status of all top-level resources running on that system. This can be combined with a Resource name filter or Resource class filter as data set parameter. In this case, the worst resource state is derived by the worst compound state of all resources on the system that match the specified filter criteria.
  - A **Hide operational tasks** option is added into the automation domain topology and automation node list data sets. Choose this option if the context menu of nodes that are contained in these data sets should not include any operational tasks, such as excluding a node.

IBM Service Management Unite V1.1.3 provides the following key new features:

- Added JVM Overview, JVM details, and problem isolation dashboards to monitor the Java virtual machines based on OMEGAMON for JVM.
- Integrated with System Automation (with APAR OA52610 installed) by adding support for the command `INGSUSPD` to suspend System Automation resources.
- Integrated with System Automation (with APAR OA52610 installed) by providing a problem isolation dashboard for SA Resources based on the command `INGWHY`, which is introduced in SA V4.1 to provide expert capabilities to easily determine resource problems.
- Enhanced filtering capabilities in Service Management Unite Automation data sets. This provides the possibility of status reporting based on filter criteria that can be used when you create custom dashboards.

Chapter 2. Video Gallery

Watch the following videos to have a better understanding on the capabilities of Service Management Unite.

Hands-on scenario: Solving a z/OS performance problem

You can use the **System Health** dashboard to quickly identify problems in your mainframe environment, navigating from a filtered list of performance or automation events to detailed performance data or automation status to help you to isolate issues faster.

About this task

In this best practice, you will identify, isolate and resolve real problems in a z/OS environment using Service Management Unite. Firstly, you detect z/OS performance problems (such as high CPU and an excessive wait for an enqueue) and analyze the situation. Next, you learn how to cancel address spaces to restore service again.

Hands-on video:

You can watch this video and follow the guide to perform actions in the video at the same time.

Procedure

1. On the **Welcome** page, select **Monitor System Health** dashboard. The **Monitor System Health** page is displayed. Note that component z/OS shows critical events on the left hand side.
2. In the **Health Status** widget, select the z/OS component to only display the events related to z/OS in the **Events** widget.
3. Right click one of the error events. In the drop-down menu, select **View LPAR Details**. The **LPAR Details** page opens showing key performance and status data for this z/OS LPAR.
4. The **Enqueue and Reserve Summary** widget displays information about all global enqueue conflicts and reserves for the system. Right click on the displayed entry and select **Isolate Problem**.

   The problem isolation page opens. It shows detailed information about the selected enqueue conflict. In the **Enqueue and Reserve Details** widget, you can see the address space that owns the resource, and the address space that is waiting for it. The **Wait Time** shows how long the task of the waiting address space has been waiting for the resource.
5. Maximize the **Suggested Actions** widget on the page using the widget menu.

   The **Suggested Actions** widget lists typical problems and suggested solutions. One recommended action is to cancel the job that holds the ENQ.
6. Switch back to the **LPAR Details** page.
   1. On the **LPAR Details** page, right click again on the ENQ job listed in the **Top 5 CPU Uitlization** widget. The drop-down menu provides access to common commands.

b. Select **Cancel ENQ Address Space**. The **Issue Command** page opens with the Cancel command pre-filled.

```
MVS CANCEL ENQ,A=00BF
```

c. Click **Go** on the **Issue Command** page.

7. Switch back to **LPAR Details** page. Refresh **Top 5 CPU Uitlization** , **Address Space Bottleneck** and **Enqueue** widgets.

   The job ENQ no longer exists in the table.
8. Repeat step 7 to 8 to cancel ENQ2 as well, which takes over as CPU hog.

Results

The address spaces with excessive CPU usage is canceled, and the service is restored.

Analyzing and solving an outage in IMS subsystem

This video shows how to analyze and solve an outage of a business application like IMS by checking relationship graphs, system logs , and issuing a command in the SMU dashboards.

Managing automation schedules

This video shows how to manage automation schedules by using Service Management Unite. It shows you how to view base schedules defined for a resource in the System Automation policy, how to modify existing schedules, and how to create new schedules using an easy-to-use calendar display.

Monitoring Java Virtual Machines with OMEGAMON for JVM dashboards

This video introduces the new dashboards like JVM Overview, JVM details, and problem isolation dashboards to monitor the Java Virtual Machines based on OMEGAMON for JVM.

Solving an automation problem using 'Problem Isolation with INGWHY'

This video gives you an introduction to the new 'Problem Isolation with INGWHY' dashboard in Service Management Unite V1.1.3. It also shows you how to solve an automation problem with this dashboard.

Monitoring storage groups and volumes with OMEGAMON for Storage dashboards

In Service Management Unite V1.1.4, new dashboards like 'Storage Overview', 'Storage Group Details', and 'Volume Details' are added to support OMEGAMON for Storage.

You can get the following information from the new storage dashboards:

- Overview data and status of the Storage Groups
- Details of the Storage Group
  - The lowest and highest volume free space
  - Volume highest response time.

- Details of the selected volume
  - The status
  - The space trend
  - The free/used ratio
  - Dataset information
- Events in OMEGAMON for Storage
- Abnormal conditions and problem diagnosis

This video introduces the new dashboards like Storage Overview, Storage Group Details, and Volume Details to monitor storage metrics based on OMEGAMON for Storage.

Installing SMU using a prebuilt Docker image

This video introduces the simplified installation process using a prebuilt Docker image to install Service Management Unite.

Searching for information using Ask Watson

In Service Management Unite V1.1.4, a new form of online help -- Ask Watson is provided as an open beta feature to improve your information experience.

The traditional online help only supports searching by exact keyword, and sometimes you need to jump between different topics to get the information you need. As a result, an all-in-one information entry embedded in the SMU interface to help you quickly find the information is needed.

Ask Watson is a cognitive help assistant embedded in the SMU console. It aims to improving your information experience by answering questions related to the product usage. Ask Watson is a handy 'online help', and thus reduces unnecessary navigation. It understands natural language and presents with immediate and the most relevant results to your query.

This video introduces the new form of online help in SMU V1.1.4 -- Ask Watson, and how to use it.

Chapter 3. Overview

IBM Service Management Unite is the customizable dashboard interface that is available with IBM Service Management Suite for z/OS® V1.3.0 and above. This documentation guides you through the Service Management Unite installation and configuration process.

Service Management Unite provides system programmers, operators, and administrators with a transparent view of system health status and allows for easy problem identification. The console enables operators to see both monitoring and automation exception events together, so they can identify critical problems. Operators can quickly and confidently analyze, isolate and diagnose problems by providing all relevant data in a single location. Service Management Unite also enables operators to interact directly with the system by issuing commands and viewing results without going to a different console.

Note: For the prerequisites of Service Management Unite and the download information, see the Customer Support Portal for IBM® Service Management Suite for z/OS.

The following example illustrates a Service Management Unite user scenario:

1. The operator views both monitoring and automation exception events, sorted by severity on the consolidated event viewer, and customized for her area of support.
2. The event viewer has the events sorted by priority, so the operator selects the top event not acknowledged by another operator.
3. The event pertains to a problem with a resource owned by a WebSphere® Messaging Queue Manager.
4. The operator navigates to the WebSphere Messaging Queue Manager detail page to view key performance metrics, and determines that a specific channel is not running.
5. The operator navigates to the problem isolation page for channel not running. The operator views a list of suggested actions to restore service.
6. The operator issues a command to fix the problem and restore service.

Service Management Unite also provides access to automation functions to start, stop or recycle business applications running on z/OS, even from mobile devices. This flexibility helps system programmers, operators, and administrators by delivering more usable and efficient automation and system and network management capabilities. The integrated operations console can be used by operators to issue commands such as starting and stopping heterogeneous business applications on IBM z Systems and distributed platforms.

Overview of Service Management Unite

IBM Service Management Unite is a customizable service management user interface that provides dashboards to monitor and operate z system environments.

IBM Service Management Unite has two components:

- Service Management Unite Automation. It provides the overall health status of the automation domains and nodes.

- Service Management Unite Performance Management. It helps you monitor and manage z/OS operating systems, networks, and storage subsystems.

They work together to empower the operations staff to analyze and resolve problems more quickly.

IBM Service Management Unite provides the following capabilities:

- Provides a consolidated view of system health status, and thus reduces the time and effort in accelerating problem identification.
- Delivers simplified, efficient automation, and system and network management capabilities, which streamlines operators' workflow.
- Provides an integrated operations console, which can be used to issue commands and resolve problems. It increases the degree of automation and avoids manual and time intensive tasks.
- Provides highly customized dashboard that helps you best suite your needs.
- Supports mobile access, which enables you to check your system anytime and anywhere.

Service Management Unite can be installed on Linux on z Systems or Linux on System x. You can download Service Management Unite from IBM's download portal (https://www-01.ibm.com/marketing/iwm/iwm/web/preLogin.do?source=swg-ibmsms).

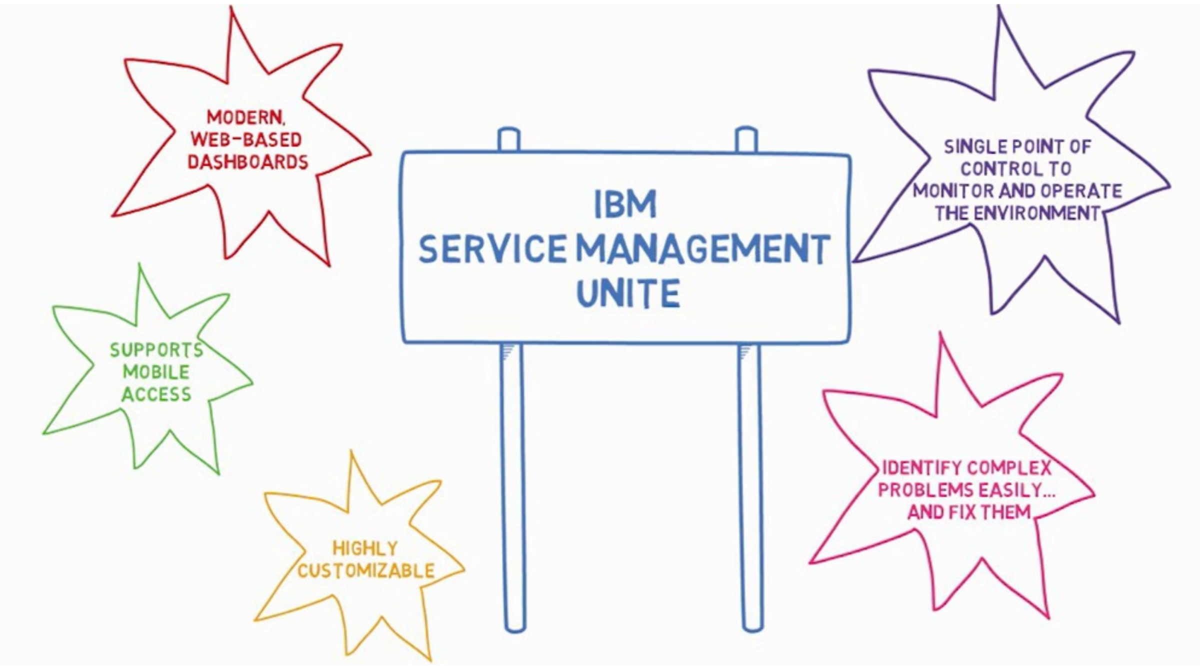

MODERN, WEB-BASED DASHBOARDS
IBM SERVICE MANAGEMENT UNITE
SINGLE POINT OF CONTROL TO MONITOR AND OPERATE THE ENVIRONMENT
SUPPORTS MOBILE ACCESS
IDENTIFY COMPLEX PROBLEMS EASILY... AND FIX THEM
HIGHLY CUSTOMIZABLE

Figure 1. Highlights of Service Management Unite

For related information, refer to the following resources:

Table 1. Related documentation for installing and configuring Service Management Unite

Related documentation	Location
IBM Service Management Unite V1.1.5 readme file	Component installation package
IBM Service Management Suite for z/OS Suite License Information CD (LC27-6399-02)	Shipped on CD

Table 1. Related documentation for installing and configuring Service Management Unite (continued)

Related documentation	Location
IBM Service Management Suite for z/OS Program Directory (GI13-2328-06)	Knowledge Center: Program Directory
Service Management Unite Automation's embedded online help	Within Service Management Unite, click the question mark icon (?) on a dashboard's console toolbar to get detailed information about the usage and how to customize dashboards

Service Management Unite architecture

The Service Management Unite architecture consolidates data from various performance and monitoring tools to empower the operations staff to analyze and resolve problems quickly.

The following diagram depicts the comprehensive IBM Service Management Unite and the related IBM Service Management Suite for z/OS V1.5.0 system architecture.

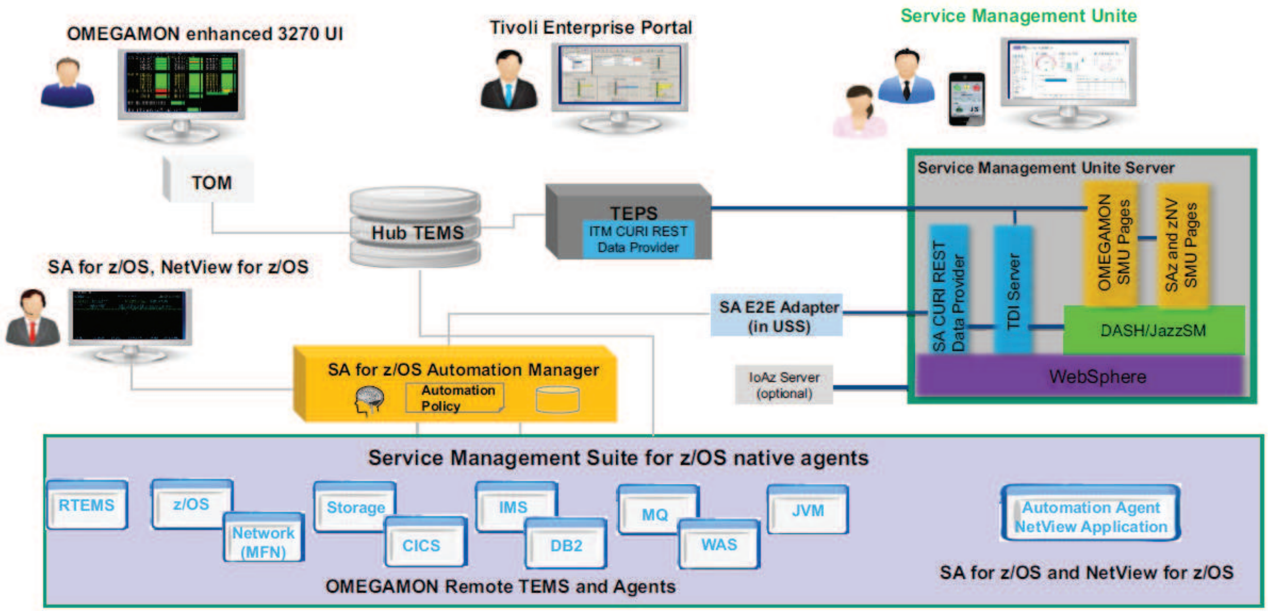

OMEGAMON enhanced 3270 UI
Tivoli Enterprise Portal
Service Management Unite
TOM
Hub TEMS
TEPS
ITM CURI REST Data Provider
Service Management Unite Server
SA CURI REST Data Provider
TDI Server
OMEGAMON SMU Pages
SAz and zNV SMU Pages
DASH/JazzSM
WebSphere
SA for z/OS, NetView for z/OS
SA E2E Adapter (in USS)
IoAz Server (optional)
SA for z/OS Automation Manager
Automation Policy
Service Management Suite for z/OS native agents
RTEMS
z/OS
Network (MFN)
Storage
CICS
IMS
DB2
MQ
WAS
JVM
Automation Agent
NetView Application
OMEGAMON Remote TEMS and Agents
SA for z/OS and NetView for z/OS

Figure 2. IBM Service Management Unite architecture

The Service Management Unite Server

Service Management Unite can be installed on Linux on IBM Z or Linux on System x.

Service infrastructure

Service Management Unite uses a service infrastructure that incorporates key products and services to run the dashboards and provide flexible integration and customization capabilities. The service infrastructure is provided with Service Management Unite and must be installed before the Service Management Unite dashboards. It consists of the following components:

IBM Dashboard Application Services Hub (DASH) / Jazz for Service Management (JazzSM)

IBM Dashboard Application Services Hub (DASH) provides visualization and dashboard services based on Jazz for Service Management (JazzSM). The DASH integration platform supports data processing and content rendering from multiple sources. The data is integrated and displayed in interactive dashboards. DASH has a single console for administering IBM products and related applications.

IBM Tivoli Directory Integrator (TDI Server)

IBM Tivoli Directory Integrator can be used to read your data or third-party data for display in DASH widgets. Also, the TDI toolkit can be used to write code to combine data from multiple sources and create new data for display in DASH widgets. The Service Management Unite Performance Management component uses TDI capabilities to reformat, combine, and enrich data that comes from IBM Tivoli Monitoring, OMEGAMON, and Service Management Unite Automation.

IBM WebSphere Application Server

IBM WebSphere Application Server provides the application server runtime environment for DASH and Service Management Unite dashboards.

Service Management Unite components

Service Management Unite Automation

Service Management Unite Automation provides the dashboards to monitor and operate resources that are automated by IBM System Automation for z/OS, issue z/OS and NetView commands, and access system logs. It also provides Universal Automation Adapter to automate non-z/OS systems from IBM System Automation for z/OS.

Service Management Unite Performance Management

Service Management Unite Performance Management provides the dashboards to find and analyze problems with subsystems that are monitored by OMEGAMON, such as z/OS LPARs, CICS, WebSphere MQ, JVMs, networks, and others.

Each Service Management Unite component has its own installer and can be installed independently. For example, if you don't need dashboards for OMEGAMON agents, you can install only SMU Automation to use the dashboards to work with System Automation for z/OS.

Note: Issuing commands on z/OS is not available if you install only SMU Performance Management. This capability is provided by SMU Automation.

Connectivity to backend systems

Connect Service Management Unite Automation with z/OS Systems

Use the following main components to interact with z/OS systems:

IBM System Automation for z/OS

IBM System Automation for z/OS is a policy-based, self-healing, high availability solution. It maximizes the efficiency and the availability of critical systems and applications. It also reduces administrative and operational tasks.

System Automation for z/OS end-to-end (E2E) adapter

The SA for z/OS E2E adapter connects an SA for z/OS domain to Service Management Unite. It enables Service Management Unite to read data like the status of automated resources and run actions like sending requests. It also provides the capability to issue NetView and z/OS commands and access system logs. In addition, the E2E adapter is used as the connection target by System Automation to provide cross-sysplex end-to-end automation.

For more information about the E2E adapter, refer to the End-to-End Automation manual.

Connect Service Management Unite Automation with non-z/OS Systems

Universal Automation Adapter (UAA)

The Universal Automation Adapter enables Service Management Unite to monitor, operate, and automate resources that run on non-z/OS systems. It can be used as the connection target by IBM System Automation for z/OS to provide end-to-end automation.

The Universal Automation Adapter is installed with IBM Service Management Unite Automation. No additional software needs to be installed on the system that hosts the monitored application. The UAA connects to remote systems using SSH. In a policy that you can edit from your Service Management Unite dashboard, you define the resources on the remote systems and the commands to monitor, start, and stop the resources. Remote systems and resources that are managed by the UAA are automatically displayed in the Service Management Unite Automation dashboards. For more information about how to configure UAA, see “[Optional] Configuring access to the Universal Automation Adapter” on page 64.

Connect Service Management Unite Performance Management with OMEGAMON agents and IBM Tivoli Monitoring (ITM)

Use the following main components to access data from OMEGAMON agents and IBM Tivoli Monitoring in a typical monitoring environment:

Tivoli Enterprise Monitoring Server (TEMS)

Tivoli Enterprise Monitoring Server controls one or more monitoring agents and performs important functions such as:

- Monitoring the availability of agents
- Evaluating situations and sending alerts when the specified availability and performance problems are detected
- Retrieving and consolidating data from monitoring agents
- Distributing situations and policies to monitoring agents

The hub TEMS server controls the remote TEMS servers and other agents that are directly connected to the hub monitoring server. The hub TEMS server is the master repository that stores and persists monitoring data, situations, user definitions, and managed object definitions. The remote TEMS servers maintain a subset of the hub repository that is relevant, which is synchronized with the hub repository.

OMEGAMON agents

The OMEGAMON agents monitor the performance of mainframe resources such as z/OS, DB2, IMS, CICS, networks, WebSphere MQ, storage, and JVM.

Tivoli Enterprise Portal Server (TEPS)
Tivoli Enterprise Portal Server acts as a conduit for Tivoli Enterprise Portal clients requesting data for analysis from monitoring agents and other components. The TEPS communicates directly with the Hub Tivoli Enterprise Monitoring Server to send requests to and retrieve data from monitoring agents.

IBM Tivoli Monitoring CURI Data Provider
Service Management Unite Performance Management uses the IBM Tivoli Monitoring CURI Data Provider running on TEPS to access monitoring data such as performance metrics that are delivered by OMEGAMON agents.

To enable the IBM Tivoli Monitoring CURI Data Provider, you must select the **Enable the dashboard data provider** option when you configure the Tivoli Enterprise Portal Server.

To connect Service Management Unite Performance Management to the ITM environment, you must specify the connectivity information to the ITM CURI Data Provider in the following two places:

- Connection definition in DASH
- Connection Properties that are used by TDI

Authentication and Authorization concepts

Go through the basic concepts to understand users, groups, and user roles in Service Management Unite.

Authentication

In the Service Management Unite architecture, you must configure user authentication for the following main components:

WebSphere Application Server
When you log in to Dashboard Application Services Hub (DASH) to access the Service Management Unite dashboards, you need a user ID to authenticate against the user repository that is configured for WebSphere Application Server. The user repository can either be the default file-based user repository or a Lightweight Directory Access Protocol (LDAP) repository.

Use the WebSphere administrative console to configure the security setup and manage users and user groups.

z/OS Systems to issue NetView or System Automation commands
All requests are routed through the E2E adapter that run in the SA for z/OS automation domain. The user is authenticated with the configured System Authorization Facility (SAF) product such as the z/OS Resource Access Control Facility (RACF). Alternatively, you can disable authentication checking in the E2E adapter configuration. In this case, the user's password is only checked during logon to the Service Management Unite server. This is useful if you use a central user repository and SSL certificates based authentication. Depending on the security setup of your System Automation environment, the detailed situation varies. For more

information about the required security definitions for the user ID, see "Requirements for user IDs that access z/OS systems from Service Management Unite" on page 16.

Use the configuration tool **cfgsmu** to define which user IDs are used by the Service Management Unite automation framework.

Non-z/OS Systems that are accessed by the Universal Automation Adapters

Non-z/OS Systems use the Universal Automation Adapters to connect to Service Management Unite through Secure Shell (SSH). You need a user ID that is configured on the remote system to authenticate through SSH.

Use the configuration tool **cfgsmu** to define which user IDs are used by the Universal Automation Adapter to access remote systems.

Tivoli Enterprise Portal Server (TEPS)

You need a user ID to access the monitoring data that is provided by the IBM Tivoli Monitoring CURI data provider on TEPS. It is used to populate the OMEGAMON dashboards and access to all the IBM Tivoli Monitoring data.

Configure this user ID in the connection definition of the Dashboard Application Services Hub and in the TDI properties files that are used by SMU Performance Management.

For an overview of the usage of the different user IDs, see User credentials.

Authorization

Authorization defines the content that you can view and the actions that you can perform.

Service Management Unite uses the following user role names:

- EEZMonitor
- EEZOperator
- EEZConfigurator
- EEZAdministrator

For more details about the permissions that are granted by these user roles, see User roles.

Three layers are used to control authorization:

DASH Roles

The DASH roles define the views, menus, and dashboards that you can see when you work with DASH. You can assign DASH roles to individual users or user groups.

When you install Service Management Unite Automation, the default user groups are created in the user repository that is configured for WebSphere Application Server. DASH roles with the role names of EEZMonitor, EEZOperator, EEZConfigurator, and EEZAdministrator are assigned to these default user groups. For more information about the default user roles, role mapping, and how to assign roles to users or user groups, see "Authorizing users and groups within the Dashboard Application Services Hub" on page 85.

WebSphere Application Server: EJB-Level Roles

The automation framework that runs as Enterprise Java Beans (EJB) in

WebSphere Application Server provides the interface to automation domains. At EJB application level, the functions that the EJB-Level role can access are defined. For example, if you have only the EEZMonitor role, you are not allowed to issue a System Automation request.

Similar to the role mapping of the DASH roles, the SMU user roles are assigned to the default groups during the installation. You can follow the steps to view and edit the EJB-level role mapping using the WebSphere administrative console:

1. Log in to the WebSphere administrative console.
2. In the navigation bar, click **Applications** > **Application types** > **WebSphere enterprise applications**.
3. In the **Enterprise Applications** window, click **EEZEAR**.
4. Under section **Detail Properties**, click **Security role to user/group mapping**. The list of role mapping is displayed.

z/OS Backend Authorization using the configured System Authorization Facility (SAF)
When you issue a command or a query against a z/OS domain, the user ID that you use to log in to the corresponding automation domain is checked against the configured SAF product such as RACF. This check process ensures that the z/OS user ID is authorized to issue the corresponding NetView, MVS, or System Automation commands and to work with the resources. For more details about the security requirements for user IDs on z/OS, see “Requirements for user IDs that access z/OS systems from Service Management Unite” on page 16.

During the installation, the DASH roles and the EJB-Level roles are assigned to the default user groups that can be used for Service Management Unite. Use the WebSphere administrative console to add the user IDs to the corresponding user groups. All the users in a user group inherit the roles that are defined at the group level.

License information

Before you install and configure IBM Service Management Unite, you must accept the license agreement.

The IBM Service Management Unite V1.1.5 license is included with the IBM Service Management Suite for z/OS V1.5.0 license. The installation launchpad will prompt you to accept the license agreement.

Chapter 4. Planning

Effective preparation and planning make your installation and deployment go more quickly and smoothly. Review the following preinstallation requirements and familiarize yourself with the installation tools to prepare for your installation.

The Service Management Unite Deployment Planning Checklist summarizes the planning and deployment of Service Management Unite and can be used as a reference.

Environment requirements

To successfully install and configure IBM Service Management Unite V1.1.5, your environment must meet certain requirements.

Your environment must include at least one system running z/OS V1.13 or later, and at least one physical or virtual image of Linux x86-64 or Linux on System z®. For the distributed systems, the language setting in system locale must be English to install Service Management Unite. Critical prerequisite components for installing and using IBM Service Management Unite include WebSphere Application Server and Jazz™ for Service Management with Dashboard Application Services Hub (DASH). Refer to "Software prerequisites" on page 19 for the complete list of requirements.

Note: Installing multiple Service Management Unite instances on one server is not supported.

IBM Service Management Unite V1.1.5 supports these IBM Service Management Suite for z/OS components:

- System Automation for z/OS 4.1.0
- System Automation for z/OS 3.5.0 (with APAR OA51668 installed)
- OMEGAMON® Performance Management Suite for z/OS 5.5.0 (which includes IBM Tivoli® Monitoring infrastructure)
- NetView® for z/OS 6.2.1
- Tivoli Asset Discovery for z/OS 8.1
- IBM Operations Analytics - Log Analysis 1.3.1

Planning for a User Repository

Information about users and groups is stored in a user registry. By default, the WebSphere Application Server that is installed with Jazz for Service Management is configured to use a local file-based user repository.

Optionally, you can also set up an LDAP server and create an LDAP user registry to use with IBM Service Management Unite.

For more information, refer to "Setting up an LDAP user registry" on page 92.

Requirements for user IDs that access z/OS systems from Service Management Unite

Access to z/OS systems is routed through the E2E adapter that runs in the System Automation for z/OS domain. The following two types of user IDs need access to the System Automation for z/OS domain from Service Management Unite:

Personal user ID

The personal user ID is used to log in to an SA domain and work with the automation resources after you log in to Dashboard Application Services Hub to access the Service Management Unite dashboards.

In the domain's login dialog, enter the z/OS user credential. The user ID is linked to your WebSphere user ID for DASH login. It can optionally be stored in the your credential store, which can store the user ID and password on a per domain basis so that you don't need to provide the credential to this domain again for login purpose.

Functional user ID

The functional user ID is used to access an SA domain on behalf of the automation framework that runs in the WebSphere Application Server. It is used for querying the SA resources that run in the SA plex independent of an actual user that is logged in to Service Management Unite. For example, the functional user ID is used to populate the resource cache in Service Management Unite during the startup of the Service Management Unite server. Only queries and no actions (for example, to start or stop a resource) are issued through the functional user ID.

Configure the functional z/OS user ID in the configuration tool **cfgsmu**. For more details about how to configure the functional user IDs, see “User Credentials tab” on page 59.

Requirements for User IDs on z/OS

Make the following security definitions depending on the purpose of the user ID and the rights that the users should have:

- **Functional User ID**
  - The functional user ID must be defined to RACF and must have at least an OMVS segment.
  - Authorization requirements:
    - Ensure the following RACF profile configuration to authorize the user ID for SA queries:
      - Class: NETCMDS
      - Permission: READ
      - Profile: netid.netvdom.INGRXTX0
- **Personal User ID**
  - The personal user ID must be defined to RACF and must have at least an OMVS segment.
  - Authorization requirements:
    - Ensure the following RACF profile configuration to authorize the user ID for SA queries:
      - Class: NETCMDS
      - Permission: READ
      - Profile: netid.netvdom.INGRXTX0

- Define the following RACF profiles for the user ID depending on the actions that the user needs to perform:
  - Class: NETCMDS
  - Permission: READ
  - Profile:
    - netid.netvdom.INGRYRU0 for issuing start or stop requests (**INGREQ**)
    - netid.netvdom.INGRYSE0 for canceling requests (**INGSET**)
    - netid.netvdom.INGRYMVX for issuing a move of sysplex application groups (**INGMOVE**)
    - netid.netvdom.AOFRASTA for resetting a resource (**SETSTATE**)
    - For any NetView command that a user needs to submit from the "Issue Command" dashboard: the profile of the corresponding command
- If System Automation resource security that is used to check if an action is allowed on a specific resource is enabled, define the following RACF profiles for the user ID depending on which resources the user can work with (defined by profile) and whether the user needs to specify advanced parameters with start and stop requests (defined by permission):
  - Class: SYSAUTO
  - Permission: UPDATE or CONTROL
  - Profile: AGT.sysplex.xcfgrp.RES.name.type.system

    Note:

    - Use AGT.*.*.RES.** to authorize the user for all System Automation resources.
    - If the user needs to specify advanced parameters for start and stop requests (**INGREQ**), such as "Override dependencies", the user needs to have CONTROL access. Otherwise, UPDATE is sufficient.

  For details about System Automation resource security, see Resources in IBM System Automation for z/OS manual.

Supported operating systems

IBM Service Management Unite Automation supports various versions of Linux operating systems.

The following table lists the operating systems that are supported for IBM Service Management Unite Automation, including the Universal Automation Adapter.

Table 2. Supported operating systems for IBM Service Management Unite

Operating system	IBM System x[1]	IBM System z
SUSE Linux Enterprise Server 11 (64 bit)	X	X
SUSE Linux Enterprise Server 12 (64 bit)[3]	X	X
Red Hat Enterprise Linux 5 (64 bit)[2]	X	X
Red Hat RHEL Linux 6 (64 bit)	X	X
Red Hat RHEL Linux 7 (64 bit)	X	X

The following Service Pack or technology levels are supported, unless one of the notes indicates a more specific minimum requirement:

- Service Pack levels of the listed supported SUSE versions or higher.

- Service Pack levels of the listed Red Hat version or higher.

Note:

1. IBM System x with IA32, EM64T, or AMD64 architecture.

   Any other systems with IA32, EM64T, or AMD64 architecture are also supported.

   Systems with IA64 architecture are not supported.

   All supported operating systems are also supported when running under VMware.

   All listed Linux operating systems running under the Red Hat Enterprise Virtualization Hypervisor (RHEV-H) KVM version 5.4 or higher are also supported. However, the live migration functionality provided by this hypervisor is not supported.
2. The supported minimum level is Red Hat Enterprise Linux 5.6.
3. For SUSE Linux Enterprise Server 12, the supported minimum level is Dashboard Application Services Hub 3.1.3 (part of JazzSM 1.1.3) and WebSphere Application Server 8.5.5.9 or higher.

Supported web browsers and mobile OS in DASH

IBM Service Management Unite V1.1.5 is supported using various web browsers and mobile devices

For specific web browser support in Service Management Unite and Dashboard Application Services Hub (DASH), refer to: http://www.ibm.com/support/docview.wss?uid=swg21652158.

Hardware requirements

Before you begin installation and configuration, be sure you have identified and addressed any required hardware prerequisites.

Memory

Make sure you have enough memory available on the server to install IBM Service Management Unite.

The minimum required memory (RAM) is 4 GB or more to install WebSphere Application Server and IBM Service Management Unite on the same server. For large environments, it is recommended to have a system with 8 GB RAM. If you start to install IBM Service Management Unite, a memory check is automatically processed. If the server provides less than 4 GB operational memory, a warning is displayed.

Disk space

Make sure that enough disk space is available for the installation.

At least 6 GB is required to install IBM Service Management Unite. You can use the prerequisite scanner for the Jazz for Service Management installation package to list the precise requirements that arise from your operating system. To run the prerequisite scanner, enter the following commands:

```
export JazzSM_FreshInstall=True
JazzSM_Image_Home/PrereqScanner/prereq_checker.sh "ODP,DSH" detail
```

The prerequisites scanner prints the expected disk space and other prerequisites.

TCP/IP connectivity

It is required to install several products to run IBM Service Management Unite. Some of these products require TCP/IP connections.

You can install WebSphere Application Server and Service Management Unite Automation on one server or on different servers, depending on your architecture.

Provide TCP/IP connections between the following products and IBM Service Management Unite components:

- WebSphere Application Server and the resource adapters

Software prerequisites

Prerequisite software must be installed in your IBM Service Management Suite for z/OS V1.5.0 environment before you install and configure IBM Service Management Unite V1.1.5. Prerequisite checks are run automatically at various points in the installation process.

Table 3. Software prerequisites for installing and configuring IBM Service Management Unite V1.1.5

Prerequisite / Requirement	**Automation / Performance Management**	**Location**
IBM Service Management Suite for z/OS V1.5.0	Both	Shopz: http://www.ibm.com/software/shopzseries/ShopzSeries_public.wss
Jazz for Service Management V1.1.2.1 or V1.1.3 (JazzSM) Note:Dashboard Application Services Hub (DASH) is a prerequisite service included with JazzSM. Make sure that you tick DASH V3.1.2.1 or V3.1.3 when you install JazzSM.	Both	IBM Service Management Unite download page: https://www.ibm.com/marketing/iwm/iwm/web/preLogin.do?source=swg-ibmsms [1]
WebSphere® Application Server V8.5.5.x for Linux Multilingual - OR - WebSphere Application Server V8.5.5.x for Linux on System z® [2] Note:Make sure you also tick WebSphere Application Server SDK V1.7 during your installation, which is included with WebSphere® Application Server V8.5.5.	Both	IBM Service Management Unite download page: https://www.ibm.com/marketing/iwm/iwm/web/preLogin.do?source=swg-ibmsms [1]
Korn shell	Automation	
Tivoli Enterprise Portal Server and IBM Operations Analytics - Log Analysis v1.3.1 integration enabled in PARMGEN	Performance Management	http://www.ibm.com/support/docview.wss?uid=swg21696831
IBM Tivoli Monitoring V6.3.0 Fix Pack 6 (includes IBM Tivoli Monitoring Data Provider)	Performance Management	Fix Pack 6: http://www.ibm.com/support/docview.wss?uid=swg24040390
Tivoli Directory Integrator (TDI) V7.1.1 - Fix Pack 4 or higher	Performance Management	TDI 7.1.1.5 installation package is included with JazzSM V1.1.3

Table 3. Software prerequisites for installing and configuring IBM Service Management Unite V1.1.5 (continued)

Prerequisite / Requirement		**Automation / Performance Management**	**Location**
OMEGAMON for z/OS and IBM Operations Analytics - Log Analysis V1.3.1 integration PTFs for the following agents	IBM® MQ Monitoring	Performance Management	http://www.ibm.com/support/docview.wss?uid=swg1OA46839
	IBM® Integration Bus Monitoring	Performance Management	http://www.ibm.com/support/docview.wss?uid=swg1OA46840
	OMEGAMON for Storage	Performance Management	http://www.ibm.com/support/docview.wss?uid=swg1OA46871

Note:

1. To access the download link, ensure that you already have an IBM ID. If you don't have one, access the following link for registration: https://www.ibm.com/account/us-en/signup/register.html?Target=https://myibm.ibm.com/. You also need the access key, which is supplied with the IBM Service Management Suite for z/OS on a CD titled "Accessing IBM Service Management Unite".
2. The minimum fixpack level for DASH 3.1.2.1 is WebSphere Application Server V8.5.5.4.

   The minimum fixpack level for DASH 3.1.3 is WebSphere Application Server V8.5.5.9.

Software to access product data

Accessing product data in IBM Service Management Unite V1.1.5 requires installing and configuring the applicable support software.

To make product data available to Service Management Unite Automation, you must install the following component and adapters, as applicable to your environment:

- IBM System Automation for z/OS V4.1
- System Automation for z/OS end-to-end adapter
- System Automation for Multiplatforms Adapter
- Universal Automation Adapter

To make product data available to Service Management Unite Performance Management, you must install OMEGAMON z/OS agents for the following product versions, as applicable to your environment:

- IBM Tivoli Composite Application Manager Agent for WebSphere Applications V7.2.0 IF5, or later
- IBM OMEGAMON for Storage on z/OS V5.4.0.
- IBM Tivoli OMEGAMON XE for CICS® on z/OS V5.3.0, or later.
- IBM Tivoli OMEGAMON XE for DB2® PE and PM on z/OS V5.3.0, or later.
- IBM Tivoli OMEGAMON XE for IMS on z/OS V5.3.0, or later.
- IBM Tivoli OMEGAMON XE for Messaging for z/OS V7.3.0, or later.
- IBM Tivoli OMEGAMON XE on z/OS V5.3.0 with PTF UA80391 Fix Pack, 5.3.0-TIV-KM5-FP0003, or later.
- IBM Tivoli OMEGAMON XE on Mainframe Networks V5.3.0, or later.

- IBM Operations Analytics - Log Analysis V1.3.2.
- IBM Tivoli NetView for z/OS Enterprise Management Agent V6.2.1.

Running commands and using canzlog in IBM Service Management Unite V1.1.5 requires NetView for z/OS V6.2.1.

Jazz for Service Management and WebSphere Application Server

Jazz for Service Management and WebSphere Application Server are software prerequisites that you must install before you install Service Management Unite. Before you install or update Jazz for Service Management, refer to the technotes and readme information for Jazz for Service Management. Technotes provide information about late-breaking issues, limitations, and fixes.

The following JazzSM pages are available online resources:

1. Jazz for Service Management Version 1.1.2.1 Readme: http://www.ibm.com/support/docview.wss?uid=swg24040447
2. Jazz for Service Management Version 1.1.3.0 Readme: http://www.ibm.com/support/docview.wss?uid=swg24042190
3. Jazz for Service Management Version 1.1.2.1 Technotes: http://www.ibm.com/support/search.wss?q=jazzsm1121relnotes (Click the **Newest first** link for the most recent posts.)
4. Jazz for Service Management Version 1.1.3.0 Technotes: http://www.ibm.com/support/search.wss?q=jazzsm1130relnotes (Click the Newest first link for the most recent posts.)
5. Jazz for Service Management developerWorks: http://www.ibm.com/developerworks/community/blogs/69ec672c-dd6b-443d-add8-bb9a9a490eba?lang=en

Ensure that your existing environment meets current Jazz for Service Management requirements including prerequisites like the IBM Installation Manager. For more information about the requirements, see Detailed system requirements for Linux.

To install Jazz for Service Management and WebSphere Application Server , refer to “Installing Jazz for Service Management and WebSphere Application Server” on page 30.

Installation tools

The following installation tools are provided with IBM Service Management Suite for z/OS V1.5.0 for installing and configuring IBM Service Management Unite V1.1.5.

Service Management Unite launchpad

Use the Service Management Unite launchpad as the starting point for installing and configuring Service Management Unite. The launchpad.sh file is located under the directory where the Service Management Unite installation .tar file has been expanded.

The launchpad takes you through verifying your prerequisites and launching the installers for Service Management Unite Automation (InstallAnywhere) and Service Management Unite Performance Management (IBM Installation Manager).

InstallAnywhere

InstallAnywhere is included in Service Management Unite and is invoked from the Service Management Unite launchpad to install and configure Service Management Unite Automation.

Start InstallAnywhere from the Service Management Unite launchpad (launchpad.sh in your product package). From the launchpad, click on **Installing** > **Service Management Unite Automation**. Use InstallAnywhere to install and configure system automation tools.

IBM Installation Manager

IBM Installation Manager is included in Service Management Unite and is invoked from the Service Management Unite launchpad to install and configure Service Management Unite Performance Management.

IBM Installation Manager can be used in a GUI or can be started from the command line in silent mode with installation values supplied from an input file.

- To start IBM Installation Manager in silent mode, see “Silent mode installation” on page 50.
- To use the GUI, start IBM Installation Manager from the Service Management Unite launchpad. From the launchpad, click on **Installing** > **Service Management Unite Performance Management wizard**.

The installation process requires that it runs under a user ID with administrative authority. **`root`** is the recommended user.

Preinstallation checklist

Use this checklist to organize the required information for installing IBM Service Management Unite V1.1.5.

Compile the following information before you begin the installation process:

__ Verify the administrator ID and password for WebSphere Application Server.

__ Verify the name of the WebSphere Application Server used by the Jazz for Service Management profile.

__ Verify the location and password for the WebSphere Application Server default root certificate key store and the node default key store.

__ Verify the key store, trust files, and passwords for Tivoli Directory Integrator (TDI) V7.1.1 Fix Pack 4. Also confirm the Tivoli Directory Integrator solution service directory and that the Tivoli Directory Integrator server is enabled as a system service.

__ Verify the installation credentials, server location, and port number for IBM Operations Analytics for z Systems if you use.

__ Verify the IBM Tivoli Monitoring, Tivoli Enterprise Monitoring Server, and Tivoli Enterprise Portal Server locations and the user IDs and passwords for each.

__ Determine the Service Management Unite Automation installation directory, if you don't want to use the default path `opt/IBM/smsz/ing`.

__ Determine the IBM Installation Manager installation directory, if you don't want to use the default path.

__ Determine whether any Tivoli Common Directory setup and whether another product uses it.

__ If remote DB2 is to be used for Service Management Unite Automation, determine the DB2 JDBC driver path, the DB2 instance host name, the DB2 instance port number, the database instance owner name and password.

__ Determine the functional user ID to be used for Service Management Unite Automation internally.

__ Determine the Service Management Unite Automation Administrator user ID.

Chapter 5. Installing and uninstalling

This information provides the following topics to help you install and uninstall Service Management Unite and related software prerequisites.

Obtaining installation files

Visit the download portal to get the Service Management Unite installation files.

Procedure

1. Go to the download portal (https://www-01.ibm.com/marketing/iwm/iwm/web/preLogin.do?source=swg-ibmsms) to download SMU installation files. You need an IBM ID to log in, if you don't have one, access this website (https://www.ibm.com/account/us-en/signup/register.html?Target=https://myibm.ibm.com/) to sign up.
2. Provide the access key to get the installation files. The access key is supplied with the IBM Service Management Suite for z/OS on a CD titled "Accessing IBM Service Management Unite".
3. Select the packages and click **Download now** to get the installation files.
   - If you prefer to install SMU using a prebuilt Docker image, select **IBM Service Manageme Unite - Docker image for Linux on System x** or **IBM Service Management Unite - Docker image for Linux on System z** depending on your system. The Docker image contains all the software prerequisites that you need to install SMU.
   - If you install SMU manually using the provided installers, select the SMU and prerequisite software packages depending on your system. For example, if you install SMU on Linux on System x, select the following packages:
     - IBM Service Management Unite - Installation image for Linux on System x
     - Jazz for Service Management 1.1.3.0 for Linux (Launchpad, PRS, Jazz Repository, TDI)
     - IBM WebSphere Application Server V8.5.5.9 for Linux

Installing Service Management Unite with Docker

Starting from Service Management Unite V1.1.4, Docker technology is introduced to reduce the time and effort in installing Service Management Unite.

Docker is an open platform for developing, shipping, and running applications. To simplify the installation, a Service Management Unite Docker image is provided as an alternative to the classic installation package. With the Docker image, you can create a Docker container that includes everything that is needed for Service Management Unite to run, including an operating system, user-added files, metadata, and the related dependencies.

The Docker image contains all runtime components that are needed to run Service Management Unite:

- IBM Service Management Unite Automation
- IBM Service Management Unite Performance Management
- IBM Tivoli Directory Integrator
- IBM WebSphere Application Server

- IBM Jazz for Service Management with IBM Dashboard Application Services Hub

Installing Service Management Unite

Load and run the Docker image to install Service Management Unite.

Before you begin

Before you install Service Management Unite by using the Docker image, you must ensure that you have Docker installed on the server. Refer to the following information to install Docker on Linux on System x or Linux on System z:

- Installing Docker on zLinux.
- Installing Docker on xLinux.

About this task

Video resource:

Watch this video for the demo of the installation process:

Procedure

1. Download the SMU Docker archive depending on the architecture of your host system, for example `SMU_v1.1.4.0_Docker_Image_xLinux.tar` for the SMU Docker image running on xLinux (x86_64).

   The SMU Docker archive is a compressed file. Run the command to extract the contained files to a target directory:

   ```
   tar -xvf <SMU_Docker_archive.tar> --directory <target_dir>
   ```

   Note: The target directory must exist before **`tar`** can extract the files into it.
   The package contains the following files:

   - An exported Docker image that includes all prerequisite software and must be loaded into your Docker environment: `smu_image.tar`
   - A shell script that helps you to manage the SMU Docker image and wraps the necessary Docker commands for loading, starting, and stopping the image: `eezdocker.sh`

     Run command '**`eezdocker.sh help`**' for more details.

     Note: The script must be ran from a user who is allowed to use Docker, for example, root.
2. Run the shell script to load the SMU Docker image into your Docker environment and to automatically create the necessary Docker volumes:

   ```
   ./eezdocker.sh load
   ```

   You can verify that the docker image has been loaded by issuing the command '**`eezdocker.sh status`**' or by querying your docker environment manually using the commands '**`docker volume ls`**' and '**`docker images`**'.

   If the load is successful, you can delete the `smu_image.tar` since it is not needed anymore.
3. Run the shell script to start the Docker container.

   ```
   ./eezdocker.sh start
   ```

The Tivoli Directory Integrator server and WebSphere Application Server are automatically started when a Docker container is started from the SMU Docker image.

Note: The Docker container is started with the Docker option '**–restart always**', which means it runs unless it's manually stopped by the command '**eezdocker.sh stop**'. This option also enables automatically starting or restarting the SMU Docker container after a reboot of the host system.

You can verify that a Docker container from the SMU Docker image has been started by issuing the command '**eezdocker.sh status**', or by querying your Docker environment manually using the command '**docker ps**'.

Results

When the Docker container is successfully started, you can access SMU dashboard via the following URL:

```
https://<hostname>:16311/ibm/console
```

The default SMU administrative user ID and password are eezadmin/eezadmin.

Note: It might take up to 1 minute after the Docker container is started until all services are initialized and available.

Access the WebSphere administrative console via the following URL:

```
https://<hostname>:16316/ibm/console
```

The default WebSphere Application Server administrative user ID and password are wasadmin/wasadmin.

You can use the WebSphere administrative console to define more user IDs or change the password.

What to do next

Follow the steps to configure SMU to connect to backend systems:

- Define the functional user IDs that are used to connect to automation domains with the configuration tool **cfgsmu**.

  To start the GUI of **cfgsmu** from within the running Docker container, the container's variable *$DISPLAY* must point to the X Display server of your host system. Run the command:

  ```
  eezdocker.sh cfgsmu
  ```

  Note: If command '**eezdocker.sh cfgsmu**' doesn't work as expected, run the command '**xhost+local:all**' before you run '**eezdocker.sh cfgsmu**' to ensure that the Docker process can access the user's X session.
- Set up the IBM System Automation for z/OS (SA z/OS) E2E automation adapter to connect an SA z/OS automation domain to SMU.
- Define the connection to the ITM Data Provider to get monitoring data from OMEGAMON agents.

For more information on how to configure SMU for your environment, refer to Chapter 7, “Configuring and administrating,” on page 55.

Accessing a command line in the SMU docker container

In some situations, you might want to get access to the command line within the SMU docker container, for example to restart individual services running in the container, to access log files, or to perform manual configuration tasks.

Procedure

To access the container's bash shell, issue the following command:

```
eezdocker.sh shell
```

Docker volumes

Docker volumes are directories and files that are outside of the Docker containers to save and share data between Docker containers.

The Docker volumes ensure that runtime configuration changes are persisted on the Docker host system and don't get lost when you stop the Docker containers. The following SMU Docker volumes are created when you load and run the Docker image:

Table 4. SMU Docker volumes

Volume name	Path in Docker container	Description
eez_eautodb	`/opt/IBM/WebSphere/AppServer/derby/EAUTODB`	The location of the database where SMU Automation domain connection information is stored
eez_restdb	`/opt/IBM/JazzSM/ui/db/restdb`	The location of the DASH internal database
eez_custdash	`/opt/IBM/JazzSM/profile/config/cells/JazzSMNode01Cell`	The location where WAS configuration including user registry, DASH customizations, and dashboard definitions are stored
eez_cfg	`/etc/opt/IBM/smsz/ing`	The location of SMU Automation configuration data and policy pool
eez_prefs	`/opt/IBM/JazzSM/profile/Tivoli/EEZ`	The location of SMU Automation operator preferences
eez_tdi	`/opt/IBM/TDI/V7.1.1/DASH_ITMCollector`	The location of the TDI preferences

If you want to reset your SMU Docker container to the default configuration (remove all of your own configuration), you can delete the Docker volumes. Run command **`docker volume rm --help`** or **`docker volume prune --help`** for further details.

Network and ports information

The SMU Docker container uses the network stack and hostname of the Docker host system (**`--network=host`**).

The Docker container opens the following ports in listen mode for services that are offered by Service Management Unite:

Table 5. Default ports information

Port number	Description
16311	Port to access the DASH that hosts the SMU dashboards
16316	Port to access the WebSphere administrative console
2002	Port that is used by automation adapters to connect to SMU and send update events for resources
2005	Port that is opened by the Universal Automation Adapter to receive requests from the E2E agent

If you want to change the default settings and you are familiar with Docker's network types and port mapping, you can change the settings with option **`-n`** and **`-r`** of command '**`eezdocker.sh`**'. See '**`eezdocker.sh help`**' for more information.

If you want to restrict access to a port (e.g. the WebSphere administrative console, port 16316), you need to configure appropriate firewall rules on the host system.

Uninstalling Service Management Unite

To uninstall Service Management Unite, remove the SMU Docker image and all SMU Docker containers from the host system.

Procedure

1. Any SMU Docker container must be stopped before the uninstallation. Issue the command to stop the SMU Docker container:
   ```
   ./eezdocker.sh stop
   ```
2. Issue the command to remove SMU Docker container and Docker image:
   ```
   ./eezdocker.sh uninstall
   ```

Results

The SMU instance is successfully removed from your server.

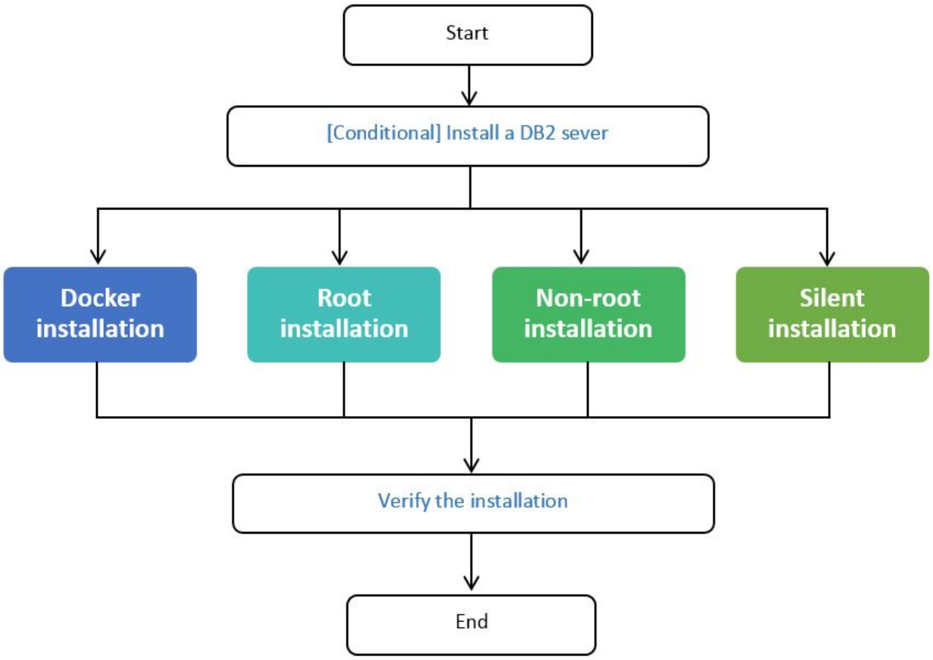
What to do next

After you remove the SMU Docker image and containers, delete the `eezdocker.sh` script and its belonging files.

Installing and uninstalling SMU Automation

Installing Service Management Unite Automation requires meeting the prerequisites, installing the required and optional software, and running the Service Management Unite launchpad and InstallAnywhere.

The following flowchart shows different ways to install Service Management Unite. Select the installation process and follow the corresponding steps.



Installing Jazz for Service Management and WebSphere Application Server

Jazz for Service Management and WebSphere Application Server are software prerequisites that you need to install before you install Service Management Unite. You can either use root or non-root user authority to install the software prerequisites.

Installing Jazz for Service Management and WebSphere Application Server

Follow the steps described in this topic to install Jazz for Service Management and WebSphere Application Server.

1. Create a common directory to store the extracted Jazz for Service Management installation media, referred to as the `JazzSM_Image_Home directory`.

   Restriction: Ensure that the path to the common root directory does not contain any spaces or special characters.

2. Extract the contents of the following deliverable into this directory:

   Jazz for Service Management Version 1.1.2.1 or Version 1.1.3:

   - Linux: Jazz for Service Management 1.1.2.1 or 1.1.3.0 for Linux (Launchpad, PRS, Jazz Repository, TDI) `IBM-jazzsm-launchpad-113-linux64.zip`
   - Linux on System z: Jazz for Service Management 1.1.2.1 or 1.1.3.0 for Linux on System z (Launchpad, PRS, Jazz Repository, TDI) `IBM-jazzsm-launchpad-113-linuxZSeries64.zip`

   WebSphere Application Server Version 8.5.5.x:

   - Linux: IBM WebSphere Application Server V8.5.5.x for Linux `IBM-was-8.5.5.x-linux64.zip`
   - Linux on System z: IBM WebSphere Application Server V8.5.5.x for Linux on System z `IBM-was-8.5.5.x-linuxZSeries64.zip`

3. Install JazzSM Services by using Installation Manager:
   a. Browse to the `JazzSM_Image_Home/im.platform_name/` directory and run the installation command, for example:

      ```
      ./install
      ```

      If the installation does not start due to missing prerequisites, check whether all required libraries are installed. For more information about Jazz for Service Management prerequisites, see Jazz for Service Management Detailed System Requirements (http://www-01.ibm.com/support/docview.wss?uid=swg27038732).
   b. The Installation Manager window opens. Select the following packages to be installed:
      1) IBM Installation Manager Version 1.8.2 or later
      2) IBM WebSphere Application Server Version 8.5.5.4 or later
      3) IBM WebSphere SDK Java™ Technology Edition Version 7.0, or later
      4) Jazz for Service Management extension for IBM WebSphere 8.5 Version 1.1.2.1
      5) IBM Dashboard Application Services Hub Version 3.1.2.1 or 3.1.3.0
   c. Click **Next**. The Installation Manager > Licenses window opens. Review and accept the License Agreements.
   d. Click **Next** and specify the directories that are used by the Installation Manager.
   e. Click **Next** and specify the installation directories for WebSphere Application Server and Jazz for Service Management.
   f. Click **Next**. The **Installation Manager > Features – languages** window opens.
   g. Accept the default translated languages that are selected in the **Translations Supported by All Packages** window. Click **Next**. The **Installation Manager > Features** window opens.
   h. Click **Next** and specify the configuration for your WebSphere Application Server installation. Define the WebSphere administrative user ID. Click **Validate**.
   i. Click **Next**. The **Installation Manager > Summary window** opens.
   j. Review the software packages to be installed and their installation directories. Click **Install** to start the installation.
   k. When the installation completed, a success window is displayed. You can now click **Finish** to close the Installation Manager.
4. Important: Activate Java 7 for the WebSphere Application Server profile:

```
was_root/bin/managesdk.sh -enableProfile -sdkName 1.7_64 -profileName JazzSMProfile -enableServers
```

JazzSMProfile is the profile name that is used for Jazz for Service Management. Default name: JazzSMProfile.

Note: More information about configuring Java 7 is provided at the following links:

- Find out how to install and configure Java 7 at the IBM Education Assistant -WebSphere software.
- Check the Java SDK Upgrade Policy for the IBM WebSphere Application Server before you apply the fixes to WebSphere Application Server, to ensure that the fix matches to the installed Java version.

- The page Verify Java SDK version shipped with IBM WebSphere Application Server fix packs describes which version of WebSphere Application Server corresponds to which Java SDK level.

You are now ready to install Service Management Unite using the launchpad.

Installing Jazz for Service Management and WebSphere Application Server as non-root

By default, the IBM WebSphere Application Server that hosts IBM Service Management Unite runs as root. However, it can also be installed and run by using a non-root user ID. In that case, Service Management Unite as well as the prerequisite WebSphere Application Server and Dashboard Application Services Hub must be all installed using the same non-root user ID.

About this task

The root or non-root installer who owns the currently installed files is the only user who can perform subsequent installation or removal operations on that installation.

To install Jazz for Service Management using a non-root user, complete the steps as follows:

Procedure

1. Log in to the system where you want to install Service Management Unite using the non-root user ID that should be the owner of this WebSphere Application Server runtime environment.
2. Follow the instructions that are described in Installing Jazz for Service Management and WebSphere Application Server, but instead of running the command `install` in step 3, use the command `userinst` to start IBM Installation Manager in "user mode".
3. In the Installation Manager, choose installation directories that are located below your user's home directory, for example, accept the default directories such as `/home/<user>/IBM/WebSphere/AppServer`.

[Conditional] Planning for the Universal Automation Adapters

Decide if you want to install the Universal Automation Adapter.

The Universal Automation Adapter is automatically installed together with the IBM Service Management Unite Automation product as described in “Installing SMU Automation” on page 36. Only one instance of the Universal Automation Adapter can be installed on any remote node on Linux systems.

For more information, refer to “Tuning the number of domains and resources of the Universal Automation Adapter” on page 72.

Requirements for target machines managed by the Universal Automation Adapter

The Universal Automation Adapter the Secure Shell (SSH) protocol to start, stop, and monitor resources on remote nodes. This topic describes the requirements that must be fulfilled by remote nodes that host the resources defined for a Universal Automation Adapter domain. These nodes are referred to as target-nodes.

Unix, Linux, and Windows targets:

The Universal Automation Adapter does not supply SSH code for UNIX machines. Ensure SSH is installed and enabled on any target you want to access using the Universal Automation Adapter.

OpenSSH 3.7.1 or higher contains security enhancements not available in earlier releases. The Universal Automation Adapter cannot establish connections with any UNIX target that has all remote access protocols (`rsh`, `rexec`, or `ssh`) disabled.

In all UNIX environments except Solaris, the Bourne shell (`sh`) is used as the target shell. On Solaris targets, the Korn shell (`ksh`) is used instead due to problems encountered with `sh`.

In order for the Universal Automation Adapter to communicate with Linux and other SSH targets using password authentication, you must:

1. Edit the file `/etc/ssh/sshd_config` on target machines and set:
   ```
   PasswordAuthentication yes (the default is 'no')
   ```
2. Now stop and restart the SSH daemon using the following commands:
   ```
   /etc/init.d/sshd stop
   /etc/init.d/sshd start
   ```

z/OS targets:

z/OS targets require z/OS UNIX System Services (USS) and IBM Ported Tools for z/OS (OpenSSH).

- Documentation for OpenSSH can be found here:

  z/OS UNIX System Services
- Make sure that the SSHD process is available, for example, using AUTOLOG.
- Edit `/etc/ssh/sshd_config`, uncomment the UsePrivilegeSeparation parameter and change it to *no*.
- Verify that port 22 is open using the netstat -P 22 command.

Installing a DB2 server

You can use the typical installation of a single-partition database environment.

Create a DB2 instance before you install IBM Service Management Unite. Make sure that the DB2 server meets the required version level.

On a 64-bit operating system, the following link must exist in the home directory of the DB2 instance owner:

```
/home/<db2 instance name>/sqllib/lib64/libdb2tsa.so
```

If this link does not exist, use the following command to create the link:

```
ln -s /home/<db2 instance name>/sqllib/lib64/libdb2tsa.so.1
  /home/<db2 instance name>/sqllib/lib64/libdb2tsa.so
```

Installing the JDBC driver for setting up a remote DB2 database

Depending on which operating system the remote DB2 is installed on, you need the following files:

- DB2 for Linux, or AIX:
  - `db2jcc.jar`
  - `db2jcc_license_cu.jar`: License file for DB2 for Linux, or AIX

You can find these files in the `<DB2_install_home>/sqllib/java` directory.

- DB2 for z/OS
  - `db2jcc.jar`
  - `db2jcc_license_cisuz.jar`: License file for DB2 for z/OS

  You can find these files in the subdirectory `classes` or `jcc/classes` of the DB2 JDBC installation directory in the HFS.

  Note: The **IBM DB2 driver for JDBC and SQLJ** needs to be installed separately, after you have installed DB2 for z/OS.

You have the following options to install the JDBC driver:

- Create a new folder. Copy the files listed above into this folder. Point the installer to the directory as described in "Starting the SMU Automation installer" on page 38.
- Use the WebSphere JDBC driver: Copy the appropriate `.jar` files into the directory `<was_home>/universalDriver/lib`, if not already available. Point the installer to the directory as described in "Starting the SMU Automation installer" on page 38.
- Use the DB2 runtime client JDBC driver: Point the installer to the directory with the appropriate `.jar` files as described in "Starting the SMU Automation installer" on page 38.

Creating the automation database and the database tables for setting up a remote DB2 database

The following tasks must be completed on the DB2 server system:

- Create the automation database.
- Create the automation tables in the database.

  Note: If the database has already been created and tables already exist, you must drop the existing tables before creating the tables.
- To use a remote database setup, install a JDBC driver.

AIX® or Linux: Creating the automation database and the database tables:

You need to create the automation database, and also create the automation tables in the database on DB2® server system. If your DB2® server runs on Linux or AIX, perform the following steps.

Procedure

1. Log into the system as root.
2. Copy the shell scripts located in the IBM® Service Management Unite`<EEZ_INSTALL_ROOT>/DDL/Script` directory to your host DB2 system.
3. Run the following shell scripts:

   `db2_create_automgr_db.sh <db_name> <instance_owner> <instance_pwd> <script_directory>`

   `db2_create_reporting_tables.sh <db_name> <instance_owner> <instance_pwd> <script_directory>`

   where

   - `<db_name>` is the desired name of the automation manager database.

     Example: `EAUTODB`
   - `<instance_owner>` is the instance owner user ID of the DB2 instance.

Example: db2inst1

- `<instance_pwd>` is the password of the instance owner user ID.
- `<script_directory>` is the directory where you copied the DB2 scripts for System Automation to in step 2 (`/DDL/Script`).

4. Issue the following commands to verify that the remote database is created correctly:
   a. Log on as DB2 instance owner.
   b. `db2 connect to <db_name>`
   c. `db2 list tables for schema eautousr`
   d. `db2 disconnect <db_name>`

   The output of the `list tables` command displays the following table names:

   ```
   EEZAUTOMATIONACCESS
   EEZAUTOMATIONRELATION
   EEZCOMMONEVENTS
   EEZDOMAINSUBSCRIPTION
   EEZNODE
   EEZOPERATORDOMAINFILTER
   EEZOPERATORDOMAINPREFERENCES
   EEZOPERATORHIDDENDOMAIN
   EEZPERSISTENTREQUEST
   EEZRESOURCESUBSCRIPTION
   EEZSAFOSEVENTS
   ```

z/OS: Creating the automation database and the database tables:

If you have a DB2 server system that runs on z/OS, adjust and run the following jobs.

Procedure

1. Adjust and run the following jobs. They are provided in the extracted directory `DDL/DB2` of your Service Management Unite Automation installation.

   ATVED100
   This job creates a DB2 table space, tables, and index entries.

   ATVED10C
   This job deletes the objects created by job ATVED100.

   Follow the instructions within the jobs to adjust them to your environment.

   Note:
   a. Make sure that DB2 is active before submitting the jobs.
   b. Before rerunning job ATVED100, run job ATVED10C to cleanup the table space and tables defined by the previous run.
   c. The user ID under which these jobs are submitted must have DB2 SYSADM (system administrator) authority.
2. Issue the following commands to verify that the remote database is created correctly:
   a. Ensure that DB2 is running.
   b. Invoke the DB2 Administration Tool from TSO.
   c. Select the DB2 that is hosting the Service Management Unite Automation tables.
   d. Invoke the DB2 System Catalog function (option **1**).
   e. Navigate to Databases (option **D**).

f. Select EAUTODB (or whatever name you have chosen) and specify option **T**.

The tables listed are displayed.

Installing SMU Automation

The following instructions describe how to install Service Management Unite Automation using InstallAnywhere.

Default directories

During the installation, default directories are used to install Service Management Unite Automation. Default directories are defined in variables. Verify and confirm all used variables and any related default directory.

The following table lists the default directory paths for which variables are used in this documentation. The paths in your environment may differ, for example, if you changed the default path during the installation of the application or component.

Table 6. Default directories

Variable used in this guide	Default path
`<EEZ_CONFIG_ROOT>`	`/etc/opt/IBM/smsz/ing/cfg`
`<EEZ_INSTALL_ROOT>`	`/opt/IBM/smsz/ing` The configuration properties files are located in the directory `<EEZ_CONFIG_ROOT>`.
`<Tivoli_Common_Directory>`	`/var/ibm/tivoli/common` The path to the Tivoli Common Directory is specified in the properties file `log.properties`. The file `log.properties` is located in the following directory `/etc/ibm/tivoli/common/cfg`.
`<was_root>`	`/opt/IBM/WebSphere/AppServer`
`JazzSM_root`	`/opt/IBM/JazzSM`

Non-root installation

To install Service Management Unite Automation using a non-root user, ensure that you've installed Jazz for Service Management and WebSphere Application Server using the same non-root user ID that Service Management Unite Automation uses. For more information, refer to “Installing Jazz for Service Management and WebSphere Application Server as non-root” on page 32.

Before you begin

If you plan to install IBM Service Management Unite Automation and want to use the Universal Automation Adapter, you need to make the following preparations:

- Make the Tivoli Common Directory (TCD) available for your non-root user.

  The TCD is a common location in which problem determination information for IBM products is saved. In Service Management Unite, the TCD is used by the Universal Automation Adapter as location for trace and log files. You need to ensure that your non-root user has write access to the following directories:

  – TCD Config Directory

    - The properties file for the TCD is stored in `/etc/ibm/tivoli/common/cfg`. Create this directory if it does not exist yet:

      `mkdir /etc/ibm/tivoli/common/cfg`.

    - Allow full access to this directory for all users:

```
chmod 777 /etc/ibm/tivoli/common/cfg
```

– Tivoli Common Directory

  If the TCD does not exist yet, you are prompted for the location of the Tivoli Common Directory during the installation of IBM Service Management Unite Automation. As preparation, create a TCD to which your non-root user has write-access. By default, the directory is: /var/ibm/tivoli/common.

  - Create the directory:

    ```
    mkdir /var/ibm/tivoli/common
    ```

  - Allow full access to this directory for all users:

    ```
    chmod 777 /var/ibm/tivoli/common
    ```

Procedure

1. Log in to the system where you want to install Service Management Unite using the non-root user ID that you also used for installing the WebSphere Application Server runtime environment.
2. Start the Service Management Unite Automation installer from the command line instead of using the common launchpad. For more information, see Starting the installers. On the command line, specify the **vconfig** parameter as follows:
   - Change to the directory that contains the installation program, for example,

     ```
     SMUAUTO1140X/x86_64/ or SMUAUTO1140Z/s390/
     ```

   - Start the installation by launching the installation wizard using:

     ```
     ./setup.bin -Dvconfig=true
     ```

   Note: The **vconfig** parameter is used to create the cfg directory below the installation root directory, for which the user has write-access, instead of using the default directory /etc/opt/IBM, for which your non-root user does not have write-access by default.
3. Choose an installation directory for which your non-root user has write-access during the installation, for example, a directory below the user's home directory: /home/<user>/IBM/smsz/ing.

   Note: If you install Service Management Unite Automation as non-root user, the shortcut to the command cfgsmu is not created. To open cfgsmu you either have to run it using a fully qualified path name (for example, /home/<user>/IBM/smsz/ing/bin/cfgsmu.sh) or create a shortcut for your non-root user manually.

Root installation

You can run a wizard-based graphical installation to install Service Management Unite Automation as root.

The installation comprises these phases:

1. In the preinstallation phase, you need to specify the installation parameters.
2. The installation phase begins when you click the **Install** button on the last preinstallation window. In this phase, all files are installed to the disk. The installation step can be canceled at any time. It can also be resumed by simply starting the installer again.
3. The configuration phase, in which the necessary WebSphere Application Server and database configuration is performed. The configuration step can be canceled at any time.

Starting the SMU Automation installer:

To install Service Management Unite Automation on Linux for System z or Linux for System x, firstly you need to start the installers – InstallAnywhere.

Before you begin

You must ensure that an X Window session is available for displaying the graphical installation panels.

Procedure

1. Extract the contents of the `SMUv1.1.4.0-zWebUI-xLinux.tar` file or the `SMUv1.1.4.0-zWebUI-zLinux.tar` file as appropriate into a temporary directory.
2. Either use the common launchpad to launch the Service Management Unite Automation installer or manually start the installer from the command line:
   a. Start the installer through the common launchpad:
      1) Run the launchpad.sh script. This opens a common launchpad from which the IBM Service Management Unite installers can be launched.
      2) From the main launchpad, select **Installing > Service Management Unite Automation wizard** to display a document in the launchpad that contains a link for Service Management Unite Automation. Select this link to start the installer. The installer displays a graphical interface to perform installation and configuration tasks.

   b. Start the installer from the command line:
      1) Change to the directory that contains the installation program: E.g.: `SMUAUTO1140X/x86_64/ or SMUAUTO1140Z/s390/`
      2) Start the installation by launching the installation wizard using `setup.bin`

Installing SMU Automation via installer:

Complete the following steps to install Service Management Unite Automation. During installation, enter the data you collected. Make sure that you specify all required parameters and that your entries are correct.

Procedure

1. Start the installer either from the command line or the launchpad. To see how to start the installer, refer to “Starting the SMU Automation installer.”
2. The installation wizard is opened and the "Introduction" window is displayed. On this window, you can see the available installation options: perform an initial installation, resume a canceled or failed installation, or perform an update installation. Read the information on this window and click **Next** to proceed.
3. The Software License Agreement window is displayed. Carefully read the terms of the license agreement.

   To accept the terms of the license agreement, select **I accept the terms** and click **Next**.
4. On the Installation Directory window, specify the directory where you want to install Service Management Unite Automation or accept the default location. Click **Next**.
5. If the installation program detects a Tivoli Common Directory on your system, for example, because a Tivoli product is already installed, the directory must

also be used for Service Management Unite Automation. In this case, the Tivoli Common Directory window is not displayed.

If the installation program does not detect a Tivoli Common Directory on your system, accept the default location or specify the directory to which the Tivoli log files are to be written. Click **Next**.

6. On the Database Server window, select the database environment type you are using and click **Next**.

   Which window is displayed next, depends on the type of database environment you selected:

   - **Embedded Derby database ("local"):** Proceed with step 7.
   - **IBM DB2 LUW on different system ("remote"):** Proceed with step 8.
   - **IBM DB2 for z/OS on different system ("remote z/OS"):** Proceed with step 9.

7. The **Derby on local system** window is displayed only if you using an embedded Derby database. Specify the database name or accept the default name and click **Next.** Note that any existing database with the name you specify is dropped automatically without warning. Click **Next** and proceed with step 10 on page 40.

8. The **IBM DB2 Database on remote system** window is displayed only if you are using a remote DB2 setup.

   a. Specify the database name (see “Creating the automation database and the database tables for setting up a remote DB2 database” on page 34) and click **Next**.

   b. Specify the path to the DB2 JDBC driver or click **Choose** to select the directory (see “Installing the JDBC driver for setting up a remote DB2 database” on page 33 and “Creating the automation database and the database tables for setting up a remote DB2 database” on page 34), and specify the name and password of the database instance owner. Click **Next.**

      Note: InstallAnywhere checks the contents of the defined directory and displays an error message if it does not contain a JDBC driver with a valid license.

   c. In the field **DB2 server host name**, type the fully qualified host name of the system where the DB2 server is installed.

      In the field **DB2 server port**, the port number of the DB2 server must be specified. Enter port number of your DB2 on z/OS database.

      To skip the access test, select the **Skip DB2 access** check box. Click **Next**.

9. The **IBM DB2 Database on remote system on z/OS** window is displayed only if you are using a remote DB2 on z/OS setup.

   a. Enter the location information of the database that runs on z/OS and the schema name of the database. Click **Next**.

   b. Specify the path to the DB2 JDBC driver or click **Choose** to select the directory, and specify the name and password of the database instance owner. Click **Next**.

   c. In the **DB2 server host name** field, type the fully qualified host name of the system where the DB2 server is installed.

      In the **DB2 server port** field, specify the port number of the DB2 server. Enter port number **446**.

10. On the User and Group Administration window, specify whether your WebSphere has administrative access to users and groups.
    - Click **Yes** if you use the default file-based user repository for managing WebSphere® Application Server users. The installer creates users and groups in the WebSphere Application Server's configured user repository.
    - Click **No** if you use a central LDAP user repository, and the users and groups exist in this repository. The installer does not make any changes to users and groups. For further information, refer to "Configuring an LDAP user registry (optional)" on page 91.

    Note: For a high available environment, click **Yes** to create users and groups when you install the first Service Management Unite server, and click **No** for the rest of the SMU servers.
11. The installation directory of WebSphere Application Server is detected on your system and displayed on the WebSphere Application Server window.
    a. Click **Next.**
    b. Specify a WebSphere Application Server administrative account and password and click **Next**.
12. On the **System Automation Functional user ID** window, specify password for the functional user ID `eezdmn` and password for the automation framework. Do not use cut and paste to enter the password and the password confirmation. Type in the password and the password confirmation directly. This functional user ID is needed for several purposes:
    - The operations console uses the credentials to populate the internal resource cache.
    - The automation framework uses the credentials to access JMS, as defined in the WebSphere Application Server JAAS authentication alias `EEZJMSAuthAlias`.
    - The automation framework uses the credentials for all asynchronous internal work that is associated with the `EEZAsync` role, as defined in the `EEZEAR` application's "User RunAs role" mapping.
13. On the **System Automation Administration user ID** window, specify the user ID and password of the System Automation administrator. It is recommended to use `eezadmin`. Click **Next**.

    Note: Do not choose the same name for both the System Automation Administration user ID and the WebSphere Application Server administrator user ID, as this may lead to problems if you uninstall Service Management Unite Automation. For example, do not specify `wasadmin` for both users.
14. When you have specified all the required information on the installation panels, the Pre-Install Summary window is displayed. The installer checks for disk availability. If the disk space requirements are not met, installation is not possible. Click **Install** to start the installation. The installation can take up to two hours to complete. While the component is being installed and configured, information panels display the progress.
15. When the installation of Service Management Unite Automation is complete, the Installation Complete window is displayed. Click **Done** to close InstallAnywhere. For information about verifying the installation, refer to Verifying the Installation.

Silent mode installation

You can also install Service Management Unite Automation in silent mode if you have the silent input properties.

Before you begin

The silent installation is run by using a previously created silent input properties file. You can generate the `install.properties` input file in two ways:

- Run a wizard-based graphical installation using `setup.bin` with the `-Dpreparesilent=true` option. When the installation procedure completes, the `install.properties` file is created in the <EEZ_INSTALL_ROOT>/install subdirectory of the product installation path. When an update installation is performed, the file is read to obtain the parameters and values needed for the update process. If this file is not found, the update installation fails.

  If you want to perform a silent installation of Service Management Unite Automation on more than one system, you can take the `install.properties` file which was generated during a graphical installation, and use it on other systems of the same type. You might need to replace system-specific parameters in the file to customize it for the target system.
- You can prepare an `install.properties` file without performing a complete installation on the target system. The first part of the installation procedure gathers all the necessary parameters needed to generate the `install.properties` file. You do this by starting the graphical installer on the target system with the options `-Dpreparesilent=true` and `-Dpropertiesfileonly=true`. With these options, the installation procedure stops before the product files are copied to the product directory. The `install.properties` file is created and stored in directory `/tmp`.

  If you want the file to be created in a specific path, you can optionally specify `-Dpropertiesfilepath=<fully_qualified_path>`. If the specified path is incorrect, the file is saved in the default temporary directory on the system.

For example, if you want the file to be saved to `/var/mydir`, use the following command:

```
setup.bin -Dpreparesilent=true -Dpropertiesfileonly=true
-Dpropertiesfilepath=/var/mydir
```

Note: The option `-Dpropertiesfilepath=<fully_qualified_path>` can be used only if `-Dpreparesilent=true` and `-Dpropertiesfileonly=true` are also specified. You can use the `install.properties` file for a silent installation only if the `-Dpreparesilent=true` option is specified.

Procedure

1. Copy the input properties file `install.properties` to the system on which you want to perform the silent installation.
2. Edit the `install.properties` file and make sure that it contains all your system-specific parameters, such as host names, directories, and so on. Password parameters in the `install.properties` file do not contain any values. You must add the passwords manually to the file, or else the installation fails.
3. To start the installation, enter the following command depending on the platform you use:

   ```
   setup.bin -f <fully_qualified_properties_file_name>
   ```

   If the input file `install.properties` is found, silent installation starts. If the file is not found, the wizard-driven installation starts.

Verifying the installation

This topic describes the tasks you should complete in order to verify that the automation manager and the operations console have been installed successfully.

Verifying the automation framework:

To verify that the automation framework is installed successfully on Linux, complete the following steps:

Procedure

1. In a web browser window, specify the following address to display the Login window of the WebSphere administrative console:

   ```
   https://<your_host_name>:<your_was_port>/ibm/console
   ```

   The default WebSphere administrative console port is 16316.
2. On the login window, enter the user ID and password of the WebSphere Application Server administrator user. The default user ID is `smadmin`. Click **Log in**.
3. Navigate to **Applications > Application Types > WebSphere enterprise applications**. The list of installed applications must contain the entry **EEZEAR**.

Verifying that the automation database accepts WebSphere Application Server requests:

Perform the following task to verify that the automation database accepts WebSphere Application Server requests:

Procedure

1. In a web browser window, specify the following address to display the Login window of the WebSphere administrative console:

   ```
   https://<your_host_name>:<your_was_port>/ibm/console
   ```

   The default WebSphere administrative console port is 16316.
2. On the login window, enter the user ID and password of the WebSphere Application Server administrator user. The default user ID is `smadmin`. Click **Log in**.
3. Navigate to **Resources > JDBC > Data sources > EAUTODBDS**. Click **Test connection** to verify that the automation database accepts WebSphere Application Server requests. If the test is successful, the following message displays:

   ```
   The test connection operation for data source EAUTODBDS on server server1 at node JazzSMNode01 was successful
   ```

Verifying the operations console:

Perform the following steps to verify that the operations console was installed successfully:

Procedure

1. In a web browser window, specify the following address to display the Login window of the Dashboard Application Services Hub:

   ```
   https://<your_host_name>:<your_dash_port>/ibm/console
   ```

   The default IBM Dashboard Application Services Hub port is 16311.

2. In the Login window, enter the System Automation administrator user ID. The default user ID is `eezadmin`. Click **Go**.
3. The Welcome Page showing the System Automation dashboards appears. Select one of the System Automation dashboards. The installation is successful if the selected dashboard opens.

Uninstalling SMU Automation

Use the uninstallation program to uninstall Service Management Unite Automation. A graphical uninstallation program is provided to remove the components that are installed.

Before you begin

- During uninstallation, a number of panels are displayed, prompting you to confirm that specific files are to be deleted. Check the files carefully before confirming the deletion.
- If you changed the user repository settings of WebSphere Application Server to an external user repository after the installation of Service Management Unite Automation component, the following change is required:

  Change the variable *EXTERNAL_USER_REP_ACTIVATE* in file `<EEZ_INSTALL_ROOT>/uninstall/installvariables.properties` to false:`EXTERNAL_USER_REP_ACTIVATE=false.`

  This prevents users and groups from being deleted in the WebSphere Application Server in a subsequent uninstallation process.

Procedure

1. Launch the uninstallation program by issueing the following command: `<EEZ_INSTALL_ROOT>/uninstall/uninstall`. This starts the uninstallation wizard.
2. Read the information on Introduction window and click **Next** to proceed.
3. Provide the requested information for the WebSphere administrative user ID and password.
4. The Start Uninstallation window is displayed. Click **Uninstall** to start the uninstallation. Some information panels are displayed while the uninstallation program checks your system for the information needed for the uninstall.
5. When the uninstallation is complete, a summary window is displayed. To exit the uninstallation program, click **Done**.

   Note: If problems were encountered during the unconfiguration step, an error window appears before the actual uninstallation step, in which the files are removed from the disk. In such a case, perform the following steps:

   a. On the error window, click **Save installation log files.**
   b. Click **Next** if you want to remove all installed files. Otherwise, click **Cancel** to perform corrective actions and then rerun the uninstallation.

Installing and uninstalling SMU Performance Management

This section introduces how to install and uninstall Service Management Unite Performance Management.

Installing Jazz for Service Management and WebSphere Application Server

Jazz for Service Management and WebSphere Application Server are software prerequisites that you need to install before you install Service Management Unite. You can either use root or non-root user authority to install the software prerequisites.

Note: If you have installed them on the server, you can skip this section.

Installing Jazz for Service Management and WebSphere Application Server

Follow the steps described in this topic to install Jazz for Service Management and WebSphere Application Server.

1. Create a common directory to store the extracted Jazz for Service Management installation media, referred to as the `JazzSM_Image_Home directory`.

   Restriction: Ensure that the path to the common root directory does not contain any spaces or special characters.

2. Extract the contents of the following deliverable into this directory:

   Jazz for Service Management Version 1.1.2.1 or Version 1.1.3:

   - Linux: Jazz for Service Management 1.1.2.1 or 1.1.3.0 for Linux (Launchpad, PRS, Jazz Repository, TDI) `IBM-jazzsm-launchpad-113-linux64.zip`
   - Linux on System z: Jazz for Service Management 1.1.2.1 or 1.1.3.0 for Linux on System z (Launchpad, PRS, Jazz Repository, TDI) `IBM-jazzsm-launchpad-113-linuxZSeries64.zip`

   WebSphere Application Server Version 8.5.5.x:

   - Linux: IBM WebSphere Application Server V8.5.5.x for Linux `IBM-was-8.5.5.x-linux64.zip`
   - Linux on System z: IBM WebSphere Application Server V8.5.5.x for Linux on System z `IBM-was-8.5.5.x-linuxZSeries64.zip`

3. Install JazzSM Services by using Installation Manager:

   a. Browse to the `JazzSM_Image_Home/im.platform_name/` directory and run the installation command, for example:

   ```
   ./install
   ```

   If the installation does not start due to missing prerequisites, check whether all required libraries are installed. For more information about Jazz for Service Management prerequisites, see Jazz for Service Management Detailed System Requirements (http://www-01.ibm.com/support/docview.wss?uid=swg27038732).

   b. The Installation Manager window opens. Select the following packages to be installed:

      1) IBM Installation Manager Version 1.8.2 or later
      2) IBM WebSphere Application Server Version 8.5.5.4 or later
      3) IBM WebSphere SDK Java Technology Edition Version 7.0, or later
      4) Jazz for Service Management extension for IBM WebSphere 8.5 Version 1.1.2.1
      5) IBM Dashboard Application Services Hub Version 3.1.2.1 or 3.1.3.0

   c. Click **Next**. The Installation Manager > Licenses window opens. Review and accept the License Agreements.

d. Click **Next** and specify the directories that are used by the Installation Manager.

e. Click **Next** and specify the installation directories for WebSphere Application Server and Jazz for Service Management.

f. Click **Next**. The **Installation Manager > Features – languages** window opens.

g. Accept the default translated languages that are selected in the **Translations Supported by All Packages** window. Click **Next**. The **Installation Manager > Features** window opens.

h. Click **Next** and specify the configuration for your WebSphere Application Server installation. Define the WebSphere administrative user ID. Click **Validate**.

i. Click **Next**. The **Installation Manager > Summary window** opens.

j. Review the software packages to be installed and their installation directories. Click **Install** to start the installation.

k. When the installation completed, a success window is displayed. You can now click **Finish** to close the Installation Manager.

4. Important: Activate Java 7 for the WebSphere Application Server profile:

```
was_root/bin/managesdk.sh -enableProfile -sdkName 1.7_64 -profileName JazzSMProfile -enableServers
```

JazzSMProfile is the profile name that is used for Jazz for Service Management. Default name: JazzSMProfile.

Note: More information about configuring Java 7 is provided at the following links:

- Find out how to install and configure Java 7 at the IBM Education Assistant -WebSphere software.
- Check the Java SDK Upgrade Policy for the IBM WebSphere Application Server before you apply the fixes to WebSphere Application Server, to ensure that the fix matches to the installed Java version.
- The page Verify Java SDK version shipped with IBM WebSphere Application Server fix packs describes which version of WebSphere Application Server corresponds to which Java SDK level.

You are now ready to install Service Management Unite using the launchpad.

Installing Jazz for Service Management and WebSphere Application Server as non-root

By default, the IBM WebSphere Application Server that hosts IBM Service Management Unite runs as root. However, it can also be installed and run by using a non-root user ID. In that case, Service Management Unite as well as the prerequisite WebSphere Application Server and Dashboard Application Services Hub must be all installed using the same non-root user ID.

About this task

The root or non-root installer who owns the currently installed files is the only user who can perform subsequent installation or removal operations on that installation.

To install Jazz for Service Management using a non-root user, complete the steps as follows:

Procedure

1. Log in to the system where you want to install Service Management Unite using the non-root user ID that should be the owner of this WebSphere Application Server runtime environment.
2. Follow the instructions that are described in Installing Jazz for Service Management and WebSphere Application Server, but instead of running the command `install` in step 3, use the command `userinst` to start IBM Installation Manager in "user mode".
3. In the Installation Manager, choose installation directories that are located below your user's home directory, for example, accept the default directories such as `/home/<user>/IBM/WebSphere/AppServer`.

Installing Tivoli Directory Integrator server

Service Management Unite uses Tivoli Directory Integrator to integrate and incorporate data into DASH widgets.

Before you install Service Management Unite Performance Management, make sure that you have installed the Tivoli Directory Integrator server. For detailed information about how to install Tivoli Directory Integrator, refer to Installation instructions for IBM Tivoli Directory Integrator.

Note: You can only install one Tivoli Directory Integrator server on the server where Service Management Unite is installed.

Installing SMU Performance Management

The following instructions describe how to install Service Management Unite Performance Management using IBM Installation Manager.

The installation process uses WebSphere Application Server and Tivoli Directory Integrator command line utilities, which require the appropriate servers to be active for the files to be installed. The installation process will start these servers if they are inactive. The installer pages provide input fields that are needed for configuration and successful execution of the command line utilities. The following pages are pre-filled with default or discovered values:

- Tivoli Directory Integrator and Jazz for Service Management installation directories
- WebSphere Application Server server name, administrator ID, and administrator password
- Tivoli Directory Integrator solutions directory
- Parameters needed to run the Tivoli Directory Integrator command utility. These parameters are an SSL key database file location, a truststore file location, and the password for the key database file. The parameters are set to the default values included with Tivoli Directory Integrator. If your installation modified Tivoli Directory Integrator security, you might need to update these parameters.
- IBM Tivoli Monitoring, IBM Operations Analytics - Log Analysis, and System Automation properties that are used by the Tivoli Directory Integrator configuration.
- Parameters are needed for WebSphere Application Server and Tivoli Directory Integrator to exchange digital certificates. These include WebSphere Application Server certificate key store properties, Jazz for Service Management profile values and Tivoli Directory Integrator trust store values. If Tivoli Directory Integrator and WebSphere Application Server are on different systems, and the

installation is running on the WebSphere Application Server system, the location of the Tivoli Directory Integrator system, and a user ID and password valid on that system must also be supplied.

Non-root installation

To install Service Management Unite Performance Management using a non-root user, ensure that you've installed Jazz for Service Management and WebSphere Application Server using the same non-root user ID. For more information, refer to "Installing Jazz for Service Management and WebSphere Application Server as non-root" on page 32.

Procedure

1. Log in to the system where you want to install Service Management Unite Performance Management using the non-root user ID that you also used for installing the WebSphere Application Server runtime environment.
2. Extract the contents of the `SMUv1.1.4.0-zWebUI-xLinux.tar` file or the `SMUv1.1.4.0-zWebUI-zLinux.tar` file into a temporary directory.
3. Browse to the location that contains the installation program, for example, `SMUPRF1140X/im64_linux/` or `SMUPRF1140Z/im64_zlinux/` (select the installation location according to your platform).
4. Run the command to start the installation:
   ```
   ./userinst
   ```
5. Choose an installation directory for which your non-root user has write-access during the installation, for example, a directory below the user's home directory: `/home/<user>/IBM/smsz/perf`.
6. Follow the instructions that are described in "Installing SMU Performance Management via installer" on page 48 to complete the installation.

Root installation

You can install Service Management Unite Performance Management as root.

Starting the SMU Performance Management installer:

You can use the launchpad and IBM Installation Manager to install Service Management Unite Performance Management on Linux for System z or Linux for System x.

Before you begin

You must ensure that an X Window session is available for displaying the graphical installation panes.

Note: If the Tivoli Directory Integrator server and WebSphere Application Server are installed on different systems, ensure that you meet the following requirements:

- The Service Management Unite Performance Management installation package is available on both systems.
- The Tivoli Directory Integrator system should be active and accessible from the WebSphere Application Server system.

Procedure

1. Extract the contents of the `SMUv1.1.4.0-zWebUI-xLinux.tar` file or the `SMUv1.1.4.0-zWebUI-zLinux.tar` file into a temporary directory.

2. Either use the common launchpad to launch the Service Management Unite Performance Management installer or manually start the installer from the command line:
   a. Start the installer through the common launchpad:
      1) Run the `launchpad.sh` script. This script opens a common launchpad from which the IBM Service Management Unite installer can be started.
      2) From the main launchpad, select **Installing > Service Management Unite Performance Management wizard** to display a document in the launchpad that contains a link for Service Management Unite Performance Management.
      3) Select the **IBM Service Management Unite Performance Management** link to start the installer. The installer displays a graphical interface to perform installation and configuration tasks.
   b. Start the installer from the command line:
      1) Browse to the location that contains the installation program, for example, `SMUPRF1140X/im64_linux/` or `SMUPRF1140Z/im64_zlinux/` (select the installation location according to your platform).
      2) Run the command to start the installation, for example,
         ```
         ./install
         ```
      3) Select **File** —>**Preferences** and click on **Add repository** after the IBM Installation Manager restarts after installation.
      4) Browse to the location that you extracted the Service Management Unite tar file and navigate to the `SMUPRF1140X` directory. Select the **`diskTag.inf`** file within that directory, and then click OK to add the repository. Click OK to exit the **Preferences** menu.
      5) Click on the **Install** in IBM Installation Manager to install Service Management Unite.

Installing SMU Performance Management via installer:

Complete the following steps to install Service Management Unite Performance Management.

Procedure

1. Start the installer either from the command line or the launchpad. To see how to start the installer, refer to "Starting the SMU Performance Management installer" on page 47.
2. On the IBM Installation Manager Start page, click **Install** to start your installation.
3. On the Install Packages page, select **IBM Service Management Unite Performance Management version 1.1.4**. Click **Next** to continue.
4. IBM Installation Manager checks for the prerequisite packages on your computer. If your computer does not meet the prerequisites check, the **Validation Results** page shows the missing prerequisites. If all prerequisites are met, you are presented with the license agreement page.
5. On the Licenses page, select **I accept the terms in the license agreement** and click **Next**.
6. The shared resources directory location is displayed. Use the default path or you can optionally specify a path in the **Shared Resources Directory** field. The shared resources directory is the directory where installation artifacts are

stored so they can be used by one or more product package groups. You can specify the shared resources directory only the first time you install a package. Click **Next**.

7. The package group name and the default installation location are shown. The **Create a new package group** option is selected by default and only this option is supported for the installation of Service Management Unite Performance Management. A package group represents a directory in which packages share resources with other packages in the same group. A package group is assigned a name automatically. Click **Next**.
8. On the Install Packages page, select **IBM Service Management Unite Performance Management 1.1.4**. If WebSphere (which supports DASH) and Tivoli Directory Integrator are on different systems, you can select only one of the extensions to install at a time. Click **Next**.
9. On the Features tab, under the DASH Extensions Configuration window, verify the **DASH directory location** and the **WebSphere user id**, **password**, and **Jazz Application server**. Click **Next**.
10. In the TDI Extensions Configuration window, verify the **TDI Install Directory** location, **TDI Solutions Directory** location, and **TDI command parameter** fields. Click **Next**. If Tivoli Directory Integrator is already being used to support a non-Service Management Unite Dashboard Application Services Hub configuration, specify this existing solutions directory. Only one solutions directory should be used for a Tivoli Directory Integrator-Dashboard Application Services Hub connection.
11. In the TDI Solution Properties window, verify the **Solution Properties** fields. Click **Next**. The **Solution Properties** fields can be updated after installation. For details on the properties, see "Configuring properties files" on page 88. Password fields do not have a default; if you are unsure of the values, enter blank spaces, and update the properties after installation.
12. In the SSL certificate exchange window, verify the **Jazz profile node directory** location, **WebSphere keystore password** for the certificate key stores found in the directory, and **Local TDI Fields**. **Note:** The **WebSphere keystore password** field is initially set to the IBM-supplied default of "WebAS" included with WebSphere Application Server. The **Local TDI Fields** verifies the location, name, and password for a Tivoli Directory Integrator trust store file for Service Management Unite. If WebSphere and Tivoli Directory Integrator are on different systems, you must verify the location and a user ID and password for the Tivoli Directory Integrator system. Additionally, you must verify the Tivoli Directory Integrator installation and solution directory on that system.
13. Click **Next**. Preinstallation summary information is displayed, which includes the target installation location, list of packages, and repository information.
14. Verify the summary information, and click **Install**. The installation starts and a progress bar is displayed. A postinstallation summary page is displayed after installation.
15. Click the **View Log File** link to inspect the Installation Manager log. **Note:** Some warning messages regarding the failure of `tdisrvctl` commands might appear in the log. These messages can be disregarded.
16. Click **Finish**. Click **File > Exit** to exit Installation Manager.

What to do next

If WebSphere Application Server and Tivoli Directory Integrator are on different systems, check the installation manager log after WebSphere Application Server is installed and verify that no errors occur for the **configure_sl.sh** command. The script might have failed due to TCP/IP problems between the two systems. If the script did not run properly, contact IBM support for assistance in manually configuring the SSL connection.

Silent mode installation

You can install Service Management Unite Performance Management by running a silent installation. In silent mode, the installation program does not display a user interface, instead it reads settings from a response file, runs a prerequisites check, and installs the software if the check succeeds.

About this task

You can use a response file to run a silent installation, the installation program does not display any installation windows. The response file contains parameters and values that you specify to tell the Service Management Unite Performance Management installation program how to run the installation.

If you are familiar with IBM Installation Manager, you can record your own response files for silent installation. As a convenience, Service Management Unite provides three response file templates and a script to install or update to install the performance management component in silent mode:

silentInstall.xml
: Use this template when WebSphere and Tivoli Directory Integrator are on the same system.

silentInstall_tdi.xml
: Use this template when WebSphere and Tivoli Directory Integrator are on different systems. This template is used for the silent installation on the Tivoli Directory Integrator system.

silentInstall_DASH.xml
: Use this template when WebSphere and Tivoli Directory Integrator are on different systems. This template is used for the silent installation on the WebSphere system.

Procedure

1. Extract the contents of the SMUv1.1.4.0-zWebUI-xLinux.tar file or the SMUv1.1.4.0-zWebUI-zLinux.tar file into a temporary directory.
2. Browser to directory `SMUPRF1140X` or `SMUPRF1140Z`, where "X" is for Linux for System x and "Z" is for Linux on System z.
3. Browser to the directory `response_files`, and select the response file to edit based on your environment. If you need to edit the response file, create a backup copy.
4. Modify or add values for a number of properties, which are indicated by the "xxxxxxxx" string. In the response file, default values are provided for many properties, but you can edit **data key=** properties if you need to modify values for your environment. See the comments in the file for more details.

   Note: The repository location is the location of the performance management code. By default, this location is the SMUPRF* directory in the installation package. In the response file, replace `xxx` with the path to the work directory where the installation package is open and `yyyyy` with the rest of the SMUPRF* directory name. For example, `location=/temp/install/SMUPRF1140Z`.

5. Save your changes to the response file. The response file contains passwords. You need to secure the file after the passwords are entered into the file.
6. Install the components as applicable.
   - To install both the Tivoli Directory Integrator and Dashboard Application Services Hub components on one server, run the following command in the directory where you extract the installation package.

     ```
     ./silentInstall.sh
     ```

     When you start **silentInstall.sh**, the default is to run **silentInstall.xml**.
   - To install only the Tivoli Directory Integrator component, edit the **silentInstall_tdi.xml** and run the following command:

     ```
     ./silentInstall.sh TDI
     ```
   - To install only the Dashboard Application Services Hub component, edit the **silentInstall_DASH.xml** and run the following command:

     ```
     ./silentInstall.sh DASH
     ```
7. Refer to the `packageinstall.log` file that is created in the same directory as the **silentInstall.sh** if the prerequisite checker fails, or the installation fails. Fix the issues and rerun the **silentInstall.sh** script.

   Note: The installation process might create informational and warning messages that appear in the log and terminal session that can usually be ignored. For example, Installation Manager message CRMA1014W that indicates an existing shared resources directory cannot be changed. Installation Manager message CRIMA1263W warns against the use of symbolic links in installation directory path names.

Results

A successful installation is noted by a final message beginning with **Installed com.ibm.cmis.webui...**.

Uninstalling SMU Performance Management

This section introduces how to uninstall IBM Service Management Unite Performance Management.

Procedure

1. Browse to the directory where IBM Installation Manager locates. The typical directory is: `/opt/IBM/InstallationManager/eclipse`
2. Issue the following command to start the dialogue.

   ```
   ./IBMIM
   ```
3. In the IBM Installation Manager dialog, select **Uninstall** to start your uninstallation.
4. In the Uninstall Packages - select packages to uninstall panel, select **IBM Service Management Unite Performance**. Click **Next**.
5. In the Uninstall Packages - Common Configurations - Dash Extensions Configuration panel, verify the fields that are already filled it, enter the password for the **WebSphere user id**. Click **Next**.
6. In the Uninstall Packages - Common Configurations - TDI Extensions Configuration panel, all of the necessary fields should be filled. Click **Next**.

   Note: If the **TDI Keystore Password** has changed since installation, you need to update it.

7. In the Uninstall Packages - Review the summary information panel, verify the package to be uninstalled. Click **Uninstall**.
8. The uninstallation will take several minutes. When the Uninstall Packages - The following package was uninstalled panel is reached, click **Finish** to return to the main IBM Installation Manager dialog.
9. To exit IBM Installation Manager, click **File** > **Exit**.

Chapter 6. Upgrading

This information provides the following topics to help you upgrade Service Management Unite to a higher version.

Upgrading SMU Automation

IBM Service Management Unite recommends installing the latest version of Service Management Unite Automation as it becomes available. The InstallAnywhere installer that is used for Service Management Unite Automation is part of the Service Management Unite package. The installer detects if an initial installation or an update installation needs to be performed.

Procedure

1. Extract the content of the `SMUv1.1.4.0-zWebUI-xLinux.tar` file or the `SMUv1.1.4.0-zWebUI-zLinux.tar` file as appropriate into a temporary directory.
2. Change to the directory that contains the installation program:

   For Linux on System x: `SMUAUTO1140X/x86_64/`

   For Linux on System z: `SMUAUTO1140Z/s390/`
3. Start the installation by launching the installation wizard using `setup.bin`.
4. When the installation wizard is launched successfully, the Welcome panel appears. The installer detects that this is an update installation if a previous version of IBM Service Management Unite is found on the system.
5. Follow the instructions on the installation panels to install the update.

Upgrading SMU Performance Management

IBM Service Management Unite recommends installing the latest version of Service Management Unite Performance Management as it becomes available. You can use the Update Packages wizard in IBM Installation Manager to install updates.

About this task

This procedure describes an update to the default installation where both the DASH and Tivoli Directory Integrator components are installed. If you are updating an installation where only one component is installed, only the pages relevant to the selected feature are shown.

Procedure

1. Start IBM Installation Manager.
2. On the Start page of Installation Manager, click **Update**.
3. In the Update Packages page, select **IBM Service Management Unite Performance Management**.
4. Select desired version, for example, **V1.1.4** and click **Next**.
5. On the Licenses page, select **I accept the terms in the license agreement** and click **Next**.

6. On the Features tab, under the Common Configurations > DASH Extensions Configuration window, verify the DASH directory installation location, Jazz application server, and enter the **WebSphere user id**, **password**, and **server name**. Click **Next**.
7. In the TDI Extensions Configuration window, verify the **TDI Install Directory**, **TDI Solutions Directory**, and **TDI command parameter** fields. Click **Next**.
8. In the TDI Solution Properties window, verify the **Solution Properties** fields. Click **Next**.
9. In the SSL certificate exchange window, verify the **Jazz profile node directory** location, **WebSphere keystore password** for the root certificate key store found in the directory, and **Local TDI Fields**. Click **Next**.

   Note: The **WebSphere keystore password** field is initially set to the IBM-supplied default of "WebAS" included with WebSphere Application Server. The **Local TDI Fields** verifies the location, file name, and password for a Tivoli Directory Integrator trust store file for Service Management Unite. If WebSphere and Tivoli Directory Integrator are on different systems, you must verify the location, user ID, and password for the Tivoli Directory Integrator system. Additionally, you must verify the Tivoli Directory Integrator installation and solution directory on that system.
10. On the Summary page, review your choices before installing the updates. Click **Update** to install the updates.

    Note: WebSphere Application Server might present a prompt to verify the **WebSphere user id** and **password**. If this occurs, reenter the user ID and password.
11. Optional: When the update process completes, a message that confirms the success of the process is displayed near the top of the page. Click **View log file** to open the log file for the current session in a new window. You must close the Installation Log window to continue.
12. Click **Finish** to close Installation Manager.

Chapter 7. Configuring and administrating

This information provides the following topics to help you configure and administrate Service Management Unite after installation.

Configuring and administering SMU Automation

This section introduces how to configure and administer Service Management Unite Automation.

Configuring SMU Automation

After you installed IBM Service Management Unite and the components that you require, complete the configuration tasks to fully prepare your infrastructure environment.

This topic describes the following configuration scenarios:

- How to configure Universal Automation Adapters (see [Optional] Configuring access to Universal Automation Adapters).
- How to configure Service Management Unite Automation and specify credentials for connected automation domains (see "Configuring the SMU Automation host" on page 58).

Note: You must ensure that an X Window is available for displaying the graphical configuration panels. At a minimum, you must use the configuration dialog after an initial installation to define at least one functional user id and password to access a connected automation domain.

You can also configure the Service Management Unite Automation in silent mode by using an input properties file. If an X Window is not available, silent configuration is the only supported method on this system. For more information, see "Starting silent configuration" on page 75.

Introducing the cfgsmu configuration tool

The `cfgsmu` configuration tool is used to configure Service Management Unite Automation.

The `cfgsmu` configuration dialog

The initial window of the configuration dialog is called task launcher and provides all configuration tasks. The task launcher opens when you start the configuration dialog. There are two main sections in this panel:

- The **Service Management Unite host configuration** section includes the following functions:

  Configure

  Click **Configure** to open Service Management Unite Automation common settings dialog. You can specify configuration settings that are common for different components of Service Management Unite Automation. For more information, see "Configuring the SMU Automation host" on page 58.

  Refresh

  Click **Refresh** to update configuration settings of Service Management

Unite Automation. For more information, see Refreshing the Service Management Unite common configuration.

- The **Universal Automation Adapter configuration** includes the following function:

  Enable Universal Automation Adapter configuration
  Select this check box to enable the configuration of Universal Automation Adapter The configuration files of the Universal Automation Adapter are updated if they are affected by the changes that you apply to the Service Management Unite configuration. The configuration dialog remembers the enable or disable status of the Service Management Unite configuration across multiple invocations.

  Configure
  Click **Configure** to open the Universal Automation Adapter configuration dialog. For more information, see "Configuring the Universal Automation Adapter" on page 65.

More detailed information about all configuration tasks is available in the Service Management Unite online help. To start the online help, click **Help** in the configuration dialog.

The `cfgsmu` command

Format

cfgsmu [**-s**

[**-z**] [**-g**|**-gr**] [**-l** *silent path*]

-eu [**-g**|**-gr**] [**-l** *silent path*]

-ru -o *host* [**-g**|**-gr**] [**-l** *silent path*]

-ru -o *host* **-ra**

-ru -o *host* **-rr**

-ru -o *host* **-rd -u** *uid* **-p** *pwd*

]

Flags

`<no option>`
Invoke configuration dialog.

`-s` Perform silent configuration (all following options and parameters only for silent configuration).

`-z` Configure the Service Management Unite host settings (this is the default configuration task).

`-eu`
Configure the Universal Automation Adapter for non-clustered nodes.

Silent configuration properties file options (for 'Configure' function of all configuration tasks):

-g Generate silent configuration properties file from defined values.

-gr
Like -g, but replace existing file.

-l Silent input properties file location is different from default silent path.

silent_path
Location of silent input properties file; default is the directory where the target properties files are located.

Starting cfgsmu in the Docker container

Start the **cfgsmu** configuration tool to configure the SMU host, the Universal Automation Adapter, and the credentials for the functional user that are needed to access backend systems.

About this task

You can run **cfgsmu** in graphical mode or silent mode. For ease of use, the graphical mode is recommended.

Procedure

1. Log on to the system where Service Management Unite Automation is installed.
2. Start the configuration tool **cfgsmu** in graphical mode or silent mode:
   - To use **cfgsmu** in graphical mode, use a VNC client to access the docker host system, and then issue the following command:

     ```
     eezdocker.sh cfgsmu
     ```

     Note: If command '**eezdocker.sh cgfsmu**' doesn't work as expected, run the command '**xhost+local:all**' before you run '**eezdocker.sh cfgsmu**' to ensure that the Docker process can access the user's X session.
   - To use **cfgsmu** in silent mode, issue the following commands:
     a. Issue the command to access a shell to the running SMU Docker container:

        ```
        eezdocker.sh shell
        ```

        The commands in the following steps must be run in this opened SMU Docker container shell.
     b. Generate a silent configuration input properties file:

        ```
        cfgsmu -s -g
        ```
     c. Edit the input properties file. For example, you can specify values for **cred-generic-userid** and **cred-generic-password** to define credentials for the backend access to z/OS automation domains.
     d. Run the silent configuration according to the values from the input properties file:

        ```
        cfgsmu -s
        ```
     e. Issue the command to exit the SMU Docker container shell:

        ```
        exit
        ```
     f. Restart the WebSphere Application Server to activate the configuration changes by restarting the SMU Docker container:

        ```
        eezdocker.sh restart
        ```

Starting the SMU Automation configuration dialog

The `cfgsmu` command configures the settings of different Service Management Unite Automation components that run on the Service Management Unite Automation server and the Universal Automation Adapters.

Before you begin

The user ID that you use to start the dialog must meet the following requirements:

- The user ID must be in same group as the user ID you used for installing Service Management Unite Automation. The group permissions for the `cfgsmu` script must be set to **`EXECUTE`**.
- The user ID must have write access to the following directory: `<EEZ_CONFIG_ROOT>` .

About this task

The command offers a graphical user interface to specify parameters, which are stored in various property files that are required by the Service Management Unite Automation components. Most parameters that are configured with this command control the behavior of the Service Management Unite Automation components and do not need to be changed frequently.

In addition, the `cfgsmu` command is used to add or change user IDs and passwords that are used to communicate with other automation domains and remote nodes.

Procedure

1. Log on to the system where Service Management Unite Automation is installed.
2. Run the command to start the graphical configuration tool:

   ```
   cfgsmu
   ```

   The configuration dialog task launcher is displayed.

Configuring the SMU Automation host

The initial configuration of IBM Service Management Unite is processed during the installation of the product. To browse or change the properties, use the IBM Service Management Unite configuration dialog or silent configuration. Do not manually edit the configuration properties files in which the configuration parameters are stored.

The following topics describe the Service Management Unite configuration dialog. To open the configuration dialog, process the following steps:

1. Start the configuration dialog (see Starting the Service Management Unite Automation configuration dialog).
2. Click **Configure** on the **Service Management Unite** host button. The common configuration dialog opens.

Post-configuration tasks:

After the configuration properties are edited, the configuration settings can be dynamically activated by clicking the **Refresh** task on the main menu of the **Service Management Unite Configuration - task launcher**. See also “Refreshing the SMU common configuration” on page 60.

Operations Console Host tab:

Use the Operations Console Host tab to configure the IBM Service Management Unite server and the host where the IBM Service Management Unite host is running.

Controls and fields on the Operations Console Host tab:

Host name or IP address
Name or IP address of the system that hosts the operations console host.

Event port number
The port on which the EIF message converter listens for events from the first-level automation domains. This port number must match the port number for the operations console host in all adapter configurations. You can configure the event port number for the operations console host during the configuration of the automation adapters on first-level automation domains.

For the System Automation for z/OS adapter, the event port number is the event port that is specified in the adapter configuration parameter `eif-send-to-port` in the adapter plug-in properties file.

WAS bootstrap port number
The bootstrap port of the WebSphere Application Server instance that hosts the operations console host.

User Credentials tab:

Use the User Credentials tab to configure the user credentials of Service Management Unite Automation. The automation framework uses these credentials to authenticate itself. The characters that are used for all user IDs entered on this tab are limited to the following ASCII characters: A–Z, a-z, 0–9, and _ (underscore).

Controls and fields on the User Credentials tab:

Generic user ID
The user ID the automation framework uses to authenticate itself to a first-level automation domain when no credentials are specified for the domain in the **Credentials for accessing specific FLA domains** table.

Generic password
The password for the generic user ID. Click **Change** to change the password.

Credentials for accessing specific first-level automation domains
Click **Add** to specify a user ID that is valid for a specific domain. The user ID is not required to be `root`, but to be authorized to run operations on resources in the first-level automation domain that are supported by the automation framework. For example, bringing an automated resource online.

- Click **Remove** or **Change** to remove or modify the credentials for the selected domain.
- Click **Validate** to validate the user ID and password that you specified for the selected domain. The domain is contacted, and the validation is performed on the system where the automation adapter that manages the domain is running.

Security tab:

Use the Security tab to configure the properties for the Secure Sockets Layer (SSL) connection to the first-level automation domains.

Controls and fields on the Security tab:

Truststore
The fully qualified file name of the truststore file that is used for SSL. Click **Browse** to select a file.

For more information on how to generate Keystore and Truststore files, refer to "Creating keystores and truststores with SSL public and private keys" on page 61.

Keystore
The fully qualified file name of the keystore file that is used for SSL. Click **Browse** to select a file.

Keystore password
The password of the keystore file. The password is required if a keystore file was specified. Click **Change** to change the password.

Note: If the truststore is in a different file than the keystore, the passwords for the files must be identical.

Certificate alias
The alias name of the certificate to be used by the server. The characters that are used for the certificate alias are limited to the following ASCII characters: A – Z, a-z, 0–9, and _ (underscore).

Enforce use of SSL for all first-level automation domains
Select this check box if you want to enforce that all first-level automation domains are properly configured to use SSL at the transport layer. Then, all first-level automation domains can successfully connect to the automation framework. If not selected, first-level automation domains are configured to use SSL on an individual basis.

Saving the common configuration: To save your changes to the IBM Service Management Unite common configuration properties files, click **Save** on the configuration dialog. On completion, a configuration update status window is displayed, showing which configuration files are updated. If errors occurred during the update, the corresponding error messages are also displayed.

Refreshing the SMU common configuration:

Click **Refresh** on the Service Management Unite main menu of the configuration dialog task launcher to trigger configuration settings changes. The settings are reloaded by the automation framework. Use this task in the following cases:

- Click **Refresh** after you changed the credentials for accessing specific first-level automation domains on the **User Credentials** tab of the IBM Service Management Unite common configuration.
- To clear the list of first-level automation domains that cannot be accessed anymore due to unrecoverable access errors.

Securing the connection to automation adapters

Complete the steps to secure the connection between the Service Management Unite server and the automation adapters connected to it.

About this task

Follow this procedure to secure the connection between the SMU server and the automation adapters using SSL encryption and SSL certificate based authentication.

Creating keystores and truststores with SSL public and private keys:

Use the Java keytool to create keystores and truststores for automation adapters and Service Management Unite.

About this task

The process generates the following files:

Truststore
Contains the public keys for Service Management Unite and the automation adapters.

Service Management Unite keystore
Contains the private key for Service Management Unite.

Automation adapter keystore
Contains the private key for the automation adapter.

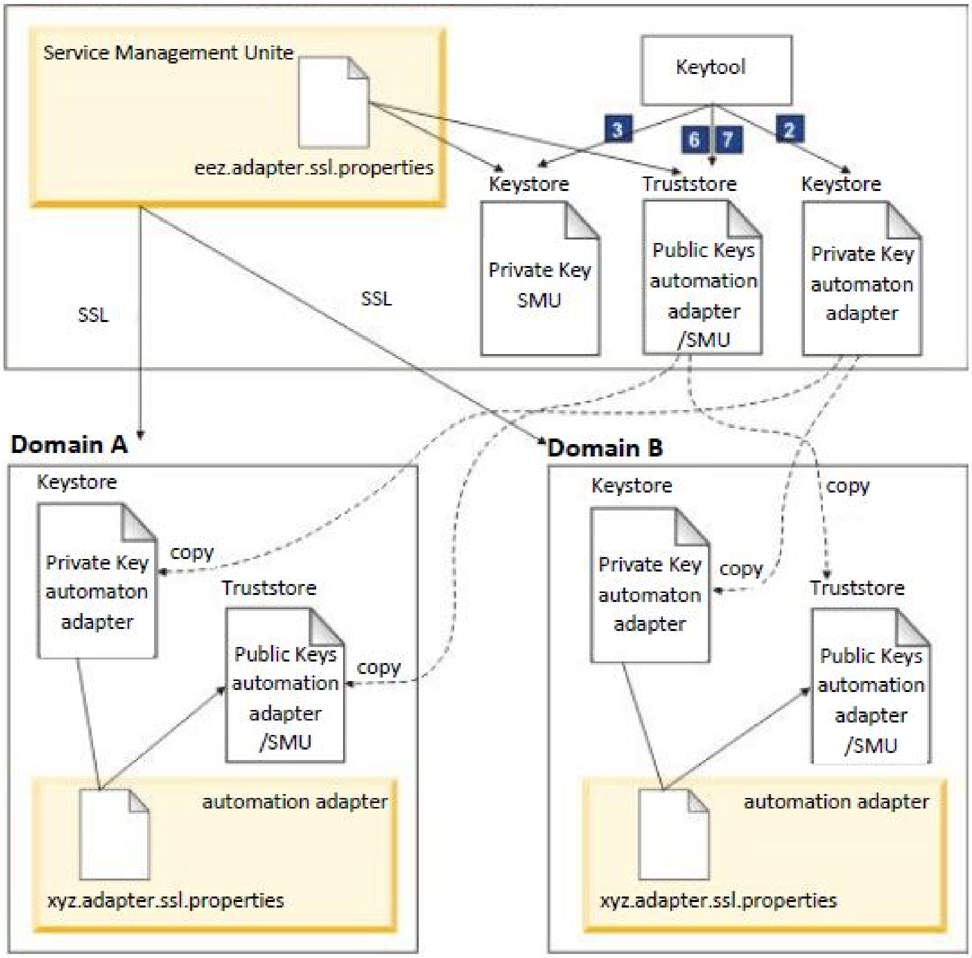


Figure 3. Keystore and truststore generation using SSL

Procedure

1. Set the following environment variables. They will be used as parameters to the keytool:

```
# java keytool from Service Management Unite installation directory
JAVA_KEYTOOL=/opt/IBM/smsz/ing/jre/bin/keytool
# SMU SSL config file directory
EEZ_CONFIG_DIR=/etc/opt/IBM/smsz/ing/cfg/ssl
# keys will expire in 25 years
KEY_VALIDITY_DAYS=9125
# passphrase at least 6 characters
PASSPHRASE=passphrase
```

2. Create a keystore with public and private keys for the automation adapter:

```
${JAVA_KEYTOOL} -genkey -keyalg RSA -validity ${KEY_VALIDITY_DAYS} \
-alias eezadapter -keypass ${PASSPHRASE} -storepass ${PASSPHRASE} \
-dname "cn=E2E Adapter, ou=System Automation, o=IBM, c=US" \
-keystore "${EEZ_CONFIG_DIR}/eez.ssl.adapter.keystore.jks"
```

3. Create a keystore with public and private keys for Service Management Unite:

```
${JAVA_KEYTOOL} -genkey -keyalg RSA -validity ${KEY_VALIDITY_DAYS} \
-alias eezsmu -keypass ${PASSPHRASE} -storepass ${PASSPHRASE} \
-dname "cn=SMU Server, ou=System Automation, o=IBM, c=US" \
-keystore "${EEZ_CONFIG_DIR}/eez.ssl.smu.keystore.jks"
```

4. Export the certificate file with the public key for the automation adapter:

```
${JAVA_KEYTOOL} -exportcert -alias eezadapter \
-file "${EEZ_CONFIG_DIR}/eezadapter.cer" -storepass ${PASSPHRASE} \
-keystore "${EEZ_CONFIG_DIR}/eez.ssl.adapter.keystore.jks"
```

5. Export the certificate file with the public key for Service Management Unite:

   ```
   ${JAVA_KEYTOOL} -exportcert -alias eezsmu \
   -file "${EEZ_CONFIG_DIR}/eezsmu.cer" -storepass ${PASSPHRASE} \
   -keystore "${EEZ_CONFIG_DIR}/eez.ssl.smu.keystore.jks"
   ```

6. Create the authorized keys truststore and import the certificate with the public key for the automation adapter:

   ```
   ${JAVA_KEYTOOL} -importcert -noprompt -alias eezadapter \
   -file "${EEZ_CONFIG_DIR}/eezadapter.cer" -storepass ${PASSPHRASE} \
   -keystore "${EEZ_CONFIG_DIR}/eez.ssl.authorizedkeys.truststore.jks"
   ```

7. Create the authorized keys truststore and import the certificate with the public key for Service Management Unite server:

   ```
   ${JAVA_KEYTOOL} -importcert -noprompt -alias eezsmu \
   -file "${EEZ_CONFIG_DIR}/eezsmu.cer" -storepass ${PASSPHRASE} \
   -keystore "${EEZ_CONFIG_DIR}/eez.ssl.authorizedkeys.truststore.jks"
   ```

8. Delete the certificate files that are no longer needed at run time for the automation adapter and Service Management Unite.

   ```
   rm ${EEZ_CONFIG_DIR}/eezadapter.cer
   rm ${EEZ_CONFIG_DIR}/eezsmu.cer
   ```

Enabling SSL security in the SMU Automation configuration:

Complete the steps to enable SSL security in SMU Automation.

Procedure

1. Start the SMU Automation configuration tool **cfgsmu**. For the detailed instructions, see “Starting the SMU Automation configuration dialog” on page 58
2. In the configuration dialogue, click **Configure** to open Service Management Unite Automation common settings dialogue.
3. In the **Security** tab, specify the values for the following parameters.

   Sample values are provided for your reference:

   - **Truststore**: /etc/opt/IBM/smsz/ing/cfg/ssl/eez.ssl.authorizedkeys.truststore.jks
   - **Keystore**: /etc/opt/IBM/smsz/ing/cfg/ssl/eez.ssl.smu.keystore.jks
   - **Keystore password**: passphrase
   - **Certificate alias**: eezsmu
4. Click **Save** to save the configuration changes.
5. Restart the WebSphere® Application Server. For detailed instructions, see Starting and stopping WebSphere Application Server.

Enabling SSL security in the automation adapter configurations:

Complete the steps to enable SSL security for automation adapter configurations.

Procedure

1. Copy the authorized keys truststore file to the nodes in the automation domain where the automation adapter runs:

   ```
   scp ${EEZ_CONFIG_DIR}/eez.ssl.authorizedkeys.truststore.jks \
   root@<adapter-nodename>:<E2E_CUSTOM_ROOT>/ssl/eez.ssl.authorizedkeys.truststore.jks
   ```

2. Copy the adapter keystore file to the nodes in the automation domain where the automation adapter runs:

```
scp ${EEZ_CONFIG_DIR}/eez.ssl.adapter.keystore.jks \
root@<adapter-nodename>:<E2E_CUSTOM_ROOT>/ssl/eez.ssl.adapter.keystore.jks
```

3. Update the adapter SSL configuration to match the copied file names, passphrase, and alias name. For System Automation for z/OS End-to-End adapter, update the configuration in the properties file: `ing.adapter.ssl.properties`.
4. Enable SSL communication for the adapter. For System Automation for z/OS End-to-End adapter, set the property `eez-remote-contact-over-ssl=true` in the properties file: `ing.adapter.properties`.

Optional: Enforcing usage of SSL for all automation domains:

To enforce usage of SSL for all automation domains, activate the corresponding setting in the configuration dialogue.

Before you begin

You must complete the SSL setup for all automation adapters before you start the following steps. If there are still automation adapters running without SSL setup, then these domains go offline and can not get reconnected after you activate the setting in the following steps.

Procedure

1. Start the SMU Automation configuration tool **`cfgsmu`**.
2. In the configuration dialogue, click **Configure** to open Service Management Unite Automation common settings dialog.
3. In the **Security** tab, select the check box **Enforce use of SSL for all first-level automation domains**, and click **Save** to save the changes.
4. In the configuration dialogue, click **Refresh** to activate the SSL configuration changes.

[Optional] Configuring access to the Universal Automation Adapter

Use the Universal Automation Adapter to access and integrate non-clustered nodes into an automation environment.

To configure the Universal Automation Adapter, run the `cfgsmu` command and start the configuration task that you want to perform from the task launcher window. For more information, see “Starting the SMU Automation configuration dialog” on page 58.

Configure the Universal Automation Adapter on the system where the Service Management Unite Automation operations console is installed. Enter the `cfgsmu` command to open the configuration utility.

Figure 4 on page 65 displays how configuration for the Universal Automation Adapter is maintained.

Post-configuration tasks:

After the configuration properties are edited, the configuration settings can be dynamically activated by clicking the **Refresh** task on the main menu of the Service Management Unite Configuration - task launcher. See also “Refreshing the

SMU common configuration" on page 60.

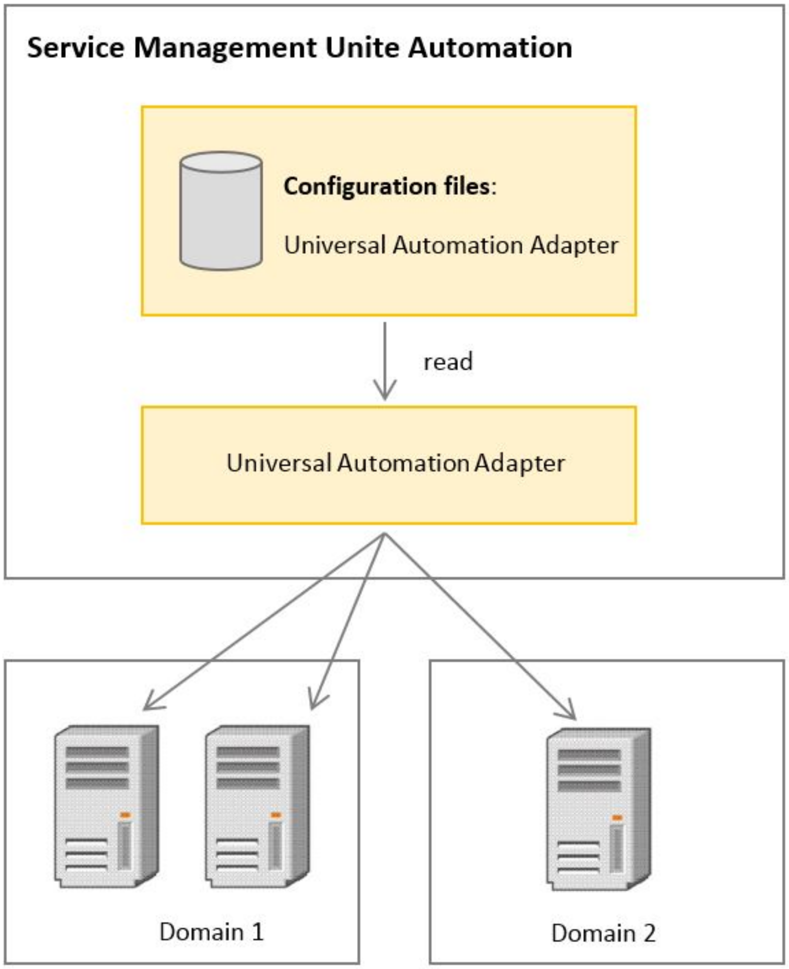

Service Management Unite Automation
Configuration files:
Universal Automation Adapter
read
Universal Automation Adapter
Domain 1
Domain 2

Figure 4. Maintaining configurations for multiple Universal Automation Adapters

Configuring the Universal Automation Adapter:

The Service Management Unite Automation Universal Automation Adapter configuration dialog helps you to configure the Universal Automation Adapter settings.

To open the configuration dialog, select the check box of **Enable Universal Automation Adapter configuration**, and then click **Configure** in the **Universal Automation Adapter** section of the task launcher window.

Adapter tab:

Use the **Adapter** tab to configure the parameters of the host system on which the adapter is running and the parameters that are required for the Universal Automation Adapter policy.

Specify values for the following parameters:

Request port number

The number of the port on which the Universal Automation Adapter listens for requests from the SA z/OS E2E agent or the operations console. The default port is 2005.

Policy pool location

The fully qualified path name of the directory that contains the Universal Automation Adapter policies. These policies define resources on non-clustered nodes that are managed by the Universal Automation Adapter. Click **Browse** to select the policy pool.

Automation domains managed by the Universal Automation Adapter

The list of automation domain names. Each domain represents a set of resources on unclustered nodes that are managed by the Universal Automation Adapter. A domain name must match the domain name value that is defined in the policy file. This policy file defines the corresponding set of resources.

Use **Add**, **Remove**, and **Rename** to main the entries in the domain list.

- **Add**

  Click **Add** to add a domain that is managed by the Universal Automation Adapter.
- **Remove**

  Select the domain from the list and click **Remove** to remove from the domain list.
- **Rename**

  Select the domain from the list and click **Rename** to change the name of the domain that is managed by the Universal Automation Adapter. Ensure that this domain name is unique in the set of all automation domains you work with. The maximum length of the domain name is 64 characters.

Note: You must recycle the Universal Automation Adapter if a domain is added or removed within the configuration tool.

Advanced

The advanced settings of the Universal Automation Adapter.

- **Adapter stop delay**

  The time that the stop of adapter is delayed. It allows the adapter to properly deliver the domain leave event. The default value is 5. The value ranges between 3 through 60 seconds.
- **Remote contact activity interval**

  The time after which the automation adapter stops if there is no communication with the SA z/OS E2E agent or the operations console. The default value is 360. The value changes between 0 through 360. If you specify '0', the adapter never stops. It continues to run and waits until it is contacted again by the SA z/OS E2E agent or the operations console.
- **Initial contact retry interval**

  The time within which the Universal Automation Adapter tries to contact the SA z/OS E2E agent host and the operations console host until it succeeds or the specified time elapses. The default value is 0, which means the adapter tries to contact the SA z/OS E2E agent host and the operations console host indefinitely. The value ranges between 0 through 1440.

- **Enable EIF event caching**

  If you select this check box, all events that can not be sent are cached.

  This can help to recover in cases where the connection to the SA z/OS E2E agent host or the operations console host is interrupted for a short period so that cached events can be sent when the connection is available again. If the cache limit is exceeded, cached events are discarded and the adapter sends a "domain offline" followed by a "domain online" event to the SA z/OS E2E agent host or the operations console host.

  If this check box is not selected, all events that can not be sent are discarded immediately.
- **EIF reconnect attempt interval**

  The time that the Universal Automation Adapter waits until it tries to reconnect if the connection to the SA z/OS E2E agent host or the operations console host is interrupted. The default value is 30.

Click **OK** to save the settings internally and the settings are stored in the corresponding configuration file if you click **Save** in the Universal Automation Adapter window.
Click **Defaults** to restore the settings to the default values.
Click **Cancel** to close the dialog without saving the settings.
Click **Help** to display the online help information.

SA z/OS E2E Agent tab:

Use the SA z/OS E2E Agent tab to configure the Universal Automation Adapter to manage first level domains for unclustered nodes.

Host name or IP address
: The name or the IP address of the host on which the SA z/OS E2E agent runs.

Event port number
: The number of the port on which the SA z/OS E2E agent listens for events from the automation adapter. This port has to match the corresponding event port number that you specify when configuring the SA z/OS E2E agent. The default port is 2003.

If you do not want the SA z/OS E2E agent to perform end-to-end automation for any domain that is managed by the Universal Automation Adapter, you can leave the host and port fields empty.

The Universal Automation Adapter also sends events to the Service Management Unite operations console. You have defined the corresponding host name or IP address and port number on the host tab of the Service Management Unite operations console configuration.

User Credentials tab:

Use the User Credentials tab to configure credentials of the Universal Automation Adapter. These credentials are used to access remote nodes that host remote resources that are managed by the Universal Automation Adapter.

The user ID that you specify for a resource in a Universal Automation Adapter policy is used to determine how authentication is performed on the remote node where that resource resides. The following is the priority sequence in which the Universal Automation Adapter determines how authentication on remote nodes is performed:

- The user ID that is specified for a resource in the universal automation adapter policy is defined in the specific non-clustered nodes credentials list on this tab: The universal automation adapter uses the password that is associated with this specific user ID.
- The user ID that is specified for a resource in the universal automation adapter policy is defined as generic user ID on this tab: The universal automation adapter uses the password that is associated with this generic user ID.
- User authentication is performed using SSH public and private keys for the user ID that is specified for a resource in the universal automation adapter policy. In this case, SSH key authentication must be enabled and configured on the Security tab.

Generic user ID

The generic user ID to access non-clustered nodes for which no specific credentials are defined and no SSH key authentication is used.

Generic password

The generic password to access non-clustered nodes.

Click **Change** to specify and confirm the generic password that is used by the Universal Automation Adapter. Note this will not change a password on any of the non-clustered nodes.

Generic credentials are optional. If you want to remove already configured generic credentials, leave the generic user ID field empty.

Credentials for accessing specific non-clustered nodes

Specific user credentials can be defined explicitly for each non-clustered node that is accessed by the universal automation adapter for which no SSH key authentication is used. The non-clustered nodes list shows the pairs of node name and user ID for which specific access credentials are currently defined. Use the Add, Remove, and Modify buttons to maintain the entries in the node list.

Add Click **Add** to define a new user ID and password to access remote nodes.

Remove

Select a user ID and click **Remove** to remove an entry from the list, s.

Modify

Select an entry from the list and click **Modify** to edit the node name, user ID, or password.

Node name

The name of the non-clustered node for that you want to change credentials.

User ID

The user ID that is used by the Universal Automation Adapter to access the selected node.

Password

The password that is used by the Universal Automation Adapter to access the selected node. Click **Change** to specify and confirm the password.

Note:

1. If an IPv6 host name is specified as node name, the DNS server must be configured to return IPv6 records only.
2. If the DNS server is configured to return IPv4 and IPv6 records, only the IPv4 address is used. To use IPv6, explicitly specify the IPv6 address as node name instead of the host name.

Use the tools that are provided by the operating system to resolve your IPv6 host name to the IPv6 address in that case. For example, on Linux use the host or nslookup commands:

```
host -a <ipv6_hostname>
```

Or to display DNS records:

```
nslookup <ipv6_hostname>
```

You can decide to use SSH public and private keys for user authentication between the Universal Automation Adapter and remote non-clustered nodes on the Security tab. In this case, do not define specific credentials for any pair of node name and user ID for which you want to use the SSH key authentication approach.

Security tab:

Use the **Security** tab to configure security settings for the communication between the Universal Automation Adapter and other systems.

Secure Sockets Layer (SSL) for transport

Configure SSL for data transport between the Universal Automation Adapter and the operations console.

Enable SSL for data transport between the automation host and the Universal Automation Adapter

Check to use SSL for data transport between the SA z/OS E2E agent or the operations console and the Universal Automation Adapter. If you select to enforce that all first-level automation adapters including Universal Automation Adapters must be properly configured to use SSL at the transport layer before they successfully connect to the operations console, you must enable SSL here.

Truststore

The name of the truststore file that is used for SSL.

Click **Browse** to select the truststore file.

For more information on how to generate Keystore and Truststore files, refer to “Creating keystores and truststores with SSL public and private keys” on page 61.

Keystore

The name of the keystore file that is used for SSL.

Click **Browse** to select a keystore file.

Keystore password

The password of the keystore file.

Click **Change** to change the password.

Note: Passwords must be identical if truststore and keystore are in two different files.

Certificate alias
The alias name of the certificate that is used by the Universal Automation Adapter.

User authentication

Enforce user authentication between the automation host and the Universal Automation Adapter
Check to enable the authentication of users on the system where the universal automation adapter is running when the universal automation adapter is contacted by the operations console. If not checked, user authentication is bypassed.

Communication between the Universal Automation Adapter and remote non-clustered nodes

The user ID that you specify for a resource in a Universal Automation Adapter policy is used to determine how authentication is performed on the remote node where that resource resides. The following is the priority sequence in which the Universal Automation Adapter determines how authentication on remote nodes is performed:

- The user ID that is specified for a resource in the Universal Automation Adapter policy is defined in the specific non-clustered nodes credentials list on the User Credentials tab: The Universal Automation Adapter uses the password that is associated with that specific user ID.
- The user ID that is specified for a resource in the Universal Automation Adapter policy is defined as generic user ID on the User Credentials tab: The Universal Automation Adapter uses the password that is associated with that generic user ID.
- User authentication is performed using SSH public and private keys for the user ID that is specified for a resource in the Universal Automation Adapter policy. In this case, SSH key authentication must be enabled and configured on this tab.

Enable user authentication with SSH public and private keys
Check to use SSH keys for authentication of users for which you define neither generic nor specific access credentials on the User Credentials tab.

SSH private key file
The fully qualified name of the private key file that is generated by the **ssh-keygen** utility. The default names of files that are generated by **ssh-keygen** are `id_dsa` or `id_rsa`. Ensure that the user ID under which the Universal Automation Adapter is running has read access for this file.

Click **Browse** to select a key file.

Private key passphrase
The passphrase that you use to generate the private key file using the **ssh-keygen** utility.

Click **Change** to specify and confirm the passphrase. The passphrase is optional, because you can omit it when you use the **ssh-keygen** utility. To remove a passphrase, leave the entry fields in the dialog empty and click **OK**.

Logger tab:

Use the **Logger** tab to specify settings for logging, tracing, and First Failure Data Capture (FFDC) for the Universal Automation Adapter.

Maximum log/trace file size
The maximum disk usage in KB that a log file can reach. If the limit is reached, another log file is created. The maximum number of log files is two, which means that the oldest file gets overwritten after both files are filled up. The default maximum file size is 1024 KB.

Message logging level

Error Only error messages are logged.

Warning
Only error and warning messages are logged.

Information
Error, warning, and information messages are logged. This is the default message logging level.

Trace logging level

Off Trace logging is disabled.

Minimum
Only a minimum of trace data is logged.

Medium
A medium amount of trace data is logged. This is the default trace logging level.

Maximum
The maximum amount of trace data is logged.

First failure data capture (FFDC) recording level
Select the FFDC recording level, depending on the severity of the incidents for which you want FFDC data to be collected.

Off FFDC recording is disabled.

Minimum
Only a minimum of FFDC data is recorded.

Medium
A medium amount of FFDC data is recorded. This is the default FFDC recording level.

Maximum
The maximum amount of FFDC data is recorded.

First failure data capture (FFDC) disk space

Maximum disk space
The maximum disk space in bytes that is used to store FFDC data. The default maximum disk space is 10485760 bytes (10 MB).

Space exceeded policy
The maximum disk space in bytes that is used to store FFDC data. The default maximum disk space is 10485760 bytes (10 MB).

Select the space exceeded policy

Ignore Issue a warning, but do not enforce the FFDC disk space limitation.

Auto-delete
Automatically delete FFDC files to enforce the FFDC disk space limitation. This is the default space exceeded policy.

Suspend
Halt further FFDC actions until disk space is freed manually.

First failure data capture (FFDC) message IDs

Filter mode

Passthru
All log events with messages that are specified in the message ID list will pass the filter and FFDC data is written. This is the default filter mode.

Block All log events with messages that are specified in the message ID list are blocked.

Message ID list

First failure data capture (FFDC) message ID list
The message IDs that control for which log events FFDC data is written, depending on the filter mode. The comparison of message IDs is case sensitive. Each message ID must occur in a new line. Note you may use "*" as a wildcard character for a generic specification of a set of message IDs that follows a certain pattern, for example "*E". The default value is "EEZR*E EEZA*E".

Saving the Universal Automation Adapter configuration: To save your changes to the IBM Service Management Unite Universal Automation Adapter configuration properties files, click **Save** on the configuration dialog. Upon completion, a configuration update status window is displayed, showing which configuration files are updated. If errors occurred during the update, the corresponding error messages are also displayed.

Controlling the Universal Automation Adapter:

Use the `eezuaadapter` command to start, stop, and monitor the Universal Automation Adapter. To control the Universal Automation Adapter, run the command on the system where the Service Management Unite Automation operations console is installed.

Configuring Universal Automation Adapters in silent mode:

You can configure Universal Automation Adapters in silent mode as an alternative to using the configuration dialogs.

Use the silent mode when you configure the Universal Automation Adapter. Refer to “Configuring SMU Automation in silent mode” on page 73 for a detailed description of the silent mode configuration tasks.

Tuning the number of domains and resources of the Universal Automation Adapter: The number of resources that can be managed by Universal Automation Adapter without performance degradation depends on the hardware. Your performance depends in particular on processor power and CPU cycles that are available on the system where the Universal Automation Adapter runs. Make sure that CPU and memory utilization is not higher than 80% after policy activation.

Depending on your hardware capabilities, the numbers that are given in the following recommendations may vary slightly. Adhering to these recommendations provides good performance using Universal Automation Adapter.

Recommendations for the Universal Automation Adapter:

1. Do not define more than 20 domains.
2. Do not include more than 50 resources in each domain.
3. Do not define more than 150 remote resources in total.

For the Universal Automation Adapter, balance the number of resources per domain by including a similar number of resources in each domain.

Configuring SMU Automation in silent mode

You can configure Service Management Unite Automation and the automation adapters without starting the configuration dialogs by using the configuration tool in silent mode. If you use the silent configuration mode, you do not need to have an X Window session available.

- You can use the silent mode to perform the following configuration tasks:
  - Configuring Service Management Unite Automation common settings
  - Refreshing the Service Management Unite Automation common configuration.
- You can use the configuration tool in silent mode to configure the following components:
  - Service Management Unite Automation operations console host
  - Universal Automation Adapters

You configure these components by editing configuration parameter values in an associated properties file. The parameter values in each properties file correspond directly to the values that you enter in the configuration dialog. You must first start the configuration tool to generate silent mode input properties files before you process a configuration update.

To use the configuration tool in silent mode, you need to follow these steps for each component that you want to configure:

1. Generate or locate the silent mode input properties file.
2. Edit the parameter values in the file.
3. Start the configuration tool in silent mode to update the target configuration files.
4. If the configuration tool does not complete successfully, deal with any errors that are reported and start the configuration tool again.

Processing tasks manually:

No silent configuration support is available to refresh first level automation (FLA) domain access credentials. After you have added or changed your FLA domain access credentials, you can use the refresh function of the configuration dialog to initiate a reload of the credentials by the operations console. If you do not want to use the configuration dialogs, you must recycle the WebSphere Application Server that hosts the operations console instead.

Generating silent mode input properties file:

This information provides information about how to generate a silent mode input properties file from the values that are currently configured, and use it to modify configuration settings in silent mode.

The silent input properties file has the following advantages:

- You can generate properties files immediately after installation and before you process the customization.
- If you customize with the configuration dialog and in silent mode, you can first generate an up-to-date input file before you apply changes in silent mode.
- You can easily recover from the accidental deletion of the silent mode input properties file.

To generate a silent mode input properties file, use one of the following options when you start silent configuration:

-g Generate the input properties file only if it does not exist.

-gr
Generate the input properties file and replace it if it exists.

-l *location*
The input properties file for silent configuration is in the directory that is specified with *location*. If `-l` is omitted, the input properties file is in the default directory `<EEZ_CONFIG_ROOT>`.

Depending on the target configuration, Table 7 shows the silent input properties files that are generated if the **-g** or **-gr** option is specified.

Table 7. Generated input properties files

Component	Target configuration	Silent input properties file
IBM Service Management Unite operations console	**cfgsmu -s -z -g | -gr**	**<EEZ_CONFIG_ROOT>/ silent.smuhost.properties**
	cfgsmu -s -z -g | -gr -l *location*	*location*/**silent.smuhost.properties**
Universal Automation Adapter	**cfgsmu -s -eu -g | -gr**	**<EEZ_CONFIG_ROOT>/ silent.eezaladapt.properties**
	cfgsmu -s -eu -g | -gr -l *location*	*location*/**silent.eezaladapt.properties**

If you update configuration settings in silent mode, the silent properties file is used as input for the update task. If you want the configuration tool to retrieve the input file from a location other than in the `<EEZ_CONFIG_ROOT>` directory, use the **-l** *location* option.

Editing the input properties file:

Modify the values in the input properties file to change the configuration in silent mode.

The input properties files that are generated for each of the components contain configuration parameter keyword-value pairs. The structure, terminology, and wording of the properties content and the configuration dialog are identical. This fact makes it easy to switch between modes and minimizes errors when you edit the properties file.

The names of tabs, for example **Host name or IP address**, on the configuration dialog are used as identifiers in the properties file, for example:

```
# ===============================================================================
# ... Host name or IP address
```

Each field name on the configuration dialog, for example **Host name or IP address**, is contained in the properties file, followed by a brief description and the keyword for that field, for example:

```
#     ---------------------------------------------------------------------
#  ... Host name or IP address
#      The name or IP address of the WebSphere Application Server hosting the operations
#      console. Although this has to be on the local system, do not specify 'localhost'.
#      Instead use the host name of this server or its IP address.
host-oc-hostname=my.oc.host
#
```

To edit the properties file, locate the keyword that is associated with the value that you want to change and overwrite the value.

If you set the value of a required keyword to blank or comment out the keyword, the value that is defined in the target configuration file remains unchanged.

Note:

1. If a keyword is specified several times, the value of the last occurrence in the file is used.
2. Each value must be specified on one single line.

Starting silent configuration:

Use the command **cfgsmu -s** to start silent configuration.

About this task

Because silent configuration is an alternative to the configuration dialog, silent mode is started by using the same command. For each component, you specify the -s option after the command to start the configuration tool.

Procedure

1. Log on to the system where IBM Service Management Unite is installed.
2. Issue the following commands to configure
   a. Process configuration tasks for the IBM Service Management Unite common configuration:

      ```
      cfgsmu -s -z [-r]
      ```

   b. Configure the IBM Service Management Unite Universal Automation Adapter:

      ```
      cfgsmu -s -eu
      ```

Output in silent mode:

Inspect the output that is generated by the configuration tool in silent mode.

Start the configuration tool in silent mode by using one of the commands described in “Generating silent mode input properties file” on page 74. This task leads to output that closely matches the output that is displayed in interactive mode in the update status dialogs or in the message boxes. The silent mode output falls into one of the following categories:

No update
There are no configuration updates to be saved. All parameters in all target configuration files already match the specified silent input parameters. No errors were detected when the silent input parameters were checked. If additional information is available or any warning conditions are detected, the information and warnings are reported. If warnings are reported, the configuration tool issues return code "1" rather than "0". You might need to observe the return code when you start silent configuration, for example within a shell script.

Successful completion
At least one of the target configuration files is updated and all configuration files and their update status are listed. No errors are detected when you check the silent input parameters. If additional information is available or any warning conditions are detected, the information and warnings are reported. If warnings are reported, the configuration tool issues return code "1" rather than "0". You might need to observe the return code when you start silent configuration, for example within a shell script.

Unsuccessful completion
No target configuration file is updated. Any errors that are detected when you check the silent input parameters are reported. The configuration tool stops and issues return code "2".

Silent input properties file generation
Values from the target configuration files are used to generate the input file. No target configuration file is updated.

Unrecoverable error
Error messages report the reason for the error. The configuration tool stops and issues a return code greater than "2".

Configuring properties files

Configuration properties files are used to store the settings of the IBM Service Management Unite operations console host and Universal Automation Adapters.

SMU Automation configuration properties files:

To change the values of the properties, use the Service Management Unite Automation `cfgsmu` configuration tool. The **`cfgsmu`** command ensures that the files are not corrupted during manual editing and that the change history in the files is updated whenever a property is changed.

It also ensures that dependencies between parameter values in different properties files are observed.

For more information about the `cfgsmu` configuration tool, refer to “Introducing the cfgsmu configuration tool” on page 55.

The configuration properties files of Service Management Unite Automation are in the following directory:

```
<EEZ_CONFIG_ROOT>
```

The following list describes the properties files that are changed when you modify a property value by using the `cfgsmu` configuration tool:

eez.automation.engine.properties
The properties in this file are used to configure the operations console host. The configuration properties specify, for example, the operations console host name or IP address.

eez.automation.engine.dif.properties
The domain identification file contains the user IDs and the passwords to authenticate to first-level automation domains.

eez.fla.ssl.properties
This file contains the configuration properties for the SSL connection to the first-level automation domains.

eez.aladapter.properties
The properties in this file are used to configure the Universal Automation Adapter. For example, the host and port the Universal Automation Adapter listens on, or the host and port of the automation framework it communicates with.

eez.aladapter.dif.properties
The properties in this file are used to configure the user IDs and the corresponding passwords that the Universal Automation Adapter uses to access remote non-clustered nodes. The resources that the Universal Automation Adapter starts, stops, and monitors are on remote nodes.

eez.aladapter.ssh.properties
The properties in this file are used to configure security settings that are related to SSH private keys. SSH keys can be configured for user authentication on remote non-clustered nodes as an alternative to configuring credentials in the `eez.aladapter.dif.properties` file for the Universal Automation Adapter.

eez.aladapter.ssl.properties
The properties in this file are used to configure Secure Sockets Layer (SSL) for transport between the automation framework and the Universal Automation Adapter.

eez.aladapter.jaas.properties
This file contains the configuration of the LoginModule that is used for user authentication between the automation framework and the Universal Automation Adapter.

eez.aladapter.jlog.properties
The properties in this file determine which information is written to the log and trace files of the Universal Automation Adapter.

eez.aladapter.plugin.properties
The properties in this file are used to configure settings that are unique for the Universal Automation Adapter: for example, the location of the XML policy pool.

eez.aladapter.plugin.<domain>.properties
For each Universal Automation Adapter domain, a domain-specific copy of `eez.aladapter.plugin.properties` is created:

User-based configuration properties files:

Some configuration properties of Service Management Unite Automation are stored for a user.

Refer to "Administering users, groups, and roles" on page 79. For each user, a unique configuration properties file can be stored. Additionally, a global configuration properties file can be specified, allowing the administrator to configure a default behavior for Service Management Unite Automation.

The user-based configuration properties files are located in the following directory where `JazzSM_root` depends on your installation:

```
<JazzSM_root>/profile/Tivoli/EEZ
```

Refer to "Default directories" on page 36 for the default path of `JazzSM_root`.

The global configuration properties file is `properties.dat`. The name of a user-based configuration properties file is `<user_name>_properties.dat`, where `<user_name>` is the name of the user with all "." and "/" replaced by "_".

If there are no properties configured (globally or for a specific user), the files are optional.

The user-based configuration properties files are written by Service Management Unite Automation and are not intended for manual editing. The global configuration properties file `properties.dat` can be edited by an administrator with an editor of his choice. A restart of the WebSphere Application Server is necessary to enable changes to this file.

The following precedence is used by Service Management Unite Automation to search for a property:

1. `<user_name>_properties.dat` of the current user
2. `properties.dat`
3. default configuration (hard-coded)

This means that user-based configurations in general overwrite the global configurations.

If, for example, the property "a" is defined in the `<user_name>_properties.dat` for the current user and in the `properties.dat`, the value of the user-based configuration properties file is taken. If another user has no `<user_name>_properties.dat` or it does not contain the property "a" for this user, the value of the global configuration properties file is taken.

Some of the configurations are not allowed to be changed on a user basis, in general due to security restrictions. For these configuration properties Service Management Unite Automation only searches the global configuration properties and the default configuration.

The following properties values are currently available:

Property	**User-based**	**Description**
`prefdom`	yes	*Preferred automation domain.* The domain that is selected per default when the user opens the *Domain and Automation Health* dashboard.

Property	User-based	Description
`syslog_global_limit`	no	*Maximum number of system log messages* that are loaded per request from its source into the *System Log* dashboard.
`mandatory_comments`	no	Defines if comments in request dialogs are mandatory or not. Possible values: `true` - The comment in a request dialog, for example, to issue an offline request or suspend automation for a resource, is mandatory. You have to enter a comment. Otherwise the OK button of the dialog is not enabled. `false` - The comment field is optional. You can click OK in the dialog even if no comment has been specified. This is the default.

Administering users, groups, and roles

Manage users, groups, and roles to work with Service Management Unite Automation and the WebSphere Application Server.

Roles, such as the administrator role, define the rights that each user has. You need to work with your system. One or many users can be members of a group. You can define users and groups in a user registry or repository. Roles define the rights a user has. An example for a role is the administrator. You need to map a user or a group to a role, to grant the user any rights to work with the WebSphere Application Server or the Dashboard Application Services Hub. Users and groups are mapped to `Roles` in the Dashboard Application Services Hub.

If you want to use a central, LDAP-based user repository to hold your users and groups, see “Configuring an LDAP user registry (optional)” on page 91.

User credentials

The following table gives you an overview of the usage of the different user IDs that are used to operate on resources hosted by various automation adapters.

Table 8. User credentials to operate on resources hosted by different automation adapters

#	Description	Location	Configuration	Details
1	Credential to log on to the IBM Dashboard Application Services Hub running on WebSphere Application Server.	**web browser:** See details. **Automation Framework:** Depends on the user repository that is used for WebSphere Application Server, for example WAS-based security or LDAP.	**web browser:** See details. **Automation Framework:** The administrator user of WebSphere Application Server can log in to the WebSphere administrative console to add or delete users. You can find these tasks in **Users and Groups -> Manage Users.**	Web browsers allow you to store user ID and password in the browser password cache. For more information, see your browser documentation.
2	Credential to access the domains hosted by the adapter from within the automation framework and the operations console.	**Automation Framework:** Queries performed by functional user: `<EEZ_CONFIG_ROOT>/eez.automation.engine.dif.properties` **Operations Console:** Queries and requests performed by a user who is logged on to the Dashboard Application Services Hub: Credential Store. **Adapter:** Operating system security or LDAP.	**Automation Framework:** Use the configuration tool `cfgsmu`. In the Service Management Unite Host Configuration, on the **User Credentials** tab, define the credentials used by the functional user to access automation domains. **Operations Console:** A Dashboard Application Services Hub user can store credentials when logging on to an automation domain in the credential store. Edit and delete these domain credentials using the **User > Credential Store** page within the Dashboard Application Services Hub. **Adapter:** Use the adapter's configuration utility to configure user authentication details.	If security configuration is enabled, the automation framework authenticates each user that accesses domains and resources of the individual automation adapter using the operations console. If a user cannot be authenticated by the configured security backend of the adapter, it cannot access domains and resources of the automation adapter.
3	Credential for the Universal Automation Adapter to access remote nodes. The user ID is specified for each resource in the Universal Automation Adapter policy.	**Adapter:** `<EEZ_CONFIG_ROOT>/eez.aladapter.dif.properties` **Remote node:** • SSH access: SSHd - OS security or LDAP	**Adapter:** Use the configuration tool, for example `cfgsmu` for the Universal Automation Adapter: in the Service Management Unite Host Configuration, on the **User credentials** and **Security** tab. **Remote node:** • SSH access: refer to SSHd documentation.	This credential is used by a Universal Automation Adapter to access remote nodes for resources of class IBM.RemoteApplication. The credential is not used for resources of class IBM.ITMResource which are defined for the Universal Automation Adapter. Depending on what you configured, different authentication methods are used.

Table 8. User credentials to operate on resources hosted by different automation adapters (continued)

#	Description	Location	Configuration	Details
4	Credential for the Universal Automation Adapter to access Tivoli Monitoring resources via a hub monitoring server. A user ID can be specified for each resource in the Universal Automation Adapter policy or a generic Tivoli Monitoring user is used.	**Adapter:** `<EEZ_CONFIG_ROOT>/eez.aladapter.dif.properties` **Hub TEMS**: • TEMS SOAP server configuration and configured security backend	**Adapter:** Use the configuration tool `cfgsmu` for the Universal Automation Adapter: in the Universal Automation Adapter configuration on the **Monitoring** tab. **Hub TEMS:** • In the configuration of the hub TEMS	This credential is used by a Universal Automation Adapter to access the SOAP server on the hub monitoring server (TEMS) for the resources of class IBM.ITMResource.

The scenarios described in the following topics describe which credentials are used depending on how you work with resources, either hosted by a Universal Automation Adapter or by any other automation adapter:

Resources hosted directly by a Universal Automation Adapter:

Describes which user credentials are required to operate resources hosted directly by the Universal Automation Adapter.

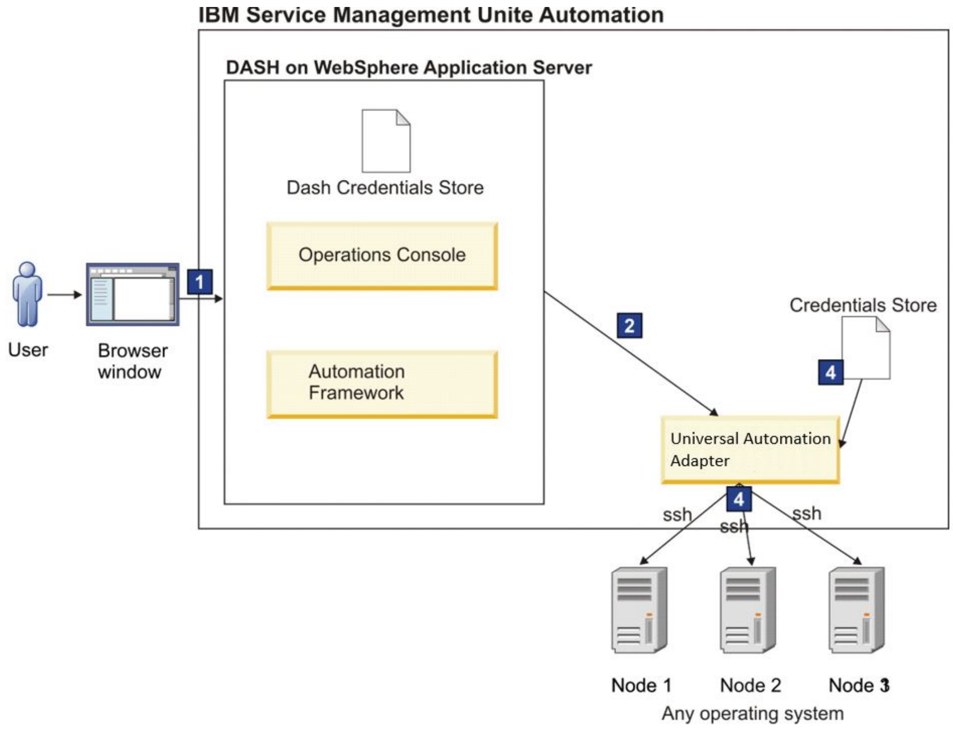


Figure 5. Operating resources directly on single nodes

The numbers in the pictures refer to the numbers of the credentials in “User credentials” on page 79.

Procedure

1. Log on to the IBM Dashboard Application Services Hub. Specify your user ID and password (Credential 1) for the IBM Dashboard Application Services Hub.
2. After successful login, stop a resource hosted by a Universal Automation Adapter. As soon as you select the Universal Automation Adapter domain, the operations console prompts for a credential to access the Universal Automation Adapter domain (Credential 2).
3. Select the resource that you want to stop, and run a stop command against it. The Universal Automation Adapter checks which user ID is specified for the resource in the Universal Automation Adapter policy and then authenticates itself using the configured authentication method (Credential 4).

User roles

Assign access roles that determine which Service Management Unite Automation tasks are available to a user in the Dashboard Application Services Hub.

Access roles are created during the installation of Service Management Unite Automation and assigned to the user groups that are listed in the **Group Name** column of the table. To assign access roles to individual users, add the users' IDs to the corresponding user groups in the WebSphere administrative console.

Table 9. Access roles for IBM Service Management Unite

Role	Permissions	Group name
`EEZMonitor`	Grants minimum access rights. Users who have the `EEZMonitor` role can run query-type operations. This role cannot activate and deactivate automation policies or run actions that modify the state of resources: for example, they cannot submit start requests. The following dashboards are available to `EEZMonitor` users: • Welcome Page • Domain and Automation Health • Explore Automation Nodes • Explore Automation Domains • Information and Support • Domain Adapter Log	`EEZMonitorGroup`

Table 9. Access roles for IBM Service Management Unite (continued)

Role	Permissions	Group name
EEZOperator	In addition to the permissions granted by the EEZMonitor role, users who have this role can send requests against resources. With this role, users cannot run tasks that change the configuration, such as activating and deactivating policies. The following dashboards are available to EEZOperator users: • Welcome Page • Domain and Automation Health • Explore Automation Nodes • Explore Automation Domains • Information and Support • Domain Adapter Log • System Log • Command Execution	EEZOperatorGroup
EEZConfigurator	In addition to the permissions granted by the EEZMonitor role, users who have this role can run tasks that change the configuration, such as activating and deactivating policies. Users who have only this role cannot submit requests against resources. The role is required to be able to work with policies. The following dashboards are available to EEZConfigurator users: • Welcome Page • Domain and Automation Health • Explore Automation Nodes • Explore Automation Domains • Information and Support • Domain Adapter Log • Activate Automation Policies • Create a New Automation Policy • Edit an existing Policy	EEZConfiguratorGroup

Table 9. Access roles for IBM Service Management Unite (continued)

Role	Permissions	Group name
EEZAdministrator	Extends the EEZOperator and EEZConfigurator roles, granting maximum access rights. Users who have this role can run all operations available on the operations console. The following dashboards are available to EEZAdministrator users: • Welcome Page • Domain and Automation Health • Explore Automation Nodes • Explore Automation Domains • Information and Support • Domain Adapter Log • System Log • Command Execution • Activate Automation Policies • Create a New Automation Policy • Edit an Existing Automation Policy	EEZAdministratorGroup

The EEZ* access roles authorize users only to access and work with IBM Service Management Unite tasks and dashboards. Other administrative console tasks of the Dashboard Application Services Hub are only available to users who have the iscadmins access role.

You also need the iscadmins role to be able modify existing or create new dashboards in the Dashboard Application Services Hub.

By default, the iscadmins role is assigned to the default System Automation administrator (for example eezadmin) during the installation of Service Management Unite Automation.

Creating and modifying users and groups

The following steps describe how to set up the user account repository with the default setup and names, for example, eezadmin. If you choose to use different names for users and groups, adjust the described steps accordingly.

Procedure

Note: By default, these steps are performed during the installation of Service Management Unite Automation and you do not have to perform these steps manually. This is only required if you selected to not create automatically the users and groups during installation.

1. Log in to the WebSphere administrative console.
2. Click **Users and Groups > Manage Users** to create users.
3. Click **Create . . .** to create a new user.

4. Enter the **User ID**, **First name**, **Last name**, and passwords for the following users: eezadmin, eezdmn
5. Click **Create** to create both users.
6. Click **Close**.
7. Click **Users and Groups > Manage Groups** to create groups.
8. Click **Create . . .** to create a new group.
9. Enter the **Group name** of the following groups:
   - EEZAdministratorGroup
   - EEZConfiguratorGroup
   - EEZMonitorGroup
   - EEZOperatorGroup
10. Click **Create** to create the group and click **Close**.
11. Repeat steps 7 and 8 to create all of the groups that are listed in step 9.
12. To add eezadmin to the following groups, click the Group name EEZAdministratorGroup and proceed as follows:
13. Select the **Members** tab on the selected group page.
14. Click **Add Users . . .**
15. Enter the user name **eezadmin** into the **Search** field or enter * to see all users.
16. Click **Search**.
17. Select **eezadmin** and click **Add**.
18. Repeat steps 13 - 17 to add **eezadmin** to all groups listed in step 9.
19. To add **eezdmn** to the EEZAdministratorGroup, click the **Group** name and proceed as follows:
20. Select the **Members** tab on the selected group page.
21. Click **Add Users . . .**
22. Enter the user name **eezdmn** into the Search field or enter * to see all users.
23. Click **Search**.
24. Select **eezdmn** and click **Add**.

Results

After new users are added to the user repository and assigned to a group, access rights are granted. If you want to setup your external user repository with the default users and groups, adjust the steps to the administrative interfaces of the external user repository.

Authorizing users and groups within the Dashboard Application Services Hub

Users must have specific roles to work with dashboards that are available in the Dashboard Application Services Hub (DASH). This role assignment is configured in the DASH. Assign the required roles on the user group level, so that all users that belong to a group inherit the same roles.

The roles are assigned to user groups and users during the installation of Service Management Unite Automation as follows:

Table 10. Role to group assignment

Role	Group name
EEZMonitor	EEZMonitorGroup

Table 10. Role to group assignment (continued)

Role	Group name
EEZOperator	EEZOperatorGroup
EEZConfigurator	EEZConfiguratorGroup
EEZAdministrator	EEZAdministratorGroup

In addition, the iscadmins role is assigned to the default System Automation administrator (for example eezadmin) and to the default WebSphere administrative user (for example wasadmin):

Table 11. Role to user ID assignment

Role	User ID
iscadmins	eezadmin, wasadmin

You must have at least one user that has the iscadmins role.

For a list of the available user roles for System Automation and their meaning, see "User roles" on page 82

If you want to create more role assignments, proceed as follows:

1. Log in to the **Dashboard Application Services Hub** by using the WebSphere administrative user that you specified during the installation of Jazz for Service Management (for example wasadmin) or any other user that has the iscadmins role.
2. Use one of the following entries in the navigation bar to manage your roles:

   Console Settings > Roles
   List all roles and assign groups or individual users to a selected role.

   Console Settings > User Roles
   List all users and assign roles to selected users.

   Console Settings > Group Roles
   List all groups and assign roles to selected groups.

Authorizing users to create dashboards

By default, Dashboard Application Services Hub (DASH) users have limited authority to edit existing dashboards and no authority to create new dashboards.

To authorize individual users to create and edit dashboards, perform the following steps:

1. Log in to the **Dashboard Application Services Hub**.
2. Click **Console Settings > User Roles** in the navigation bar.
3. Click **Search** to list the available groups.
4. Click the entry for the user ID you want to modify.
5. Ensure that **iscadmins** is selected in the **Available Roles** list.
6. Click **Save**.
7. Close the **User Roles** tab.

To authorize a complete group to create and edit dashboards, perform the following steps:

1. Log in to the **Dashboard Application Services Hub**.
2. Click **Console Settings > Group Roles** in the navigation bar.
3. Click **Search** to list the available users.

4. Click the entry for the group you want to modify, for example EEZAdministratorGroup.
5. Ensure that `iscadmins` is selected in the **Available Roles** list.
6. Click **Save**.
7. Close the **Group Roles** tab.

Modifying user credentials to access DB2

This authentication entry is required to allow the application EEZEAR to access the automation database, if a remote DB2 is used. Perform the following steps to modify the default authentication data the automation management server uses to access DB2:

Procedure

1. Log on to the **WebSphere administrative console**. Go to **Security > Secure administration, applications, and infrastructure > Java Authentication and Authorization Service > J2C authentication data**
2. In the table, select the alias `EEZDB2AuthAlias`
3. Change the password or the user ID and the password and click **OK**.
4. From the menu, select **save**.
5. Click **save** to save and activate the new configuration. Do not restart the WebSphere Application Server. For more information, refer to the documentation of the WebSphere Application Server.

Modifying the functional user ID of the automation framework

The automation framework functional user ID (default user ID: eezdmn) may be modified in the following two areas:

Procedure

1. The Java EE framework uses the automation framework functional user ID to access the WebSphere Application Server JMS Provider. This JMS Provider is used to send and receive asynchronous messages (events). Modify the functional user ID as follows:
   a. Log in to the **WebSphere administrative console**.
   b. Navigate to **Security > Global security**. In the **Authentication** group, expand **Java Authentication and Authorization Service** and select **J2C authentication data**.
   c. In the table, select the Alias `EEZJMSAuthAlias`.
   d. Make your changes and click **OK**.
   e. Click **Save** to save and activate the new configuration.
2. The Java EE framework uses the automation framework functional user ID to perform asynchronous tasks. Modify the functional user ID as follows:
   a. Select **Applications** > **Application Types** > **WebSphere enterprise applications**.
   b. Select the application **EEZEAR** in the table.
   c. Select **User RunAs roles** in the Details Properties area.
   d. Select the role **EEZAsync.**
   e. Change the settings and click **Apply**.
   f. Click **OK** and save the new configuration.
   g. Select **Security role to user/group mapping** in the Details Properties area of the EEZEAR application.

h. Select the row for role **EEZFunctionalUser** and click **Map Users....**
i. Search and select the functional user, such that it appears in the **Selected** list.
j. Click **OK** to return to the **Security role to user/group mapping** table.
k. Click **OK** and save the new configuration.
l. Select the application **isc** in the table.
m. Select **User RunAs** roles in the Details Properties area.
n. Select the role **EEZFunctionalUser**.
o. Change the settings and click **Apply**.
p. Click **OK** and save the new configuration.
q. Restart **WebSphere Application Server**.

Modifying the user credentials for accessing first-level automation domains

Use the cfgsmu configuration utility to specify user credentials for accessing first-level automation domains. Domain user credentials are defined on the **User Credentials** tab of the configuration utility. For more information, refer to “User Credentials tab” on page 59.

The automation framework uses the credentials to authenticate to first-level automation domains.

Configuring SMU Performance Management

After a successful installation, you must complete configuration tasks to finish setting up Service Management Unite Performance Management.

Note: If you installed Service Management Unite Performance Management by running a silent installation program, you can skip to Configuring historical data collections.

Configuring properties files

You can modify the properties file values for Service Management Unite Performance Management after installation.

About this task

During installation, you can configure the DASH_ITMCollector, DASH_SA, and DASH_IOALA properties files for Service Management Unite Performance Management using IBM Installation Manager.

After installation, you can configure Tivoli Directory Integrator using the Tivoli Directory Integrator configuration editor. The configuration editor is GUI-based and allows you to edit assembly lines and customize how data is presented in Dashboard Application Services Hub (DASH) V3.1.2.1.

This topic guides you to configure the properties files after installation.

Procedure

1. Go to the solution directory. The default directory is /opt/IBM/TDI/V7.1.1/DASH_ITMCollector.
2. Edit the following fields in the DASH_ITMCollector properties file.

itm.provider
Location of the Tivoli Enterprise Monitoring Server.

itm.url
Location of the Tivoli Enterprise Portal Server.

itm.user
The Tivoli Enterprise Portal Server user ID.

itm.password
The IBM Tivoli Monitoring user password

3. If you are using the default solution directory, /opt/IBM/TDI/V7.1.1/DASH_ITMCollector (SOLDIR), enter the following commands to encrypt the password that is specified in the DASH_ITMCollector properties file.

```
/opt/IBM/TDI/V7.1.1/serverapi/cryptoutils.sh -input /opt/IBM/TDI/V7.1.1/DASH_ITMCollector/DASH_
-output /opt/IBM/TDI/V7.1.1/DASH_ITMCollector/DASH_ITMCollector.properties -mode encrypt_props
-keystore /opt/IBM/TDI/V7.1.1/testserver.jks -storepass server -alias server
```

If you are not using the default solution directory, you see the following command where you replace **SOLDIR** with your chosen solution directory:

```
-input SOLDIR/DASH_ITMCollector.properties -output SOLDIR/DASH_ITMCollector.properties
```

The Tivoli Directory Integrator solutions directory **TDI_SOLDIR** defaults to /opt/IBM/TDI/V7.1.1/DASH_ITMCollector and the Tivoli Directory Integrator installation directory **TDI_INSTDIR** defaults to /opt/IBM/TDI/V7.1.1.

```
TDI_INSTDIR/serverapi/cryptoutils.sh
-input TDI_SOLDIR/DASH_ITMCollector/DASH_ITMCollector.properties
-output TDI_SOLDIR/DASH_ITMCollector/DASH_ITMCollector.properties -mode encrypt_props
-keystore TDI_INSTDIR/testserver.jks -storepass server -alias server
```

You must replace **TDI_SOLDIR** with your chosen Tivoli Directory Integrator solution directory and replace **TDI_INSTDIR** with your chosen Tivoli Directory Integrator installation directory.

4. Edit the following fields in the DASH_SA properties file.

sa.user
The SMU functional user ID that is used by TDI to access to SA domains. The default value is eezdmn.

sa.password
The password for the SMU functional user ID.

5. Edit the following fields in the DASH_IOALA properties file if you are using IBM Operations Analytics - Log Analysis.

Server
The host name or IP address of your IBM Operations Analytics for z Systems®

Port
The IBM Operations Analytics for z Systems server port.

Integration with IBM Operations Analytics - Log Analysis

To use the IBM Operations Analytics - Log Analysis launch functions, it is recommended to configure single sign-on (SSO) between the WebSphere Application Server server hosting JazzSM and the Liberty Server used by IBM Operations Analytics - Log Analysis.

WebSphere Application Server products include SSO functionality based on IBM's Lightweight Third-Party Authentication (LTPA) technology. When properly configured, these functions support navigation among WebSphere-based applications, passing authentication information as LTPA tokens in HTTP cookies. The user is prompted for authentication credentials only once, and any subsequent authentications are automatically handled in the background using the LTPA tokens included in the associated web requests. If SSO is not set up between the WAS server hosting JazzSM and the Liberty Server that is used by IBM Operations Analytics - Log Analysis, you must sign on to the IBM Operations Analytics - Log Analysis server from a separate browser tab before launching from within the IBM Service Management Unite product. This will create the LTPA tokens and HTTP cookies required by this function.

Configuring historical data collections

Some of the data that is displayed in Service Management Unite Performance Management requires the creation of historical collections.

Complete the following steps for each attribute group from which you want to collect historical data. Your user ID must have “Configure History” permission to open the History Collection Configuration window. To create a historical collection, log on to the Tivoli Enterprise Portal server.

Configuring OMEGAMON XE on z/OS historical data collections

Use the following procedure to create historical collections for OMEGAMON XE on z/OS if you have not already had historical collection active for the Address Space CPU Utilization attribute table.

Procedure

1. Click **History Configuration**.
2. In the left pane, select **OMEGAMON XE on z/OS** and right-click to select **Create new collection setting**.
3. In the dialog box, enter **Address Space CPU Utilization** in the **Name** field and select **Address Space CPU Utilization** from the **Attribute Group** list.
4. Click **OK** to open the History Collection Configuration window.
5. Complete the fields in the **Basic** tab:
   - **Collection Interval**: 5 minute
   - **Collection Location**: TEMA
6. In the **Distribution** tab, select the **Managed System (Agent)** check box.
7. From the **Available Managed System Groups** list, select ***MVS_SYSTEM** and move it to the **Start collection on** list.
8. Click **OK**.

Configuring WebSphere Application Server historical data collections

Use the following procedure to create historical collections for WebSphere Application Server.

Procedure

1. Click **History Configuration**.
2. In the left pane, select **ITCAM for WebSphere** and right-click to select **Create new collection setting**.
3. In the dialog box, enter **Application Server Summary** in the **Name** field and select **Application Server** from the **Attribute Group** list.
4. Click **OK** to open the History Collection Configuration window.
5. Complete the fields in the **Basic** tab:

- **Collection Interval**: 1 minute
- **Collection Location**: TEMA

6. In the **Distribution** tab, select the **Managed System (Agent)** check box.
7. From the **Available Managed System Groups** list, select ***CAM_WAS_SERVER** and move it to the **Start collection on** list.
8. Click **OK**.
9. Repeat steps 4-8, entering **Garbage Collection** in the **Name** field and select **Garbage Collection Analysis** from the **Attribute Group** list.
10. Repeat steps 4-8, entering **Request Time and Rates** in the **Name** field and select **Request Time and Rates** from the **Attribute Group** list.
11. Repeat steps 4-8, entering **Request Analysis** in the **Name** field and select **Request Analysis** from the **Attribute Group** list.

Configuring and administrating Service Management Unite

Complete the following tasks after installing Service Management Unite Automation and Service Management Unite Performance Management.

Configuring an LDAP user registry (optional)

If you don't want to use the default file-based user repository for managing WebSphere Application Server users, you can configure a central user registry, such as a Lightweight Directory Access Protocol (LDAP) registry, for user management and authentication.

Configure WebSphere Application Server to use the LDAP user registry as a federated repository. The WebSphere Application Server uses this registry for user authentication and the retrieval of information about users and groups to run security-related functions.

For more information about how to configure a federated user repository in WebSphere Application Server, see Managing the realm in a federated repository configuration.

Procedure for pre-defined LDAP setup

1. Install Jazz for Service Management including WebSphere Application Server and Dashboard Application Services Hub (DASH).
2. LDAP configuration
   a. Add the LDAP user registry as a federated repository to the WebSphere Application Server.
   b. Configure the supported entity types so that new users and groups are created in the LDAP user repository.
3. Install IBM Service Management Unite.
4. Optional: Configure the connection to the LDAP server for secure communications. For more information, see Configuring an SSL connection to an LDAP server.

Procedure for post-defined LDAP setup

1. Install Jazz for Service Management including WebSphere Application Server and Dashboard Application Services Hub (DASH).
2. Install IBM Service Management Unite.
3. LDAP configuration

    a. Add the LDAP user registry as a federated repository to the WebSphere Application Server.
    b. Configure the supported entity types so that new users and groups are created in the LDAP user repository.
4. Port from a file-based repository to an LDAP repository
    a. Create users and groups to use with IBM Service Management Unite in the LDAP repository if they do not exist.
    b. Authorize the LDAP groups within the Dashboard Application Services Hub.
    c. Remove duplicate users from the file-based user repository.
5. Optional: Configure the connection to the LDAP server for secure communications. For more information, see Configuring an SSL connection to an LDAP server.

The core LDAP configuration is done in the same way for both pre-defined and post-defined setup. This LDAP configuration is described in the next sections.

Setting up an LDAP user registry

Information about users and groups is stored in a user registry. By default, the WebSphere Application Server that is installed with Jazz for Service Management and is used by IBM Service Management Unite is configured to use a local file-based user repository.

Companies often use a central user registry that is based on the Lightweight Directory Access Protocol (LDAP) to manage users and groups company-wide and provide single sign-on to every service. Examples for LDAP servers:

- IBM Tivoli Directory Server
- Resource Access Control Facility (RACF®)
- Windows Server Active Directory
- OpenLDAP

You can set up an LDAP server and create an LDAP user registry to use with IBM Service Management Unite. The WebSphere Application Server uses this registry for user authentication and the retrieval of information about users and groups to run security-related functions.

There are two different setup types:

Pre-defined

The LDAP user repository is configured in the WebSphere Application Server before the installation of IBM Service Management Unite.

The installer of IBM Service Management Unite can already use the configured LDAP repository for user creation and role assignments.

Post-defined

The LDAP user repository is configured in the WebSphere Application Server after the installation of the IBM Service Management Unite.

If you reconfigure the user repository after you installed IBM Service Management Unite, you must complete extra steps to port from a file-based repository to an LDAP user repository.

Adding the LDAP user registry as a federated repository

Federated repositories can access and maintain user data in multiple repositories, and federate that data into a single federated repository. For example, use the default file-based repository and an LDAP repository that is combined under a single realm.

Pre-requisites for this task:

Set up an LDAP server and create an LDAP user registry. Ensure that WebSphere Application Server supports the LDAP user registry as a federated repository, for example, IBM Tivoli Directory Server or Microsoft Active Directory Server.

Before you configure a central user registry, make sure that the user registry or registries that you plan to identify are started. The user registry must be accessible from the computer where you set up the Jazz for Service Management application server.

Configuring an LDAP user repository:

Configure the LDAP user repository by running the following steps:

Procedure

1. Open your web browser and connect to the WebSphere administrative console.
2. Enter the WebSphere administrator user ID and password, and click **Log in**.
3. Select **Security > Global security**.
4. From the **Available realm definitions** list, select **Federated repositories** and click **Configure**.
5. In the **Related Items** area, click the **Manage repositories** link and then click **Add > LDAP repository** to configure a new LDAP user repository.
6. In the **Repository identifier** field, provide a unique identifier for the repository. The identifier uniquely identifies the repository within the cell. For example, `LDAP1`.
7. From the **Directory type** list, select the type of LDAP server. The type of LDAP server determines the default filters that are used by WebSphere Application Server. If you choose one of the predefined LDAP servers, you get default definitions for the mapping of entity types to corresponding object classes and for the attribute name that is used to determine group membership. If you choose **Custom** as directory type, you must specify these definitions as **Additional Properties** depending on your specific LDAP server. For more information, see “Configuring custom LDAP servers” on page 94.
8. In the **Primary host name** field, enter the fully qualified host name of the primary LDAP server. The primary host name and the distinguished name must contain no spaces. You can enter either the IP address or the domain name system (DNS) name.
9. In the **Port** field, enter the server port of the LDAP user registry. The default port value is `389`, which is not a Secure Sockets Layer (SSL) connection port. Use port `636` for a Secure Sockets Layer (SSL) connection. For some LDAP servers, you can specify a different port. If you do not know the port to use, contact your LDAP server administrator.
10. Optional: In the **Bind distinguished name** and **Bind password** fields, enter the bind distinguished name (DN) (for example, `cn=root`) and password. The bind DN is required for write operations or to obtain user and group

information if anonymous binds are not possible on the LDAP server. In most cases, a bind DN and bind password are needed, except when an anonymous bind can satisfy all of the functions. Therefore, if the LDAP server is set up to use anonymous binds, leave these fields blank.

11. Optional: In the **Login properties** field, enter the property names used to log in to the WebSphere Application Server. This field takes multiple login properties, delimited by a semicolon (;). For example, `uid`.
12. Optional: From the **Certificate mapping** list, select your preferred certificate map mode. You can use the X.590 certificates for user authentication when LDAP is selected as the repository. The **Certificate mapping** field is used to indicate whether to map the X.509 certificates to an LDAP directory user by `EXACT_DN` or `CERTIFICATE_FILTER`. If you select `EXACT_DN`, the `DN` in the certificate must match the user entry in the LDAP server, including case and spaces.
13. Click **Apply** and then **Save**.

Configuring custom LDAP servers:

If you chose `Custom` as directory type and not one of the predefined LDAP servers, define manually the mapping of entity types to corresponding object classes and the attribute name that is used to determine group membership.

Procedure

- **Set the object class for an entity type.** If you chose `Custom` as directory type and not one of the predefined LDAP servers, you must manually specify the object classes that are used in your LDAP server for the entity types `PersonAccount` and `Group`. A `PersonAccount` represents a user, whereas a `Group` represents a group of users.
  1. On the configuration page of your LDAP repository in the **Additional Properties** area, click **Federated repositories entity types to LDAP object classes mapping**.
  2. Click **New** to define a new entity type to class mapping.
  3. Specify a mapping for the **PersonAccount** entity type. As object classes, specify the object classes that are mapped to this entity type. Multiple object classes are delimited by a semicolon (;). For example, enter `PersonAccount` in the **Entity type** field, and enter `iNetOrgPerson` in the **Object classes** field to define that LDAP entries that have the object class `iNetOrgPerson` are mapped to the `PersonAccount` entity type.
  4. Click **Apply** and then **Save**.
  5. Specify a mapping for the `Group` entity type. As object classes, specify the object classes that are mapped to this entity type. Multiple object classes are delimited by a semicolon (;). For example, enter `Group` in the **Entity type** field, and enter `groupOfNames` in the **Object classes** field to define that LDAP entries that have the object class `groupOfNames` are mapped to the `Group` entity type.
  6. Click **Apply** and then **Save**.
- **Define group membership attribute** If you chose `Custom` as directory type and not one of the predefined LDAP servers, you must manually configure how group membership is modeled in your LDAP server. Model the group membership in the **Group attribute definition** properties of the repository. There are two main ways of specifying group membership. Configure the group membership depending on which group membership definition is supported by your LDAP server:

Option	Description
Static group membership that is defined in Group entity.	The `Group` entity has an attribute, for example member, which points to its members. The member attribute in this example is called the group member attribute. All LDAP server implementations support static group membership. If the group member attribute of the group is used, specify the name of the object class, and the attribute name that is used to indicate the group membership in **Group attribute definition -> Member attributes**. If the group `objectclass` for the user is `groupOfUniquePersons`, and within that `objectclass` members are listed as `persons`, then the static group `Member attributes` property is set as follows: 1. On the configuration page of your LDAP repository in the **Additional Properties** area, click **Group attribute definition**. 2. Under **Additional properties**, click **Member attributes**. 3. Click **New** to specify a new member attribute. Set the **Name of member attribute** field to `persons`. Set the **Object class** field to `groupOfUniquePersons`. 4. Click **Apply** and then **Save**.
Direct group membership.	The `PersonAccount` entity has an attribute, for example, `memberof`, which points to the groups that this person belongs. The `memberof` attribute in this example is called the group membership attribute. Some LDAP servers support this kind of linking user objects to the groups to which they belong, for example Microsoft® Active Directory Server. Use direct group membership if it is supported by the LDAP server. If the group membership attribute in the `PersonAccount` entity is used, specify the group membership attribute in **Group attribute definition -> Name of group membership attribute**. For example, if a `PersonAccount` entity (that is, a user) contains attributes called `ingroup` that contain each group membership, then you specify the direct group membership as follows: 1. On the configuration page of your LDAP repository in the **Additional Properties** area, click **Group attribute definition**. 2. Set the **Name of group membership attribute** field to `ingroup`. 3. Click **Apply** and then **Save**.

Adding configured LDAP repository as federated repository to the security realm:

To add an already configured LDAP user repository as federated repository to the security realm, complete the following steps:

Procedure

1. On the **Global security > Federated repositories** page, click **Add repositories (LDAP, custom, etc)...**.
2. To add an entry to the base realm:
   a. Ensure that the LDAP federated repository is selected from the **Repository** list.
   b. In the field, enter the distinguished name (DN) of a base entry that uniquely identifies this set of entries in the realm. This base entry must uniquely identify the external repository in the realm.

      Note: If multiple repositories are included in the realm, use the **DN** field to define an extra distinguished name that uniquely identifies this set of entries within the realm. For example, repositories LDAP1 and LDAP2 might both use `o=ibm,c=us` as the base entry in the repository. So `o=ibm,c=us` is used for LDAP1 and `o=ibm2,c=us` for LDAP2. The specified DN in this field maps to the LDAP DN of the base entry within the repository, such as `o=ibm,c=us b`. The base entry indicates the starting point for searches in this LDAP server, such as `o=ibm,c=us c`).
3. In the administrative console, select **Security > Global security**.
4. From the **Available realm definitions** list, select **Federated repositories** and click **Set as current** to mark the federated repository as the current realm.
5. Restart the WebSphere Application Server.
6. Verify that the federated repository is correctly configured:
   a. In the administrative console, click **Users and Groups > Manage Users**.
   b. Confirm that the list of displayed users includes users from both the LDAP federated repository and the local file registry.
   c. Click **Users and Groups > Manage Groups**.
   d. Confirm that the list of displayed groups includes groups from both the LDAP federated repository and the local file registry.

      Note: Verify that the default administrative user (for example, `wasadmin`) that is created during installation of Jazz for Service Management is in the local file registry. If IBM Service Management Unite is installed before the LDAP repository is configured, also the users and groups that are generated during the installation are in the local file registry.

Configuring supported entity types

Configure the supported entity types before you can create users and groups in your LDAP repository in the administrative console.

This configuration specifies which `RDN` property is used for the default entity types, for example users and groups, and where in the repository name space these entities are created.

This configuration is also required if you install IBM Service Management Unite after you configured an LDAP repository. The installer creates the default users and user groups for you in the LDAP repository.

This configuration is also required if you install IBM Service Management Unite Automation after you configured an LDAP repository. The installer creates the default users and user groups for you in the LDAP repository.

The supported entity types are `Group`, `OrgContainer`, and `PersonAccount`. A `Group` entity represents a simple collection of entities that might not have any relational context. An `OrgContainer` entity represents an organization, such as a company or a division. A `PersonAccount` entity represents a user that logs in. You cannot add or delete the supported entity types, because these types are predefined.

1. In the administrative console, click **Security > Global security**.
2. From the **Available realm definitions** list, select **Federated repositories** and click **Configure**.
3. Click **Supported entity types** to view a list of predefined entity types.
4. Click the name of a predefined entity type to change its configuration.
5. In the **Base entry for the default parent** field, provide the distinguished name of a base entry in the repository. This entry determines the default location in the repository where entities of this type are placed on write operations by user and group management.
6. Supply the relative distinguished name (`RDN`) properties for the specified entity type in the **Relative Distinguished Name properties** field. Possible values are `cn` for `Group`, `uid` or `cn` for `PersonAccount`, and `o`, `ou`, `dc`, and `cn` for `OrgContainer`. Delimit multiple properties for the `OrgContainer` entity with a semicolon (;).
7. Click **Apply** and then **Save**.
8. Repeat all steps for all predefined entity types.
9. Restart the WebSphere Application Server.

You can now manage your LDAP repository users in the console through the **Users and Groups > Manage Users** menu item.

Note: When you add a user, check that the user ID you specify does not exist in any of the user repositories. You can avoid difficulties when the new user attempts to log in.

What to do next:

Pre-defined setup:

The LDAP repository is configured and connected to the WebSphere Application Server. Next, install IBM Service Management Unite.

On the **User and Group Administration** page of the installer click **Yes**. The default users and groups for IBM Service Management Unite are created in your configured LDAP user repository. If you already created the default user groups and users for IBM Service Management Unite in the LDAP repository through a previous installation or by adding them manually, click **No**. In this case, the installer does not make changes to users and groups.

Post-defined setup:

If you already installed IBM Service Management Unite and you did not define the default users and groups for IBM Service Management Unite in the LDAP repository, create these users and groups in your LDAP repository as the next step. Assign roles to the new LDAP groups and remove the old groups that are no longer used from the file-based repository.

These steps are explained in "Porting from a file-based repository to an LDAP repository in a post-defined setup."

Porting from a file-based repository to an LDAP repository in a post-defined setup

If you configured WebSphere Application Server to use an LDAP repository after you installed IBM Service Management Unite, complete extra steps to port from a file-based repository to an LDAP user repository.

Run the following steps to port the users, groups, and roles that are created during the installation of IBM Service Management Unite to an LDAP-based configuration:

1. Create users and groups to use with IBM Service Management Unite in the LDAP repository if they do not exist. For more information, see "Creating default users and groups."
2. Authorize the LDAP groups within the Dashboard Application Services Hub. For more information, see "Authorizing LDAP groups within the Dashboard Application Services Hub" on page 100.
3. Remove duplicate users from the file-based user repository. For more information, see "Removing duplicate users from the file-based user repository" on page 102.

Creating default users and groups:

IBM Service Management Unite requires a set of default users and groups. These users and groups are created during the installation of IBM Service Management Unite.

If you configured a new LDAP user repository after IBM Service Management Unite is installed, the default users and groups are created in the local file-based user repository by the installer. In this case, manually create the default users and groups also in the LDAP repository and later delete the old definitions from the file-based repository.

During installation, users and groups are created and mapped to a group role automatically. Table 1 lists these user IDs and user groups and shows which group role they are assigned to.

Table 12. Default user IDs and groups of the Service Management Unite Automation

Default user IDs	Default groups	Group roles
eezadmin, eezdmn	EEZAdministratorGroup	EEZAdministrator
	EEZOperatorGroup	EEZOperator
	EEZConfiguratorGroup	EEZConfigurator
	EEZMonitorGroup	EEZMonitor

The following steps describe how to set up the default users (for example `eezadmin`), and groups (for example `EEZAdministratorGroup`) in the LDAP repository. If you choose to use different names for users and groups, adjust the described steps.

Procedure

1. Log in to the administrative console.
2. Click **Users and Groups > Manage Users** to create users.

3. Click **Create . . .** to create a new user. Enter the user ID for `eezadmin` and `eezdmn`.
4. Click **Create** to create both users.
5. Click **Users and Groups > Manage Groups** to create groups.
6. Click **Create . . .** to create a new group. Enter the group name of the following groups:
   - `EEZAdministratorGroup`
   - `EEZConfiguratorGroup`
   - `EEZMonitorGroup`
   - `EEZOperatorGroup`
7. Click **Create** to create all groups.
8. To add `eezadmin` to the following group, click the **Group** name of the following groups and proceed as follows:
   - `EEZAdministratorGroup`
9. Select the **Members** tab on the selected group page.
10. Click **Add Users . . .**
11. Enter the user name `eezadmin` into the **Search** field or enter * to see all users.
12. Click **Search**.
13. Select `eezadmin` and click **Add**.
14. Repeat step 8 - 13 to add **eezadmin** to more than one group.
15. To add `eezdmn` to the **`EEZAdministratorGroup`**, click the **Group** name.
16. Select the **Members** tab on the selected group page.
17. Click **Add Users . . .**.
18. Enter the user name **eezdmn** into the search field or enter * to see all users.
19. Click **Search**.
20. Select `eezdmn` and click **Add**.

You created the default users and groups. Since an LDAP repository is shared across multiple IBM Service Management Unite installations, the users and groups must be created only once and can then be used by all IBM Service Management Unite installations that are configured for this LDAP repository.

What to do next

- If you chose non-default group names, the role mapping for the EEZEAR application must be updated, see "Updating the user and role mapping for the EEZEAR application."
- Next, assign roles to these groups, so that users that belong to a group have the expected access rights to work with System Automation dashboards in the Dashboard Application Services Hub, see "Authorizing LDAP groups within the Dashboard Application Services Hub" on page 100.

Updating the user and role mapping for the EEZEAR application:

If your LDAP user repository uses non-default group names, roles that are used by the IBM Service Management Unite must be adjusted to the group names. If your LDAP user repository uses the default group names, no further action is required.

Procedure

1. Log in to the administrative console as a WebSphere administrative user.

2. Click **Applications > Application Types > WebSphere enterprise application** in the navigation tree on the left side.
3. Click **EEZEAR**.
4. Click **Security role to user/group mapping**.
5. To change the mapping according to your settings, select a role and click **Map Groups.....**
6. Enter in the **Search** field the name of the group you are looking for, or use * to see all available groups.
7. Select the appropriate group and move it to the **Selected** list by using the arrow button >>.
8. Remove the groups that you don't use. Otherwise, errors can occur in the WebSphere logs.
9. Save the settings to the master configuration and restart the WebSphere Application Server.

Adapting installation variables:

If you ported from a file-based user repository to a central LDAP user repository that is shared by multiple IBM Service Management Unite installations, adapt an installation variable that defines whether a local or an external user repository is used. Otherwise, a later uninstallation of this IBM Service Management Unite installation deletes the default users and groups from the LDAP repository.

Procedure

To adapt the installation variables, apply the following change:

Change the variable `EXTERNAL_USER_REP_ACTIVATE` in file `<EEZ_INSTALL_ROOT>/uninstall/installvariables.properties` to `false`: `EXTERNAL_USER_REP_ACTIVATE=false`.

Authorizing LDAP groups within the Dashboard Application Services Hub:

Users must have specific roles to work with dashboards that are available in the Dashboard Application Services Hub (DASH). This role assignment is configured in the DASH. Assign the required roles on the user group level, so that all users that belong to a group inherit the same roles.

Roles are assigned to user groups and users during the installation of IBM Service Management Unite.

If you configured a new LDAP user repository after IBM Service Management Unite is installed (see post-defined setup), assign the expected roles to the groups and users that are available in the LDAP repository. At the time of the installation of IBM Service Management Unite Automation, the roles are assigned to the groups, and users are created in the local file-based user repository.

Table 13. Role to group assignments:

Role	Group name
`EEZMonitor`	`EEZMonitorGroup`
`EEZOperator`	`EEZOperatorGroup`
`EEZConfigurator`	`EEZConfiguratorGroup`
`EEZAdministrator`	`EEZAdministratorGroup`

The iscadmins role is assigned to the default System Automation administrator (for example eezadmin) and to the default WebSphere administrative user (for example wasadmin):

Table 14. Role to user ID assignment

Role	User ID
iscadmins	eezadmin, wasadmin

You must have at least one user that has the iscadmins role.

Procedure

1. Log in to the **Dashboard Application Services Hub** by using the WebSphere administrative user ID that you specified during installation of Jazz for Service Management (for example wasadmin). This user is in the file-based repository and has the iscadmins role that allows this user to change role assignments.
2. Click Console Settings > Roles in the navigation bar.
3. Click the EEZAdministrator role and then expand the **Users and Groups** section. The **Users and Groups** tables display the current list of users and groups to which the EEZAdministrator role is assigned. If you configured LDAP after IBM Service Management Unite is installed (post-defined setup), the **Groups** table displays the following entry: cn=EEZAdministratorGroup,o=defaultWIMFileBasedRealm. This default configuration is made by the installer that assigns the EEZAdministrator role to the EEZAdministratorGroup that is created in the file-based user repository.
4. Click + (Add Group) in the toolbar of the **Groups** table to add the corresponding EEZAdministratorGroup that exists in the LDAP repository. The Available Groups window opens.
5. Enter EEZ* in the **Group ID** field and click **Search** to list all groups that begin with EEZ from the configured federated repositories. The results table lists all EEZ* groups from both the file-based repository and the LDAP repository.
6. Select the EEZAdministratorGroup that is defined in LDAP and click **Add** and then **Save**.

   Note: Ensure that you select the group that is defined in LDAP and not the one with the same name that still exists in the file-based repository by examining the distinguished name. If you use other group names in LDAP than you previously used in the file-based repository, you can also assign the EEZ-roles to groups named differently. In this case also adjust the group configuration for the EEZEAR application.
7. Repeat steps 3 – 6 for all EEZ* roles (EEZAdministrator, EEZConfigurator, EEZMonitor, EEZOperator). Adjust the mappings so that they match the expected role assignments as listed in the table.
8. Finally, assign the iscadmins role to either one of your LDAP groups or to individual LDAP users. For example, if you want all your EEZAdministrator users to modify existing dashboards or define new dashboards in the DASH, assign the iscadmins role to the LDAP-based EEZAdministratorGroup.

Removing duplicate users from the file-based user repository:

During the porting from a file-based user repository to an LDAP-based user repository, you might have users and groups that have the same name in both repositories. This setting leads to problems when you try to log on with one of the users that exists in both user repositories.

Procedure

For example, if the functional user id used by the IBM Service Management Unite (default: `eezdmn`) is in the file-based and in the LDAP repository, the `EEZEAR` application does not start. This prevents the `EEZEAR` application from being started. Therefore, you must remove the old System Automation users and groups from the file-based repository.

1. Log in to the **WebSphere administrative console**.
2. Click **Users and Groups > Manage Users**. The users from both the file-based and the LDAP repository are listed.
3. Select the following users:
   a. `eezadmin` with the unique name: `uid=eezadmin,o=defaultWIMFileBasedRealm`
   b. `eezdmn` with the unique name: `uid=eezdmn,o=defaultWIMFileBasedRealm`
4. Click **Delete**. Click **Delete** again in the confirmation dialog to delete both users.
5. Click **Users and Groups > Manage Groups**. The groups from both the file-based and the LDAP repository are listed.
6. Select the following groups:
   a. `EEZAdministratorGroup with the unique name:`

      `cn=EEZAdministratorGroup,o=defaultWIMFileBasedRealm`
   b. `EEZConfiguratorGroup with the unique name:`

      `cn=EEZAdministratorGroup,o=defaultWIMFileBasedRealm`
   c. `EEZMonitorGroup with the unique name:` `cn=EEZMonitorGroup,o=defaultWIMFileBasedRealm`
   d. `EEZOperatorGroup with the unique name:`

      `cn=EEZOperatorGroup,o=defaultWIMFileBasedRealm`
7. Click **Delete**. Click **Delete** again in the confirmation dialog to delete the selected groups from the file-based repository.
8. Restart WebSphere Application Server and verify that you can log on with your LDAP users into the DASH. See the dashboards for which they are enabled according to their role and group assignments. Also, verify that you can still log in to the WebSphere Application Server administrative console by using your administrative user. The administrative user (for example `wasadmin` by default) is still in the file-based repository.

Results

You now ported the default groups and users that are used by IBM Service Management Unite to an LDAP user repository. You can continue to create further users in your newly configured LDAP repository.

What to do next

Optionally, you can define a different user who is in your LDAP repository as an WebSphere administrative user. Assign the following administrative roles to any of your LDAP users by using the WebSphere Application Server administrative console:

1. Admin Security Manager
2. Administrator
3. ISC Admins

Go to **Users and Groups > Administrative user roles** to assign these roles to a new user.

Defining a CURI Data Provider connection

An IBM Tivoli Monitoring CURI Data Provider connection is required to provide monitoring agent data to IBM Service Management Unite.

Each Tivoli Enterprise Monitoring Server has an IBM Tivoli Monitoring CURI Data Provider (ITMcDP) to serve the data.

Attention: To enable the IBM Tivoli Monitoring CURI Data Provider, you must select the **Enable the dashboard data provider** option when configuring the Tivoli Enterprise Portal Server.

1. Start your Tivoli Enterprise Portal interface.
2. Navigate to **Console Settings > Connections**.
3. Under the Server information section, select **HTTP** from the Protocol list.
4. Specify the Tivoli Enterprise Portal Server host name and set the port to `15200`.
5. Specify a valid Tivoli Enterprise Portal Server user ID and password, and click **Search**.
6. Select the radio button for the CURI Data Provider connection that is displayed.
7. Under the Connection information section, enter `ITMSD` in the **Provider ID** field.
8. Select **OK** to complete the CURI Data Provider connection definition.

Working with console preference profiles

Preference profiles are a collection of portal behavior preferences for using the portal. These preferences include the visibility of the navigation tree, contents of the view selection list, and the default view. The portal administrator assigns preference profiles to roles to manage how the navigation area and view selections are displayed to users.

Attention: Each role is limited to one preference profile.

Creating preference profiles

Preference profiles are a collection of console behavior preferences for using the console that are created by the console administrator. Complete the following steps to create a preference profile and assign it to a role:

Procedure

1. Click **Settings > Console Preference Profiles** in the console navigation. The Console Preference Profiles page is displayed with the list of preference profiles that have already been created in the console.
2. Click **New**. The properties panel for the new preference profile is displayed.

3. Required: Enter a descriptive name for the preference profile. Consider how the name reflects the roles that have been assigned to it or the console settings that are defined.
4. Optional: Edit the system-provided unique name for the preference profile. Accept the default value or provide a custom value.
5. Optional: Select a theme for the preference profile. IBM recommends the "IBM Design" theme. A theme dictates how elements of the console are displayed, such as background colors and contrast. You can select a theme, click **Preview**, and go to areas of the console to assess the impact of your selection. The theme that you select is committed only when you save the preference profile; you can preview other themes before deciding which one is appropriate.
6. Indicate whether the navigation tree should be hidden. This option might be preferable when the user has few pages to access and display space in the console is better reserved for page content.
7. Optional: Use the Console Bidirection Options to set the direction to display console content and text. The default option lets the browser dictate the text and content direction. For example, for Arabic and Hebrew the text is displayed right-to-left, whereas for other languages the text is displayed left-to-right. Alternatively, you can decide to set the text and content direction to either left-to-right or right-to-left. In the **Text direction** list, you can also select **Contextual Input** so that for portlets that include text entry fields, the direction of text is dependent on the language used to enter data.
8. Select which view options should be available for users in the role.
9. Expand the section **Roles Using this Preference Profile**.
10. Click **Add** and select one or more roles to use this preference profile. When assigning roles, you might notice some roles missing from the list. This means they are assigned to another preference profile. The role must be removed from the other profile before it can be assigned to this one.
11. Select the default console view for this preference profile. The default view is the one that is selected when users in this role log in to the console. This field is enabled when at least one role has been added for this preference profile.
12. Click **Save** to save your changes and return to Console Preference Profiles.

Results

The new preference profile is created and listed on the main panel for Console Preference Profiles.

Editing console preference profiles

Preference profiles are a collection of console behavior preferences for using the console that are created by the console administrator. Complete the following steps to change the properties or roles assigned to a preference profile:

Procedure

1. In the navigation pane, click **Settings > Console Preference Profiles**. The Console Preference Profiles page is displayed with the list of preference profiles that have already been created in the console.
2. Click the name of the preference profile that you want to edit. The properties panel for the preference profile is displayed.
3. Enter a descriptive name for the preference profile.
4. Edit the system-provided unique name for the preference profile. Accept the default value or provide a custom value.

5. Optional: Select a theme for the preference profile. A theme dictates how elements of the console are displayed, for example, background colors and contrast. You can select a theme, click **Preview**, and navigate to areas of the console to assess the impact of your selection. The theme that you select is committed only when you save the preference profile; you can preview other themes before deciding which one is appropriate.
6. Indicate whether the navigation tree should be hidden. This might be preferable when the user has few pages to access and display space in the console is better reserved for page content.
7. Optional: Use the Console Bidirection Options to set the direction to display console content and text. The default option lets the browser dictate the text and content direction. For Arabic and Hebrew, for example, the text is displayed right-to-left, whereas for other languages the text is displayed left-to-right. Alternatively, you can decide to set the text and content direction to either left-to-right or right-to-left. In the **Text direction** list, you can also select **Contextual Input** so that for portlets that include text entry fields, the direction of text is dependent on the language used to enter data.
8. Select which view options should be available for users in the role.
9. Expand the section **Roles Using this Preference Profile**.

Option	Description
To add roles	Click **Add** and select one or more roles to add to the list. Click **OK** when you have made all of your selections. **Note:** If a role is not listed, it likely means that it has been assigned to another preference profile.
To remove roles	Select one of more roles in the list and click **Remove**. Be certain of your selections. When you delete, there is no warning prompt and the action cannot be undone.
To assign a default view	Select from the **Default console view** section to the side of the role list.

10. Click **Save** to save your changes.

Deleting console preference profiles

Preference profiles are a collection of console behavior preferences for using the console that are created by the console administrator. Complete the following steps to delete a preference profile:

Procedure

1. Click **Settings > Console Preference Profiles** in the navigation pane. The Console Preference Profiles page is displayed with the list of preference profiles that have already been created in the console.
2. Locate the preference profile that you want to delete in the table provided. You can use the filter in the table to type in the preference profile name and quickly display it.
3. In the **Select** column select one or more preference profiles.
4. Click **Delete**. A message is displayed at the top prompting you to confirm the deletion.
5. Click **OK**.

Configuring time intervals for Jazz for Service Management

Jazz for Service Management defines default values for the time intervals within which the browser polls for new content. These default values are higher than the values that are required by System Automation to ensure timely visualization when an automation resource changes its state.

During initial installation of IBM Service Management Unite Automation, the timeout values are adjusted automatically. But when service for Jazz for Service Management is installed afterwards, the original default values are restored.

Perform the following steps after installing service for Jazz for Service Management:

1. Open file `/opt/IBM/JazzSM/ui/properties/ActiveMQBroker.properties`.
2. Ensure that each of the following properties are set to 5 seconds:
   ```
   ActiveMQBroker.timeout=5
   ActiveMQBroker.pollDelay=5
   ActiveMQBroker.pollErrorDelay=5
   ```
3. Save the file and restart WebSphere Application Server.

Modifying the Lightweight Third Party Authentication (LTPA) settings

After the installation of IBM Service Management Unite, you should check whether the LTPA settings are appropriate for your environment.

During installation, the following LTPA parameters are automatically set in WebSphere Application Server:

- LTPA Password is set to the password of the IBM Dashboard Application Services Hub administrator user ID
- LTPA Timeout for forwarded credentials between servers is set to 1440 minutes

  LTPA Timeout is a security-related timeout. Because this timeout is absolute, a user will be logged out and forced to log in to the IBM Dashboard Application Services Hub again when the LTPA timeout is reached even if the user is working with the operations console at the time.

To change the LTPA settings (for example, password and timeout) you use the WebSphere Application Server administrative console. In the administrative console, select **Security > Global Security > Authentication > LPTA**.

Logging on to Service Management Unite

After your environment is installed and configured correctly, log on to Service Management Unite using the web browser and credentials that you defined during the installation. The default DASH login URL is https://*hostname*:16311/ibm/console/logon.jsp.

Displaying the Service Management Unite welcome page

To display the IBM Service Management Unite welcome page when you log in, your WebSphere Application Server user ID must be granted a minimum System Automation group permission of `EEZMonitor`.

This group permission can be set in the WebSphere Application Server administrative console by going to **Users and Groups > Manage Users**. Search for the user ID, click its name, and then open the **Groups** tab and add the necessary EEZ group permissions. Additional group permissions, such as `EEZAdministrator`, are required for access to System Automation functions and command execution from pages.

For information on group roles, see "Authorizing users and groups within the Dashboard Application Services Hub" on page 85.

Using the online help

All user, administrative and task information is available in the Service Management Unite dashboard console online help only.

You can access the online help after you have installed Service Management Unite by clicking the ? icon (**Help**) on the dashboard navigation toolbar and selecting **InfoCenter**.

To access context help for widgets on the predefined Service Management Unite Automation and Service Management Unite Performance Management dashboards, click the **Help** button in the top right corner of the widget. Information about data that is used in the widget is displayed in the **General** tab. A technical description of the widget is shown in the **Usage** tab.

Chapter 8. Setting up Service Management Unite with High Availability

To ensure a reliable system with high performance and less downtime, use this information to set up Service Management Unite with high availability.

What is High Availability (HA)?

Availability refers to the time when a service or system is available. High availability is a quality of a system that assures a high level of operational performance for a given period.

Related concepts:

Load balanced cluster
A group of servers that act as a single system and provide continuous uptime.

Downtime
Time periods when a system is unavailable or unresponsive.

Load balancing
An effective way to increase the availability of web-based applications. When server failure instances are detected, the traffic is automatically redistributed to servers that are still running. It facilitates higher levels of fault tolerance within service applications.

Failover
The process by which one node takes over the job of another when it becomes unavailable.

Why is High Availability important?

When a server goes down, the entire system always becomes unavailable. However, in an HA environment, if a node in the cluster stops working, other active nodes in the cluster can take over services to keep on working. In other words, systems with high availability can avoid this kind of problems by eliminating single point of failure and thus increase reliability.

An SMU environment with high availability has the following capabilities:

Data Synchronization
After the load balancer is set up, all changes in the SMU console are stored in a common repository. In a cluster, updates that require synchronization are first committed to the database. At the same time, the node that submits the update notifies all other nodes in the cluster about the change. When other nodes in the cluster are notified, they get the updates from the database and commit the changes to the local configuration.

If data fails to be committed on a node, a warning message is written in the log file. The node is prevented from making its own updates to the database. Restarting the Jazz for Service Management application server instance on the node resolves most synchronization issues. Otherwise, the node must be removed from the cluster for corrective actions. For more information, see “Maintaining a load balanced cluster” on page 129.

Load balancing

The web server plug-in dispatches workload to different nodes by using the round robin method. When a browser connects to the HTTP server, it is directed to one of the configured nodes. When another browser connects to this HTTP server, it is directed to a different node.

SMU failover

When one of the nodes in the cluster fails, the workload is redirected to other active nodes, and thus eliminate single point of failure in the infrastructure.

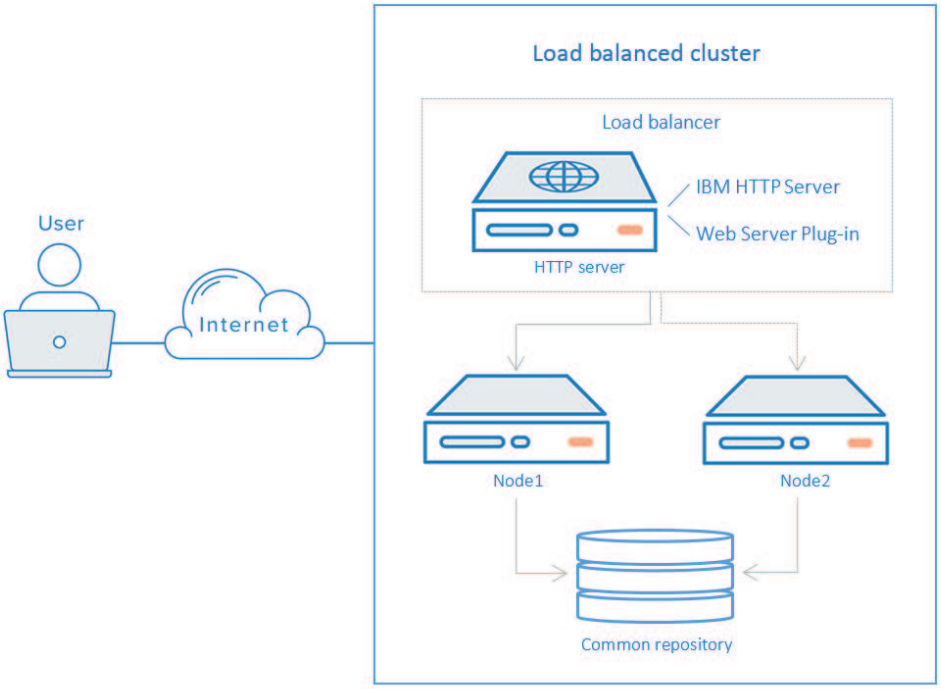
Note: Workload is distributed by session, not by request. If a node in the cluster fails, users who are in session with that node must log back in to access the Dashboard Application Services Hub. Any unsaved work is not recovered.

TDI failover

When the primary Tivoli Directory Integrator (TDI) server is down, data traffic is redirected to the secondary TDI server.

What makes SMU High Availability?

To set up a high available Service Management Unite, you need at least two servers for running Dashboard Application Services Hub (DASH), and one server for DB2, IBM HTTP Server and Web Server Plug-ins. The following diagram shows a Service Management Unite instance deployed in a high availability environment:



For the back-end IBM Tivoli Monitoring (ITM) setup, you can configure multiple portal servers for high availability and disaster recovery. Use one of the portal servers as master read/write portal server for customization data, and one or more read-only portal servers for data backup and recovery. To keep data synchronized in real-time between portal servers, you need to export data from the master portal server if there's any customization change and import it into any other portal servers. Use the Tivoli Monitoring migrate-export and migrate-import commands to replicate data between portal servers. For detailed instructions, see Replicating the Tivoli Enterprise Portal Server database.

System Automation for Multiplatforms (SA MP) that is included in the ITM package provides an HA cluster solution for Linux. You can set up a load balanced cluster with SA MP for TDI servers and portal servers if you install TDI and portal servers on separate servers. For more information, see High availability in System Automation for Multiplatforms documentation. Otherwise, if no HA cluster is configured for TDI servers and portal servers, you need to restart the portal server if it becomes unavailable.

To set up a high available environment, complete the following steps:

1. Go through the tasks that are described in Chapter 5, “Installing and uninstalling,” on page 25 to install Service Management Unite Automation on at least two servers.
   a. Install Jazz for Service Management and WebSphere Application Server.
   b. Optional: Configure Jazz for Service Management to use the LDAP for a central user registry.

      Note:

      - For ease of operation, it's highly recommended to configure the LDAP registry before you install Service Management Unite Automation.
      - Each node in the cluster must be enabled to use the same LDAP with the same user and group configuration.
   c. Install Tivoli Directory Integrator server. You can install TDI on the same server where DASH is installed, or install it on separate servers.
   d. Install SMU Automation and SMU Performance Management.

      Note:

      - When you install Service Management Unite and the related prerequisites, you must ensure all the user IDs and passwords are the same on different servers.
2. Go through the information in this chapter to complete the other steps.

Creating a common repository

In an HA environment, a common repository is used to store the console changes. These changes are synchronized to all of the nodes in the cluster using a common database.

Before you begin

If you do not have an existing supported DB2 installation, install the IBM DB2 server. See Installing DB2 database servers in the IBM DB2 Knowledge Center.

The DB2® database manager must be running before you create database instances. Issue the following command to start the database manager:

```
db2start
```

Procedure

1. Log in to the DB2 server. The default user ID is **db2inst1**.
2. Issue the following command to create a DB2 database:

```
db2 create database database_name
```

The database is shared as a common repository for SMU servers. The database administrator must have the authority to create tables.

3. Optional: To view the detailed information of the database that you create, issue the following command:

   ```
   db2 list database directory
   ```

Preparing the DASH nodes for load balancing

A load balanced cluster includes at least two nodes that share information through common repository. Use this information to create and configure a load balanced cluster.

1. "Setting up a load balanced cluster."
2. "Adding other nodes to a load balanced cluster" on page 114.
   a. "Exporting data from a DASH server" on page 116.
   b. "Importing data to the cluster" on page 116.
3. "Enabling server-to-server trust" on page 117.
4. "Verifying the load balancing implementation in DASH" on page 118.

For more background information on configuring load balancing for the Dashboard Application Service Hub, refer to Load balancing for Dashboard Application Services Hub.

Setting up a load balanced cluster

Load balancing is ideal for Dashboard Application Services Hub installations with a large user population. When a node in a cluster fails, new user sessions are directed to other active nodes. To enable load balancing, you must create a load balanced cluster first.

Procedure

1. Check that you have the JDBC driver for DB2 on the server where Dashboard Application Services Hub is installed. The JDBC driver is available at:

   JazzSM_HOME/lib/db2

   The default directory of *JazzSM_HOME* is /opt/IBM/JazzSM.
2. Log in to **WebSphere Administrative Console**.
3. Create a JDBC provider for the DASH server.
   a. On the navigation bar, click **Resources** > **JDBC** > **JDBC providers** to open the **JDBC providers** page.
   b. From the drop-down list of **Scope**, select the server scope where Dashboard Application Services Hub is installed, for example, Node=JazzSMNode01, Server=server1.
   c. Click **New...** to open the **Create a new JDBC Provider** pane.
   d. Complete the fields to set the basic configuration of a JDBC provider and click **Next**.
      - Select DB2 as the database type.
      - Select DB2 Universal JDBC Driver Provider as the provider type.
      - Select Connection pool data source as the implementation type.
      - Accept the default name of the provider or specify a new name.

e. In pane **Step 2: Enter database class path information**, set the class path, directory location, and native library path. For example:
   - Class path:

     ```
     ${DB2UNIVERSAL_JDBC_DRIVER_PATH}/db2jcc.jar
     ${UNIVERSAL_JDBC_DRIVER_PATH}/db2jcc_license_cu.jar
     ${DB2UNIVERSAL_JDBC_DRIVER_PATH}/db2jcc_license_cisuz.jar
     ```
   - Directory location for "db2jcc_license_cisuz.jar": `*JazzSM_HOME*/lib/db2`.
   - Native library path: `*JazzSM_HOME*/lib/db2`.

f. Click **Next** to go over a summary of the actions. If all the settings are correct, click **Finish**.

g. Click **Save** to save all your changes. A new JDBC provider is created.

4. Create a data source for the DASH server.

   a. On the navigation bar, click **Resources** > **JDBC** > **Data sources** to open the **Data sources** page.

   b. From the drop-down list of **Scope**, select the server scope where Dashboard Application Services Hub is installed, for example, `Node=JazzSMNode01, Server=server1`.

   c. Click **New...** to open the **Create a data source** pane.

   d. Complete the fields to set the basic configuration of a data source, and then click **Next** to proceed.
      - In the **Name** field, type `tipds`.
      - In the **JNDI Name** field, type the name of Java™ Naming and Directory Interface (JNDI), for example, `jdbc/tipds`.

        The application server uses the JNDI name to bind resource references for an application to this data source.

   e. In pane **Step 2: Select JDBC provider**, select the JDBC provider that you created, for example, `DB2 Universal JDBC Driver Provider`.

   f. In pane **Step 3: Enter database specific properties for the data source**, set the following properties:
      1) Driver type: `4`
      2) Type the database name, server name, and port number that is created in DB2 server.
      3) Check the **CMP** check box.

   g. In pane **Step 4: Setup security aliases**, right-click the link **Global J2C authentication alias** and click **Open Link in New Tab**. The J2C authentication data pane is displayed.
      1) Click **New** to define a new alias.
      2) Specify the properties for Java Connector security to use. The J2C authentication alias must be created using a DB2 user ID that has the authority to create and modify database tables.
      3) Click **OK** to save your settings.

   h. Go back to the **Create a data source** pane, and select the authentication values for the data resource. For example,
      - Select `JazzSMNode01/db2inst1` as the Component-managed authentication alias.
      - Select `DefaultPrincipalMapping` as the Mapping-configuration alias.
      - Select `JazzSMNode01/db2inst1` as the Container-managed authentication alias.

i. Go through the summary of actions, and click **Finish** to save the configuration and exit the pane.

j. Click **Save** to save all the changes to the master configuration.

5. Restart the DASH server.

   For example, in the *JazzSM_HOME*/profile/bin directory, for a server that is named *server1*, issue the following commands to stop and start the server:

   ```
   ./stopServer.sh server1
   ./startServer.sh server1
   ```

Results

The load balanced cluster is created and the DASH node is added to the cluster as the first node.

What to do next

Add other DASH nodes to the cluster.

Adding other nodes to a load balanced cluster

A load balanced cluster includes more than one node so that user sessions can be evenly distributed. Add other nodes after you set up the cluster.

Before you begin

- If you add a node that contains custom data, ensure that you export all of its data first. For information about how to export data from a server, see "Exporting data from a DASH server" on page 116.
- Make sure that a load balanced cluster is created as described in Setting up a load balanced cluster.
- If the cluster uses any customization changes in consoleProperties.xml, copy the customized consoleProperties.xml to the same location on the node that you want to add.

Procedure

1. Check that you have the JDBC driver for DB2 on the server where Dashboard Application Services Hub is installed. The JDBC driver is available at:

   JazzSM_HOME/lib/db2

   The default directory of *JazzSM_HOME* is /opt/IBM/JazzSM.
2. Log in to **WebSphere Administrative Console**.
3. Create a JDBC provider for the DASH server.
   a. On the navigation bar, click **Resources** > **JDBC** > **JDBC providers** to open the **JDBC providers** page.
   b. From the drop-down list of **Scope**, select the server scope where Dashboard Application Services Hub is installed, for example, Node=JazzSMNode01, Server=server1.
   c. Click **New...** to open the **Create a new JDBC Provider** pane.
   d. Complete the fields to set the basic configuration of a JDBC provider and click **Next**.
      - Select DB2 as the database type.
      - Select DB2 Universal JDBC Driver Provider as the provider type.
      - Select Connection pool data source as the implementation type.
      - Type the name of the provider in the **Name** field.

e. In pane **Step 2: Enter database class path information**, set the class path, directory location, and native library path. For example:
   - Class path:

     ```
     ${DB2UNIVERSAL_JDBC_DRIVER_PATH}/db2jcc.jar
     ${UNIVERSAL_JDBC_DRIVER_PATH}/db2jcc_license_cu.jar
     ${DB2UNIVERSAL_JDBC_DRIVER_PATH}/db2jcc_license_cisuz.jar
     ```
   - Directory location for "db2jcc_license_cisuz.jar": `JazzSM_HOME/lib/db2`.
   - Native library path: `JazzSM_HOME/lib/db2`.

f. Click **Next** to go over a summary of the actions. If all the settings are correct, click **Finish**.

g. Click **Save** to save all your changes. A new JDBC provider is created.

4. Create a data source for the DASH server.

   a. On the navigation bar, click **Resources** > **JDBC** > **Data sources** to open the **Data sources** page.

   b. From the drop-down list of **Scope**, select the server scope where Dashboard Application Services Hub is installed, for example, `Node=JazzSMNode01, Server=server1`.

   c. Click **New...** to open the **Create a data source** pane.

   d. Complete the fields to set the basic configuration of a data source, and then click **Next** to proceed.
      - In the **Name** field, type `tipds`.
      - In the **JNDI Name** field, type the name of Java™ Naming and Directory Interface (JNDI), for example, `jdbc/tipds`.

        The application server uses the JNDI name to bind resource references for an application to this data source.

   e. In pane **Step 2: Select JDBC provider**, select the JDBC provider that you created, for example, `DB2 Universal JDBC Driver Provider`.

   f. In pane **Step 3: Enter database specific properties for the data source**, set the following properties:

      1) Driver type: `4`

      2) Type the database name, server name, and port number that is created in DB2 server.

      3) Check the **CMP** check box.

   g. In pane **Step 4: Setup security aliases**, right-click the link **Global J2C authentication alias** and click **Open Link in New Tab**. The J2C authentication data pane is displayed.

      1) Click **New** to define a new alias.

      2) Specify the properties for Java Connector security to use. The J2C authentication alias must be created using a DB2 user ID that has the authority to create and modify database tables.

      3) Click **OK** to save your settings.

   h. Go back to the **Create a data source** pane, and select the authentication values for the data resource. For example,
      - Select `JazzSMNode01/db2inst1` as the Component-managed authentication alias.
      - Select `DefaultPrincipalMapping` as the Mapping-configuration alias.
      - Select `JazzSMNode01/db2inst1` as the Container-managed authentication alias.

i. Go through the summary of actions, and click **Finish** to save the configuration and exit the pane.

j. Click **Save** to save all the changes to the master configuration.

5. Restart the DASH server.

   For example, in the *JazzSM_HOME*/profile/bin directory, for a server that is named *server1*, issue the following commands to stop and start the server:

   ```
   ./stopServer.sh server1
   ./startServer.sh server1
   ```

Results

The DASH node is successfully added to the cluster.

Exporting data from a DASH server

You can export data from an existing stand-alone DASH server to create a data file that can be imported to a load balanced cluster.

About this task

Before you add a node that contains custom data to an existing cluster, you must export the data first. The exported data is later imported to one of the nodes in the cluster so that it is replicated across the other nodes in the cluster.

Procedure

1. Browse to the directory: *DASH_HOME*/bin/. The default directory of *DASH_HOME* is /opt/IBM/JazzSM/ui.
2. Issue the following command (as one line) to export the custom data from the DASH server:

   ```
   ./consolecli.sh export --username console_admin_user_ID --password console_admin_password
    --destination data_file
   ```

   Where:

   console_admin_user_ID
   Specifies the administrator user ID.

   console_admin_password
   Specifies the password that is associated with the administrator user ID.

   data_file
   Specifies the path and file name of the exported data, for example, /opt/IBM/JazzSM/data.tar.

What to do next

After you export the custom data, join the node to the cluster and then import custom data to the nodes in the cluster.

Importing data to the cluster

After you export custom data from a node and add the node to the cluster, you can import the data to any node in the cluster. The data will be replicated across the cluster.

Procedure

1. Browse to the directory: *DASH_HOME*/bin/. The default directory of *DASH_HOME* is /opt/IBM/JazzSM/ui.
2. Issue the following command (as one line) to import the custom data from the node:

   ```
   ./consolecli.sh import --username console_admin_user_ID --password console_admin_password
    --source data_file
   ```

   Where:

   console_admin_user_ID
   Specifies the administrator user ID.

   console_admin_password
   Specifies the password that is associated with the administrator user ID.

   data_file
   Specifies the path and file name of the data file to be imported, for example, /opt/IBM/JazzSM/data.tar.

Results

The data is imported and replicated across the other cluster nodes.

Enabling server-to-server trust

To enable nodes to connect to each other and send notifications, you must update SSL properties files for all nodes and retrieve signers to enable trust.

Procedure

1. Browse to the directory *JazzSM_WAS_Profile*/properties and open the ssl.client.props file.

   The default directory of *JazzSM_WAS_Profile* is /opt/IBM/JazzSM/profile.
2. Uncomment the section that starts with com.ibm.ssl.alias=AnotherSSLSettings, for example,

   ```
   com.ibm.ssl.alias=AnotherSSLSettings
   com.ibm.ssl.protocol=SSL_TLS
   com.ibm.ssl.securityLevel=HIGH
   com.ibm.ssl.trustManager=IbmX509
   com.ibm.ssl.keyManager=IbmX509
   com.ibm.ssl.contextProvider=IBMJSSE2
   com.ibm.ssl.enableSignerExchangePrompt=true
   com.ibm.ssl.keyStoreClientAlias=default
   com.ibm.ssl.customTrustManagers=
   com.ibm.ssl.customKeyManager=
   com.ibm.ssl.dynamicSelectionInfo=
   com.ibm.ssl.enabledCipherSuites=
   ```
3. Uncomment the section that starts with # TrustStore information, for example,

   ```
   # TrustStore information
   com.ibm.ssl.trustStoreName=AnotherTrustStore
   com.ibm.ssl.trustStore=${user.root}/etc/trust.p12
   com.ibm.ssl.trustStorePassword={xor}CDo9Hgw=
   com.ibm.ssl.trustStoreType=PKCS12
   com.ibm.ssl.trustStoreProvider=IBMJCE
   com.ibm.ssl.trustStoreFileBased=true
   com.ibm.ssl.trustStoreReadOnly=false
   ```

4. Update the value of **com.ibm.ssl.trustStore** in the `# TrustStore information` section. This property value represents the location of the trust store that the signer should be added to, for example,

   ```
   com.ibm.ssl.trustStore=${user.root}/config/cells/JazzSMNode01Cell/nodes/JazzSMNode01/trust.p12
   ```
5. Save and exit the `ssl.client.props` file.
6. Restart the server.

   In the *JazzSM_HOME*`/profile/bin` directory, for a server that is named *server1*, issue the following command to stop and start the server:

   ```
   ./stopServer.sh server1
   ./startServer.sh server1
   ```
7. Repeat steps 1-6 on all the nodes before you continue with the next steps.
8. Issue the following command (as one line) on each node to enable trust with each other in the cluster.

   ```
   JazzSM_WAS_Profile/bin/retrieveSigners.sh NodeDefaultTrustStore AnotherTrustStore
    -host myremotehost -port remote_SOAP_port
   ```

   Where

   myremotehost

   The name of the computer to enable trust with

   remote_SOAP_port

   The SOAP connector port number. The default value is 16313. If you installed with non-default ports, check the value of **SOAP_CONNECTOR_ADDRESS** in file `JazzSM_WAS_Profile/properties/portdef.props`.
9. Restart the servers.

Verifying the load balancing implementation in DASH

After you add all the nodes into the cluster and enable server-to-server trust, verify that the DASH load balancing setup is working correctly.

About this task

You can verify the following functions through the verification process:

- The database that is used for the load balanced cluster is properly created and initialized.
- Every node in the cluster uses the database instead of its own local file system as its repository.
- Server-to-server trust is properly enabled between nodes in the cluster.

Procedure

1. Ensure that each JazzSM application server on every node in the cluster is running.

   To check the server status, change to the directory *JazzSM_HOME*`/profile/bin` and issue the following command:

   ```
   ./serverStatus.sh server1
   ```
2. Log in to the web console of any DASH node.
3. Customize the console as needed, for example, create a new page and save the changes.
4. Log in to other nodes in the cluster and check if the newly created page is available.

Preparing the HTTP server for load balancing

IBM HTTP Server uses a web server plug-in to dispatch HTTP requests to the Jazz for Service Management application server. Install and configure the HTTP server and web server plug-in to act as the load balancing server to pass requests (HTTPS or HTTP) to the nodes in the cluster.

Procedure

1. "Installing IBM HTTP Server and Web Server Plug-ins."
2. "Creating web server definitions" on page 121.
3. "Creating a CMS-type key database" on page 122.
4. Create a self-signed certificate to allow SSL connections between nodes.
5. "Enabling SSL communication" on page 123.
6. "Verifying SSL communication" on page 124.

Installing IBM HTTP Server and Web Server Plug-ins

Use IBM Installation Manager to install IBM® HTTP Server and Web Server Plug-ins for IBM WebSphere Application Server.

Before you begin

Before you install IBM HTTP Server and Web Server Plug-ins, ensure that you installed IBM Installation Manager.

Procedure

1. Add the product repositories to Installation Manager preferences.

   Note: Jazz for Service Management bundles the WebSphere Application Server Version 8.5 Supplements installation media, which contains the installation packages for IBM HTTP Server and the IBM HTTP Server plug-in for IBM WebSphere Application Server. If you do not have the DVDs, you can download the electronic images for Jazz for Service Management, see Downloading Jazz for Service Management.

   a. Start Installation Manager.
   b. Select **File** > **Preferences**, and then click **Add repository**.
   c. Browse to the directory where you extracted the installation packages of IBM HTTP Server and Web Server Plug-ins, and select the following repository files:
      - `diskTag.inf` from the JDK directory, for example, `/`*`WAS_DIR`*`/`*`version_number`*`/java8/disk1/diskTag.inf`. It is used to install the required Java SDK.

        Note: For new installations of IBM HTTP Server version 8.5.5.11 and later, the default Java SDK is Java SE 8. Java 8 is the recommended Java SDK because it provides the latest features and security updates. You can continue to use Java SE 6, but no service can be provided after the end of support in April 2018, which might expose your environment to security risks.
      - `repository.config` from `/`*`WAS_DIR`*`/`*`version_number`*`/supplements/ihs/`, which is used to install IBM® HTTP Server.
      - `repository.config` from `/`*`WAS_DIR`*`/`*`version_number`*`/supplements/plugins/`, which is used to install Web Server Plug-ins.

- `repository.config` from `/`*`WAS_DIR`*`/`*`version_number`*`/supplements/wct/`, which is used to install WebSphere Customization Toolbox.

  Note: For IBM HTTP Server for WebShere Application Server V8 and later, you must install WebSphere Customization Toolbox together to do further configuration.

d. Click **OK** to save and exit the **Preferences** pane.

2. In the Installation Manager pane, click **Install**. Installation Manager searches its defined repositories for available packages.
3. In the **Install Packages** pane, select the following products to install, and then click **Next**.
   - IBM HTTP Server for WebSphere Application Server
   - Web Server Plug-ins for IBM WebSphere Application Server
   - WebSphere Customization Toolbox
4. Accept the terms in the license agreements and click **Next**.
5. Specify a path in the **Shared Resources Directory** field, or use the default path `/opt/IBM/IMShared`, and then click **Next**.

   The shared resources directory is the directory where installation artifacts are stored so that they can be used by one or more product package groups. You can specify the shared resources directory only when you install a package for the first time.
6. Specify the installation root directory for the product binary files, which are also referred to as the core product files or system files. The default directory is `/opt/IBM/HTTPServer`.
7. If you install IBM HTTP Server on a 64-bit system, choose a 32-bit or 64-bit HTTP server environment and click **Next**.

   Note:
   - This option is displayed only if you install on a 64-bit system. You cannot modify this installation later and change this selection.
   - This option does not apply to Solaris x86 64-bit systems.
8. Select the translations to install and click **Next**.
9. Select the features to install and click **Next**.

   By default, all the features are selected. You can deselect the products if you don't need them. For example, if you don't need to build and process definitions for creating or migrating WebSphere Application Server profiles, clear the selection of Profile Management Tool (z/OS only) and z/OS Migration Management Tool.
10. In the **Common Configurations** pane, specify the HTTP port number for IBM HTTP Server to communicate, and then click **Next**. The default port is 80.
11. Review the summary information and click **Install**.

    A message indicating that installation is successful is displayed if no errors occurr. Otherwise, click **View Log File** to troubleshoot the problem.
12. Click **Finish** to exit.

Results

IBM HTTP Server and Web Server Plug-ins are successfully installed.

Creating web server definitions

Use the WebSphere Customization Toolbox to configure the web server plug-in. The Web Server Plug-ins Configuration Tool creates web server definitions in a default profile.

Procedure

1. Browse to the default directory `/opt/IBM/WebSphere/Toolbox/WCT` and issue the following command to start WebSphere Customization Toolbox:

   ```
   ./wct.sh
   ```

2. Select **Web Server Plug-ins Configuration Tool** and click **Launch Selected Tool**.
3. In tab **Web Server Plug-in Runtime Locations**, click **Add** to add a web server plug-in location to the working set.
   a. Type the name of the web server plug-in in the **Name** field.
   b. Click **Browse** to select the location of the installed web server plug-ins. For example, the default path is `/opt/IBM/WebSphere/Plugins`.
   c. Click **Finish**. The web server plug-in location is successfully added.
4. In tab **Web Server Plug-in Configurations**, click **Create** to create a web server definition.
5. In the **Web Server Plug-ins Configuration Tool** wizard, select the web server (IBM HTTP Server) to configure and click **Next**.
6. Select the architecture of the installed web server and click **Next**.
7. Select the web server configuration file and identify the web server port, and then click **Next**. For example,
   - Select the IBM HTTP Server configuration file: `/opt/IBM/HTTPServer/httpd.conf`.
   - Specify the web server port: `80`.
8. Set up IBM HTTP Server Administrator Server.
   - Select the check box **Set up IBM HTTP Server Administrator Server**.
   - Specify a port number for IBM HTTP Server administration server to communicate, for example, `8008`.
   - Create a user ID for IBM HTTP Server Administrator authentication. You need to use the credentials created here to connect to IBM HTTP Server Administrator from WebSphere Administrator Console.
9. Specify a system user ID and group. For example,
   - User ID: `1001`.
   - Group: `1001`.
10. Specify a unique web server definition name and click **Next**.
11. Select and specify the configuration scenario.
    - Choose the remote configuration scenario if the web server and the application server are not on the same computer. In the remote scenario, specify the host name of the application server.
    - Choose the local configuration scenario if the web server and the application server are on the same computer. In the local scenario, the web server definition is defined automatically in the application server.
12. Review the plug-in configuration summary and click **Configure**. You get a success message if no errors occur during the configuration.

Creating a CMS-type key database

A key database is a file that the web server uses to store one or more key pairs and certificates.

Procedure

Issue the following command (as one line) to create a new key database:

```
<ihsinst>/bin/gskcmd -keydb -create -db <filename> -pw <password>
-type <cms | jks | jceks | pkcsk> -expire <days> -stash
```

Where:

<ihsinst>
The root directory for IBM® HTTP Server. The default value is `/opt/IBM/HTTPServer`.

-keydb -create
The creation of a key database

-db <filename>
The name of the database.

-pw <password>
The password to access the key database.

-type <cms | jks | jceks | pkcsk>
The database type.

Note: IBM HTTP Server supports CMS-type database only.

-expire <days>
The number of days before the password expires. This parameter is valid for only CMS key databases.

-stash
stashes the password for the key database. When the `-stash` option is specified during the key database creation, the password is stashed in a file with a name as follows:

```
<filename_of_key_database>.sth
```

This parameter is valid for only CMS key databases. If the database being created is named `keydb.kdb`, the stash file name is `keydb.sth`.

Note: Stashing the password is required for IBM HTTP Server.

Creating a self-signed certificate

A self-signed certificate provides a certificate to enable Secure Sockets Layer (SSL) sessions between clients and the server. Creating a self-signed certificate generates a self-signed X509 certificate in the identified key database.

Procedure

Issue the following command (as one line) to create a self-signed certificate:

```
<ihsinst>/bin/gskcmd -cert -create -db <filename> -pw <password>
-size <2048 | 1024 | 512> -dn <distinguished_name>
-label <label> -default_cert <yes | no> - expire <days> -ca <true | false>
```

Where:

-cert -create
The creation of a self-signed certificate.

-db <filename>
The name of the database.

-pw <password>
The password to access the key database.

-dn <distinguished_name>
Indicates an X.500 distinguished name. Enter a quoted string of the following format:

"CN=weblinux.raleigh.ibm.com,O=IBM,OU=IBM HTTP Server,L=RTP,ST=NC,C=US", of which only CN, O, and C are required.

-label <label>
A descriptive comment that is used to identify the certificate in the database.

-size <2048 | 1024 | 512>
Indicates a key size of 2048, 1024, or 512. The default key size is 1024. The 2048 key size is available if you are using Global Security Kit (GSKit) Version 7.0.4.14 and later.

-default_cert <yes | no>
Specifies whether this is the default certificate in the key database.

-expire <days>
The number of days before the new self-signed digital certificates expires. The minimum is 1 day and the maximum is 7300 days.

-ca <true | false>
specifies the basic constraint extension to the self-signed certificate. If you set CA:true, the extension is added with a CA:true and PathLen:<max int>. Otherwise, they are not added.

Enabling SSL communication

SSL ensures the data that is transferred between a client and a server remains private. To set up SSL communication, enable the SSL directives in the IBM® HTTP Server configuration file.

Procedure

1. Browse to the directory where the IBM HTTP Server configuration file httpd.conf locates. The default directory is /opt/IBM/HTTPServer/conf/httpd.conf.
2. Open the configuration file and locate the line # End of example SSL configuration.
3. Before the line # End of example SSL configuration, add the following lines in the configuration file and ensure that KeyFile and SSLStashfile reference the key database files that are created in task "Creating a CMS-type key database" on page 122.

```
LoadModule ibm_ssl_module modules/mod_ibm_ssl.so
Listen 443
<VirtualHost *:443>
SSLEnable
SSLProtocolDisable SSLv2
ErrorLog "/opt/IBM/HTTPServer/logs/sslerror.log"
TransferLog "/opt/IBM/HTTPServer/logs/sslaccess.log"
```

```
KeyFile "/opt/IBM/HTTPServer/smuha.kdb"
SSLStashfile "/opt/IBM/HTTPServer/smuha.sth"
</VirtualHost>
SSLDisable
```

For more information about the `httpd.conf` file, see Securing with SSL communications.

4. Save and exit the configuration file.
5. Restart IBM® HTTP Server:

   In the *HTTP_SERVER_PATH*`/bin` directory, issue the following commands to stop and start the IBM HTTP Server:

   ```
   ./apachectl stop
   ./apachectl start
   ```

Verifying SSL communication

SSL enables the client to authenticate the identity of the server. To verify that the SSL communication is enabled, run SSL requests using HTTPS to request an SSL-protected document.

Procedure

Open the browser and enter the url `https://localhost`. You can access to the IBM HTTP Server page if SSL is successfully enabled.

Setting clone IDs for DASH nodes

To distinguish different nodes in the cluster, set a unique clone ID for each node.

Procedure

1. Log in to the node for which you want to set the clone ID. .
2. Browse to the directory *JazzSM_WAS_Profile*`/config/cells/JazzSMNode01Cell/nodes/JazzSMNode01/servers/server1` and open `server.xml`.

   The default directory of *JazzSM_WAS_Profile* is `/opt/IBM/JazzSM/profile`.
3. Add the following line to the `<components xmi:type="applicationserver.webcontainer:WebContainer` section:

   ```
   <properties xmi:id="WebContainer_1183077764084" name="HttpSessionCloneId" value="12345"
   required="false"/>
   ```

   Where:

   `value` is the clone ID for the node. The clone ID must be unique. See the following example of an updated `<components>` section:

   ```
   <components xmi:type="applicationserver.webcontainer:WebContainer"
   xmi:id="WebContainer_1183077764084" enableServletCaching="false" disablePooling="false">
   <stateManagement xmi:id="StateManageable_1183077764087" initialState="START"/>
   <services xmi:type="applicationserver.webcontainer:SessionManager"
    xmi:id="SessionManager_1183077764084" enable="true" enableUrlRewriting="false"
    enableCookies="true" enableSSLTracking="false" enableProtocolSwitchRewriting="false"
    sessionPersistenceMode="NONE" enableSecurityIntegration="false"
    allowSerializedSessionAccess="false" maxWaitTime="5" accessSessionOnTimeout="true">
    <defaultCookieSettings xmi:id="Cookie_1183077764084"domain="" maximumAge="-1"secure="false"/>
    <sessionDatabasePersistence xmi:id="SessionDatabasePersistence_1183077764084"
    datasourceJNDIName="jdbc/Sessions" userId="db2admin" password="{xor}Oz1tPjsyNjE="
    db2RowSize="ROW_SIZE_4KB" tableSpaceName=""/>
    <tuningParams xmi:id="TuningParams_1183077764084" usingMultiRowSchema="false"
    maxInMemorySessionCount="1000" allowOverflow="true" scheduleInvalidation="false"
    writeFrequency="TIME_BASED_WRITE" writeInterval="10"  writeContents="ONLY_UPDATED_ATTRIBUTES"
   ```

```
 invalidationTimeout="30">
 <invalidationSchedule xmi:id="InvalidationSchedule_1183077764084"
 firstHour="14" secondHour="2"/>
 </tuningParams>
 </services>
<properties xmi:id="WebContainer_1183077764084" name="HttpSessionCloneId" value="12345"
required="false"/>
</components>
```

4. Save the changes.
5. Repeat the previous steps for all the nodes in the cluster.

Updating the `plugin-cfg.xml` file

The `plugin-cfg.xml` file determines how the web server plug-in forwards requests. To configure the web server plug-in, update the `plugin-cfg.xml` file.

Procedure

1. Log in to one of the nodes in the cluster.
2. Browse to the directory *JazzSM_WAS_Profile*/bin/ and issue the following command:

   ```
   ./GenPluginCfg.sh
   ```

   This command generates a `plugin-cfg.xml` file and saves it to the *JazzSM_WAS_Profile*/config/cells directory.
3. Complete the previous steps for all the nodes in the cluster.
4. Log in to the HTTP server.
5. Browse to the directory *HTTP_web_server_install_dir*/plugins/config/webserver1 and replace the existing `plugin-cfg.xml` file with the one that is generated in step 2.
6. Edit the new `plugin-cfg.xml` file to include server information that is copied from the generated `plugin-cfg.xml` file on each node in the cluster.
   a. Copy the `<server>` section from the `plugin-cfg.xml` file on each DASH server and add the entry into the `ServerCluster` section.

      The value of `keyring` in the **<Property>** section must be `HTTP_web_server_install_dir/plug-ins/etc/`*xxx*`.kdb` and the value of `stashfile` in the **<Property>** attribute must be `HTTP SERVER PATH /plug-ins/etc/`*xxx*`.sth`.
   b. Add an entry in section `PrimaryServers` for each additional DASH server.

   See the following example of the updated section:

   ```
    <ServerCluster CloneSeparatorChange="false" GetDWLMTable="false" IgnoreAffinityRequests="fals
   LoadBalance="Round Robin" Name="server1_JazzSMNode01_Cluster" PostBufferSize="0"
   PostSizeLimit="-1" RemoveSpecialHeaders="true" RetryInterval="60" ServerIOTimeoutRetry="-1">
   <Server CloneID="19216820017" ConnectTimeout="0" ExtendedHandshake="false"
   MaxConnections="-1" Name="JazzSMNode01_server1" ServerIOTimeout="900" WaitForContinue="false">
           <Transport Hostname="smuha-server05" Port="16310" Protocol="http"/>
           <Transport Hostname="smuha-server05" Port="16311" Protocol="https">
              <Property Name="keyring" Value="/opt/IBM/WebSphere/Plugins/etc/plugin-key.kdb"/>
              <Property Name="stashfile" Value="/opt/IBM/WebSphere/Plugins/etc/plugin-key.sth"/>
           </Transport>
   </Server>
   <Server CloneID="19216820018" ConnectTimeout="0" ExtendedHandshake="false"
   MaxConnections="-1" Name="JazzSMNode02_server1" ServerIOTimeout="900" WaitForContinue="false">
           <Transport Hostname="smuha-server06" Port="16310" Protocol="http"/>
           <Transport Hostname="smuha-server06" Port="16311" Protocol="https">
              <Property Name="keyring" Value="/opt/IBM/WebSphere/Plugins/etc/plugin-key.kdb"/>
              <Property Name="stashfile" Value="/opt/IBM/WebSphere/Plugins/etc/plugin-key.sth"/>
   ```

```
        </Transport>
</Server>
     <PrimaryServers>
        <Server Name="JazzSMNode01_server1"/>
        <Server Name="JazzSMNode02_server1"/>
     </PrimaryServers>
  </ServerCluster>
```

For more information about the `plugin-cfg.xml` file, see plugin-cfg.xml file.

7. Optional: If the DNS server can't parse the names of the nodes, add the mapping relationship in the `hosts` file, for example,

```
192.168.200.17 smuha-server05 smuha-server05.cn.ibm.com
```

Configuring SSL from each node to the IBM HTTP Server

After you install and configure IBM HTTP Server for load balancing, configure SSL between the IBM HTTP Server plug-ins and each node in the cluster.

Procedure

1. Log in to the **WebSphere Administrative Console** of one node.
2. Follow these steps to extract signer certificate from the truststore in node:
   a. In the console navigation pane, click **Security** > **SSL certificate and key management**.
   b. In the **Related Items** area, click **Key stores and certificates**.
   c. In the table, select **NodeDefaultTrustStore**.
   d. In the **Additional Properties** area, click **Signer certificates**.
   e. In the table, select the **root** check box and click **Extract**.
   f. In the **File name** field, enter a certificate file name, for example, `/root/certificate_`*`hostname`*`.arm`.
   g. From the **Data Type** list, select **Base64-encoded ASCII data** and click **OK**.
   h. Copy the extracted signer certificate to the server that IBM HTTP Server is running.
3. Follow these steps to import the extracted signer certificate into the key database on the HTTP server.
   a. Browse to the directory `/`*`HTTP_SERVER_PATH`*`/bin` and issue the following command to start the Key Management Utility (iKeyman):

      ```
      ./ikeyman
      ```

      iKeyman is a component of the IBM SDK that generates keys, certification requests, and self-signed certificates. You can use iKeyman to create certificates to secure communications, and to encrypt and decrypt data.
   b. Select **Key Database File** > **Open**. The open box is displayed.
   c. Select the CMS key database file that is specified in the configuration file `plugin-cfg.xml` and click **OK**. For example,
      - **Key database type**: `CMS`
      - **File Name**: `plugin-key.kdb`
      - **Location**: `/opt/IBM/WebSphere/Plugins/etc`
   d. In the **Password Prompt** window, enter the password for the key database and click **OK**. The default value is `WebAS`.
   e. From the **Key database content** drop-down list, select **Signer Certificates**.

f. Click **Add** and select the signer certificate that you copied from the node, and then click **OK**.

g. In the prompt window, enter a descriptive label for the certificate and click **OK**. The signer certificate is successfully imported into the key database.

h. Select **Key Database File** > **Stash Password** and click **OK** in the prompt window. The password has been encrypted and saved in the stash file.

4. Repeat the previous steps for all the nodes in the cluster.
5. Restart all the nodes in the cluster.

   In the `JazzSM_HOME/profile/bin` directory, for a server that is named *server1*, issue the following commands to stop and start the server:

   ```
   ./stopServer.sh server1
   ./startServer.sh server1
   ```
6. Restart IBM HTTP Server:

   In the `HTTP_SERVER_PATH/bin` directory, issue the following commands to stop and start IBM HTTP Server:

   ```
   ./apachectl stop
   ./apachectl start
   ```

Results

You can access the load balanced cluster through `https://http_server_hostname/ibm/console` if the cluster is configured successfully.

Adding a secondary TDI server

To realize TDI failover, add a secondary TDI server so that data traffic is redirected when the primary TDI server is down.

Procedure

1. Log in to the DASH console.
2. On the navigation bar, click **Console settings** > **Connections**. The **Connections** page is displayed.
3. In the list that displays all configurable connections, right-click **Tivoli Directory Integrator** and select **Edit**. The **Configure: TDI** page is displayed.
4. In the **Secondary TDI Server (URL)** field, enter the URL of your secondary TDI server.
5. Click **OK** to save all the settings.
6. Repeat the previous steps to configure TDI for all the nodes.

Configuring an Event Integration Facility Event Dispatcher

The Event Integration Facility (EIF) event dispatcher forwards events that come from end-to-end adapter (E2E adapter) to the Service Management Unite servers. Use this information to customize the EIF configuration files.

Procedure

1. On the server where Service Management Unite is installed, browse to the following directory: `/opt/IBM/smsz/ing/EIFEventDispatcher`.
2. Extract the file `eezeifeventdispatcher.tar.gz` to a server where both the E2E adapter and the Service Management Unite servers can access, for example, the HTTP server.

3. Specify the following parameters in `receive.conf` to configure settings for the EIF event dispatcher to receive data from the E2E adapter:

   ServerLocation
   The host name of the server where the EIF Event Dispatcher is running. Typically, you can leave the default value: `localhost`.

   SpaceReplacement
   The spaces in the EIF event log are replaced by an underscore if you set `SpaceReplacement=TRUE`.

   ServerPort
   The port number on which the EIF event dispatcher listens for EIF events from the E2E adapter. The default value is `2002`.

   ConnectionMode
   The mode of IP connection. The supported values are as follows:
   - `connection_less`: A new connection is established and ended for each event that is sent.
   - `Connection_oriented`: A connection is established when the event dispatcher is initialized, and is maintained for all events that are sent. A new connection is established only if the connection is lost.

   EventMaxSize
   The maximum number of EIF event messages.

   BufEvtPath
   The location of an EIF buffer cache where the event dispatcher writes events.

4. Configure settings for the EIF event dispatcher to forward data to SMU servers.
   a. Go to the directory `EEZEIFEventDispatcher`, and rename file `send.conf` to `send.conf.bak`.
   b. Create a folder and name it as `send.conf`.
   c. Create as many copies of the `send.conf.bak` file as the number of SMU servers, and then save as the *xxx*`.conf` files in the `send.conf` folder.

      The extension name of the new files must be `.conf`.
   d. Specify the parameters **ServerLocation**, **ServerPort**, and **BufEvtPath**in the configuration file *xxx*`.conf` for each SMU server.

      ServerLocation
      The host name of the server where the SMU server is running.

      ServerPort
      The port number on which the EIF event dispatcher forwards data to the SMU server. The default value is `2002`.

      BufEvtPath
      The location of an EIF buffer cache where the event dispatcher writes events.

      Note: For each SMU server, specify its own EIF buffer cache file. Different SMU servers cannot share the same EIF buffer cache file.

5. Issue the command to start the EIF event dispatcher service:

```
./eifEventDispatcher.sh receive.conf send.conf
```

Verifying the implementation of HA setup

To verify the implementation of HA setup, trace logs to check whether load balancing and failover can be fulfilled.

Before you begin

To collect detailed logs from the web server, you must define the trace information. To enable tracing logs, complete the following steps:

1. Log in to the HTTP server.
2. Browse to the directory where `plugin-cfg.xml` locates and open this file.

   The default directory is `/opt/IBM/WebSphere/Plugins/config/webserver1`.
3. Locate the line `<Log LogLevel = "Error"` and change the value of **`LogLevel`** from `Error` to `Trace`.
4. Restart IBM HTTP Server.
5. Issue the following command to start tracing:

   ```
   tail -f <plugins_root>/logs/http_plugin.log | grep STATS
   ```

   The default directory of `<plugins_root>` is `/opt/IBM/WebSphere/Plugins`.

Procedure

1. To verify the implementation of load balancing, check whether the requests are directed to different nodes when multiple users log in to SMU console.
   a. On different servers, log in to SMU consoles through `https://<`*`httpserver_hostname`*`>/ibm/console`.
   b. Check the logs in `http_plugin.log` to see which nodes the requests are directed to.

      The load balancing is fulfilled if the requests are directed to different nodes.
2. To verify the implementation of failover, check whether the requests are directed to other active nodes when a running node fails.
   a. Log in to SMU console.
   b. Check the logs in `http_plugin.log` to see which node the requests are directed to.
   c. Stop the node that the requests are directed to.
   d. Select and click any menu in SMU console.

      The failover is fulfilled if the login page is displayed, and the requests are directed to another active node.

Maintaining a load balanced cluster

Use the load balancing **`consolecli`** commands to analyze and update the nodes in the cluster.

The consolecli.sh commands for maintaining the cluster are available at *`DASH_HOME`*`/bin`. The default directory of *`DASH_HOME`* is `/opt/IBM/JazzSM/ui`.

- To list the component modules in the cluster, issue the **`ListHAModules`** command (as one line):

  ```
  ./consolecli.sh ListHAModules --username console_admin_user_ID --password
  console_admin_password [--nodename true|false]
  ```

  Where:

nodename is an optional parameter to the **ListHAModules** command. When you set it as `true`, the local component modules are also listed. Otherwise, only modules from the database are listed.

- To list the current nodes in the cluster, determine whether they are active or not, view their synchronization status and their version level of Dashboard Application Services Hub, issue the **ListHANodes** command:

  ```
  ./consolecli.sh ListHANodes --username console_admin_user_ID --password console_admin_password
  ```

- To refresh the node with the latest content from the database, issue the **ForceHARefresh** command:

  ```
  ./consolecli.sh ForceHARefresh --username console_admin_user_ID --password console_admin_password
  ```

  The **ForceHARefresh** command exports data from the database and imports it to the local node. The database module version for Dashboard Application Services Hub must be lower than the local node for export and import.

- To force a database update after you run the **ForceHARefresh** command, issue the **ForceHAUpdate** command as an administrator:

  ```
  ./consolecli.sh ForceHAUpdate --username console_admin_user_ID --password console_admin_password
  ```

  The **ForceHAUpdate** command pushes the local node configuration to the database and updates the modules table to match the local node's module versions. Notifications are sent to other nodes to synchronize. Notified nodes with module versions that match those of the originating nodes are synchronized. Notified nodes with module versions that do not match, go into maintenance mode until an administrator updates their modules accordingly.

- To remove a node from the cluster, issue the **RemoveHANode** command (as one line):

  ```
  ./consolecli.sh RemoveHANode --username console_admin_user_ID --password console_admin_password
   [--nodename node_name]|[-- active true|false|unreachable]
  ```

  Where:

  active is an optional parameter that is used for cleanup purposes. Supported values are **true**, **false** and **unreachable**.

  – `true`: All the active nodes that are reachable in the database are deleted.

  – `false`: All the inactive nodes in the database are deleted.

  – `unreachable`: All the nodes that are unreachable from that node are deleted.

  The **RemoveHANode** command is used to permanently remove a node from the cluster before you delete the WebSphere Application Server data source. If the data source was deleted beforehand, this command can be run from another node to remove a separate node by specifying the relevant server name.

- To remove a node from the cluster without removing it from the cluster, in the WebSphere Application Server administrative console, set the value for `com.ibm.isc.ha` custom property to `false`. For more information about the detailed steps, see Disabling a node without removing it from the cluster.

Chapter 9. Troubleshooting and support

Troubleshooting Service Management Unite includes reviewing messages and debugging information.

The following sections contain messages and troubleshooting information for Service Management Unite Automation and Performance Management. Support information and resources are also included.

Unable to start the launchpad on certain Red Hat and Firefox releases

If the launchpad doesn't start after you run the launchpad.sh from a Terminal Window, it is often caused by the version incompatibility between Mozilla Firefox and the launchpad. The SMU launchpad and the JazzSM launchpad can not launch on Red Hat Linux 6.x or 7.x with Mozilla Firefox 43.0.0 and later.

To resolve this problem, you can start the installers directly to install the products instead of using the launchpad.

- To start the SMU Automation installer manually from the command line, refer to Starting the installers.
- To start the SMU Performance Manager installer manually, refer to Starting the Service Management Unite Performance Management installers.

Jazz for Service Management and WebSphere Application Server installation failed with errors

Use the prerequisite scanner to debug errors when the Jazz for Service Management and WebSphere Application Server installation fail with errors.

Problem

When you install Jazz for Service Management and WebSphere Application Server, the installation fails with errors. The errors might be related to dick space, memory, or Java errors.

Cause

The prerequisites for Service Management Unite are not met.

Solution

Use the prerequisite scanner for the Jazz™ for Service Management installation package to list all the requirements.

1. Issue the following commands to run the prerequisite scanner:

   ```
   export JazzSM_FreshInstall=True
   JazzSM_Image_Home/PrereqScanner/prereq_checker.sh "ODP,DSH" detail
   ```

   The prerequisites including the expected disk space are listed.
2. Go through the output and ensure that each item gets a **PASS** result. Otherwise, fix the problems until you get all **PASS** results.

Docker container enters a 'loop situation'

Use this information to solve the problem when Docker container enters a 'loop situation'.

Problem

WAS is not running and SMU console cannot be accessed via the browser.

Cause

The SMU Docker container is looping.

A 'loop situation' might occur if SMU (WAS) or TDI can't start successfully. If WAS or TDI cannot be started, the SMU Docker container stops. However, the Docker environment is configured to automatically start a new SMU Docker container in that case, as a result, it enters a loop situation: The SMU Docker container tries to start WAS or TDI when it is created, if it fails and results in the container to be stopped, immediately a new container is created with WAS or TDI started again, and thus enters a 'loop situation'.

Solution

1. Check whether the SMU Docker container is 'looping'.
   a. Run the command **`docker ps`** several times.
   b. Compare the 'status' field for the SMU Docker container. If the uptime of the SMU Docker container is always several seconds (but varying), even if the container was started quite some time ago, it is likely to have a 'loop situation'.
2. Run the command **`eezdocker.sh stop`** to stop looping SMU Docker container.
3. Run the command **`eezdocker.sh debug`** to start a new SMU Docker container in debug mode. This starts a new container without automatically starting SMU (WAS) or TDI, instead, only a shell is opened in the container.

   A started SMU Docker container with only a running shell makes it possible to start WAS or TDI manually. You can see the reported errors and search the log files for further problem identification. The default directory of WAS's log is `/opt/IBM/JazzSM/profile/logs/server1/SystemOut.log`.

   You need to commit these changes in the container to the SMU Docker image so that the newly started SMU Docker containers will have these changes included. Run command **`docker commit --help`** for more information.

Unable to start WAS in Docker environment

Use this information to solve the problem when WebSphere Application Server (WAS) cannot be started in the Docker environment.

Problem

WebSphere Application Server cannot be started and enters a 'loop situation'.

Symptom

SMU Docker container is in a 'loop situation', and you see the following exception in WAS's `SystemOut.log` when starting WAS manually in the SMU Docker container debug mode:

```
com.ibm.wsspi.runtime.variable.UndefinedVariableException: Undefined
variable HOST
```

Cause

The host name of the Docker host isn't configured correctly. For example, only a subname is set instead of the fully qualified name (FQN). The SMU Docker container might not be able to resolve this host name. For example, if the FQN of the Docker host server is *mydocker.mycompany.com*, but the host name is set only to *mydocker*, the SMU Docker container inherits this host name but not be able to resolve it. As a result, WAS will not be able to start successfully, resulting in a 'loop situation'.

Solution

To solve this problem, configure your docker host's host name to the FQN so that the Docker container can resolve it properly.

Unable to log in to the automation domain with the TSO user ID

Use this information to solve the problem when you are unable to log in to the automation domain with the TSO user ID.

Problem

The authentication for user ID *user name* is unsuccessful.

Symptom

```
ICH420I PROGRAM INGIOC FROM LIBRARY ING.V3R5M0.SINGMOD1 CAUSED THE
ENVIRONMENT TO BECOME UNCONTROLLED.
BPXP014I ENVIRONMENT MUST BE CONTROLLED FOR DAEMON (BPX.DAEMON)
PROCESSING
+EEZA0013E Authentication for user ID <user_id> was unsuccessful
```

Cause

The profile `BPX.DEAMON` is defined in the RACF class FACILITY. In addition, profiles in the class PROGRAM are defined in RACF. However, the dynamic load libraries that are used by the automation adapter are not defined to the RACF class PROGRAM, or the user ID running the started task INGXADPT or IHSAEVNT is not permitted to access the profile `BPX.DAEMON`. For more information, refer to Prerequisites for USS.

Solution

1. Verify whether the user ID that you use to run the started tasks INGXADPT and IHSAEVNT is permitted to access the `BPX.DAEMON` profile in the class FACILITY. If not, grant this user ID READ access to the profile.
2. Add the CSSLIB, SINGMOD1, SCEERUN, SCEERUN2, SCLBDLL libraries to the appropriate profile in class PROGRAM.
3. For the user ID that you use to run the INGXADPT and IHSAEVNT started tasks, grant it READ access to the appropriate profile in the class PROGRAM.
4. Run a SETROPTS refresh for class PROGRAM.

   See the following example of the commands that you might use:

   Note:

- Before you use these commands, refer to the RACF related information and consult your local security administrator for advice.
- The following example shows the commands for a generic profile definition '*'. The defined profiles in your enterprise might differ.
- Before you use the sample commands, adapt the high-level qualifier data set and verify its location. If the data set is not on the IPL volume, then use the appropriate VOLSER instead of the '******' pointing to the IPL volume.

```
PE BPX.DAEMON CL(FACILITY) ID(stc_userid) ACCESS(READ)
RALT PROGRAM * ADDMEM('hlq.SCEERUN'/******/NOPADCHK) UACC(READ)
RALT PROGRAM * ADDMEM('hlq.SCEERUN2'/******/NOPADCHK) UACC(READ)
RALT PROGRAM * ADDMEM('hlq.SCLBDLL'/******/NOPADCHK) UACC(READ)
RALT PROGRAM * ADDMEM('hlq.SINGMOD1'/******/NOPADCHK) UACC(READ)
RALT PROGRAM * ADDMEM('hlq.CSSLIB'/******/NOPADCHK) UACC(READ)
SETR REFRESH RACLIST(FACILITY)
SETROPTS WHEN(PROGRAM) REFRESH
```

5. Recycle the started tasks INGXADPT and IHSAEVNT.

Column 'Worst Resource State' is not shown after upgrading to SMU V1.1.4

The new column 'Worst Resource State' is not shown in dashboard 'Explore Automation Domains' and dashboard 'Explore Automation Nodes' after you upgrade to SMU V1.1.4.

Problem

In IBM Service Management Unite Version 1.1.4, the following default columns in dashboard 'Explore Automation Nodes' and dashboard 'Explore Automation Domains' are changed:

- In dashboard 'Explore Automation Nodes', the column 'Resource Class' is removed, and the column 'Worst Resource State' is added.
- In dashboard 'Explore Automation Domains', the column 'Domain Health State' is renamed to 'Worst Resource State'.

When you upgrade from a previous version of IBM Service Management Unite, these column changes don't take effect automatically. You still see the column definitions that are used in the previous release.

Solution

To apply these column changes after you update to SMU V.1.1.4, follow these steps to reset the two pages to the product defaults:

1. In the SMU navigation bar, click **Administration** > **Explore Automation Nodes**.
2. Select **Page Actions** > **Edit Page...**.
3. Click **Save and Exit** without changing anything.
4. In the SMU navigation bar, click **Console Settings** > **Pages**.
5. In dashboard **Pages**, under **Administration**, select **Explore Automation Nodes**. The page properties for dashboard Explore Automation Nodes are displayed.
6. Click **Restore**, and then click **Save**.
7. Repeat the above steps for dashboard 'Explore Automation Domains' to update to the new column 'Worst Resource State'.

Open dashboard 'Explore Automation Nodes' or 'Explore Automation Domains', you can see the columns as defined in the new product defaults.

Creating a Request For Enhancement (RFE) for Service Management Unite

Use the RFE community to create a request for Service Management Unite.

Problem

When you submit a new request for Service Management Unite via the RFE community, **Service Management Unite** is not provided in the RFE product list .

Solution

1. Open the Submit a request page in the RFE community.
2. In the **Product** field, specify **Service Management Suite for z/OS**.
3. The Component field is automatically filled with **Service Management Unite**.
4. Complete the other fields.
5. Submit your request.

Troubleshooting SMU Automation

Troubleshooting and support information for Service Management Unite Automation helps you understand, isolate, and resolve problems. Troubleshooting and support information contains instructions for using the problem-determination resources that are provided with your IBM products. To resolve a problem on your own, you can find out how to identify the source of a problem, how to gather diagnostic information, where to get fixes, and which knowledge bases to search. If you need to contact IBM Support, you can find out what diagnostic information the service technicians need to help you address a problem.

Communication flow between components

The following topic provides an overview of the communication flows between the components of Service Management Unite Automation. Understanding the communication flows helps you, if you try to solve communication-related problems with help of different log and trace files. All WebSphere components (such as the automation framework, adapters, or UI components) write trace statements, assuming trace is enabled. Trace statements are written to the corresponding WebSphere trace file. The location of the trace file is configured in the WebSphere Administrative Console.

Other components, for example, the Universal Automation Adapters, or Automation adapters are located on the FLA domains. They write trace and log files in the Tivoli Common Directory that can be found on the system where the particular component runs.

If you want to follow the communication flows described in this, gather all distributed trace and log files. Gathering all trace and log files of all components is also required when you contact IBM service in order to debug problems.

Starting a resource on a single node using remote command execution

The following scenario shows the communication flow that occurs if an operator starts a resource hosted by the Universal Automation Adapter:

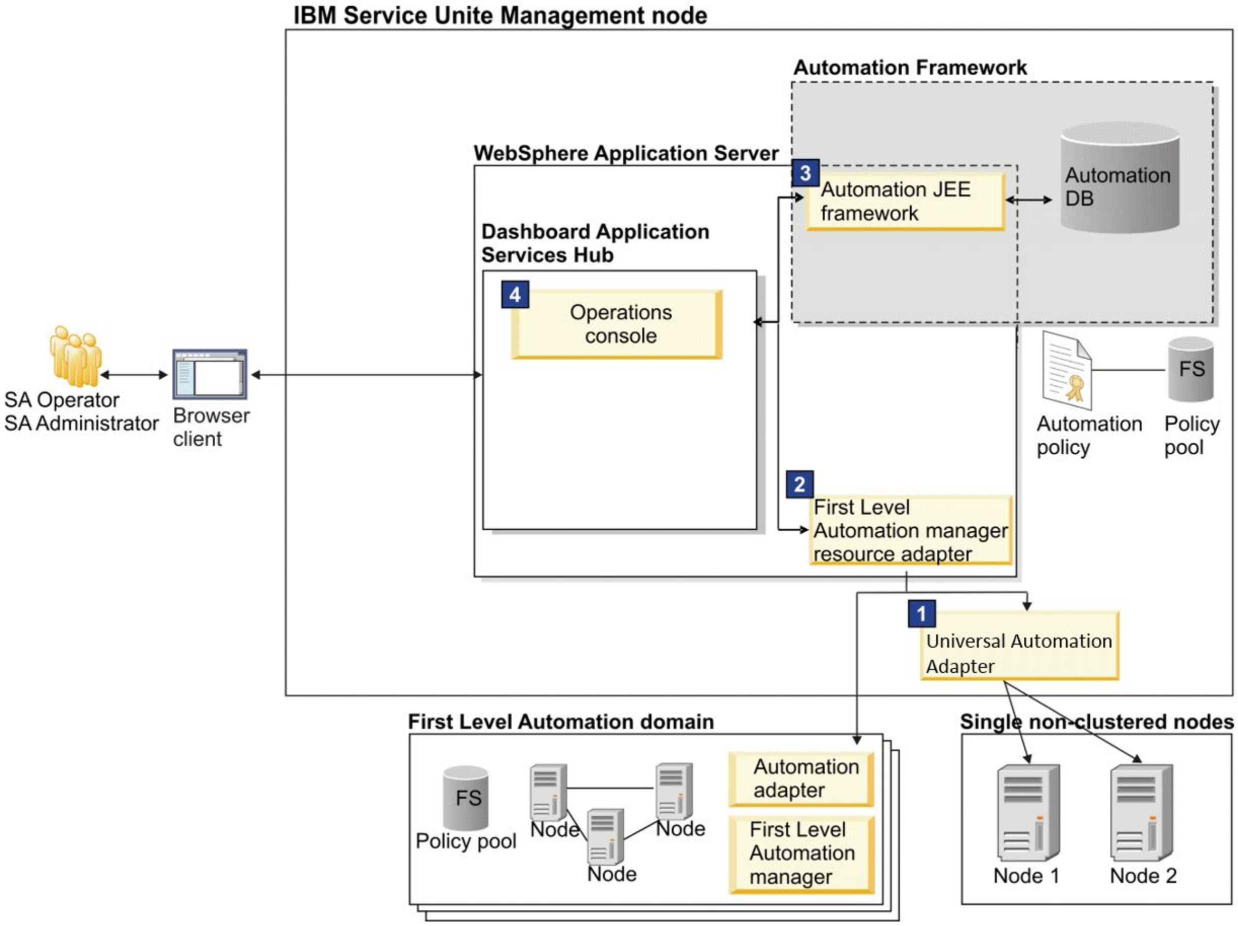

IBM Service Unite Management node
Automation Framework
WebSphere Application Server
3
Automation JEE framework
Automation DB
Dashboard Application Services Hub
4
Operations console
SA Operator
SA Administrator
Browser client
FS
Automation policy
Policy pool
2
First Level Automation manager resource adapter
1
Universal Automation Adapter
First Level Automation domain
FS
Policy pool
Node
Node
Node
Automation adapter
First Level Automation manager
Single non-clustered nodes
Node 1
Node 2

Figure 6. Communication flow: Start a resource on a single node

1. An operator submits a start request against a resource configured for a UAA domain using the System Automation operations console.
2. The System Automation operations console forwards the request to the automation JEE framework.
3. The request is passed through the first-level automation manager resource adapter.
4. The request is passed to the UAA.
5. The UAA remotely executes the start script on the remote node. The scripts and the node are specified in the UAA policy.

Resource status changes are not reflected in the Service Management Unite dashboard

Use this information to solve the problem where the resources status changes are not reflected in the Service Management Unite dashboard.

Problem

After you start or stop a resource from the Service Management Unite dashboard, the status of the resource is not changed in the dashboard.

Cause

The NetView for z/OS message adapter service is not configured properly. The message adapter service of the NetView for z/OS event/automation service (E/AS) is used to convert and forward messages from NetView for z/OS to the E2E automation adapter.

Diagnose

Issue the **INGE2E** command with the `Verify` option to check the E2E configuration:

```
NETVASIS INGE2E VERIFY JOBEAS=eas-jobname CPATH=/custom-root/adapter
```

If the E/AS message adapter does not show **active**, or **ERROR**, or a **Verification failed** message is shown, complete the following steps to review and edit the configuration file.

Solution

1. Go to the user data set `hlq.SCNMUXCL` and edit the message adapter configuration file `IHSAMCFG`.
2. Ensure the value of parameter **ServerLocation** is the host name where Service Management Unite is installed, and is the same as the value of **eif-send-to-hostname** in the E2E adapter's `ing.adapter.properties`.
3. Ensure the value of parameter **ServerPort** is the same as the value of **eif-receive-from-port** in the E2E adapter's `ing.adapter.properties` file.
4. Uncomment the line that starts with `AdapterFmtFile`.
5. Specify the name of the NetView message adapter format file: `AdapterFmtFile=INGMFMTE`.

   Parameters need to be set as follows:

   ```
   ServerLocation=127.0.0.1
   - - - - - - - - - - - - - - - -
   ServerPort=5529
   - - - - - - - - - - - - - - - -
   ConnectionMode=connection_oriented
   - - - - - - - - - - - - - - - -
   BufferEvents=no
   - - - - - - - - - - - - - - - -
   BufEvtPath=/etc/Tivoli/tec/cache_nv390msg
   - - - - - - - - - - - - - - - -
   AdapterFmtFile=INGMFMTE
   ```
6. Issue the following command to display the configuration parameters of the NetView message adapter:

   ```
   MVS F <EASJOBNAME>,SETTINGS,TASK=MESSAGEA
   ```

   If the problem still exists, enable the trace mode of the E2E adapter to identify if there's any connection problem between the adapter and the Service Management Unite server. For detailed instructions on how to enable the trace mode, refer to Syntax and User-Defined USS File System for the Automation Adapter in IBM System Automation for z/OS End-to-End Automation. Check the logs and also check the messages EEZA0116I and EEZA0118I. The messages provide information about the connection status of the adapter and the Service Management Unite server. For example,

   ```
   EEZA0116I The status of the event sender changed: Address=<SMU_hostname>/<SMU_IP> Port=2002, S
   EEZA0118I The connection to the management server <SMU_hostname> : 2002 has been established.
   ```

If the **Status** in message EEZA0116I is not '1', check the status of the port or firewall to fix the communication problem between the adapter and Service Management Unite.

Troubleshooting for administration

Find out all the help that is offered if you require support or want to solve an issue while administering Service Management Unite Automation.

Known problems and solutions

This section contains know problems and solutions of troubleshooting for administration.

Log and trace file location:

Locate the log and trace files that are relevant for automation management.

Log and trace files of the operations console and the automation framework

The operations console and the automation framework of IBM Service Management Unite use the log files and the tracing function of WebSphere Application Server.

By default, the information is written to the following log and trace files:

- `SystemOut.log`
- `SystemErr.log`
- `trace.log`

The files are in the following directory:

```
<JazzSM_root>/profile/logs/<server_name>
```

Use the WebSphere administrative console to set the parameters for logging and tracing:

- To specify log file parameters, for example, the log file names, the maximum size, and the number of history log files to be preserved, open the WebSphere administrative console and go to **Troubleshooting > Logs and Trace >** <server_name> **> Diagnostic Trace**.
- To set the parameters for tracing, for example, to switch tracing on or off or to define for which components traces should be recorded, open the WebSphere administrative console and go to **Troubleshooting > Logs and Trace > Diagnostic Trace> Change Log Detail Levels**.

Traceable components

For the components of IBM Service Management Unite that run in WebSphere Application Server, it is possible to enable logging and tracing with different scopes, varying from all component groups (com.ibm.eez.*) to fine-grained individual components.

You change the logging and tracing levels for the components of IBM Service Management Unite on the Change Log Detail Levels page in the WebSphere administrative console. The names of the components start with the string *com.ibm.eez*. To change the log detail levels for all traceable user interface components, change the settings for the component group *com.ibm.eez.ui.**. For tracing all Service Management Unite Automation components, you would enter in the field *=info: *com.ibm.eez.*=all*.

Tivoli Common Directory location

Message and trace logs for Tivoli products are located under a common parent that is called the Tivoli Common Directory. The log and trace files of all components of IBM Service Management Unite that are not running within WebSphere Application Server, for example, the log and trace files of the automation framework and of the automation adapters, are written to the product-specific subdirectory of the Tivoli Common Directory.

The path to the Tivoli Common Directory is specified in the properties file `log.properties`. The file `log.properties` is located in the `/etc/ibm/tivoli/common/cfg` directory.

In the `log.properties` file, the path to the Tivoli Common Directory is defined in the property `tivoli_common_dir=<path_to_Tivoli_Common_Directory>`.

The path `/var/ibm/tivoli/common` is the default value.

These are the relevant subdirectories for automation management:

Subdirectory	Description
`<Tivoli_Common_Directory>/eez/logs`	message log files, trace files
`<Tivoli_Common_Directory>/eez/ffdc`	FFDC files

For information about the log and trace files of the automation adapters, refer to the adapter-specific documentation.

Restart workflow fails:

If the restart workflow fails, it can have one of the following three reasons.

1. The restart workflow is rejected. The workflow does not start or terminates immediately. The following reasons apply:
   - The observed state of the resource is not Online.
   - The desired state of the resource is NoChange.
   - The restart of the resource is already running.
   - The automation domain throws an exception while processing the initial offline request.
2. The restart workflow is interrupted. The following reasons apply:
   - Another request with a higher priority changes the observed state of the resource.
   - The restart workflow timed out. The offline or online request does not complete within a given timeframe. The default timeout range is 48 hours. For more information, see Resolving timeout problems.
3. All restart workflows are interrupted for the whole domain or node. The following reasons apply:
   - Activation of an automation policy.
   - Start or stop the first-level automation adapter.
   - Exclude the first-level cluster node.
   - Stop the WebSphere Application Server which affects all ongoing restart workflows.

Resources do not appear because credentials for accessing automation domains are not configured:

The System Automation operations console implements a cache of automated resources which is populated automatically after the startup of WebSphere Application Server. It is populated using the functional user ID that is configured in the configuration dialog as described in this topic.

In addition, any queries against automation domains are issued using functional credentials. Note that operational tasks, like issuing requests or commands, are always issued using the credentials of the user that has logged in to the domain from within the dashboards and never using the functional user credentials configured in the configuration dialog.

Indicators are:

- No nodes displayed for the first-level automation domain.
- Message EEZJ0076E in WAS SystemOut.log and as message in dashboard views.

For all connected first-level automation domains, credentials must be configured using the configuration utility.

1. From the command line, open the configuration dialog using `cfgsmu`.
2. In the Service Management Unite host configuration section, click **Configure**.
3. Navigate to the User Credentials tab.
4. Configure the credentials for accessing first-level domains.

You can configure generic credentials if you use the same user ID and password for many domains, and you can configure specific configuration for domains that have different credentials.

OutOfMemory exception when trying to view the domain log:

The size of log files of your automation domain grows up to a specified limit. When this limit is reached, the current log file is automatically saved as a different file name.

Logging continues with a new empty file with the same name. When you experience OutOfMemory problems when trying to view the log file this problem can be circumvented by reducing the maximum size of the file using the IBM Service Management Unite Automation configuration tool (**Logger** tab of the Universal Automation Adapter configuration dialog). You may consider to copy your current log file on a regular basis to a different location, for example once a week into a folder named OldLogFiles. You achieve a well structured log file history as you start each week with an empty log file.

Using multiple browser windows to connect to the same IBM Dashboard Application Services Hub from the same client system:

If you are using a browser other than Microsoft Internet Explorer, opening multiple browser windows on the same client machine to connect to the same IBM Dashboard Application Services Hub causes unexpected results.

This is because only Microsoft Internet Explorer establishes a separate HTTP session for each browser instance. Other browser types share a single session between multiple browser instances on the same system if these instances connect to the same IBM Dashboard Application Services Hub.

The same situation occurs if you open multiple Microsoft Internet Explorer browser windows using **File > New Window** (or Ctrl + N) from an existing IBM Dashboard Application Services Hub session, because in this case the new browser window and the one from which it was opened also share the same session.

Topology widget graph area is blank:

Graph area of a topology dashboard widget may be blank when using Internet Explorer 9 or 10 (64-bit only). The topology widget requires the Adobe flash plugin. Even with the Adobe flash plugin installed there might be a conflict between the video driver and the flash plugin when using Internet Explorer.

From a 64-bit Internet Explorer browser, this behavior may be caused by a conflict between the IE Adobe plugin and your video driver. To resolve the issue:

1. Open Internet Explorer and in the **Tools** menu, select **Internet Options**.
2. Click the Advanced tab, and locate the Accelerated Graphics section.
3. Change the setting for **Use software rendering instead of GPU rendering** check box.
4. Click **Apply** to commit your changes.
5. Click **OK** to exit Internet Options Dialog.
6. To enable the updated setting, restart Internet Explorer.

Topology node selection with browser or desktop zoom level greater than 100% does not work reliably:

Resources which are displayed using the graphical topology widget, for example in the Relationships view on the domain page, are not selectable and the right-click context menu cannot be opened reliably.

The topology widget reads the zoom level of the widget using the toolbar actions, but it cannot read the zoom level set in the browser or on the desktop. Also for a browser, when zoom levels are set to greater than 100%, the topology widget does not register the changed settings and the mouse cursor position is incorrectly mapped.

Browser Zoom Level

Set a browser zoom level. Use the following keystroke combinations to adjust the browser zoom level.

- Press Ctrl and 0 to reset browser zoom level.
- Press Ctrl and = to zoom in.
- Press Ctrl and - to zoom out.

Desktop Zoom Level

Follow your operating system documentation to set zoom levels to 100%.

- In Microsoft 7, for example, change the zoom level for the desktop in Control Panel through **Appearance and Personalization -> Display** and select the **Smaller** option. If you set the zoom level to Medium or Larger, it equates to 125% and 150% respectively. The topology widget does not register the new settings and therefore the mouse cursor position is not correctly mapped to the coordinates of the topology widget nodes.

- In Microsoft Windows XP, right-click on your desktop and select **Display Properties**. In the Settings tab, click **Advanced** and set the **Display DPI** setting to Normal (96 DPI).

A first-level automation domain is not displayed in the topology tree after an outage:

After a planned or unplanned outage of the automation framework, it may happen that first-level automation domains that were previously visible on the topology tree in the operations console do not appear again. This may occur if the automation database was cleared for some reason, or if the timeout defined by the environment variable com.ibm.eez.aab.domain-removal-hours was exceeded.

For more information, see "Resolving timeout problems" on page 145.

To resolve the problem, stop and restart the first-level automation adapter. If the first-level automation domain is still not displayed in topology tree, check the instructions in "A System Automation for Multiplatforms domain is not displayed in the topology tree."

A System Automation for Multiplatforms domain is not displayed in the topology tree:

If a first-level automation domain does not appear in the topology tree on the operations console, perform the following steps to analyze and resolve the problem:

Procedure

1. Check if the adapter is running by issuing the following command on one of the nodes of the domain:

   ```
   samadapter status
   ```

   If the adapter is running, a message similar to the following example comes up:

   ```
   samadapter is running on sapb13
   ```

   Make a note of the name of the node on which the adapter runs (in the example this is sapb13) and proceed with step 4.
2. If the adapter is not running, issue the following command to check if the domain is online:

   ```
   lsrpdomain
   ```

   A message like in the following example comes up:

   ```
   Name    OpState RSCTActiveVersion MixedVersions TSPort GSPort
   domain1 Online  2.4.4.2           No            12347  12348
   ```

   If OpState is not Online, start the domain.
3. If the domain is online, start the adapter with the following command:

   ```
   samadapter start
   ```

   After the start message has appeared, reissue the following command:

   ```
   samadapter status
   ```

4. If the adapter is running, check again on the operations console if the domain now appears in the topology tree. Note that it may take time until the contact to the automation framework is established after the adapter is started.
5. If the domain still does not appear in the topology tree, you need the connection information that you specified in the adapter configuration dialog to resolve the problem. Perform the following steps:
   a. Launch the adapter configuration dialog of System Automation by issuing the following command on a node in the domain:

      ```
      cfgsamadapter
      ```
   b. On the entry window of the configuration dialog, click **Configure**.
   c. Open the Adapter page on the Configure window and write down the values that appear in the following fields:
      - **Host name or IP Address**
      - **Request port number**

      This is the connection information the operations console host uses to reach the adapter on any of the nodes in the domain.
   d. Open the page Host using adapter and write down the values that appear in the following fields:
      - **Host name or IP Address**
      - **Event port number**

      This is the connection information the adapter on any of the nodes in the domain uses to reach the operations console host.
6. Check if the operations console host can be reached from each node in the domain. A simple test is `ping <operations console host>`.

   If there is a firewall between the nodes of the domain and the operations console host, check with the network administrator if the firewall permits a connection between the node (page Adapter: **Host name or IP Address**) and the operations console host (page Host using adapter: **Host name or IP Address** and **Event port number**).
7. The adapter determines whether SSL must be used for the communication with the operations console host. To check the SSL settings of the adapter, launch the adapter configuration dialog using the command `cfgsamadapter`. On the Security page, verify that the SSL settings are correct.

   Note: If the operations console host is configured for using SSL, the adapter must be configured for SSL as well. The SSL configuration of the end-to-end automation manager is performed using the `cfgsmu` configuration utility.
8. On the operations console host, use **netstat** to find out if it is listening for events on the event port defined in **Event port number**.

   When the event port number is set to 2002 host, **`netstat -an`** displays a message like in the following example:

   ```
   Active Internet connections (servers and established)
   Proto Recv-Q Send-Q Local Address       Foreign Address     State
   tcp        0      0 :::2002             :::*                LISTEN
   tcp        0      0 10.0.0.1:2002       10.0.0.2:59261      ESTABLISHED
   ```

   If **netstat** does not display any information about the event port defined in **Event port number**, open the file `/etc/hosts` and verify that the loopback address (`127.0.0.1`) is not related to the actual host name. The loopback address should be related to localhost only. For example, the entry in `/etc/hosts` may look like the following:

   ```
   127.0.0.1             localhost.localdomain localhost
   ```

9. Check if each node in the domain can be reached from the operations console host. A simple test is `ping <host name or IP Address>`.

   If there is a firewall between the operations console host and the nodes of the domain, check with the network administrator if the firewall permits a connection between the operations console host (page Host using adapter: **Host name or IP Address** and **Request port number**) and the node (page Adapter: **Host name or IP Address**).

10. On the node on which the adapter is running, use **netstat** to find out if it is listening on the port defined in **Request port number**.

    For example, when the request port number is set to 2001, **`netstat`** displays a message like the following:

    ```
    sapb13:~ # netstat -atn |grep 2001
    tcp        0      0 9.152.20.113:2001       :::*                    LISTEN
    ```

11. When the communication between all ports has been established correctly (see the descriptions above), check whether the EEZ Publisher is running. The EEZ Publisher must be running on the master node of the System Automation for Multiplatforms domain. To check if the publisher is running, perform the following steps:

    a. Issue the following command on one of the nodes of the first-level automation domain:

       ```
       lssamctrl
       ```

       If the publisher is enabled, you will receive output like in the following example:

       ```
       safli03:~ # lssamctrl | grep Publisher
       EnablePublisher        = EEZ
       ```

    b. Issue the following command on the master node of the System Automation for Multiplatforms domain:

       ```
       ps axw | grep SAMAdapter
       ```

       You should receive output like in the following example:

       ```
       32739 ? Sl 0:01 /usr/sbin/rsct/bin/SAMAdapter
       /etc/opt/IBM/tsamp/sam/cfg/sam.adapter.properties EEZ false 1
       ```

12. If the domain still does not appear on the operations console contact IBM support and provide diagnostic information:

    a. On each node in the domain, find out where the trace files are located. The trace files can be found in the `/eez/logs` subdirectory of the Tivoli Common Directory. To find the path to the Tivoli Common Directory, issue the following command:

       ```
       cat /etc/ibm/tivoli/common/cfg/log.properties
       ```

       The command returns the path to the Tivoli Common Directory, for example:

       ```
       tivoli_common_dir=/var/ibm/tivoli/common
       ```

       This means that the trace files can be found in the following directory:

       ```
       /var/ibm/tivoli/common/eez/logs
       ```

    b. Use `tar` to package all files in the directory and provide the archive to IBM support.

Command Execution:

IBM Service Management Unite provides the Issue Command dashboard that allows a user to issue NetView commands. If issues occur with any return codes of your executed command, you can use information in this topic for root cause analysis.

Reserved Return Codes

The adapter, used to issue NetView commands on a remote system, utilizes the reserved codes to signal to IBM Service Management Unite a problem with the execution of the command.

If the issued command itself exits with one of these defined return codes, IBM Service Management Unite interprets this return code and shows an error message, even if the issued command implies another meaning with this return code.

It is a good practice to issue only commands that will not return the reserved return codes.

Table 15. Reserved return codes for Command Execution

Reserved Return Code	Meaning for IBM Service Management Unite	EEZ Message
9001	User not authorized to execute command.	EEZU0049E
9002	Command does not exist.	EEZU0050E
9003	Unknown misbehavior during execution of command.	EEZU0056E
9004	Operator task not defined.	EEZU0051E

Resolving timeout problems:

If you experience timeout problems when accessing first-level automation domains, this could mean that the default values of some optional JEE framework environment variables are not appropriate for your environment.

The following table lists the environment variables that you might need to change to resolve the problems.

More information about the environment variables is provided in the following topics.

Table 16. Environment variables of the automation JEE framework

Variable name	Minimum value	Default value	Maximum value
com.ibm.eez.aab.watchdog-interval-seconds	60	300	86400
com.ibm.eez.aab.watchdog-timeout-seconds	2	10	60
com.ibm.eez.aab.domain-removal-hours	1	48	1000
com.ibm.eez.aab.resource-restart-timeout-hours	1	1	3600
com.ibm.eez.aab.invocation-timeout-seconds	30	60	3600

Rules:

- If the value of an environment variable is below the minimum value for that variable, the minimum value is used.
- If the value of an environment variable is above the maximum value for that variable, the maximum value is used.
- Cross-dependency: To ensure that domains are removed only after the health state has moved to some timeout or failed state, the value of the variable:

  ```
  com.ibm.eez.aab.domain-removal-hours
  ```

  must be greater than the value of:

  ```
  com.ibm.eez.aab.watchdog-interval-seconds/3600
  ```

  If you specify values that violate this rule, the user-specified value for:

  ```
  com.ibm.eez.aab.domain-removal-hours
  ```

  is ignored and the value of:

  ```
  com.ibm.eez.aab.domain-removal-hours
  ```

  is set to

  ```
  com.ibm.eez.aab.watchdog-interval-seconds/3600 +1
  ```

Watchdog - A mechanism for monitoring the domain communication states

The automation framework includes a watchdog mechanism to determine the health state of the communication with each domain. If the automation framework and the domain in question have not communicated successfully during the time interval defined by the environment variable:

```
com.ibm.eez.aab.watchdog-interval-seconds
```

(default value: 300), the automation framework invokes a test operation on the domain. This test operation may only take a limited amount of time, as defined by the environment variable:

```
com.ibm.eez.aab.watchdog-timeout-seconds
```

Depending on the outcome of this test operation, the domain communication health state is updated and reflected in the operations console accordingly.

If a very large number of domains is to be monitored or the domain contains a very large number of resources and the value of:

```
com.ibm.eez.aab.watchdog-interval-seconds
```

is not sufficiently large, the watchdog might not be able to contact all domains and receive their reply events within the given time. This results in incorrect communication state changes for the affected domains:

- In the WebSphere Application Server message log, pairs of messages EEZJ1003I can be found for each of these domains, indicating that the domain's communication state was changed from “OK” to “AsyncTimeout” and back to “OK” within a short time.
- In addition, the operations console icons for the affected domains change accordingly for a short time from “The domain is online” to “Resource events cannot be received” and back to “The domain is online”.

To resolve the problem, increase:

```
com.ibm.eez.aab.watchdog-interval-seconds
```

to a value that is approximately double that of the number of domains. For example, if there are 200 domains, the value of:

```
com.ibm.eez.aab.watchdog-interval-seconds
```

should be set to `400`.

If the number of resources to be monitored on the operations console is very large, increase the value of:

```
com.ibm.eez.aab.watchdog-interval-seconds
```

in steps of 200 seconds until the result is satisfactory.

Database cleanup timeout for automation domains

The automation framework contains a mechanism for removing automation domains from the database after a period of inactivity. The domains themselves are not removed, just the representation of the domains in the automation framework is removed.

When the automation framework detects that no communication with a particular domain has occurred for a time interval that is longer than the clean-up timeout interval defined in the environment variable:

```
com.ibm.eez.aab.domain-removal-hours
```

it removes the related domain information from the database.

If the automation framework are stopped for a time, such domains will be removed only after attempts to contact them failed.

Whenever the automation framework removes a domain, the operations console is notified about the change and refreshed accordingly.

Restart request timeout

The automation framework observes resource restart requests until they are completed. After the restart, the resource is online. In some other situations, the restart does not finish. For example, a restart request is sent to resource A. Resource A has a dependency relationship to resource B. This dependency relationship inhibits to stop resource A. In this case, the restart request waits until B changes its state. Pending restart requests are removed after they timed out. You can find the timeout value in the environment variable:

```
com.ibm.eez.aab.resource-restart-timeout-hours
```

Method invocation timeout between the automation framework and the automation adapters

A timeout value can be set to control how long an operation between the automation framework and the automation adapters might take. The environment variable *com.ibm.eez.aab.invocation-timeout-seconds* is used to define this timeout value.

The value of this environment variable should be at least 15 seconds less than the value of the WebSphere ORB request timeout property. Otherwise, "CORBA.NO_RESPONSE: Request timed out" errors could be encountered by the operations console if an operation takes longer than the time interval specified by the ORB request timeout. The default value for the WebSphere ORB request timeout is 180 seconds. The ORB request timeout property can be changed from the WebSphere administrative console. To view or change the property, open the WebSphere administrative console and go to **Servers > Server Types > WebSphere application servers > server1 > Container Services > ORB service**. For more information about the ORB request timeout property, see the WebSphere documentation.

The *com.ibm.eez.aab.invocation-timeout-seconds* variable is used for the communication with all automation adapters. There is no individual timeout value per automation adapter.

Note: The communication with the automation framework does not support method invocation timeout. This means that either the connection cannot be established, in which case the operation returns with an exception immediately, or the operation continues until a connection is established.

Modifying the environment variables for the automation framework

The current value of each variable is displayed when the application EEZEAR is started. Look for messages EEZJ1004I, EEZJ1005I, EEZJ1006I in the WebSphere Application Server log (`SystemOut.log`).

If the default values of the environment variables are not appropriate for your environment, you can change them by running these steps in the WebSphere administrative console:

1. Log on to the WebSphere administrative console.
2. Go to **Servers > Server Types > WebSphere application servers > server1 > Server Infrastructure > Java and Process Management > Process Definition > Additional Properties > Java Virtual Machine > Additional Properties > Custom Properties**.

   Click **New** to create a new variable, or select an existing variable to change its value.
3. Enter values for **Name** (com.ibm.eez.aab.<variable_name>) and **Value** (<new_value>). You can also enter a description.
4. Save your changes.

WebSphere Application Server must be restarted for the changes to take effect.

OutOfMemoryError in the WebSphere Application Server log file:

An OutOfMemoryError may occur if a large amount of data is returned from a first-level automation domain. Depending on the situation, the error may become visible on the operations console or in the WebSphere Application Server message log file.

Perform the following steps to increase the JVM heap size:

1. Log on to the **WebSphere administrative console**.
2. Navigate to **Servers > Server Types > WebSphere application servers > server1 > Server Infrastructure > Java and Process Management > Process definition > Additional Properties > Java Virtual Machine**.

3. Set the value to at least 768 MB. Refer to the WebSphere Application Server online documentation for more information about how to determine the optimum value for the maximum heap size, depending on the available physical memory.
4. Save your changes. WebSphere Application Server must be restarted for the changes to take effect.

Modifying available heap size:

After the installation of IBM Service Management Unite, modify the heap size settings of the WebSphere Application Server to the following recommended values:

- Minimum heap size: 768 MB
- Maximum heap size: 2048 MB

Perform the following steps to increase the JVM heap size:

1. Log on to the **WebSphere administrative console**.
2. Go to **Servers > Server Types > WebSphere application servers > server1 > Server Infrastructure > Java and Process Management > Process Definition > Additional Properties > Java Virtual Machine**.
3. Enter **2048** for the Maximum Heap Size and **768** for the Minimum Heap Size to avoid `OutOfMemoryErrors`. Refer to the WebSphere Application Server online documentation for more information about how to determine the optimum value for the maximum heap size, depending on the available physical memory.
4. **Save** your changes. Restart WebSphere Application Server for the changes to take effect.

EEZBus is not started:

The EEZBus is a sub-component of the automation JEE framework that runs within WebSphere Application Server. There are several potential reasons why the EEZBus cannot be started. The reasons and proposed actions are described in this topic.

EEZBus is not started due to a security problem

If the EEZBus cannot be started, this may indicate a problem with the DB2 instance account for the automation framework databases, regardless of whether you are using DB2 or LDAP as the user registry.

In such a case, one or more of the following symptoms may occur:

- On the messaging engine panel of the WebSphere administrative console **Service integration > Buses > EEZBus > Topology > Messaging engines**, you can see that the EEZBus is not started. When you try to start the bus, the following error message is displayed:

  ```
  The message engine <node_name.server_name> EEZBus cannot be started.
  ```

- If you are using DB2 as the user registry, the following exception appears in the WebSphere Application Server log file:

  ```
  00000f1d FreePool      E   J2CA0046E:
  Method createManagedConnectionWithMCWrapper caught an exception
  during creation of the ManagedConnection for resource jms/
        EEZTopicConnectionFactory,
  throwing ResourceAllocationException.
  Original exception: javax.resource.ResourceException:
  CWSJR1028E: An internal error has occurred.
  ```

```
The exception com.ibm.websphere.sib.exception.SIResourceException:
CWSIT0006E: It is not possible to contact a messaging engine in bus EEZBus.
was received in method createManagedConnection.
```

- If you are using LDAP as the user registry, the following exception appears in the WebSphere Application Server log file:

```
000000a2 FreePool      E   J2CA0046E:
Method createManagedConnectionWithMCWrapper caught an exception
during creation of the ManagedConnection for resource jdbc/EAUTODBDS,
throwing ResourceAllocationException.
Original exception: com.ibm.ws.exception.WsException:
DSRA8100E: Unable to get a XAConnection from the DataSource.
with SQL State : null SQL Code : -99999
```

To eliminate a problem with the DB2 instance account as the cause, check the database connection from the WebSphere administrative console:

1. Select the data source.
2. Click **Test connection**.

If the DB2 instance account for the automation framework databases causes the problem, you receive the following message:

```
Test connection failed for data source EAUTODBDS
on server <serverName> at node <nodeName> with the following exception:
java.lang.Exception: java.sql.SQLException:
      Connection authorization failure occurred.
Reason: password invalid. DSRA0010E: SQL State = null, Error Code = -99,999.
```

The automation framework fails to initialize:

The message EEZJ0030E The end-to-end automation manager is not fully initialized and refuses to accept requests. The following subcomponents are not yet initialized: [EventHandlerBean] may appear when logging in on the operations console. This message indicates that the initialization phase of the automation framework has not yet completed after a restart. Normally, this message will not show up again if you log in again after a short period of time. Internally, the automation framework regularly tries to initialize the missing components.

However, there are situations when this initialization step never completes.

A transaction timeout may occur before the communication timeout is reached. In addition, the WebSphere Application Server process may be restarted automatically.

Solution:

The following table shows the sub-components that may be listed within message EEZJ0030E, and the respective troubleshooting actions:

Table 17. Sub-components implicated by message EEZJ0030E

Subcomponent name	Solution
AutomationProperties	Ensure that the automation framework has read access to the properties file eez.automation.engine.properties that is located in the EEZ_CONFIG_ROOT directory.
DB2	If remote DB2 is used, ensure that the DB2 instance is started. See “WebSphere Application Server cannot connect to DB2” on page 151 for details.
EventHandlerBean	See “EEZBus is not started” on page 149.

Table 17. Sub-components implicated by message EEZJ0030E (continued)

Subcomponent name	Solution
FLAEventReceiver	Transient state only. Indicates that the subcomponent that receives events from first-level automation domains has not been initialized yet. If the problem persists, restart WebSphere Application Server. If this does not solve the problem, check the WebSphere Application Server logs and the IBM Service Management Unite installer logs for more details related to the first-level automation resource adapter.
ManagedDomainsRegistry	Transient state only, or accompanied by subcomponent "DB2". Check the solution for that subcomponent first.
ServerConfigCache	Transient state only. Indicates that the automation framework has not yet read the WebSphere Application Server configuration properties that the automation framework needs to know.
StartupBean	Transient state only. If it persists, restart WebSphere Application Server.
WatchdogBean	Transient state only. The WatchdogBean is the last component that gets started. After all other components are started successfully, then this component refreshes the states of the automation domains and verifies if the previously known nodes still exist.
RestartRegistry	Transient state only. Indicates that the in-memory registry of pending restart requests has not yet been initialized.

WebSphere Application Server cannot connect to DB2:

When you receive an error message indicating that WebSphere Application Server could not establish a connection to the automation framework database, check first if the database server is started.

If it was not started, start the database server. If the System Automation operations console does not recover within two minutes, restart WebSphere® Application Server.

If the DB2 database server was started already this may indicate that the DB2 port number is not specified correctly in the WebSphere administrative console.

To verify if the DB2 port number is specified correctly, run the following steps:

1. On the DB2 server system, check which port number DB2 is using. On Linux, for example, use the **netstat** command to obtain the following information:

   ```
   sys1:~ #
   netstat -atnp | grep db2
   tcp  0  0 0.0.0.0:50001     0.0.0.0:*         LISTEN      8714/db2sysc
   tcp  0  0 x.x.x.x:50001     y.y.y.y:38306     ESTABLISHED 8714/db2sysc
   tcp  0  0 x.x.x.x:50001     z.z.z.z:42614     ESTABLISHED 8714/db2sysc
   ```

   In the example, the correct DB2 port number is 50001.
2. In the WebSphere administrative console, navigate to **Resources>JDBC>Data sources >EAUTODBDS** and check whether the port number is specified correctly in the field **Port number**.

"Unable to set up the event path..." error message is displayed in the IBM Dashboard Application Services Hub:

When you try to connect the operations console the following error message is displayed in the IBM Dashboard Application Services Hub:

```
Unable to set up the event path between the operations console
  and the management server:
CWSIA024E: An exception was received during the call to the method
   JmsManagedConnectionFactoryImpl.createConnection:
   com.ibm.websphere.sib exception SIRexourceException:
CWSIT0006E: It is not possible to contact a messaging engine in bus EEZBus
```

This may indicate a problem with the DB2 instance account for the automation framework databases. To check if this is the case, check whether the password for the DB2 instance account has expired or is incorrect.

Mozilla Firefox browser displays special characters incorrectly when editing policies: If special characters are incorrectly displayed when you edit policies, select **View > Character Encoding > Auto Detect > Universal** in the browser menu.

Troubleshooting the Universal Automation Adapter

Universal Automation Adapter does not start: If there is no UAA domain already defined, the UAA will not start successfully. Define at least one domain using the configuration utility and retry to start the UAA.

Universal Automation Adapter log files:

Location of the adapter log files:

Tivoli Common Directory
The log files are written to the following sub-directories of the Tivoli Common Directory:

- `eez/ffdc` – Contains the First Failure Data Capture files (if the FFDC recording level is not set to Off in the adapter configuration dialog)
- `eez/logs` – Contains the Universal Automation Adapter log files:
  - `msgEEZALAdapter.log`
  - `eventEEZALAdapter.log` and `traceFlatEEZALAdapter.log` (if the trace logging level is not set to Off)

Default Universal Automation Adapter installation directory
`/opt/IBM/smsz/ing/eez/bin`

Universal Automation Adapter fails to connect to the operations console host:

For a Universal Automation Adapter (UAA) installation check if ports are configured as expected, and TCP sessions are established.

Check with `netstat` if TCP sessions are established:

- Whether the UAA listens on the request port (default port is 2001).
- Whether the operations console host listens on the event port (default port is 2002).

For UAA, if no sessions are established try to set up TCP sessions, for example using `telnet`:

- `telnet <operations console host> 2002` from the system running the UAA.

- `telnet <Universal Automation Adapter address> 2001` from the system running the IBM Service Management Unite installation.

Where `<operations console host>` is the IP address or fully qualified domain name of the system hosting the IBM Service Management Unite installation. `<Universal Automation Adapter address>` is the IP address or fully qualified domain name of the UAA. If a session setup is not possible using `telnet` check again that the firewall allows this.

Universal Automation Adapter domain and resource states are not refreshed as expected:

If the states of remote resources that are managed by the Universal Automation Adapter do not reflect the actual state of the resources within a reasonable time frame then consider to tune the Universal Automation Adapter domain topology. For more information, see "Tuning the number of domains and resources of the Universal Automation Adapter" on page 72.

Analyzing the states of remote resources:

If the states of remote resources that are managed via the Universal Automation Adapter indicate some issue, see the Monitor command for hints about the potential root cause of the issue based on the combination of the monitor command return codes and the resource states.

Resource states that are affected by the state of the target node

The following table lists resource states caused by communication problems with the target node.

Table 18. Resource states that are affected by the state of the target node

Scenario	Root cause	Resource Observed State	Resource Operational State	Resource Compound State	Monitoring consequences for resources and target node states
Waiting for state information	• after eezaladapter started (last policy activated) • after new policy activated • after subscription is deleted (unsubscribed)	Unknown	NoContact	Warning	Next resource monitor is started with next subscription or after next resource query. Target node is also not being monitored until next resource monitor is started.
Communication has been interrupted or timed out.	• network problem • monitor command timeout	Unknown	LostCommunication	Error	Next resource monitor is started after MonitorCommandPeriod. Same for target node monitor.

Table 18. Resource states that are affected by the state of the target node (continued)

Scenario	Root cause	Resource Observed State	Resource Operational State	Resource Compound State	Monitoring consequences for resources and target node states
Hosting node is not available.	• target node offline • wrong hostname in policy • no IP address found for hostname • firewall prevents access to host • sshd stopped	Unknown	SupportingEntityInError	Error	Next resource monitor is started after MonitorCommandPeriod. Same for target node monitor.
User credentials are incorrect	• wrong user ID or password in configuration • password expired • user ID does not exist • wrong ssh public keys in configuration	Unknown	BrokenResource	Fatal	Next resource monitor is started after next reset action. Target node will no longer be monitored to avoid user IDs to be revoked.
Unable to run a command defined for the resource.	• command not found • user ID has no permissions to execute command	Unknown	InvalidResource	Fatal	Next resource monitor is started after next reset action. Target node will continue to be monitored.
Non recoverable error	• MP monitor command rc = 3 or 4 • start/stop command timeout • start/stop command rc != 0 (Failed)	see UNIX command and System Automation for Multiplatforms monitor command return styles (Using Monitor Command).	NonRecoverableError	Fatal	Next resource monitor is started after next reset action. Target node will continue to be monitored.

Observed states that are affected by the state of the target node

The following table lists all observed states for a target node.

Table 19. Observed states that are affected by the state of the target node

Resource Observed State	Monitoring consequences for resources and target node states
Unknown	If all resources on that node have the operational state NoContact or BrokenResource.
Offline	If at least one resource on that node has the operational state SupportingEntityInError.
Online	All other cases.

Troubleshooting for installation

Use this topic for troubleshooting problems you experience when you install IBM Service Management Unite.Use this topic for troubleshooting problems you experience when you install IBM Service Management Unite Automation.

Procedures for troubleshooting an installation

If the installation fails, the installation wizard displays an error message.

When an error occurs, immediately archive the installation log files (see “Using the log file collector utility” on page 156). This ensures that the original log files are retained, which is important should you need to contact IBM Support, and you can use the archive for your own troubleshooting activities.

An error occurred in the pre-installation phase
If an error occurs in the pre-installation phase, that is, before the **Install** button was clicked, click the button **Save installation log files** to collect all installation log files. The zip file will be created at the location specified.

An error occurred in the installation phase
Typically, errors only occur in the installation phase if insufficient disk space is available.

An error occurred in the configuration phase
Click **Finish** to finish the installation, then change to `<EEZ_INSTALL_ROOT>/install` and run the log file collector utility. The log zip will be created in the same directory. For details see “Using the log file collector utility” on page 156.

Using the Configuration problem analysis dialog

The Configuration problem analysis dialog assists in handling post-installation configuration issues. The Configuration problem analysis dialog is displayed if a post-installation step fails. The dialog is divided into two panels. The first panel displays an introductory explanation and points to the directory that contains the detailed installation log.

The second panel provides information that assists to identify the root cause of the problem on the following tabs:

- The Step details tab shows the step number, the technical step ID, the return code of the step, and the step description.
- The Executed command tab shows details of the executed command.

After you resolved the issue, you can then click **Retry** to re-execute the step.

Click **Retry** to re-execute the most recent step. Click **Exit** to quit the installation. If you restart the installation later, the installation resumes at the step that previously failed.

Installing on machines with system resources at or below the minimum required level can lead to timeouts. Normally, a timeout is not a problem in the configuration phase. A pop-up window is displayed with a detailed explanation of why the timeout occurred. Click **Retry** to rerun the step that had timed out.

Cleaning up from a failed installation

Installation can be canceled at any time. Clean up depending on the installation phase when the installation was canceled or when the installation failed:

- Installation was canceled or failed before the installation was started: no cleanup is necessary
- Installation was canceled or failed during the installation phase: Run the uninstaller to clean up files that were installed on disk.
- Installation was canceled during the configuration phase: Installation can be resumed.

  If the system must be cleaned up again, rerun the installer, and then run the uninstaller to undo all configuration steps and to remove all installed files from disk.
- Installation failed during the configuration phase: Corrective actions might be needed before installation can be resumed.

  To recover the files if the product was uninstalled, but the unconfiguration was not successful and the files are needed to manually run the remaining unconfiguration steps: Run the installer with the option `-Dfilesonly=true` in this case, only the files are installed; no configuration is performed.

  Be sure to undo the configuration changes that were made during the installation before uninstalling. Otherwise, the configuration changes are retained and the scripts to remove them are already uninstalled.

Recovering from a lock out situation during installation:

If the installation fails try to uninstall the product and reinstall again. If the re-installation fails showing a message like "product is already installed at same level", delete the file `/var/.com.zerog.registry.xml`.

Note: `.com.zerog.registry.xml` is a hidden file.
Make sure that no other product needs this file. Browse the file and verify whether you have no other entries that point to different products. Otherwise, contact support for further recommendations.

Using the log file collector utility

When an error occurs, use the log file collector utility to collect the log files that were written during the installation. The utility generates an archive that you can use for your own troubleshooting activities and send to IBM Support if you cannot resolve the error.

Perform these steps to run the log file collector utility:

1. Change the directory to `<EEZ_INSTALL_ROOT>/install`.

2. Issue the command `collectinstallerlogs.sh`.

   The command can be invoked with the option **-D** to copy all logs (in case Java is not available). The directory tree created can then be packed manually.

   The name of the file that is created by the utility is `eezinstallerlogs_<timestamp>.zip`.

   On Linux you can invoke the command with the option **tar** to use tar rather than jar for packing.

   The resulting archive has the following directory structure:

   ```
   -   EEZ_logs
   -   cfg:          configuration files (for the automation framework, etc.)
   -   logs:         eezinstall.log, etc.
   -   sh:         scripts used by installer
   -   WAS_logs
   -   logs:         general WAS server logs
   -   <server name>: logs for the selected WebSphere Application Server
   ```

Installation Manager 32-bit installation error

Use this procedure to debug a 32-bit installation error when using Installation Manager.

The 32-bit Service Management Unite Performance Management package cannot be installed in JazzSM 64-bit core services. To correct this error use the default value for installing Service Management Unite Performance Management, which is to install as a new package group.

WebSphere SDK not enabled for JazzSM profile

Use this procedure to debug WebSphere SDK not being enabled for the JazzSM profile.

Service Management Unite Automation requires version 1.7, or later, of the WebSphere Java SDK. The SDK must be installed and also enabled for the JazzSM WebSphere profile. If an error message indicates that the installed SDK is missing, it might require enablement.

To enable the SDK for the JazzSM profile, run the WebSphere managesdk.sh command with the -enableProfile option. For example:

```
was_root/bin/managesdk.sh -enableProfile -sdkName 1.7_64 -profileName
JazzSMProfile -enableServers
```

Known problems and solutions

This section contains know problems and solutions of troubleshooting for installation.

Installer cannot detect non-default SOAP port:

If the default SOAP port settings are changed in the WebSphere Administrator Console, the installer cannot detect these. This causes an error window to be displayed with the message that the cell could not be retrieved.

Changing the SOAP port via the WebSphere Administrator Console does not update the value used by the `wsadmin.sh` command. This will cause all commands which use `wsadmin.sh` and a SOAP connection to fail.

A quick workaround for this problem is to manually edit the file `/opt/IBM/JazzSM/profile/properties/wsadmin.properties` and adjust the value of the variable `com.ibm.ws.scripting.port`.

You can change the default ports of WebSphere using an Ant script. For more information, see http://www-01.ibm.com/support/knowledgecenter/SSEQTP_8.5.5/com.ibm.websphere.base.doc/ae/tins_updatePorts.html. Using the `Ant` script avoids the problem as it correctly updates the SOAP port for `wsadmin.sh`.

DB2 access test hangs:

If the attempt to access the database does not return (an indeterminate dialog is shown for a very long time), the test may be hung. The DB2 password may be expired.

To resolve the problem, perform these steps:

1. End the installer. Because **Cancel** is not enabled at this point, end the installer using the **`kill`** command. If the installer is killed, files in the system temporary directory remain on the system. If desired, you can manually delete the files in the following way:

   Delete the directories `dirs /tmp/<xxxxxx>.tmp` and `/tmp/install.dir.<xxxxxx>>` (where <xxxxxx> is an arbitrary number)
2. Check if the DB2 password is expired.
3. Renew the DB2 password.
4. Restart the installation.

Exceptions appear in file eezinstall.log:

Any NoClassDefFoundError exceptions that appear in the `eezinstall.log` file *before* the file EEZEAR was deployed can be ignored.

Note: In the last step of the install process the intermediate log is copied to the subfolder `install` in the user install directory. This copy omits the messages from the installer finish process (3 or 4 lines). If these lines are required the original install log should be read. This log file can be found in the `tmp` directory with a name of the form: `install.dir.`*`xxxxxxxx`*.

Troubleshooting for configuration

Use this topic for troubleshooting problems you experience when you configure IBM Service Management Unite.

SSL configuration problems

If problems occur with the SSL setup, you can use the information in this topic for root cause analysis.

SSL configuration error messages are stored in the following paths:

- On the IBM Service Management Unite side, the messages are stored in the WebSphere Application Server log file:

  `<WAS_PROFILE>/logs/server1/SystemOut.log`
- On the Adapter side in the log file:

  `/var/ibm/tivoli/common/eez/logs/msg<ADAPTER_TYPE>Adapter.log`

The following list describes the most common SSL errors with their corresponding error messages.

1. **Corrupt or empty SSL truststore file specified**
   a. Messages in the Adapter log:

Table 20. Corrupt or empty SSL truststore file - Adapter messages

Message Identifier	Exception Text
EEZA0038E	Unrecognized keystore entry
EEZA0038E	Received fatal alert: certificate_unknown
EEZA0022E	No trusted certificate found
EEZA0038E	Certificate chain is null

b. Messages in the Service Management Unite Automation WebSphere log:

Table 21. Corrupt or empty SSL truststore file - Service Management Unite Automation messages

Message Identifier	Exception Text
EEZA0038E	Invalid keystore format
EEZA0022E	Received fatal alert: handshake_failure
EEZJ0101E	Embedded message EEZI0015E: Unable to connect to the adapter

User response: Check SSL truststore files on Adapter and Service Management Unite Automation side.

2. **Corrupt or empty SSL keystore file specified**

a. Messages in the Adapter log:

Table 22. Corrupt or empty SSL keystore file - Adapter messages

Message Identifier	Exception Text
EEZA0038E	No trusted certificate found
EEZA0038E	Received fatal alert: certificate_unknown
EEZA0038E	Invalid keystore format
EEZA0032E	Embedded message EEZA0033E: Unable to create socket factory object
EEZA0105I	Embedded return code rc=20: Adapter has been stopped due to initialization failure

b. Messages in the Service Management Unite Automation WebSphere log:

Table 23. Corrupt or empty SSL keystore file - Service Management Unite Automation messages

Message Identifier	Exception Text
EEZA0038E	Received fatal alert: certificate_unknown
EEZA0038E	Invalid keystore format
EEZJ0101E	Embedded message EEZI0046E: SSL connection could not be established
EEZJ0101E	Embedded message EEZI0015E: Unable to connect to the adapter

User response: Check SSL keystore files on Adapter and IBM Service Management Unite Automation side.

3. **Wrong SSL keystore password specified**

a. Messages in the Adapter log:

Table 24. Wrong SSL keystore password specified - Adapter messages

Message Identifier	Exception Text
EEZA0038E	Keystore was tampered with, or password was incorrect
EEZA0032E	Embedded message EEZA0033E: Unable to create socket factory object
EEZA0105I	Embedded return code rc=20: Adapter has been stopped due to initialization failure

b. Messages in the Service Management Unite Automation WebSphere log:

Table 25. Wrong SSL keystore password specified - Service Management Unite Automation messages

Message Identifier	Exception Text
EEZA0038E	Keystore was tampered with, or password was incorrect
EEZA0033E	Unable to create socket factory object
EEZJ0101E	Embedded message EEZI0046E: SSL connection could not be established

User response: Check SSL keystore password on Adapter and IBM Service Management Unite Automation side.

4. **Wrong SSL certificate alias specified**

a. Messages in the Adapter log:

Table 26. Wrong SSL certificate alias specified - Adapter messages

Message Identifier	Exception Text
EEZA0038E	Certificate chain is null
EEZA0047E	No available certificate corresponds to the SSL cipher suites which are enabled
EEZA0047E	No cipher suites in common
EEZA0105I	Embedded return code rc=12: Adapter has been stopped because initial contact failed

b. Messages in the Service Management Unite Automation WebSphere log:

Table 27. Wrong SSL certificate alias specified - Service Management Unite Automation messages

Message Identifier	Exception Text
EEZA0022E	Received fatal alert: handshake_failure
EEZJ0101E	Embedded message EEZI0015E: Unable to connect to the adapter

User response: Check SSL certificate alias on Adapter and IBM Service Management Unite Automation side.

5. **Missing SSL configuration on one side**

a. Messages in the Adapter log:

Table 28. Missing SSL configuration on one side - Adapter messages

Message Identifier	Exception Text
EEZJ0101E	Embedded message EEZI0021E: Using SSL is required for all first-level automation adapters but not enabled for this particular adapter

Reason: SSL was configured only at the IBM Service Management Unite side and enforce use of SSL was enabled, or the adapter was not restarted after SSL was configured.

User response: Check the SSL configuration on the adapter side and restart the adapter.

b. Messages in the Service Management Unite Automation WebSphere log:

Table 29. Missing SSL configuration on one side - Service Management Unite Automation messages

Message Identifier	Exception Text
EEZA0038E	No such file or directory
EEZJ0101E	Embedded message EEZI0046E: SSL connection could not be established

Reason: SSL was only configured at the adapter side, or WebSphere was not restarted after SSL was configured.

User response: Check the SSL configuration at the IBM Service Management Unite Automation side and restart WebSphere.

Unable to start `cfgsmu` in Docker container

Use this information to solve the problem when you are unable to start **`cfgsmu`** in Docker container.

Problem

The configuration tool **`cfgsmu`** cannot be started after you run command **`eezdocker.sh cfgsmu`**.

Cause

`cfgsmu` is a GUI tool, and **`eezdocker.sh cfgsmu`** doesn't work over SSH sessions to the Docker host machine.

Solution

- If the Docker host machine is accessed by an SSH session, you can select either of the following ways to start the tool:
  - Run command **`eezdocker.sh shell`** to open a shell inside the SMU container and do a silent configuration. For more information, see "Starting **`cfgsmu`** in the Docker container" on page 57.
  - Configure a VNC server on the host machine and log into the desktop environment using VNC to start **`cfgsmu`**.
- If **`cgfsmu`** cannot be ran out of the Docker container, it might be necessary to allow access to the X11 session on the host machine. Run the command '**`xhost+local:all`**' before you run '**`eezdocker.sh cfgsmu`**' to ensure that the Docker process can access the user's X session.

Gathering information for IBM Support

If you cannot resolve an installation problem, send the installation log file archive to IBM support (see "Using the log file collector utility" on page 156).

Troubleshooting SMU Performance Management

Troubleshooting and support information for Service Management Unite Performance Management helps you understand, isolate, and resolve problems. Troubleshooting and support information contains instructions for using the problem-determination resources that are provided with your IBM products. To resolve a problem on your own, you can find out how to identify the source of a problem, how to gather diagnostic information, where to get fixes, and which knowledge bases to search. If you need to contact IBM Support, you can find out what diagnostic information the service technicians need to help you address a problem.

Installation Manager 32-bit installation error

Use this procedure to debug a 32-bit installation error when using Installation Manager.

The 32-bit Service Management Unite Performance Management package cannot be installed in JazzSM 64-bit core services. To correct this error use the default value for installing Service Management Unite Performance Management, which is to install as a new package group.

Installation log files

Use this procedure to work with installation log files

Installation Manager log files are located in the Installation Manager `/data/logs` directory. The default location is `/var/ibm/InstallationManager/data/logs`. Otherwise, the `/data` directory location is available from the *appDataLocation* value in the `/etc/.ibm/registry/InstallationManager.dat` file.

Installation Manager logs are XML files in the `/logs` directory. Output files from the multiple system commands that are run during installation are located in the `logs/native` directory. If any command has failed and stopped the installation, the Installation Manager error window will identify the native log file containing output for the failed command.

Increasing runtime memory

Tivoli Directory Integrator does not use all available memory so edit the `ibmdisrv` file to increase runtime memory and avoid out of memory errors. To increase the runtime memory, add the two **`-Xms2048M -Xmx4096M`** space-separated arguments to the Java invocation command.

Procedure

1. To increase the heap size of Java Virtual Machine, include **`-Xms`** and **`-Xmx`** options in the `ibmdisrv` script file. For example, to set the minimum heap memory size to 2048 bytes and maximum heap memory size to 4096 bytes, modify the script.

   Note: On Linux systems, the file name is `ibmdisrv` and the file is in the main Tivoli Directory Integrator directory.

2. Find the following line in `ibmdisrv`:

   ```
   "$TDI_JAVA_PROGRAM" $TDI_MIXEDMODE_FLAG -cp
   "$TDI_HOME_DIR/IDILoader.jar" "$LOG_4J"
   com.ibm.di.loader.ServerLauncher "$@" &
   ```

3. Change the script as shown:

   ```
   "$TDI_JAVA_PROGRAM" $TDI_MIXEDMODE_FLAG -Xms2048m -Xmx4096m -cp
   "$TDI_HOME_DIR/IDILoader.jar" "$LOG_4J"
   com.ibm.di.loader.ServerLauncher "$@" &
   ```

   Note: Do not copy and paste the examples into your `ibmdisrv` file. Add the two arguments without changing any of the other arguments.

Recycle the Tivoli Directory Integrator server

After you complete the post installation configuration tasks, manually recycle the Tivoli Directory Integrator server by issuing the following commands.

Procedure

1. To stop the Tivoli Directory Integrator server:

   ```
   ps -ef | grep TDI | gawk '!/grep/ {print $2}' | xargs kill -9
   ```

2. To start the Tivoli Directory Integrator server, if you are using the default solution directory:

   ```
   /opt/IBM/TDI/V7.1.1/ibmdisrv -d -s /opt/IBM/TDI/V7.1.1/DASH_ITMCollector
   &> /opt/IBM/TDI/V7.1.1/DASH_ITMCollector/logs/ibmdisrv.log &
   ```

Turning on debug in the TDI properties file

To debug problems in the Service Management Unite Performance Management dashboards, enable the trace mode in the TDI properties file and analyze the generated logs.

Procedure

1. Go to the solution directory. The default directory is `/opt/IBM/TDI/V7.1.1/DASH_ITMCollector`.
2. To enable the trace mode, edit the TDI properties file `DASH_ITMCollector.properties` and set the corresponding parameters to `true`. For example, to turn on debug for JVM-related dashboards, set **`itm.jvm_debug`** to `true`. You can find the detailed logs that contain messages and exceptions for analysis in `ibmdi.log`. The default directory for the log file is `/opt/IBM/TDI/V7.1.1/DASH_ITMCollector/logs/ibmdi.log`.

Creating an SSL connection between Tivoli Directory Integrator and WebSphere Application Server

The Tivoli Directory Integrator component is used as a client to retrieve data from the System Automation data provider that is run in IBM Service Management Unite.

During Service Management Unite installation, digital certificates needed for Secure Sockets Layer (SSL) connections between WebSphere Application Server and Tivoli Directory Integrator are exchanged. When WebSphere Application Server and Tivoli Directory Integrator are on different systems, this process can fail without failing the entire installation. If this occurs, the following process can be used to manually exchange the certificates. If the certificate exchange worked properly, this section can be skipped.

If the connection between Tivoli Directory Integrator and WebSphere Application Server is configured to use SSL, a truststore must be defined and used by Tivoli Directory Integrator for this communication. WebSphere Application Server and Tivoli Directory Integrator must exchange their public keys so communication between Tivoli Directory Integrator and the System Automation data provider is possible. Use the following steps, which must be completed with a session that has graphical support, to set up the SSL connection if WebSphere Application Server and Tivoli Directory Integrator are using security defaults.

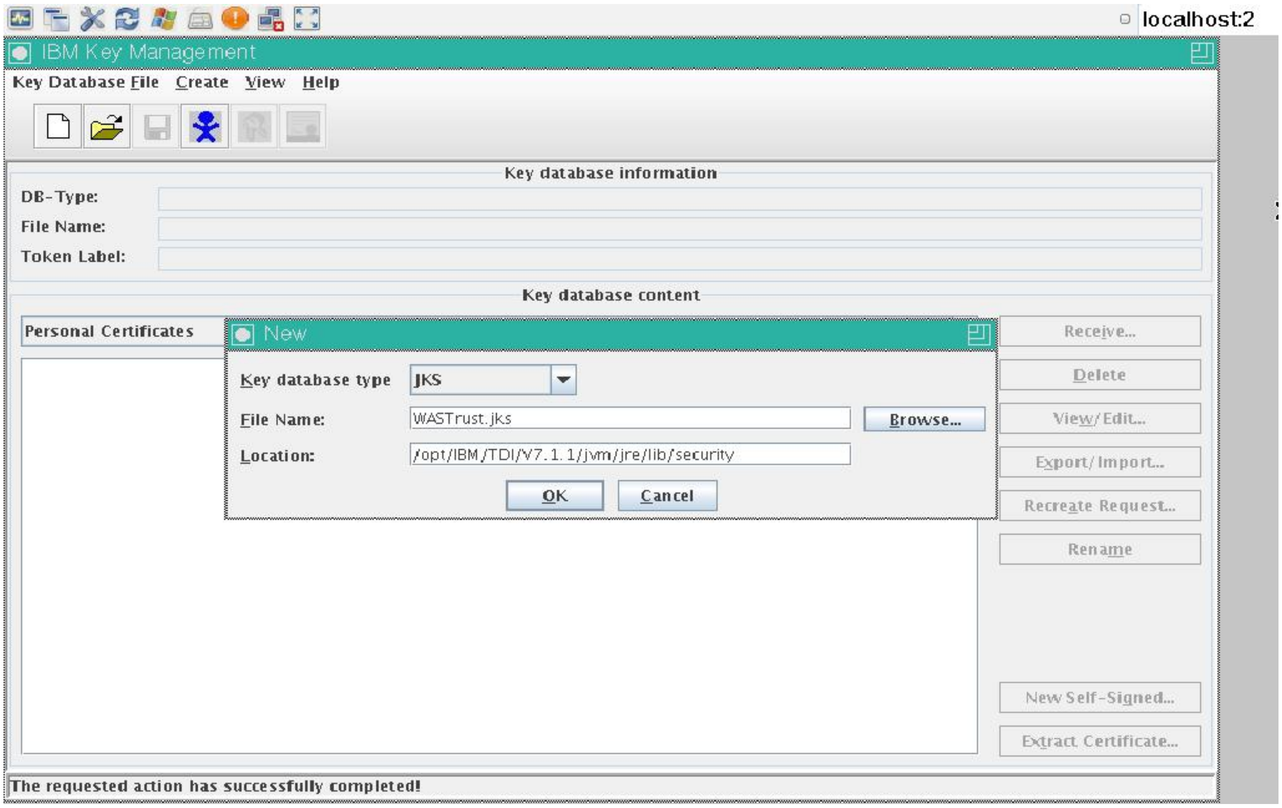
Some of these steps might not be necessary (for example, a truststore for Tivoli Directory Integrator might already be defined). Verify the requirements to set up the SSL connection in your environment with your security administrators.

Creating a truststore

A truststore is a database of public keys for target servers. The SSL truststore contains the list of signer certificates (CA certificates) that define which certificates the SSL protocol trusts. Only a certificate that is issued by one of these listed trusted signers can be accepted.

Procedure

1. To create a truststore for the `DASH_ITMCollector` project, start the IBM Key Management Tool with the following command:
   ```
   /opt/IBM/TDI/V7.1.1/jvm/jre/bin/ikeyman
   ```
2. Select **New** from the **Key Database File** list.
3. Create a key database with the following values:
   - **Type**: "JKS"
   - **File Name**: "WASTrust.jks"
   - **Location**: `/opt/IBM/TDI/V7.1.1/jvm/jre/lib/security`



Key database type: JKS

File Name: WASTrust.jks

Location: /opt/IBM/TDI/V7.1.1/jvm/jre/lib/security

The requested action has successfully completed!

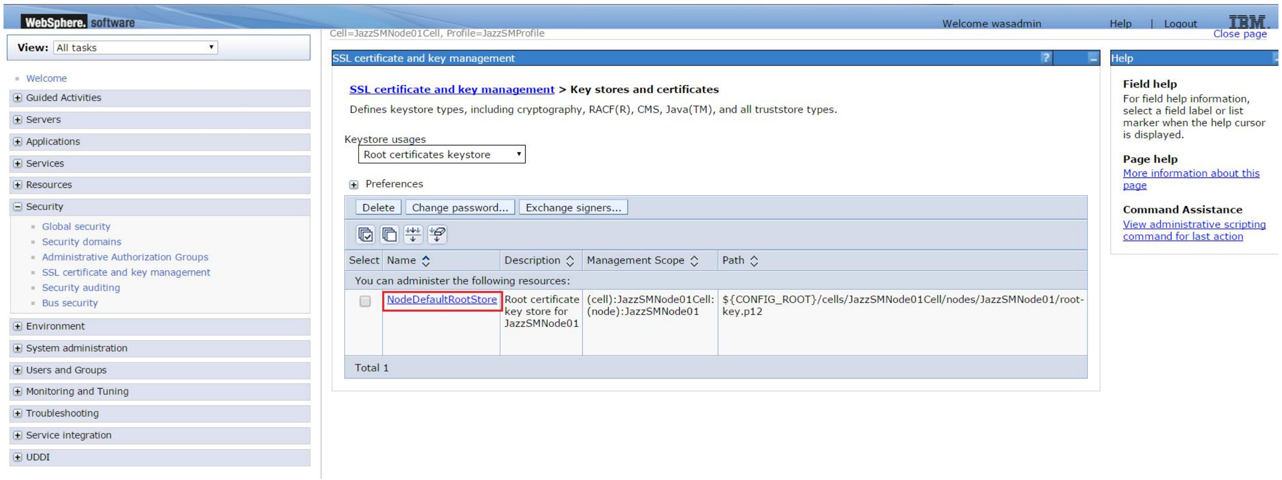
4. Click **OK**. A new window displays. Specify a password for your key database and click **OK** to create the file.

Configuring the WebSphere Application Server Connection

Export a public certificate from WebSphere Application Server so it can be imported into the WASTrust.jks truststore.

Procedure

1. Start the WebSphere Application Server administrative console.
2. Enter the WebSphere Application Server administrator user ID and password and click **Log in**.
3. From the menu on the left side of the window, expand **Security** and click **SSL certificate and key management**.
4. On the right side of the window, under the Related Items heading, click **Key stores and certificates**.
5. A new window displays. From the **Keystore usages** menu towards the top of the page, select **Root certificates keystores**.
6. Select **NodeDefaultRootStore** from the table.



Cell=JazzSMNode01Cell, Profile=JazzSMProfile

SSL certificate and key management > Key stores and certificates

Defines keystore types, including cryptography, RACF(R), CMS, Java(TM), and all truststore types.

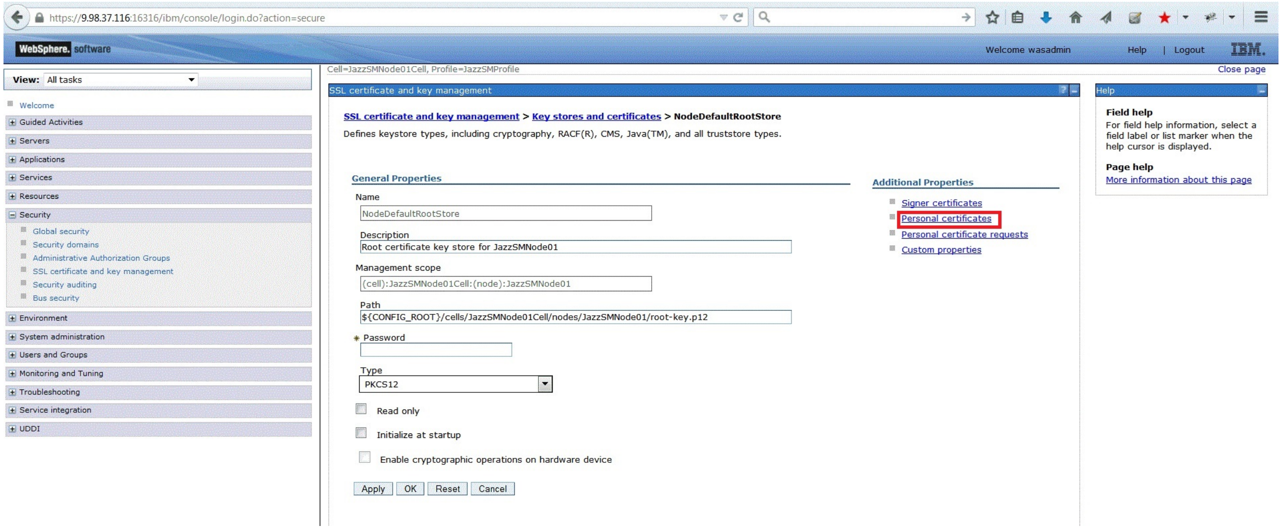
Keystore usages: Root certificates keystore

You can administer the following resources:

Select	Name	Description	Management Scope	Path
□	NodeDefaultRootStore	Root certificate key store for JazzSMNode01	(cell):JazzSMNode01Cell:(node):JazzSMNode01	${CONFIG_ROOT}/cells/JazzSMNode01Cell/nodes/JazzSMNode01/root-key.p12

Total 1

7. A new window displays. On the right side of the window, under the Additional Properties heading, click **Personal certificates**.



Cell=JazzSMNode01Cell, Profile=JazzSMProfile

SSL certificate and key management > Key stores and certificates > NodeDefaultRootStore

Defines keystore types, including cryptography, RACF(R), CMS, Java(TM), and all truststore types.

General Properties

Name: NodeDefaultRootStore

Description: Root certificate key store for JazzSMNode01

Management scope: (cell):JazzSMNode01Cell:(node):JazzSMNode01

Path: ${CONFIG_ROOT}/cells/JazzSMNode01Cell/nodes/JazzSMNode01/root-key.p12

* Password:

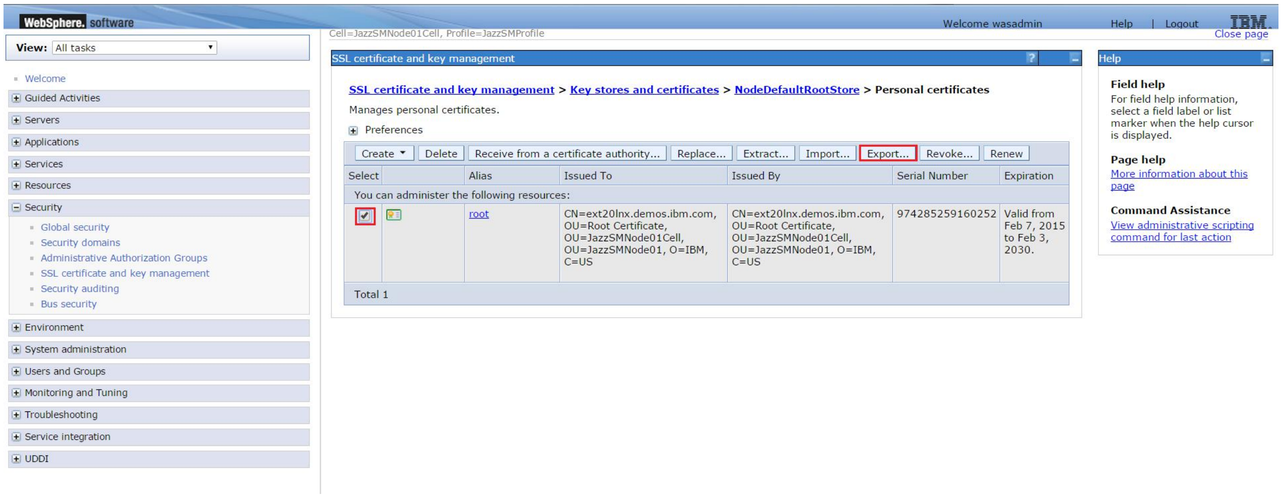
Type: PKCS12

□ Read only

□ Initialize at startup

□ Enable cryptographic operations on hardware device

8. Use the check box in the **Select** column to select the **root** alias. Click **Export** at the top of the table.



Cell=JazzSMNode01Cell, Profile=JazzSMProfile

SSL certificate and key management

SSL certificate and key management > Key stores and certificates > NodeDefaultRootStore > Personal certificates

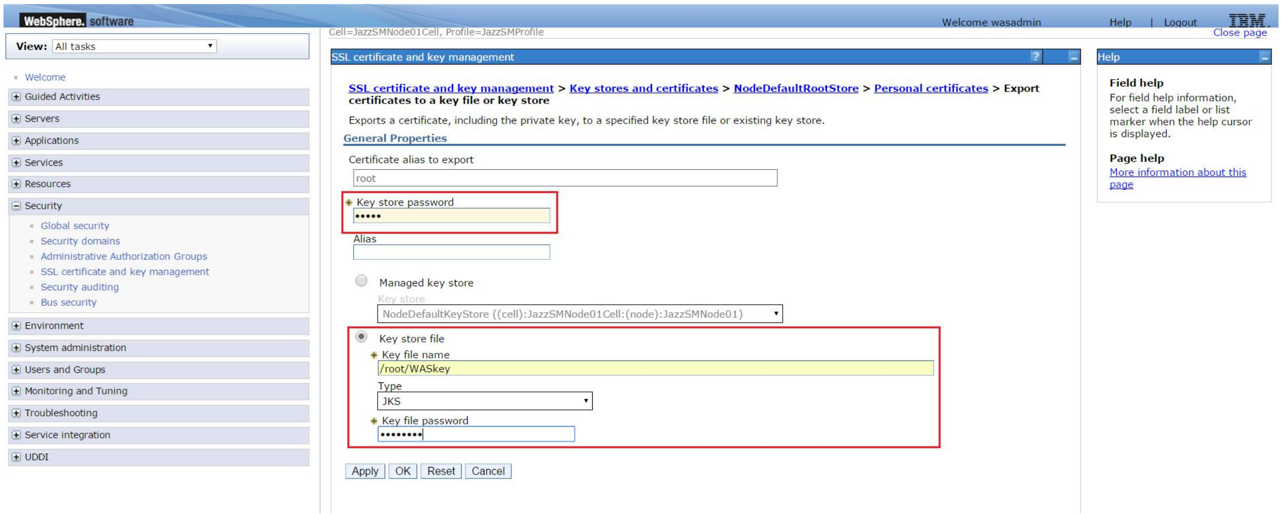
Manages personal certificates.

You can administer the following resources:

Select	Alias	Issued To	Issued By	Serial Number	Expiration
☑	root	CN=ext20lnx.demos.ibm.com, OU=Root Certificate, OU=JazzSMNode01Cell, OU=JazzSMNode01, O=IBM, C=US	CN=ext20lnx.demos.ibm.com, OU=Root Certificate, OU=JazzSMNode01Cell, OU=JazzSMNode01, O=IBM, C=US	974285259160252	Valid from Feb 7, 2015 to Feb 3, 2030.

Total 1

9. On the next screen that is displayed, in the center pane under the General Properties heading, enter the **key store password** and **key store file** information to export your WebSphere Application Server root certificate keystore file.
   - The default keystore password is “WebAS”.
   - Under **Key store** file, specify the path and name for the file you are exporting.
   - Set the **Type** field to “JKS”. Assign a password for your WebSphere Application Server root certificate keystore file.



Cell=JazzSMNode01Cell, Profile=JazzSMProfile

SSL certificate and key management

SSL certificate and key management > Key stores and certificates > NodeDefaultRootStore > Personal certificates > Export certificates to a key file or key store

Exports a certificate, including the private key, to a specified key store file or existing key store.

General Properties

Certificate alias to export: root

* Key store password: •••••

Alias:

○ Managed key store

Key store: NodeDefaultKeyStore ((cell):JazzSMNode01Cell:(node):JazzSMNode01)

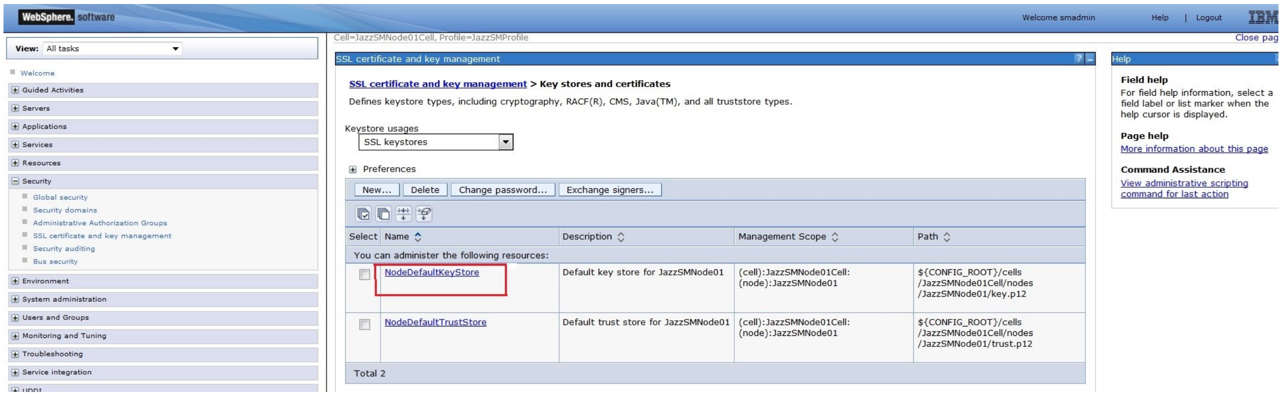
● Key store file

* Key file name: /root/WASkey

Type: JKS

* Key file password: ••••••••

10. Click **OK**. You are asked for a password; enter it here.
11. From the **Keystore usages** menu towards the top of the page, select **SSL keystores**.
12. Select **NodeDefaultKeyStore** from the table.



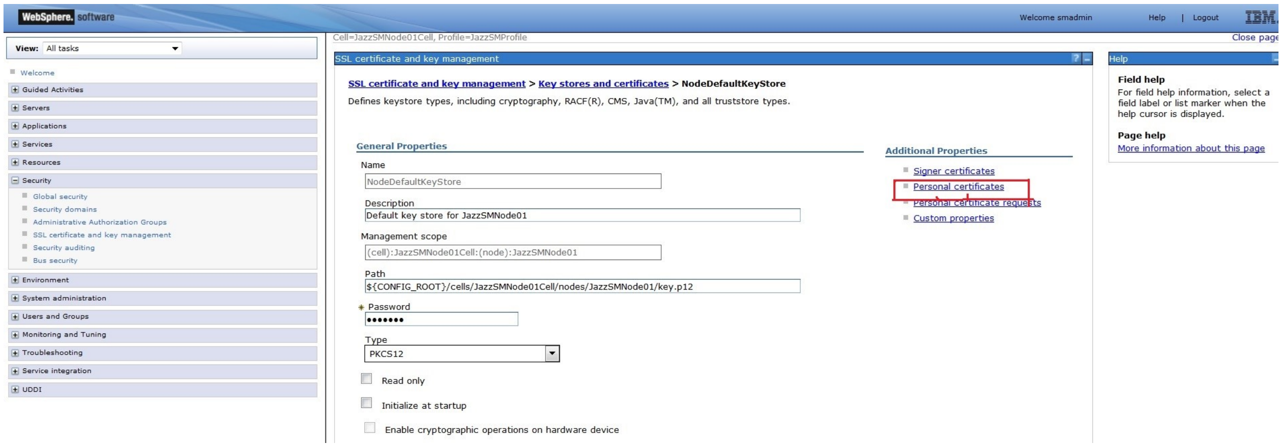
Cell=JazzSMNode01Cell, Profile=JazzSMProfile

SSL certificate and key management > Key stores and certificates

Defines keystore types, including cryptography, RACF(R), CMS, Java(TM), and all truststore types.

Select	Name	Description	Management Scope	Path
You can administer the following resources:				
□	NodeDefaultKeyStore	Default key store for JazzSMNode01	(cell):JazzSMNode01Cell:(node):JazzSMNode01	${CONFIG_ROOT}/cells/JazzSMNode01Cell/nodes/JazzSMNode01/key.p12
□	NodeDefaultTrustStore	Default trust store for JazzSMNode01	(cell):JazzSMNode01Cell:(node):JazzSMNode01	${CONFIG_ROOT}/cells/JazzSMNode01Cell/nodes/JazzSMNode01/trust.p12
Total 2				

13. A new window displays. On the right side of the window, under the Additional Properties heading, click **Personal certificates**.



Cell=JazzSMNode01Cell, Profile=JazzSMProfile

SSL certificate and key management > Key stores and certificates > NodeDefaultKeyStore

Defines keystore types, including cryptography, RACF(R), CMS, Java(TM), and all truststore types.

Name: NodeDefaultKeyStore

Description: Default key store for JazzSMNode01

Management scope: (cell):JazzSMNode01Cell:(node):JazzSMNode01

Path: ${CONFIG_ROOT}/cells/JazzSMNode01Cell/nodes/JazzSMNode01/key.p12

Password: •••••••

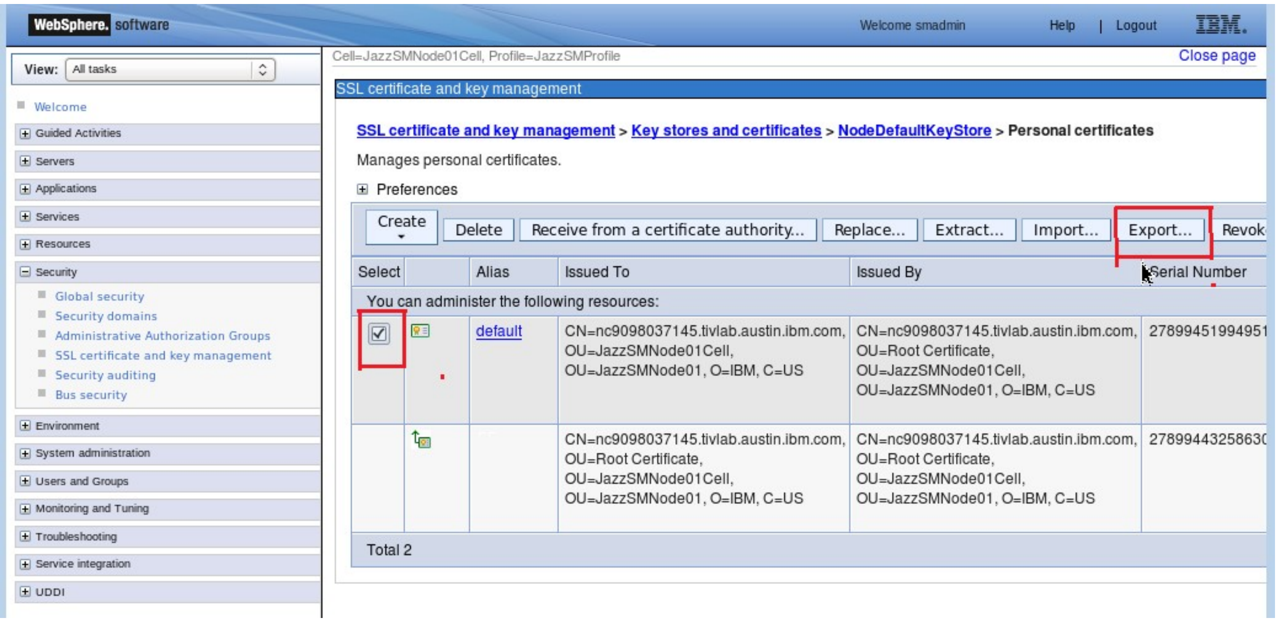
Type: PKCS12

□ Read only

□ Initialize at startup

□ Enable cryptographic operations on hardware device

14. Use the check box in the **Select** column to select the **default alias**. Click **Export** at the top of the table.



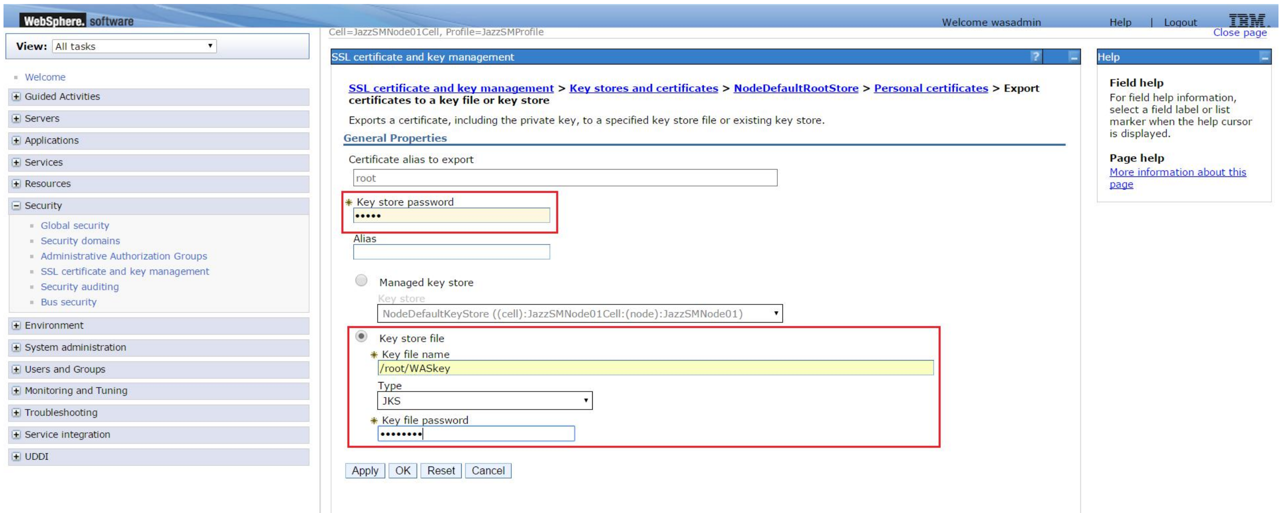
Cell=JazzSMNode01Cell, Profile=JazzSMProfile

SSL certificate and key management > Key stores and certificates > NodeDefaultKeyStore > Personal certificates

Manages personal certificates.

Select		Alias	Issued To	Issued By	Serial Number
You can administer the following resources:					
☑		default	CN=nc9098037145.tivlab.austin.ibm.com, OU=JazzSMNode01Cell, OU=JazzSMNode01, O=IBM, C=US	CN=nc9098037145.tivlab.austin.ibm.com, OU=JazzSMNode01Cell, OU=JazzSMNode01, O=IBM, C=US	27899451994951
			CN=nc9098037145.tivlab.austin.ibm.com, OU=Root Certificate, OU=JazzSMNode01Cell, OU=JazzSMNode01, O=IBM, C=US	CN=nc9098037145.tivlab.austin.ibm.com, OU=Root Certificate, OU=JazzSMNode01Cell, OU=JazzSMNode01, O=IBM, C=US	27899443258630
Total 2					

15. On the next screen that is displayed, in the center pane under the General Properties heading, enter the **key store password** and **key store file** information to export your WebSphere Application Server root certificate keystore file.
   - The default keystore password is “WebAS”.
   - Under **Key store** file, specify the path and name for the file you are exporting.
   - Set the **Type** field to “JKS”. Assign a password for your WebSphere Application Server root certificate keystore file.



Cell=JazzSMNode01Cell, Profile=JazzSMProfile

SSL certificate and key management

SSL certificate and key management > Key stores and certificates > NodeDefaultRootStore > Personal certificates > Export certificates to a key file or key store

Exports a certificate, including the private key, to a specified key store file or existing key store.

General Properties

Certificate alias to export: root

* Key store password: •••••

Alias:

○ Managed key store

Key store: NodeDefaultKeyStore ((cell):JazzSMNode01Cell:(node):JazzSMNode01)

● Key store file

* Key file name: /root/WASkey

Type: JKS

* Key file password: ••••••••

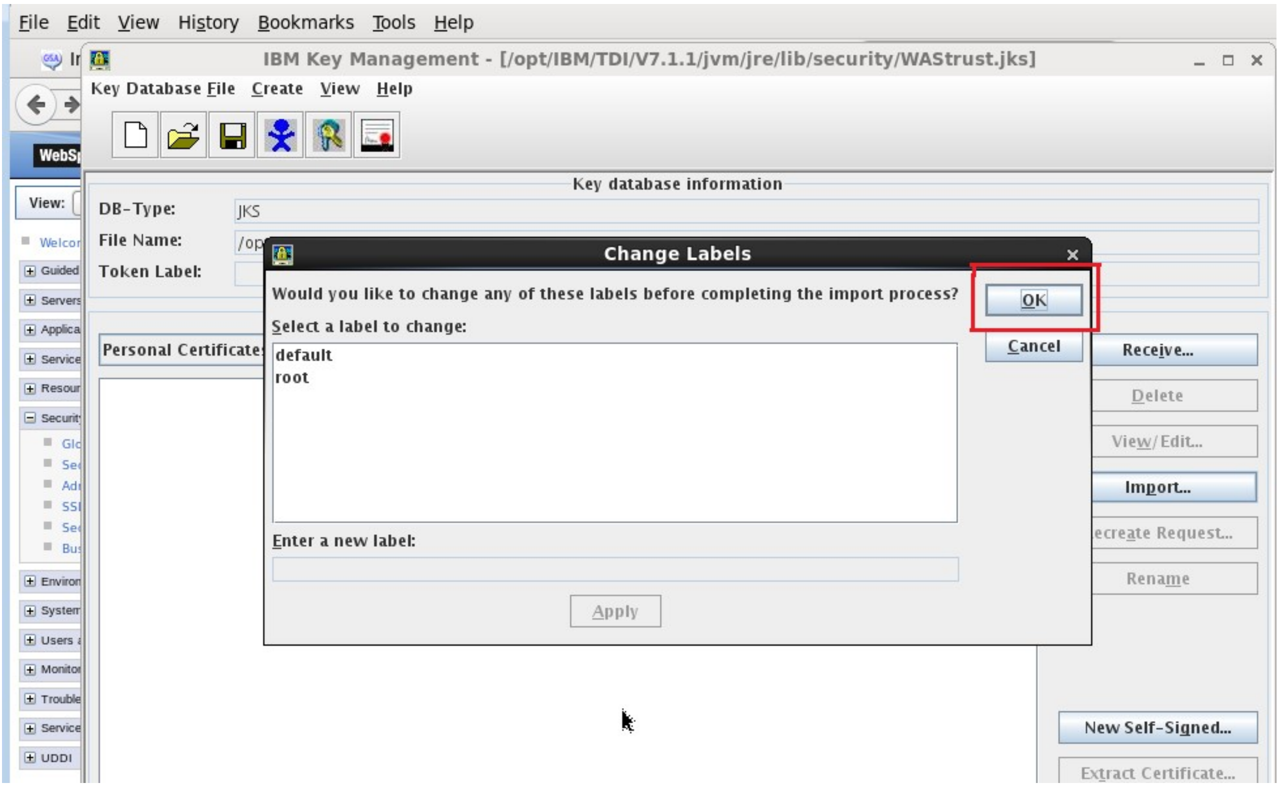
Field help

For field help information, select a field label or list marker when the help cursor is displayed.

Page help

More information about this page

16. Click **OK**. You are asked for a password; enter it here.



IBM Key Management - [/opt/IBM/TDI/V7.1.1/jvm/jre/lib/security/WAStrust.jks]

Key database information

DB-Type: JKS

File Name: /op

Token Label:

Change Labels

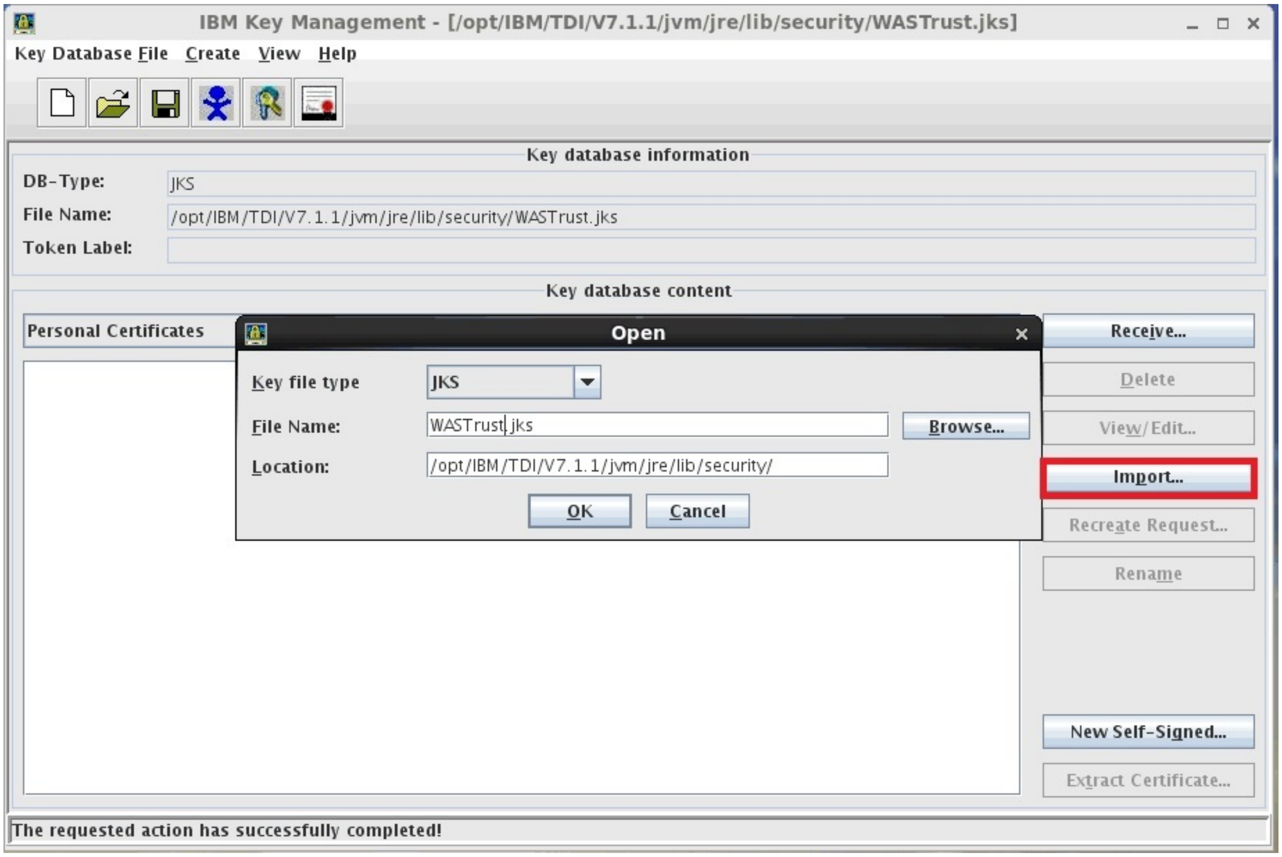
Would you like to change any of these labels before completing the import process?

Select a label to change:

default
root

Enter a new label:

17. If the Tivoli Directory Integrator server is not on the same system as WebSphere Application Server, the exported certificates must be made available as a file on the Tivoli Directory Integrator system.
18. Start the IBM Key Management Tool with the following command: `/opt/IBM/TDI/V7.1.1/jvm/jre/bin/ikeyman`
19. On the right side of the window, click **Import**. Go to the `/root/WASkey` keystore file to open and import the keystore file into the `WASTrust.jks` truststore you created earlier.



IBM Key Management - [/opt/IBM/TDI/V7.1.1/jvm/jre/lib/security/WASTrust.jks]

Key database information

DB-Type: JKS

File Name: /opt/IBM/TDI/V7.1.1/jvm/jre/lib/security/WASTrust.jks

Token Label:

Key database content

Personal Certificates

Open

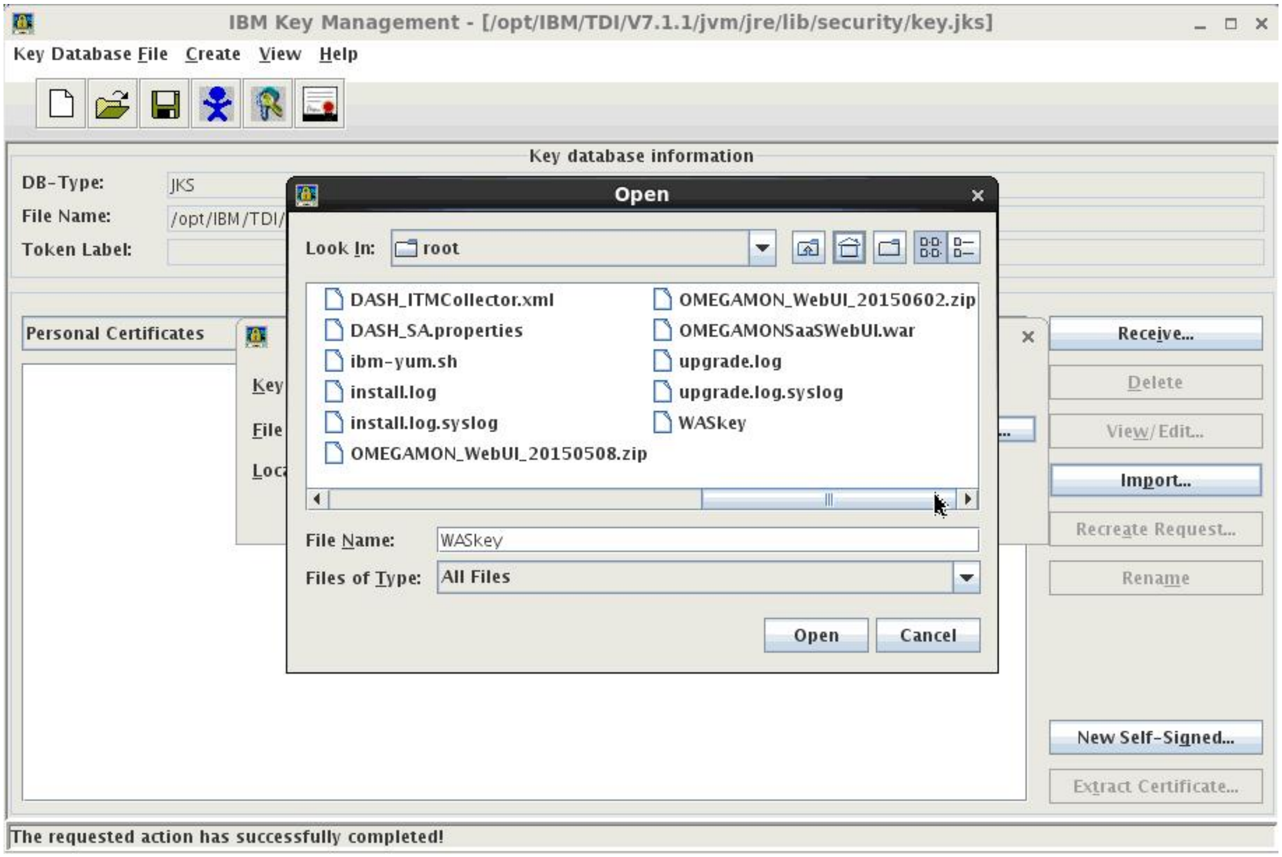
Key file type: JKS

File Name: WASTrust.jks

Location: /opt/IBM/TDI/V7.1.1/jvm/jre/lib/security/

The requested action has successfully completed!

20. Click **Browse** to show the **Open** window. Set the **Look In** menu to navigate to “root”. In the **File Name** field, enter “WASkey”and set the **Files of Type** field to “All Files”. Click **Open**.



DB-Type: JKS

File Name: /opt/IBM/TDI/

Token Label:

Look In: root

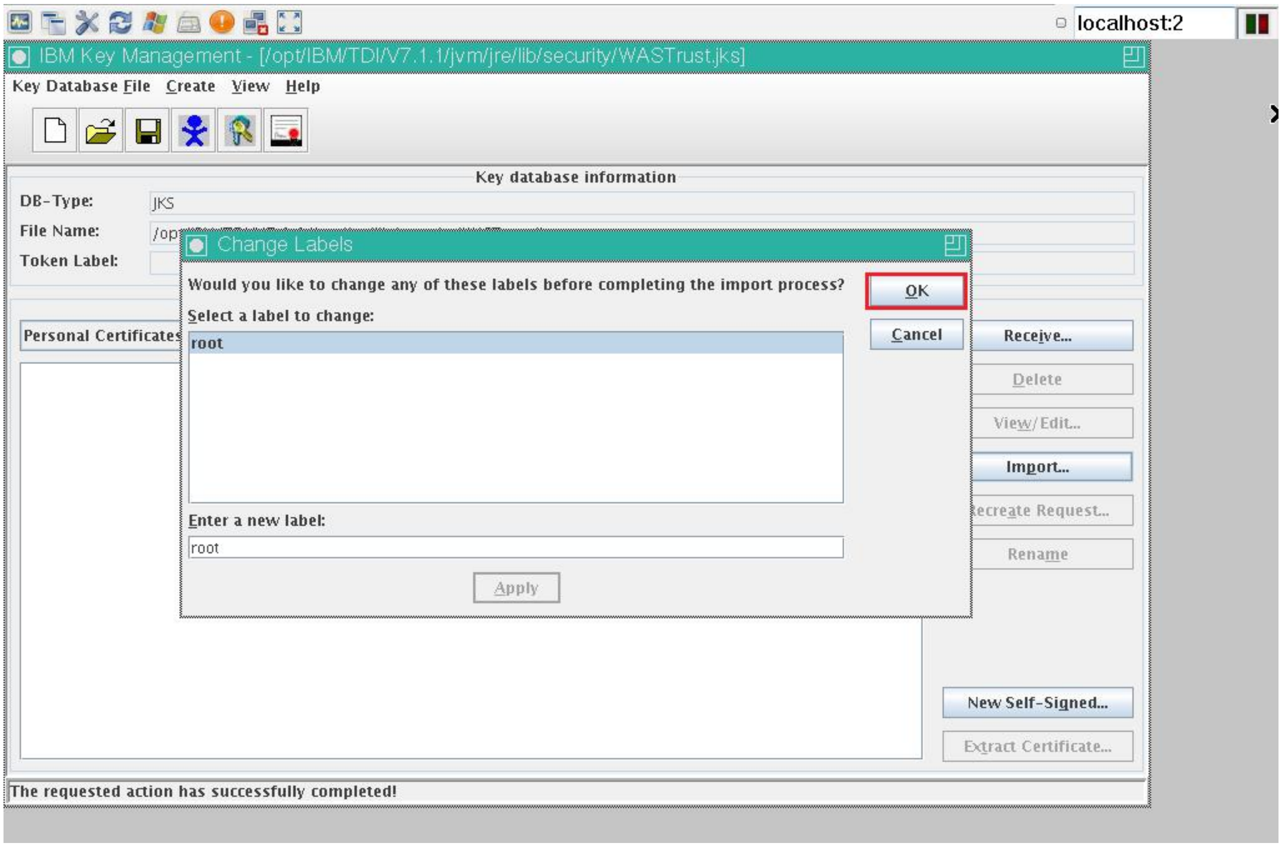
File Name: WASkey

Files of Type: All Files

The requested action has successfully completed!

21. Click **OK** to return to the previous window. You might be prompted to enter the WebSphere keystore password. The default is "WebAS."

22. In the **Change Labels** window, click **OK** to import the keystore file into the WASTrust.jks truststore. You are prompted to enter the password you set when you created the keystore file. You do not need to change the label.



IBM Key Management - [/opt/IBM/TDI/V7.1.1/jvm/jre/lib/security/WASTrust.jks]

DB-Type: JKS

File Name: /op

Token Label:

Change Labels

Would you like to change any of these labels before completing the import process?

Select a label to change:

root

Enter a new label:

root

The requested action has successfully completed!

The personal certificates of “root” and “default” are now in the WASTrust.jks truststore. Save and close the WASTrust.jks key database file. You completed the WebSphere Application Server connection.

Configuring the Tivoli Directory Integrator Connection

Add the Tivoli Directory Integrator administrator certificate to the WebSphere Application Server root certificate key database to enable SSL connection.

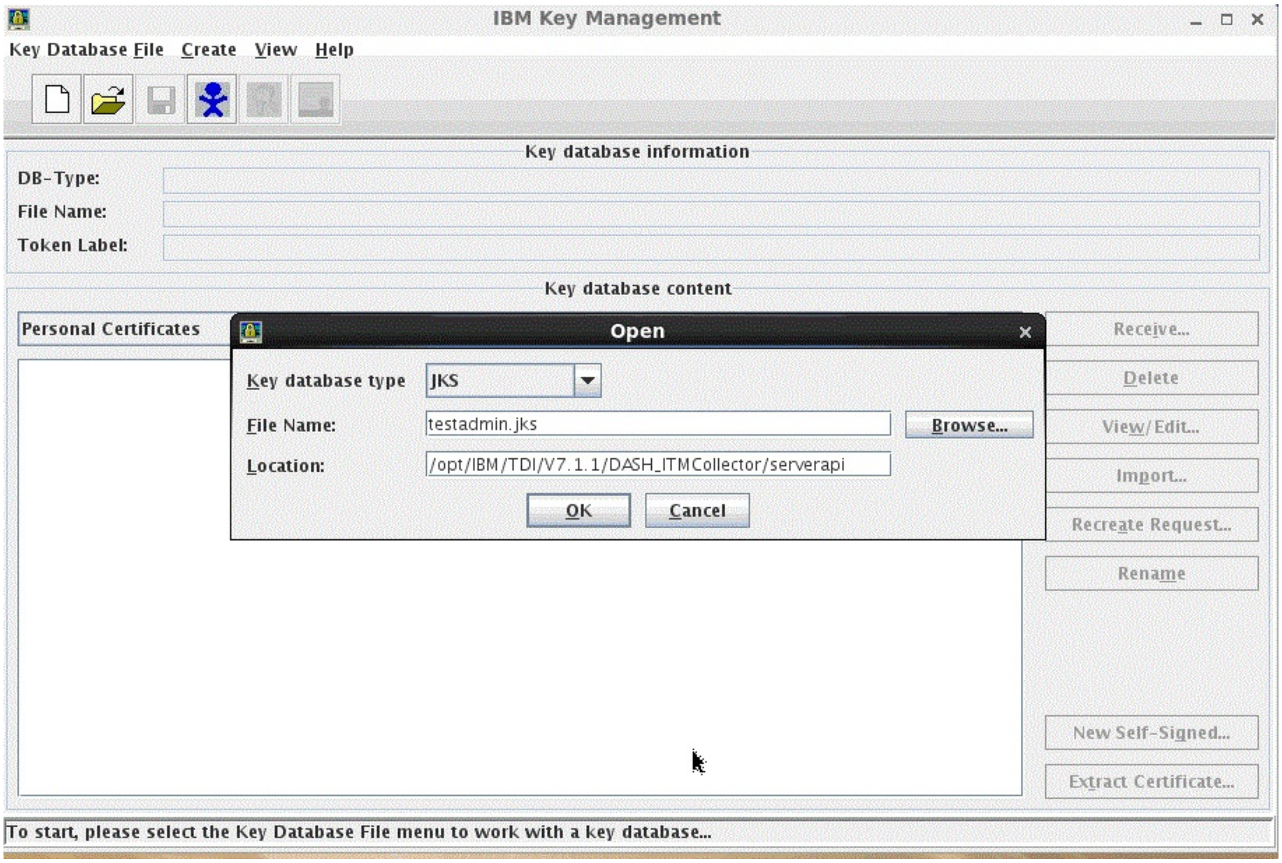
Procedure

1. If you are using the default directory, edit the /opt/IBM/TDI/V7.1.1/DASH_ITMCollector/solution.properties file with the following updates:

   ```
   ## server authentication
   javax.net.ssl.trustStore=/opt/IBM/TDI/V7.1.1/jvm/jre/lib/security/WASTrust.jks
   {protect}-javax.net.ssl.trustStorePassword=password
   javax.net.ssl.trustStoreType=jks
   ```

   The password that is specified in the solution.properties file will be encrypted the next time you restart the DASH_ITMCollector project.

2. Export the Tivoli Directory Integrator admin key so that it can be imported into WebSphere Application Server. In the IBM Key Management tool, select **Open** from the Key Database File list.



DB-Type:

File Name:

Token Label:

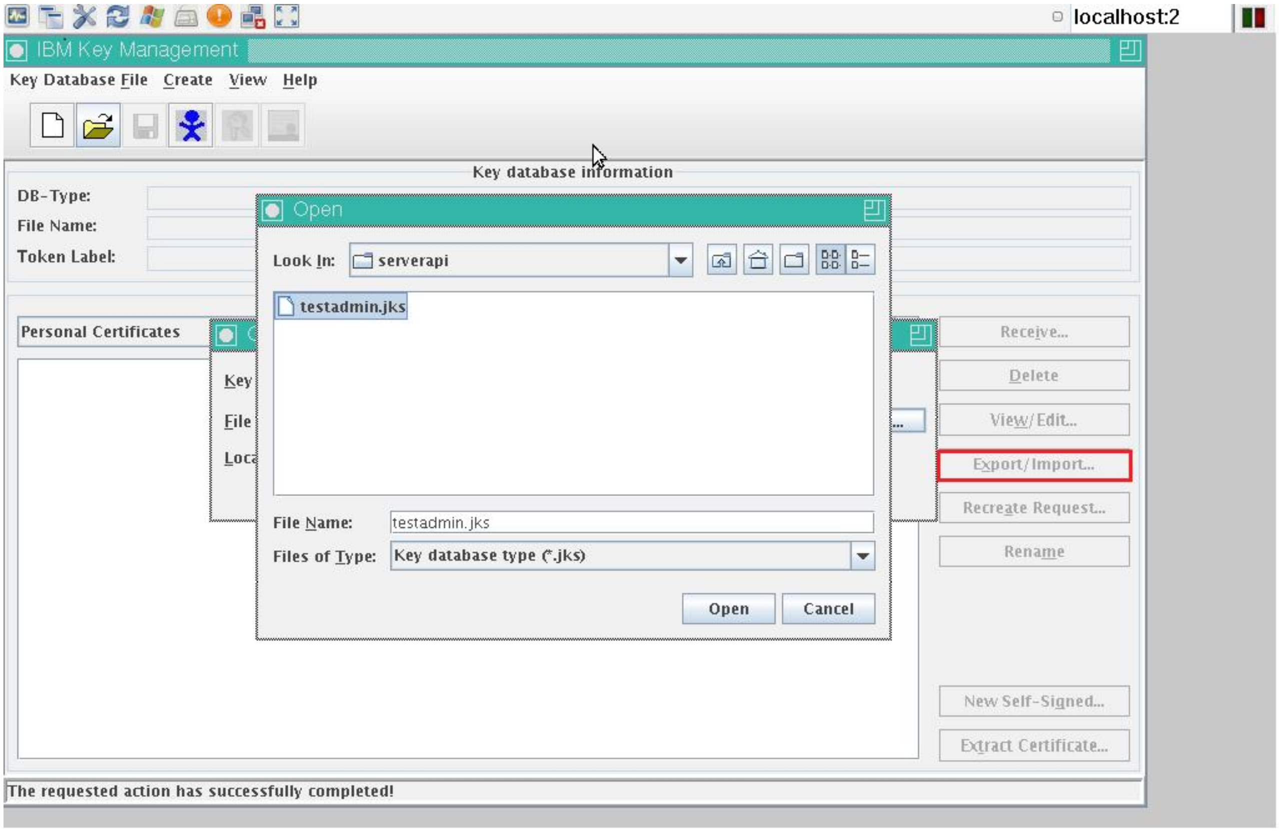
Key database type: JKS

File Name: testadmin.jks

Location: /opt/IBM/TDI/V7.1.1/DASH_ITMCollector/serverapi

To start, please select the Key Database File menu to work with a key database...

3. In the new Open dialog box:
   a. Set the **Look In** menu to “serverapi”.
   b. In the **File Name** field, enter “testadmin.jks”.
   c. Set the **Files of Type** field to “key database type (*.jks)”.
   d. Click **Open**. The Open pop-up window closes, returning you to the original Open window.



Look In: serverapi

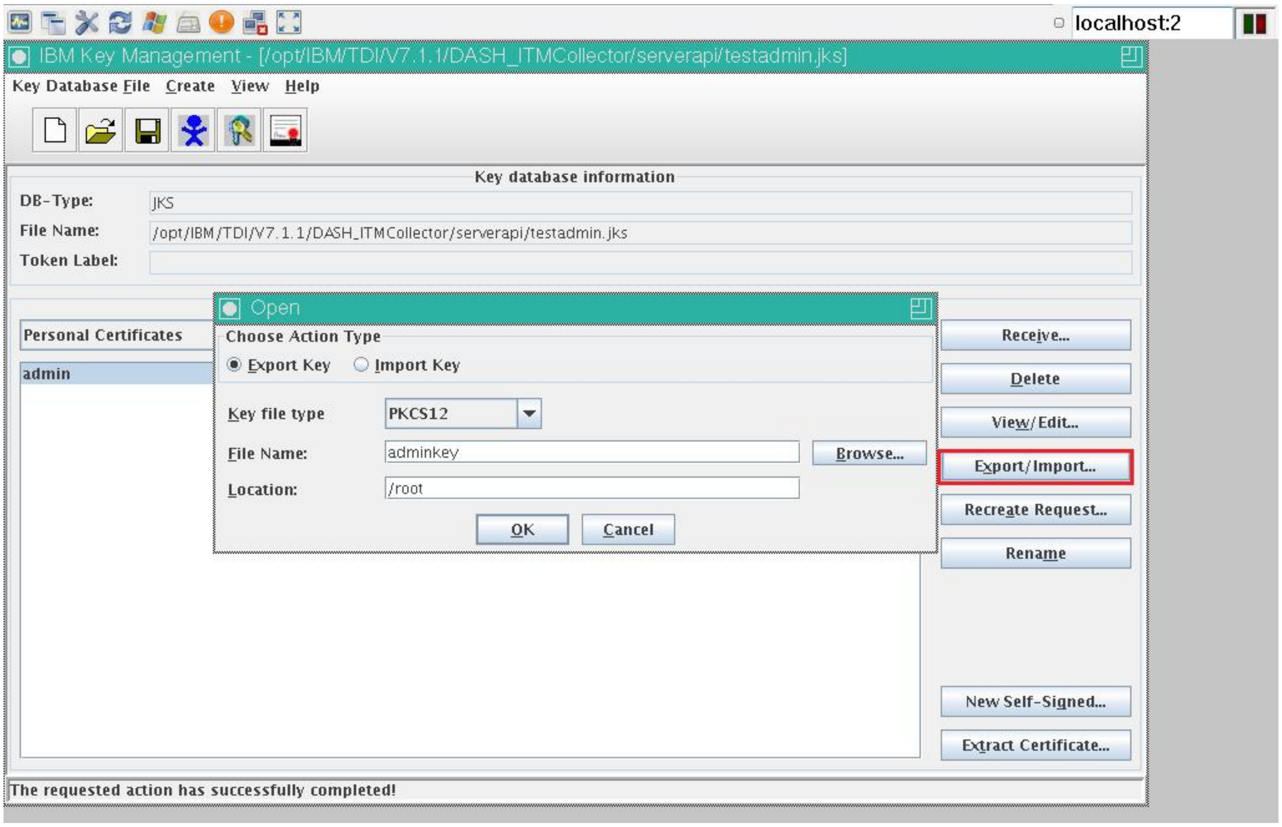
testadmin.jks

File Name: testadmin.jks

Files of Type: Key database type (*.jks)

The requested action has successfully completed!

4. Click **OK** to import the `testadmin.jks` key database file. The default password for this database is "administrator".
5. Select the admin certificate in the key database and click **Export/Import**.
6. Click **Export Key** and set the key file type to **PKCS12**. Save the keystore file as "adminkey" in the `/root` directory. Click **OK**.



IBM Key Management - [/opt/IBM/TDI/V7.1.1/DASH_ITMCollector/serverapi/testadmin.jks]

Key database information

DB-Type: JKS

File Name: /opt/IBM/TDI/V7.1.1/DASH_ITMCollector/serverapi/testadmin.jks

Token Label:

admin

Open

Choose Action Type

● Export Key ○ Import Key

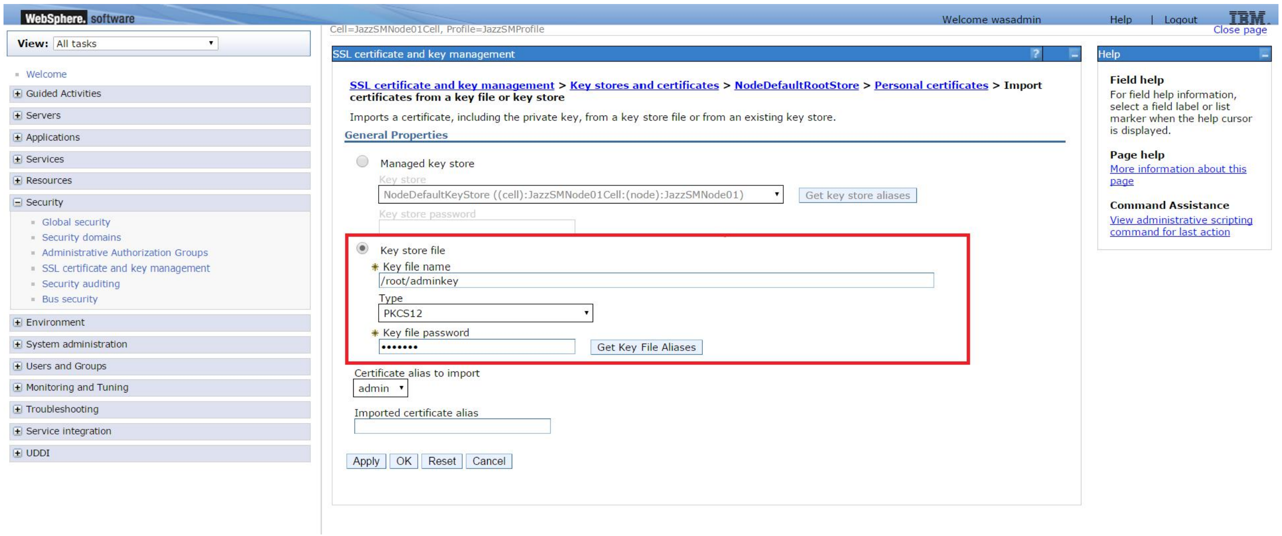
Key file type: PKCS12

File Name: adminkey

Location: /root

The requested action has successfully completed!

7. You are prompted for a password. Enter it here.
8. If WebSphere Application Server is not on the same system as Tivoli Directory Integrator, the exported certificate must be made available as a file on the system that runs WebSphere Application Server.
9. Import the adminkey keystore file into WebSphere Application Server:
   a. Start the WebSphere Application Server administrative console.
   b. Enter the WebSphere Application Server administrator user ID and password and click **Log in**.
   c. From the menu on the left side of the window, expand **Security** and click **SSL certificate and key management**.
   d. On the right side of the window, under the Related Items heading, click **Key stores and certificates**.
   e. From the **Keystore usages** menu towards the top of the page, select **Root certificates keystores**.
   f. Select **NodeDefaultRootStore** from the table.
   g. On the right side of the window, under the Additional Properties heading, click **Personal certificates**.
   h. From the table, click **Import**.
10. Click **Key store file** and enter the path to the keystore file you exported from the Tivoli Directory Integrator `testadmin.jks` key database. Click **Get Key File Aliases** to enter the “admin” alias. Click **OK**.



Cell=JazzSMNode01Cell, Profile=JazzSMProfile

SSL certificate and key management

SSL certificate and key management > Key stores and certificates > NodeDefaultRootStore > Personal certificates > Import certificates from a key file or key store

Imports a certificate, including the private key, from a key store file or from an existing key store.

General Properties

○ Managed key store

Key store
NodeDefaultKeyStore ((cell):JazzSMNode01Cell:(node):JazzSMNode01) [Get key store aliases]

Key store password

● Key store file

* Key file name
/root/adminkey

Type
PKCS12

* Key file password
••••••• [Get Key File Aliases]

Certificate alias to import
admin

Imported certificate alias

[Apply] [OK] [Reset] [Cancel]

11. The administrator certificate displays in the database. Click **Save directly to the master configuration** to save your changes.
12. Recycle the Tivoli Directory Integrator and WebSphere Application Server servers.

What to do next

Open a new browser window and log in to Dashboard Application Services Hub (DASH) V3.1.2.1. Under **Console Settings**, click **Connections**. Right-click the Tivoli Directory Integrator connection and click **Edit**. Click **OK**. You do not need to make changes to the fields.

Known problems and solutions

This section contains know problems and solutions of troubleshooting for Service Management Unite Performance Management.

Error installing into non-default package group

Use this procedure to debug an error installing into an existing package group.

Attempting to install the performance management package into an existing Installation Manager package group results in an error. Because performance management requires a unique package group, use the default settings and allow Installation Manager to create a new package group for performance management.

Invalid Configuration Location

Use this procedure to debug an invalid configuration location error.

This error can occur if the user ID that is doing the installation does not match the user ID that installed Installation Manager. A window with Invalid Configuration Location is displayed containing text starting with, "Locking is not possible in the directory *directory_path*." This error is related to file permission bits for `.fileTableLock` files within the configuration directory structure.

To fix this problem, change to the configuration directory within the *directory_path* described in the error, and issue the following commands:

```
chmod -R g+rwx .
chgrp -R groupName config_directory .
```

The *groupName* value is the primary group of the user attempting the installation.

Installation Manager installed by non-root user

Use this procedure to enable running Installation Manager as root user.

If Installation Manager was installed by a user with non-root authority, Installation Manager might not run for a root user, or it might not detect an installed WebSphere and JazzSM. Use the **su** *userid* command to switch to the root user and run as authorized to address the problem.

TDISRVCTL installation failure

Use this procedure to debug a failure during Tivoli Directory Integrator installation.

If Tivoli Directory Integrator installation attempts result in a **tdisrvctl** command failure, verify that the Tivoli Directory Integrator server is active and that the security credentials for the command are valid.

The following command returns Tivoli Directory Integrator server status:

```
ps -ef | grep TDI
```

If the server is not active, open a terminal window and issue the following command from the Tivoli Directory Integrator installation directory:

```
ibmdisrv -d
```

If the server is active, the port and security parameters specified for the command on the configuration panel might be incorrect. An efficient method for debugging command problems is to issue a **tdisrvctl** command from the Tivoli Directory Integrator installation directory. For example, run the following command:

```
./bin/tdisrvctl –K serverapi/testadmin/jks –P administrator –T
testserver.jks –op srvinfo
```

The command uses the default TDI security for the –K,-T and –P parameters, which might have changed during your Tivoli Directory Integrator installation.

Unable to discover the installed TDI

Use this procedure to debug a failed Tivoli Directory Integrator prerequisite check when the correct TDI level is installed.

If the prerequisite check for Tivoli Directory Integrator fails but the correct level of Tivoli Directory Integrator is installed, Tivoli Directory Integrator might have been installed by a non-root user. To detect Tivoli Directory Integrator and its installed level, Installation Manager examines the file named .com.zerog.registry.xml. If Tivoli Directory Integrator was not installed by a root user, this file might be located in the home directory of the applicable non-root user. Search for the file and copy it to the /var directory, and then rerun the prerequisite check.

IBM Tivoli Monitoring CURI Data Provider not defined

Use this procedure to debug "no data" errors that occur if the IBM Tivoli Monitoring CURI Data Provider is not defined.

When you configure Service Management Unite, you must define the connection from the Dashboard Application Services Hub to the IBM Tivoli Monitoring CURI Data Provider. If Tivoli Directory Integrator is running, but the IBM Tivoli Monitoring CURI Data Provider connection is not defined, only partial data is available on the details pages. On these pages, some widgets show data, while other widgets display errors with a dataset name included in the error message. The error messages have "@ITMSD" at the end, which indicates the connection is not defined.

To detect if the dashboard data provider is defined, go to **Console Settings > Connections** and look for a connection with an ID of "ITMSD". If one is not listed, define the connection from Dashboard Application Services Hub to the IBM Tivoli Monitoring CURI Data Provider as described in the “Defining a CURI Data Provider connection” on page 103 topic.

IBM Tivoli Monitoring CURI Data Provider not enabled

Use this procedure to debug "no data" errors that occur if the IBM Tivoli Monitoring CURI Data Provider is not enabled.

If the System Health dashboard displays no data, check to see whether the dashboard data provider is enabled. When you configure the Tivoli Enterprise Portal Server, you must enable it to be a dashboard data provider to deliver data to Service Management Unite.

To detect if the dashboard data provider is enabled, in the Service Management Unite dashboard, go to **Console Settings > Connections**. If you correctly entered the server information details during post-installation configuration as described in “Defining a CURI Data Provider connection” on page 103, it is likely that the dashboard data provider was not enabled.

In the `SystemOut.log` file, a message displays saying that it cannot get to the Tivoli Enterprise Portal Server. This statement is an extra indication that the data provider is not enabled.

To enable the dashboard data provider, see the "Verifying the dashboard data provider is enabled" topic in the *IBM Tivoli Monitoring Installation and Setup Guide*.

Secure Sockets Layer connection error

Use this procedure to debug a failure to define the Secure Sockets Layer (SSL) connection between WebSphere Application Server and Tivoli Directory Integrator.

If the System Health page does not display automation events in the Events table, or automation domains in the Health Status widget, the SSL connection between WebSphere Application Server and Tivoli Directory Integrator might not be properly defined.

For the System Health page to display System Automation and OMEGAMON data, there must be an SSL connection established between Tivoli Directory Integrator and WebSphere Application Server. This connection should be defined during the installation process.

Tivoli Directory Integrator errors

Use this procedure to debug "no data" conditions that might occur because of Tivoli Directory Integrator issues.

The performance management component uses Tivoli Directory Integrator to get data. If Tivoli Directory Integrator is not configured correctly, you cannot access the details dashboards for performance management.

To detect a Tivoli Directory Integrator error, go to **Console Settings > Connections**. When the status of the Tivoli Directory Integrator is "No data returned", this indicates a problem between the Tivoli Directory Integrator component that runs inside of WebSphere Application Server and the Tivoli Directory Integrator server.

Try to edit the Tivoli Directory Integrator connection by clicking **OK** and then **Cancel**. If the status of the Tivoli Directory Integrator changes to “Working” in the Connections page, you can skip the rest of this topic. If it does not change to “Working”, then continue with the following steps.

To verify that the Tivoli Directory Integrator server is running correctly, you can issue the following command:

`curl http://localhost:1098/rest`.

If the command returns a message that says "couldn't connect to the host", this message indicates that the server has a problem or is not running.

When there are two Tivoli Directory Integrator servers with the same solution directory running, the multiple processes running might cause a "no data" condition. The Tivoli Directory Integrator component that runs on WebSphere Application Server can handle a single connection. If you are already using Tivoli Directory Integrator with other Jazz for Service Management products, you must use the same solution directory. All Tivoli Directory Integrator solutions or projects must be run in the same solution directory that Service Management Unite uses.

If a performance management workspace or the System Health dashboard displays "No data returned" and the Tivoli Directory Integrator components are running, there might be an issue in the Tivoli Directory Integrator connection. You might also see “Cannot Access Data Provider xxxxxxx@TDI” or “No Items to Display” messages in Dashboard Application Service Hub widgets. On the System Health page, if the System Automation domains or automation events are not displaying, this indicates an issue between Tivoli Directory Integrator and the System Automation data provider.

Note: Anything after the at sign (@) symbol in a data widget refers to the data provider used for the widget.

Tivoli Directory Integrator solution directory (SOLDIR) contains the properties files and logs. The logs subdirectory contains the `ibmdi.log` file where Tivoli Directory Integrator server messages are recorded. Each time an assembly line runs, messages and exceptions are written to the log. An exception typically causes an assembly line to fail and not return data, or return only some data. The last five Tivoli Directory Integrator logs are stored in `ibmdi.log.1` through `ibmdi.log.5`. Each time Tivoli Directory Integrator is restarted, a new log is rewritten.

Welcome page display error

Use this procedure to debug an error in displaying the welcome page.

This error can occur if a user was not granted the System Automation group permission of `EEZMonitor`.

To fix this issue, see “Displaying the Service Management Unite welcome page” on page 106.

Gathering information for IBM Support

If you cannot resolve an installation problem, send the installation log file archive to IBM support (see "Using the log file collector utility" on page 156).

Support for Service Management Unite

To access service and support for IBM Service Management Unite V1.1.5, use the following resources:

Service Management Unite software:
http://www.ibm.com/software/products/en/service-management-unite

Customer portal:
http://www.ibm.com/support/docview.wss?uid=swg21962625

Fix Central:
http://www.ibm.com/support/fixcentral/

Service Engage:
http://www.ibmserviceengage.com

Service Management Connect for System z:
http://www.ibm.com/developerworks/servicemanagement/z/index.html

Support Portal:
https://www.ibm.com/support/entry/portal

Chapter 10. Messages

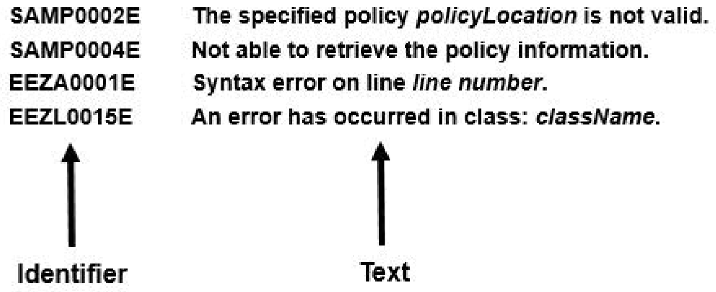
This section contains messages for Service Management Unite Automation and Performance Management.

Message formats

This section introduces the formats of IBM Service Management Unite messages, including the text formats and description formats.

- Message text formats

  Most messages are preceded by an identifier, as illustrated in Figure 1.



SAMP0002E The specified policy *policyLocation* is not valid.

SAMP0004E Not able to retrieve the policy information.

EEZA0001E Syntax error on line *line number*.

EEZL0015E An error has occurred in class: *className*.

Figure 7. Sample message format

- Message description formats

  A message consists of several sections. Not all categories are used for each message. For messages that are always issued as a group, the "Explanation" section of the first message usually contains a complete description of the other messages in the group.

SMU Automation messages

All messages that are generated by Service Management Unite Automation installation and configuration are included in this section, including the appropriate user responses.

This section also includes messages for any problems related to launching or using the Service Management Unite Automation dashboard console or the dashboard console online help.

Note: For all other administrative, user and other console-related messages, refer to the dashboard console online help.

EEZ message catalog

This section lists the messages that are generated by subcomponents of the IBM Service Management Unite that have the prefix EEZ. The messages are sorted alphabetically by subcomponent prefix.

For information about additional messages you might encounter while working with the Service Management Unite Automation, see the remaining message sections of this document and to the documentation for the corresponding first-level automation product.

EEZ message code

Most messages that are generated by subcomponents of IBM Service Management Unite begin with a unique message code.

Example:

EEZS1234E

- **EEZ** – component identifier of the IBM Service Management Unite. The EEZ component identifier is also used for System Automation Application Manager.
- **S** – represents one of the following prefixes:
  - **A** - Messages issued by automation adapters

    Note: System Automation for z/OS adapter messages:
    - Within NetView an additional * may be appended to the end of the message text.
    - Because these messages are written to the syslog on z/OS, the message text must be in English.
  - **J, L, T** – Automation JEE framework messages
  - **C** – Messages issued by various utilities
  - **I** – Automation manager resource adapter messages
  - **K, X** – Automation Software Development Kit messages
  - **P** – Policy-related messages
  - **Q** – ITM integration messages
  - **R** – Universal Automation Adapter messages
  - **U** – Operations console messages

  Messages are sorted alphabetically by subcomponent prefix.
- **1234** – unique four-digit number
- **E** – one of the following severity code identifiers:
  - **I** for Information
  - **W** for Warning
  - **E** for Error

Prefix EEZA

This section contains messages with prefix EEZA.

EEZA0001E Syntax error on line *line number*

Explanation: A syntax error has occurred in the configuration file, for example a leading = on a line.

System action: The automation adapter stops.

Operator response: Analyze the configuration file for invalid syntax.

EEZA0002E Wrong datatype in key *the key*. **Expected** *the desired type*, **found value "** *the value that was found* **"**

Explanation: The value of the given key cannot be interpreted as the desired type. For example, the system expected a boolean value but found the string "hello".

System action: The automation adapter stops.

Operator response: Analyze the configuration file for invalid key/value pairs.

EEZA0003E The key " *the key that was not found* **" was not found and no default value was given**

Explanation: The system attempted to retrieve a value from the configuration file that did not exist and no default value was given.

System action: The automation adapter stops.

Operator response: Supply a value for the key in the configuration file.

EEZA0004E **Integer out of bounds in key "** *the key* **". Expected value between** *the lower bound expected* **and** *the upper bound expected***, found** *the value parsed*

Explanation: The system expected an integer value between the given bounds (inclusive) for the given key, but found a value outside these bounds.

System action: The automation adapter stops.

Operator response: Supply a value within the given bounds for the key.

EEZA0006E **Cannot create an instance of the class because class not found:** *class name*

Explanation: The automation adapter cannot load the class.

System action: The automation adapter rejects the request.

Operator response: Check whether the class name is valid and is available in the corresponding classpath.

EEZA0007E **Cannot create an instance of the class because method not found:** *class name*

Explanation: The automation adapter can load the class but cannot create an instance.

System action: The automation adapter rejects the request.

Operator response: Check whether the class is valid.

EEZA0008E **Cannot create an instance of the class because of an unknown error:** *class name*

Explanation: The automation adapter cannot load the class or create an instance.

System action: The automation adapter rejects the request.

Operator response: Check whether the class is valid and analyze the attached original exception.

EEZA0009E **Invocation of adapter plug-in failed: plug-in=***plug-in name***, method=***method name***, internalRetcode=***internal return code***, taskRetcode=***task return code*

Explanation: The automation adapter client API was called to execute a task on the remote adapter. The call failed. There are three error categories: The client suffers an error on the connection or the execution of the task within the automation adapter backend failed or execution failed in the automation adapter plug-in.

System action: Execution of the remote task failed.

Operator response: Analyze the return code description. If it is an internal error, check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZA0010E **Request expires before the adapter passes it to the adapter plug-in. Timeout period is** *timeout value* **seconds**

Explanation: All requests have an associated expiration date. The request is scheduled to an execution thread that detected that the expiration time had expired.

System action: The automation adapter rejects the request.

Operator response: Analyze the reason (for example, high working load). Increase the timeout period if necessary.

EEZA0011E **The backend program specification is invalid**

Explanation: The backend program is not a Java program or the Java program name was not specified.

System action: The automation adapter rejects the request.

Operator response: Check the program that called the automation adapter client API.

EEZA0012E **Invalid parameter list**

Explanation: The automation adapter detected a request that is associated with an invalid parameter list.

System action: The automation adapter rejects the request.

Operator response: Check the program that called the automation adapter client API.

EEZA0013E **Authentication for user ID** *user name* **was unsuccessful**

Explanation: The request is associated with a user ID and password that have been validated unsuccessfully.

System action: The automation adapter rejects the request.

Operator response: Check whether the user ID is authorized for the system and check the security policy. Also check if you have stored a user ID and password for this domain in the credential store of the Dashboard Application Services Hub.

EEZA0014E The original exception *original-class* **needs to be transported to the remote caller**

Explanation: An exception from an underlying component needs to be transported to the remote caller.

System action: None.

Operator response: Analyze the original exception attached with this message.

EEZA0015E Method not supported: *name of the missing method*

Explanation: The automation adapter detected an unknown method name. The list of all valid method names is defined in the EEZAdapterInteraction interface.

System action: The automation adapter rejects the request.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZA0017E Request not supported: *name of the unsupported request*

Explanation: The automation adapter plug-in does not support the specified request.

System action: The request might be rejected depending on the behavior of the plug-in.

Operator response: Check if the automation domain supports this type of request.

EEZA0022E Adapter client is unable to connect to the adapter at *host***:***port* **due to exception:** *the exception that was caught*

Explanation: The automation adapter client cannot connect to the server at the given host and port. The original exception text is provided.

System action: The connection is not established.

Operator response: Analyze the original exception.

EEZA0023E Cache directory is invalid

Explanation: The EIF cache directory is not a directory.

System action: The automation adapter stops.

Operator response: Correct the configuration file.

EEZA0024E EIF sender and receiver must not be equal

Explanation: The EIF configuration parameters are not allowed to point to each other.

System action: The automation adapter stops.

Operator response: Correct the configuration file.

EEZA0025E Cannot find the plug-in configuration file: *configuration file name*

Explanation: The master configuration file contains the name of a plug-in configuration file that cannot be found.

System action: The automation adapter stops.

Operator response: Correct the configuration file.

EEZA0026E No plug-in configuration file was specified

Explanation: The master configuration file must contain at least one plug-in configuration file.

System action: The automation adapter stops.

Operator response: Correct the configuration file.

EEZA0027E Cannot load configuration file: *configuration file name*

Explanation: The specified configuration file cannot be loaded.

System action: The automation adapter stops.

Operator response: Correct the configuration file.

EEZA0028E Plug-in configuration file does not contain all mandatory parameters: *configuration file name*

Explanation: The specified configuration file does not contain all mandatory parameters. The plug-in is not used.

System action: The automation adapter does not deploy the plug-in.

Operator response: Correct the configuration file.

EEZA0029E Cannot create the first instance of the plug-in class: *class name*

Explanation: An attempt was made to create the first instance of the plug-in during initialization. Creation failed.

System action: The automation adapter does not deploy the plug-in.

Operator response: Correct the configuration file.

EEZA0030E Cannot set up event subscription list for plug-in configuration file: *plug-in configuration file name*

Explanation: The specification of the EIF event classes in the plug-in configuration file is invalid.

System action: The automation adapter does not deploy the plug-in.

Operator response: Correct the configuration file.

EEZA0031E Cannot load configuration file from: *plug-in configuration file name*

Explanation: The automation adapter cannot load the specified configuration file because either no configuration file or an invalid one was specified.

System action: The automation adapter stops.

Operator response: Check whether the name of the configuration file is correct.

EEZA0032E Initialization of the adapter failed*original exception*

Explanation: An error occurred in the initialization step of the automation adapter.

System action: The automation adapter stops.

Operator response: Analyze the associated exception. If there is no exception text for this message, try to find additional messages that were sent previously.

EEZA0033E Unable to create *type of factory* **SocketFactory**

Explanation: The automation adapter server or client cannot create a socket factory for remote contact.

System action: The automation adapter client cannot create a connection or the automation adapter server cannot receive connections.

Operator response: Analyze the reason using previous messages.

EEZA0036E The adapter suffered an unexpected interruption: *original exception*

Explanation: The automation adapter waits for a termination command. An unexpected interruption occurred.

System action: The automation adapter stops.

Operator response: Analyze original exception.

EEZA0037E The adapter stops running because no plug-in has been successfully initialized

Explanation: At least one plug-in must have been successfully initialized otherwise the automation adapter stops.

System action: The automation adapter stops.

Operator response: Analyze previous messages and exceptions issued by the failing plug-in.

EEZA0038E A (SSL) socket configuration error occurred: *exception text*

Explanation: An error occurred during the loading or processing of (SSL) socket-related configuration data. An SSL handshake exception will only be reported during initial contact.

System action: The automation adapter client cannot create a connection or the automation adapter server cannot receive connections.

Operator response: Analyze the exceptions text. Check the SSL configuration file if necessary.

EEZA0039E Not all data was read from socket: *number of bytes read* **bytes read,** *number of bytes expected* **bytes expected to be read**

Explanation: The incoming request has a length in bytes, but not all bytes can be read.

System action: The automation adapter rejects the request.

Operator response: Check why the socket connection was broken while transfering data.

EEZA0040E The adapter client cannot establish connection to the adapter: *string representation of the connection*

Explanation: Opening the connection failed. A request cannot be sent to the automation adapter. The string representation of the connection contains details about the connection.

System action: The automation adapter frontend failed.

Operator response: Analyze the connection information.

EEZA0041E The adapter client cannot invoke an adapter request: InternalRC=*internal return code***, TaskRC=***task return code*

Explanation: A connection to the automation adapter has been successfully established. The automation adapter frontend might have sent a request to the automation adapter but the request failed. If the internal or task return codes are not applicable (n/a), some other unexpected exception occurred.

System action: The automation adapter frontend failed.

Operator response: Analyze the internal and task return codes (see EEZA0009E for an explanation of the return codes).

EEZA0042E The adapter has thrown a remote exception: InternalRC=*internal return code*, **TaskRC=***task return code*. **The original message was:** *message text*

Explanation: A connection to the automation adapter has been successfully established. The automation adapter frontend has sent a request to the automation adapter but the plug-in has thrown an exception.

System action: None.

Operator response: Analyze the internal and task return codes (see EEZA0009E for an explanation of the return codes).

EEZA0043E A required command line parameter is missing

Explanation: One of the required command line parameters is missing (such as -start, -stop or -terminate).

System action: The automation adapter frontend failed.

Operator response: Specify the required command-line parameters and try again.

EEZA0045E The adapter cannot establish a server socket due to illegal arguments: *exception text*

Explanation: The automation adapter cannot establish a receiver thread and cannot accept incoming connections.

System action: The automation adapter stops.

Operator response: Analyze the configuration file for invalid IP address.

EEZA0047E The adapter is unable to accept connections due to socket exception " *exception* **"**

Explanation: An exception occurred as the automation adapter was about to accept an incoming connection.

System action: The automation adapter stops.

Operator response: Analyze the exception text.

EEZA0051W Termination of the adapter failed due to exception: *error message*

Explanation: The attempt to stop the receiver thread failed because an exception occurred.

System action: None.

Operator response: Analyze the exception text.

EEZA0052E Cannot create an in-storage EIF configuration file: *exception text*

Explanation: An instance of the Java class ByteArrayInputStream cannot be created or written.

System action: The automation adapter stops.

Operator response: This is probably an internal error. The exception text might give the reason for the problem.

EEZA0053E Missing argument for command line parameter " *the parameter* **"**

Explanation: A required argument for a command line parameter (such as -start) is missing. For example, "AdapterCmd -start" would be wrong, because "-start" requires an argument. A correct example would be: "AdapterCmd -start com.ibm.ing.saplugin.INGXPluginInvocation".

System action: Processing of this command ends.

Operator response: Check the documentation for information about valid command line arguments and their parameters.

EEZA0055E Remote Contact inactivity threshold exceeded: elapsed seconds=*elapsed seconds* **threshold=***threshold*

Explanation: The automation adapter calculates the elapsed time since the last synchronous request was received. The automation adapter stops itself if this time exceeds the number specfied in the parameter eez-remote-contact-activity-interval-seconds. Any incoming event is used as a trigger for the calculation.

System action: The automation adapter stops.

Operator response: You might want to increase the number of seconds specified by parameter eez-remote-contact-activity-interval-seconds. Setting this parameter to 0 (zero) means it never expires.

EEZA0056I Initial contact was enabled and the connection to the management server has been established

Explanation: The parameter eez-initial-contact was set to true and the automation adapter attempted to connect the management server. The handshake to the management server was successful.

System action: None.

Operator response: No action required.

EEZA0057E The connection to the management server cannot be established

Explanation: The automation adapter stops attempting to connect the management server because the timeout interval is over.

System action: The automation adapter stops.

Operator response: You might want to increase the number of minutes specified by parameter eez-initial-contact-retry-interval-minutes. Specify the value 0 (zero) in order to retry forever.

EEZA0058E The plug-in has not been deployed or is not yet started: *name of the Java plug-in class*

Explanation: An attempt was made by the automation server to issue a request to the automation adapter against an unknown plug-in or a plug-in that has not been started.

System action: The automation adapter rejects the request.

Operator response: Check the plug-in configuration file on the automation adapter site for the parameter plugin-impl-class. Compare it with the plugin class name specified in the message. If there is a mismatch an installation problem might be the reason for the problem. Analyze further adapter messages e.g. EEZA0115I.

EEZA0059E An internal error occurred

Explanation: The automation adapter detected an internal error.

System action: None.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZA0060I The termination of the adapter is delayed for *duration of the delay in seconds* **seconds**

Explanation: Stopping the automation adapter is delayed for a short while until it has sent the appropriate domain leave events. You can configure the duration of this delay with the eez-stop-delay-seconds parameter.

System action: The automation adapter attempts to send domain leave events.

Operator response: No action required.

EEZA0061E Unable to bind a socket to address *eez-remote-contact-hostname* **at port** *eez-remote-contact-port***. Reason:** *message of the exception*

Explanation: The automation adapter was unable to use this address or port. Possible causes of the problem are: 1) The port is already in use by another program. 2) The address could not be assigned.

System action: The automation adapter stops.

Operator response: Make sure that no program uses this port (that is, an automation adapter that is already running). If another program needs this port, then configure the automation adapter to use another port (with the eez-remote-contact-port parameter in the master configuration file). Ensure that the address is valid.

EEZA0062I The start command of the automation plug-in *name of the Java plug-in class* **was successful**

Explanation: The selected automation plug-in was successfully started.

System action: The automation adapter has started the automation plug-in.

Operator response: No action required.

EEZA0063I The stop command of the automation plug-in *name of the Java plug-in class* **was successful**

Explanation: The selected automation plug-in was successfully stopped.

System action: The automation adapter has stopped the automation plug-in.

Operator response: No action required.

EEZA0064I The termination command for the adapter was successful

Explanation: The automation adapter was successfully stopped.

System action: The automation adapter stops.

Operator response: No action required.

EEZA0070E The host name *eez-remote-contact-hostname* **is unknown**

Explanation: The automation adapter was unable to resolve the host name.

System action: The automation adapter stops.

Operator response: Specify a valid host name.

EEZA0071E The domain name is either null or empty

Explanation: The plug-in returned an invalid domain name since its is either null or empty.

System action: The plug-in cannot be started.

Operator response: Specify a valid domain name in the plug-in configuration file.

EEZA0100I The adapter has been started

Explanation: This is the first of a sequence of three messages until the automation adapter is ready. The automation adapter starts initialization and will try to connect to the management server if eez-initial-contact=true.

System action: None.

Operator response: No action required.

EEZA0101I The adapter is active

Explanation: The automation adapter becomes "active" after a connection has been successfully established to the management server. The automation adapter continues initialization, finds and starts up all plug-ins.

System action: None.

Operator response: No action required.

EEZA0102I The adapter is ready

Explanation: The automation adapter startup sequence is complete.

System action: None.

Operator response: No action required.

EEZA0103I The adapter is stopping

Explanation: An internal or an external stop command has been received.

System action: The automation adapter is about to stop.

Operator response: No action required.

EEZA0104I The adapter has been stopped

Explanation: The automation adapter termination is complete. All possible stop delay periods are over. The process stops immediately.

System action: The automation adapter has stopped.

Operator response: No action required.

EEZA0105I The adapter has been stopped due to a failure, rc=*return code*

Explanation: The automation adapter stopped because an error occurred. All possible stop delay periods are over. The process stops immediately.

System action: The automation adapter stops.

Operator response: Search for error messages that were issued previously. On z/OS return code 28 might be caused due to the 64-bit JVM. You should use the 32-bit JVM instead. If a stop command has been issued against the adapter, while the adapter is trying to establish an inital contact to the management server, the adapter will stop with return code 12 or 13 indicating that the adapter was not able to establish an inital contact within the time period before the stop command was received. See also message EEZA0057E.

EEZA0111I The plug-in is starting: *name of the Java plug-in class*

Explanation: The automation adapter has already successfully created an instance of the plug-in class and will now call function INIT_DOMAIN.

System action: None.

Operator response: No action required.

EEZA0112I The plug-in has been started: *name of the Java plug-in class*

Explanation: The automation adapter plug-in has successfully initialized the domain (INIT_DOMAIN).

System action: None.

Operator response: No action required.

EEZA0113I The plug-in is stopping: *name of the Java plug-in class*

Explanation: The automation adapter will call plug-in function TERM_DOMAIN.

System action: None.

Operator response: No action required.

EEZA0114I The plug-in has been stopped: *name of the Java plug-in class*

Explanation: The automation adapter plug-in has successfully stopped the domain (TERM_DOMAIN).

System action: None.

Operator response: No action required.

EEZA0115I The plug-in startup failed: *name of the Java plug-in class*

Explanation: This message might follow after EEZA0111I, but the attempt to start the plug-in via function INIT_DOMAIN failed. The automation adapter plug-in will not be started automatically.

System action: The plug-in will be disabled. A join event was not sent.

Operator response: You might want to restart the plug-in using the automation adapter start command. Analyze further plug-in messages.

EEZA0116I The status of the event sender changed: Address=*Address***, Port=***Port***, Status=***Status*

Explanation: This message occurs if the status of the EIF connection changed. The reason could be that a new EIF connection is created or an existing EIF connection is lost. The reason can be found in the status. A status='connection timed out' is expected if the management server is stopped e.g. if the management server moves to another system and therefore the adapter needs to change the EIF sender destination.

System action: None.

Operator response: No action required.

EEZA0117I The combination of hostname and port is invalid. Please check the adapter property file.

Explanation: This message occurs if the combination of hostname and port is invalid.

System action: The automation adapter stops.

Operator response: Supply the correct hostname and port combination in the adapter property file

EEZA0118I The connection to the management server *Target* **has been established.**

Explanation: The automation adapter has successfully connected to the management server. This message appears only if parameter eez-initial-contact was set to false.

System action: None.

Operator response: No action required.

EEZA9991E The message file is not installed

Explanation: The English message file must be available.

System action: The automation adapter stops.

Operator response: Make sure that the message file is in the class path.

EEZA9992E EEZAdapterLogger is not available

Explanation: The automation adapter logging component has not been initialized.

System action: The automation adapter stops. Other processes using the automation adapter client API will be unable to write messages into log and trace files.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

Prefix EEZC

This section contains messages with prefix EEZC.

EEZC0001I Setting up Tivoli Common Directory at *location where Tivoli Common Directory is being set up***.**

Explanation: The Tivoli Common Directory path was set to its default value, as shown in the message text.

System action: No system action required.

Operator response: No operator action required.

EEZC0002I Unable to determine Tivoli Common Directory. Diverting serviceability related output to *alternative location***.**

Explanation: The system was not able to determine the Tivoli Common Directory.

System action: Processing continues. The application will attempt to divert serviceability related output to another location for this session.

Operator response: In order to manage its serviceability related output, the application should be granted read/write permission to the location /etc/ibm/tivoli/common.

EEZC0003I Base output directory for serviceability related files (for example, message log files and trace files) has been set to *new output directory***.**

Explanation: The output directory for serviceability related files was set to its default value, as shown in the message text.

System action: From now on the application will write serviceability related information to the directory that is contained in the message text.

Operator response: No action is required if the base output directory for serviceability related files is acceptable. Otherwise, if it is required to relocate the base output directory, modify the entry in log.properties which should be located at /etc/ibm/tivoli/common/cfg/log.properties. Changes to this file will take effect once the corresponding component is restarted.

EEZC0004I Changing base output directory for serviceability related files of *name of logger* **from** *old output directory* **to** *new output directory***.**

Explanation: Due to changes in configuration settings the output directory of serviceability related files has been relocated.

System action: From now on the system will write serviceability related information to the new location.

Operator response: No action is required if the base output directory for serviceability related files is acceptable. Otherwise, if it is required to relocate the base output directory, modify the entry in log.properties which should be located at /etc/ibm/tivoli/common/cfg/log.properties. Changes to this file will take effect once the corresponding component is restarted.

EEZC0006E Remote replication operation failed for file " *fileName* **". A connection from local node "** *loaclNode* **" to remote node "** *remoteNode* **" could not be established.**

Explanation: An error occurred when attempting to replicate, create or delete a file on a remote node. Establishing a connection between the local node and the remote target node on which the replication, creation or deletion actually was supposed to be performed failed. The remote file operation could not be completed successfully.

System action: The failing remote file operation is skipped and processing continues.

Operator response: Make sure that the local as well as the remote node are known host names and that IP connectivity between those two systems is correctly set up. Check whether network problems were reported at the time where the failure occured.

EEZC0007E Remote replication operation failed for file " *fileName* **". Authentication failed when establishing a connection from local node "** *loaclNode* **" to remote node "** *remoteNode* **" for user ID "** *userID* **".**

Explanation: An error occurred when attempting to replicate, create or delete a file on a remote node. Establishing a connection between the local node and the remote target node on which the replication, creation or deletion actually was supposed to be performed failed due to incorrect user credentials. The remote file operation could not be completed successfully.

System action: The failing remote file operation is skipped and processing continues.

Operator response: Make sure that the user ID and password used to perform the remote file operation are correctly defined on the target node.

EEZC0008E Replication of file " *fileName* **" failed. The connection from local node "** *loaclNode* **" to remote node "** *remoteNode* **" was lost. The original exception was: "** *excMessage* **".**

Explanation: An error occurred when attempting to replicate a file on a remote node. The connection between the local node and the remote target node on which the replication actually was supposed to be performed was lost during the replication operation. The replication of the file could not be completed successfully.

System action: The failing file replication is skipped and processing continues.

Operator response: Make sure that IP connectivity between those two systems is correctly set up. The failure may also occur due to timeouts. The original exception message may give some hints about the root cause of the problem.

EEZC0009E Remote deletion of file " *fileName* **" failed. The connection from local node "** *loaclNode* **" to remote node "** *remoteNode* **" was lost. The original exception was: "** *excMessage* **".**

Explanation: An error occurred when attempting to delete a file on a remote node. The connection between the local node and the remote target node on which the deletion actually was supposed to be performed was lost during the delete operation. The remote deletion of the file could not be completed successfully.

System action: The failing remote file deletion is skipped and processing continues.

Operator response: Make sure that IP connectivity between those two systems is correctly set up. The failure may also occur due to timeouts. The original exception message may give some hints about the root cause of the problem.

EEZC0010E Remote creation of file " *fileName* **" failed. The connection from local node "** *loaclNode* **" to remote node "** *remoteNode* **" was lost. The original exception was: "** *excMessage* **".**

Explanation: An error occurred when attempting to create a file on a remote node. The connection between the local node and the remote target node on which the creation actually was supposed to be performed was lost during the create operation. The remote creation of the file could not be completed successfully.

System action: The failing remote file creation is skipped and processing continues.

Operator response: Make sure that IP connectivity between those two systems is correctly set up. The failure may also occur due to timeouts. The original exception message may give some hints about the root cause of the problem.

EEZC0011E An unexpected I/O Exception occurred when attempting to replicate file " *fileName* **" from local node "** *loaclNode* **" on remote node "** *remoteNode* **". The original exception was: "** *excMessage* **".**

Explanation: An error occurred when attempting to replicate a file on a remote node. Writing the file on the remote target node failed with an unexpected I/O exception. The replication of the file could not be completed successfully.

System action: The failing file replication is skipped and processing continues.

Operator response: Make sure that the directory on the target node where the file is to be written is correctly defined and accessible in read/write mode. The original exception message may give some hints about the root cause of the problem.

EEZC0012E An unexpected I/O Exception occurred when attempting to delete file " *fileName* **" on remote node "** *remoteNode* **". The original exception was: "** *excMessage* **".**

Explanation: An error occurred when attempting to delete a file on a remote node. Deleting the file on the remote target node failed with an unexpected I/O exception. The remote deletion of the file could not be completed successfully.

System action: The failing remote file deletion is skipped and processing continues.

Operator response: Make sure that the directory on the target node where the file is to be deleted is correctly defined and accessible in read/write mode. The original exception message may give some hints about the root cause of the problem.

EEZC0013E An unexpected I/O Exception occurred when attempting to create file " *fileName* **" on remote node "** *remoteNode* **". The original exception was: "** *excMessage* **".**

Explanation: An error occurred when attempting to create a file on a remote node. The name of the remote file indicates either the file actually to be created or a temporary file that is supposed to be created before renaming it to the actual target file. Creating the file on the remote target node failed with an unexpected I/O exception. The remote creation of the file could not be completed successfully.

System action: The failing remote file creation is skipped and processing continues.

Operator response: Make sure that the directory on the target node where the file is to be created is correctly defined and accessible in read/write mode. The original exception message may give some hints about the root cause of the problem.

EEZC0014E Remote creation of file " *fileName* **" to remote node "** *remoteNode* **" failed. Renaming temporary file "** *tempFile* **" to actual target file "** *targetFile* **" failed with return code "** *rc* **". The issued rename command was: "** *cmd* **". The command result was: "** *cmdResult* **".**

Explanation: An error occurred when attempting to create a file on a remote node. The create operation consists of two steps: first creating a temporary file on the remote node and second renaming the temporary file to the file actually to be created. The creation of the temporary file completed successfully, but renaming it to the target file failed.

System action: The failing remote file creation is skipped, the temporary file is removed and processing continues.

Operator response: Inspect the result output that was produced by the rename command and that is included in the message text to determine the reason for the failure.

EEZC0015E The server name " *serverNameAndOptionalPort* **" could not be parsed successfully.**

Explanation: An error occurred while evaluating the server name. Allowed input are host names, or IPv4 addresses, or IPv6 addresses. The host name or the IP address can be followed by a colon and a port number. If a literal IPv6 address is supplied, it has to be enclosed with brackets, for example: [::1], or [::1]:2809

System action: Evaluation of the server name ends.

Operator response: Inspect the server name for syntactical correctness. If a host name has been specified, check if the host name can be resoved by DNS (for example, try to ping the host).

Prefix EEZI

This section contains messages with prefix EEZI.

EEZI0001E The WebSphere infrastructure has reported a severe error situation: ***runtimeExceptionMessage*****.**

Explanation: The application was interrupted by a RuntimeException and cannot complete its task.

System action: The current task ends. The transaction is rolled back.

Operator response: Check the description of the error situation if it indicates that the server database or another subsystem is unavailable.

EEZI0003E A critical error has occurred in class: *className*, **method:** *methodName*. **Unable to initialize Logger.**

Explanation: No Logger object could be initialized and accessed.

System action: The process cannot be completed. All parts of this component are affected

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZI0005E Failing Logger initialization in: *variable text*, **in class:** *className*. **Information:** *someInfo*

Explanation: Critical error. No logger object could be obtained. The entire application might be affected.

System action: Method terminates with a ConfigurationFailedException.

Operator response: Ensure the correct classpath configuration.

EEZI0012E Internal error. Null parameter passed in method: *methodName*, **in class:** *className*.

Explanation: Method getConnection() must not be called with null parameters. This is an indication of a programming error on the EJB exploiter side.

System action: Method terminates with an IllegalArgumentException.

Operator response: Invoke getConnection() with a fully initialized EEZFLAConnectionSpec object as a valid parameter.

EEZI0013E Internal error. Illegal parameter passed in method: *methodName*, **in class:** *className*.

Explanation: The EEZFLAConnectionSpec parameter contained an uninitialized EEZFLAConfigData member object.

System action: Method terminates with an IllegalArgumentException.

Operator response: Invoke getConnection() with a fully initialized EEZFLAConnectionSpec object as a valid parameter.

EEZI0014E Illegal invocation of method: *methodName*, **in class:** *className*.

Explanation: Method invoke() must not be called with this parameter combination. It is not supported.

System action: Method terminates with an IllegalOperationException.

Operator response: Invoke invoke() with the signature(InteractionSpec, Record) as a valid parameter combination.

EEZI0015E Critical error in class: *className*, **method:** *methodName*. **A connection to the Adapter could not be established.**

Explanation: The call to EEZAdapterConnection.open(..) returned value 0.

System action: The method terminates with a ConnectionFailedException.

Operator response: See the WebSphere and automation adapter logs if they contain further details about this error situation.

EEZI0016E Critical error in class: *className*, **method:** *methodName*. **Unknown AdapterException return code in** *variable text*.

Explanation: The operation has terminated with an AdapterException, but the internal return code is unknown.

System action: The method terminates with a ExecutionFailedException.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZI0017E Critical error in class: *className*, **method:** *methodName*. **The operation could not be performed because of** *exception*.

Explanation: An exception other than a subtype of EEZApplicationException occurred during interaction with the backend.

System action: The method terminates with a ExecutionFailedException.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZI0018E Internal error. Illegal parameter passed in method: *methodName***, in class:** *className***.**

Explanation: The EEZFLAConnectionRequestInfo parameter contained an uninitialized EEZFLAConfigData member object.

System action: Method terminates with an IllegalArgumentException.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZI0019E Internal error. Illegal invocation of method: *methodName***, in class:** *className***.**

Explanation: Method createConnection() must not be called without parameters. This is an indication of an internal JCA error.

System action: Method terminates with an IllegalOperationException.

Operator response: Invoke createConnection() with a fully initialized ConnectionManager object as a valid parameter.

EEZI0021E Security violation detected for an automation adapter at IP address " *ipAddress* **" and port number "** *portNumber* **". Using SSL is required for all first-level automation adapters but not enabled for this particular adapter.**

Explanation: According to the SSL configuration of the automation framework, it is required to use SSL for the connections to all first-level automation adapters. However, this particular adapter is not configured to communicate via SSL.

System action: The current task ends.

Operator response: If all communication between the automation framework and the first-level automation adapters should use SSL, then ensure that the failing first-level automation adapter is properly configured to use SSL. If it should be allowed that the automation framework and first-level automation adapters do not use SSL, then use the configuration dialog and change the property that enforces SSL connectivity. After having saved the change in the configuration dialog, restart the WebSphere Application Server.

EEZI0022E Security violation detected in class: *className***, method:** *methodName***. The SSL configuration file could not be found.**

Explanation: The connection factory of this J2C connector requires SSL-secure connections, but the file containing the necessary properties could not be found.

System action: The method terminates with a ConfigurationException.

Operator response: Check the custom properties of the EEZFLAConnectionFactory and ensure that the SSL configuration file exists at the correct location.

EEZI0023E Security violation detected in class: *className***, method:** *methodName***. The SSL configuration file could not be opened.**

Explanation: The ConnectionFactory of this JCA requires SSL-secure connections, but the file containing the necessary properties could not be opened and read.

System action: The method terminates with a ConfigurationException.

Operator response: Ensure the properties file is not corrupt and has the appropriate read access rights.

EEZI0031E Connector exception detected in class: *className***, method:** *methodName***. The content is:** *exceptionDetails***. A Connection object could not be allocated.**

Explanation: The call to getConnection() returned with an exception that is not attributable to an internal application exception.

System action: The method terminates with a ResourceException.

Operator response: See the WebSphere logs for further details about this error situation.

EEZI0032E Connector exception detected in class: *className***, method:** *methodName***. A ConnectionFactory object could not be allocated.**

Explanation: The ManagedConnectionFactory of this JCA encountered an internal error. The ConnectionManager instance was null.

System action: The method terminates with a ConfigurationException.

Operator response: Ensure the properties file is not corrupt and has the appropriate read access rights.

EEZI0041E Internal error. Illegal parameter passed in method: *methodName***, in class:** *className***.**

Explanation: The parameter passed to this object was not initialized.

System action: Method terminates with an IllegalArgumentException.

Operator response: Invoke this method with a fully initialized object as a valid parameter.

EEZI0042E Internal error. Illegal call to method *methodName*, in class *className*.

Explanation: This method is specified and required by the J2C specification, but must not be called this way.

System action: Method terminates with an IllegalOperationException.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZI0044E Critical error in *methodName*, in class *className*. SSL problem. Property *property* is null.

Explanation: The SSL properties file could not be read correctly. One or more properties do not exist or are incorrect.

System action: The J2C Connector will fail to load and not be operational.

Operator response: Make sure all settings in the SSL properties file are correct and restart the server.

EEZI0046E Critical error in *methodName*, in class *className*. SSL problem.

Explanation: An SSL connection could not be established. One reason might be corrupt or incorrect SSL files.

System action: The current task ends.

Operator response: Make sure all settings in the SSL properties file are correct and that all SSL files are in the correct location and not corrupted.

EEZI0047E A 'JMSSecurityException' was caught while trying to contact the JMS queue of the end-to-end automation manager.

Explanation: The automation engine was unable to establish contact with the end-to-end automation manager. This contact is required to forward EIF events from other automation domains.

System action: The automation engine is unable to contact the server. It has to be restarted when the problem has been resolved.

Operator response: Check the correct configuration for WAS Access User ID and Password. Restart the automation engine.

EEZI0048E An exception was caught while trying to contact the JMS queue of the end-to-end automation manager.

Explanation: The automation engine was unable to establish contact with the end-to-end automation manager. This contact is required to forward EIF events from other automation domains.

System action: The automation engine is unable to contact the server. It has to be restarted when the problem has been resolved.

Operator response: Check the correct configuration for WAS Access User ID and Password. Restart the automation engine.

EEZI0049E Rejected the *requestName* request against the resource " *resourceName* " in domain " *domainName* ".

Explanation: The resource does not support this request.

System action: The request is not processed.

Operator response: No action required.

EEZI0050E Rejected the *requestName* request against the resource " *resourceName* " in domain " *domainName* ".

Explanation: The resource is currently in a state that does not support this request.

System action: The request is not processed.

Operator response: Bring the resource into a state where the request is supported and issue the request again.

EEZI0051E Rejected the *requestName* request against the resource " *resourceName* " in domain " *domainName* ".

Explanation: The resource addressed in the request is not existing in the domain.

System action: The request is not processed.

Operator response: Check the resource key of the request.

EEZI0052E Rejected the SetRole request with requested role " *requestedRole* " against the resource " *resourceName* " in domain " *domainName* ".

Explanation: The resource does not support the role specified in the request.

System action: The request is not processed.

Operator response: Specify a role in the SetRole request that is supported by the resource.

EEZI0501W An exception was encountered and ignored in order to continue operation. Exception string: *exceptionString*

Explanation: The invoked method is designed to ignore exceptions and continue operation. It logs the exception for problem determination purposes.

System action: Ignores the exception.

Operator response: Evaluate the exception details.

EEZI0545W **Possible error in** *methodName***, in class** *className***. SSL problem. Property** *property* **equals null.**

Explanation: The SSL properties file could not be read correctly. One or more properties do not exist or are incorrect.

System action: The J2C Connector will start, but will only be operational for non-SSL operations.

Operator response: Make sure all settings in the SSL properties file are correct, and restart the server if SSL operations are desired.

EEZI2001I **Request:** *Request Name* **was issued by User ID:** *User Id* **against** *Resource Class* **with name:** *Resource Name***. Following comment was specified:** *Comment text*

Explanation:

System action: The replication domain will handle this request.

Operator response: No action required.

EEZI2002I **SetRole request with requested role:** *Requested Role* **was issued by User ID:** *User Id* **against** *Resource Class* **with name:** *Resource Name***. Following comment was specified:** *Comment text*

Explanation:

System action: The replication domain will handle this request.

Operator response: No action required.

Prefix EEZJ

This section contains messages with prefix EEZJ.

EEZJ0001E **The WebSphere infrastructure has reported a severe error situation:** *RuntimeException message*

Explanation: The application was interrupted by a RuntimeException and cannot complete its task.

System action: The current task ends. The transaction is rolled back.

Operator response: Check the description of the error situation if it indicates that the server database or another subsystem is unavailable. If the problem persists, check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZJ0002E **The WebSphere infrastructure has reported an error situation:** *Exception message*

Explanation: The application was interrupted by an unexpected exception or error that is not a RuntimeException.

System action: The current task ends, but the database operations that have been performed already remain valid (no transaction rollback).

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZJ0003E **Operation** *operationName* **encountered a FinderException because automation domain** *domainName* **is unknown in the scope of the management server. The operation continues processing of the other automation domains.**

Explanation: Possible causes of the problem are: 1) The automation domain name was incorrect. 2) The automation domain has been deleted in the meantime.

System action: The operation task ends as far as the indicated automation domain is concerned. The operation continues processing of the other automation domains.

Operator response: Refresh the list of existing automation domains and verify that the domain name is contained in the list of existing domains. If not, and if the domain still exists and participates in automation, then restart the end-to-end automation adapter for this domain.

EEZJ0004E **Expected a nonempty list of input data but received none in class:** *className***, method:** *methodName***, parameter:** *parameterName*

Explanation: A null or empty list parameter was encountered. This is an indication of a programming error on the EJB client side.

System action: The server method ends without processing the request.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0005E Expected nonempty input but received no input in class: *className***, method:** *methodName***, parameter:** *parameterName*

Explanation: A parameter with a null value was encountered. This is an indication of a programming error on the EJB client side.

System action: The server method ends without processing the request.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0006E Domain type *domainType* **of automation domain** *domainName* **is unknown.**

Explanation: The domain type of an automation domain is unknown.

System action: The server method ends without processing the request.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0007E Within the list of resource requests, a request was encountered that contains a null or empty automation domain name.

Explanation: One of the requests within the parameter list contains a null or empty automation domain name.

System action: All requests in the list are ignored.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0008E The automation framework is unable to publish an event to JMS topic *topicName***. The topic connection factory is** *topicConnectionFactoryName***. The following exception was encountered:** *exceptionDetails*

Explanation: An invocation of the WebSphere Application Server's JMS service failed.

System action: The automation framework failed to publish a message to the topic. This may result in a loss of event data.

Operator response: Evaluate the exception details and retry the operation. Restart the WebSphere application server.

EEZJ0009E Within the list of resource requests for automation domain *firstDomainName***, a request was encountered for automation domain** *differentDomainName*

Explanation: Request lists must contain requests against a single automation domain only. The request list that causes the problem contains requests against multiple automation domains.

System action: All requests in the list are ignored.

Operator response: Select only resources that are contained by a single automation domain, and retry the operation.

EEZJ0010E The EEZDomainNameList parameter received in class: *className***, method:** *methodName* **contains an element that is not a string.**

Explanation: An incorrect parameter value was detected. This is an indication of a programming error on the EJB client side.

System action: The method ends but the session continues to exist.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0011E The subscription method *methodName* **in class** *className* **was called before the subscriber id was set in the session.**

Explanation: Before a subscribe or unsubscribe method can be called, the subscriber id must be set within the session. This is an indication of a programming error on the EJB client side.

System action: The method ends but the session continues to exist.

Operator response: Restart the application that failed and retry the operation.

EEZJ0013E Subscriber *subscriberId* **was unable to unsubscribe from some resources in domain** *domainName* **because the automation domain is not accessible at this time.**

Explanation: The automation domain is currently not accessible, so the unsubscribe request could not be forwarded to the domain. However, the subscription cleanup within the management server was successful. Appropriate cleanup mechanisms in the domain (at domain adapter startup, for example) will take care of the orphaned subscription at the domain level.

System action: The unsubscribe operation continues to unsubscribe from resources that reside within other automation domains.

Operator response: Determine why the automation domain is not accessible at this time. If necessary, restart the end-to-end automation adapter for that domain in order to trigger resynchronization. If the domain has left, no further action is required.

EEZJ0014E Subscriber *subscriberId* was unable to unsubscribe from all resources in automation domain *domainName* because the domain is not accessible at this time.

Explanation: The automation domain is currently not accessible, so the unsubscribe request could not be forwarded to the domain. However, the subscription cleanup within the management server was successful. Appropriate cleanup mechanisms in the domain (at domain adapter startup, for example) will take care of the orphaned subscription at the domain level.

System action: The unsubscribe operation continues to unsubscribe from all resources that the subscriber has subscribed to previously and that reside within domains other than the failing one.

Operator response: Determine why the automation domain is not accessible at this time. If necessary, restart the end-to-end automation adapter for that domain in order to trigger resynchronization. If the domain has left, no further action is required.

EEZJ0015E An attempt to invoke operation *methodName* within automation domain *domainName* has been detected. The type of this domain does not support the requested operation.

Explanation: A caller tried to invoke an operation that is not supported.

System action: The operation request is ignored.

Operator response: Restart the application that failed and retry the operation.

EEZJ0016E Unable to create an initial context.

Explanation: The JNDI naming directory is not accessible, and the attempt to create an initial context failed.

System action: The current task ends.

Operator response: Restart the application that logged this message. If this does not solve the problem, restart the WebSphere Application Server that provides the runtime environment for the automation manager.

EEZJ0017E Looking up object *jndiLookupName* in JNDI failed.

Explanation: Possible causes of the problem are: 1) The JNDI naming directory is not accessible. 2) The object was not bound to the JNDI correctly.

System action: The current task ends.

Operator response: Restart the WebSphere Application Server that provides the runtime environment for the automation manager.

EEZJ0018E Automation domain *domainName* does not exist.

Explanation: Possible causes of the problem are: 1) An invalid automation domain name was supplied. 2) The automation domain has been deleted in the meantime.

System action: The current task ends.

Operator response: Check if the automation adapter that corresponds to the automation domain is running. Restart the automation adapter and verify that the automation domain is listed in the operations console or the command shell.

EEZJ0019E Automation domain *domainName* is not accessible at this time.

Explanation: The automation domain exists, but it is currently not possible to communicate with it.

System action: The current task ends.

Operator response: Make sure that the automation domain is running. If it is a first-level automation domain, verify that the automation adapter is running. Retry the operation after the timeout period defined by the environment variable *com.ibm.eez.aab.watchdog-interval-seconds*.

EEZJ0020E Automation domain *domainName* seems to be not accessible at this time. Invocation of method *methodName* failed with a RemoteException.

Explanation: The automation domain exists, but it is currently not possible to communicate with it.

System action: The current task ends.

Operator response: Make sure that the automation domain is running. If it is a first-level automation domain, verify that the automation adapter is running. Retry the operation after the timeout period defined by the environment variable com.ibm.eez.aab.watchdog-interval-seconds. If the problem persists, restart the automation adapter (in case of a first-level automation domain) or the end-to-end automation engine (in case of an end-to-end automation domain).

EEZJ0021E Automation domain *domainName* cannot be accessed because of a problem within the JEE framework.

Explanation: An attempt to create a session failed within the JEE framework.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0022E **An unrecoverable error occurred during startup of application** *productName***. The application stops. Details about the error:** *exceptionDetails***.**

Explanation: An exception was encountered.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0023E **An attempt to activate policy** *policyName* **in automation domain** *domainName* **resulted in an error which indicates that the policy is invalid.**

Explanation: The automation domain indicates that an error was detected while processing the specified automation policy.

System action: The current task ends.

Operator response: Verify the correctness of the automation policy, and activate it again.

EEZJ0024E **An attempt to activate policy** *policyName* **in automation domain** *domainName* **resulted in an error which indicates that the policy cannot be found.**

Explanation: The automation domain indicates that the specified automation policy cannot be found in the file system.

System action: The current task ends.

Operator response: Verify that the automation policy file exists and contains a valid policy, and activate it again.

EEZJ0025E **The operation setPreferredMember has ended since the automation domain name specified by the choice group key:** *choiceGroupDomainName* **did not match the domain name specified by the preferred member key:** *preferredMemberDomainName*

Explanation: The resource keys that were provided do not point to the same automation domain. It is necessary, however, that the choice group and its members reside within the same domain.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0026E **Operation** *operation name* **is not supported by class** *class name***.**

Explanation: A caller tried to invoke an operation that is not supported.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0029E **An attempt to publish an event was stopped since there is an active transaction. Event automation domain name is** *domainName* **and event reason is** *eventReason***.**

Explanation: The application does not support sending of JMS messages within a transactional boundary.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0030E **The automation framework is not fully initialized and refuses to accept requests. The following subcomponents are not yet initialized:** *listOfMissingComponents*

Explanation: The EEZEAR application is either starting or stopping. During these periods, no method requests are accepted.

System action: The current task ends.

Operator response: If the EEZEAR application is starting, retry the request. If the EEZEAR application is stopping, restart the application and retry the request. If the problem persists, review the System Automation documentation for specific information about the subcomponents that are included in this message.

EEZJ0031E **Refused to invoke operation** *methodName* **on end-to-end automation domain** *domainName* **because the user id** *userIdName* **is not in the EEZEndToEndAccess role.**

Explanation: The target of this operation is an end-to-end automation domain. This operation may be invoked against end-to-end automation domains only by operators that are in the EEZEndToEndAccess role.

System action: The operation request is ignored.

Operator response: If the operator is not allowed to invoke operations against end-to-end resources, no action is required. If the operator should be allowed to invoke operations against end-to-end resources, the operator's userid or a user group that contains the operator's userid has to be added to role EEZEndToEndAccess.

EEZJ0032E Within the list of resource keys for automation domain *firstDomainName***, a resource key was encountered for automation domain** *differentDomainName*

Explanation: In the context of this operation, each element of the list of resource keys must point to the same automation domain. This condition is not satisfied.

System action: The current task ends.

Operator response: Select only resources that are contained by a single automation domain, and retry the operation.

EEZJ0033E Automation domain *domainName* **requires user authentication.**

Explanation: The automation domain requires that authentication information be supplied for each task. The authentication information consists of a userid and a password. The failing task did not supply that information.

System action: The current task ends.

Operator response: Case 1: If user authentication checking is enabled in the automation domain, ensure that user credential information for the automation domain is supplied. If the failing task was invoked from the System Automation operations console, use the "Log In" task to enter the credential. If the failing task was invoked from the end-to-end automation engine, ensure that the user credentials in the configuration of the automation engine are correct. If you modified the credentials refresh the automation engine using the Refresh function of the configuration utility. Case 2: If user authentication checking has been disabled in the automation domain, restart the adapter for that automation domain.

EEZJ0034E You are not authorized to perform the operation.

Explanation: The authorization failed while accessing the automation framework.

System action: The requested operation is cancelled.

Operator response: Ensure that the permissions and user roles defined in the WebSphere Application Server are set up correctly. If the problem persists, contact your system administrator.

EEZJ0035E You are not authorized to perform the operation. *error details***.**

Explanation: The authorization failed while accessing the automation framework.

System action: The requested operation is cancelled.

Operator response: Ensure that the permissions and user roles defined in the WebSphere Application Server are set up correctly. If the problem persists, contact your system administrator.

EEZJ0036E A WebSphere user transaction with an unexpected status was encountered while operation *operationName* **was processed. The expected status is** *expectedStatus* **but the actual status is** *actualStatus***.**

Explanation: In the process of using a WebSphere user transaction, an unexpected transaction state was encountered.

System action: The current task ends.

Operator response: Retry the operation. If the problem persists, restart the WebSphere Application Server.

EEZJ0037E No end-to-end automation domain is accessible at this time.

Explanation: Either no end-to-end automation domain exists at all, or it exists but it is currently not accessible.

System action: The current task ends.

Operator response: Make sure that an end-to-end automation automation domain is running. If the problem persists, restart the end-to-end automation engine.

EEZJ0038E An event has been successfully published to the subscribers *successfulSubscriberIdList***. However, event publishing failed for at least one subscriber:** *failureDetailsPerSubscriberId*

Explanation: Publishing an event has failed for at least one event subscriber.

System action: The current task ends.

Operator response: Evaluate the message, which contains failure details for each subscriber the event could not be published to. Check if just before this message, other messages appear that may provide additional information on how to solve the problem.

EEZJ0039E Sending events to OMNIbus is currently disabled since an earlier attempt to deliver an event has failed. The automation framework regularly tries to send an event and enables sending events again as soon as the retry operation succeeds.

Explanation: Publishing an event to OMNIbus has failed before. In order to avoid that failing attempts to send events block the event sender for a long time period, sending automation events to OMNIbus is currently disabled. The automation framework periodically tries to send an event to OMNIbus in order to check if it is available again.

System action: The current task ends.

Operator response: Check if OMNIbus is available. Use the configuration tool to check if the event server hostname and port are set to the correct values.

EEZJ0040E Sending events to GDPS is currently disabled since an earlier attempt to deliver an event to GDPS failed. The automation framework regularly tries to send an event and enables sending events to GDPS again as soon as the retry operation succeeds.

Explanation: Publishing an event to GDPS® has failed before. In order to avoid that failing attempts to send events to GDPS block the event sender for a long time period, sending automation events to GDPS is currently disabled. The automation framework periodically tries to send an event to GDPS in order to check if it is available again.

System action: The current task ends.

Operator response: Check if GDPS is available. Use the configuration tool to check if the GDPS server hostname and port are set to the correct values.

EEZJ0041E The requests which should be stored in the automation database are based on different resource keys. The first resource key is " *firstResourceKey* **". The other resource key is "** *otherResourceKey* **".**

Explanation: The administrative interface allows storing requests that are based on one single resource key only. In order to store requests related to multiple resource keys, the administrative interface has to be invoked multiple times.

System action: The current task ends. The requests have not been stored in the automation database.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0042E The requests which should be stored in the automation database cannot be serialized into a string with maximum length *maxLength***. Even after all comment strings have been removed, there are still** *numberOfExtraCharacters* **characters beyond the maximum length.**

Explanation: The database column that is designed to store a serialized form of the requests accepts serialized strings up to the size defined by the maximum length value. But even after all superfluous information has been removed from the requests, the serialized string is too long.

System action: The current task ends. The requests have not been stored in the automation database.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0043E The request property name " *propertyName* **" is not supported.**

Explanation: The automation JEE framework accepts a specific list of request property names only.

System action: The current task ends. The request has not been stored in the automation database.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0044E The request property " *propertyName* **" does not support the value "** *propertyValue* **"**

Explanation: For some request property names there is a specified set of supported values.

System action: The current task ends. The request has not been stored in the automation database.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0045E The request property list contains duplicate property names: *propertyNameList*

Explanation: Duplicate property names within request property lists are not supported.

System action: The current task ends. The requests have not been stored in the automation database.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0046E The request properties which should be stored in the automation database cannot be serialized into a string with maximum length *maxLength***. There are** *numberOfExtraCharacters* **characters beyond the maximum length.**

Explanation: The database column that is designed to store a serialized form of the request properties accepts serialized strings up to the size defined by the maximum length value.

System action: The current task ends. The requests have not been stored in the automation database.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0047E The request list contains a request of type "vote".

Explanation: Only regular requests are applicable for being stored in the automation database. Votes are indirect consequences of regular requests. They are automatically restored when the corresponding regular request is restored.

System action: The current task ends. The requests have not been stored in the automation database.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0048E The automation JEE framework encountered the unknown WebSphere Application Server property " *propertyName* **".**

Explanation: This property is not supported by the automation JEE framework.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0049E The list of requests passed to class *className* **and method** *methodName* **contains mismatching requests:** *requestListWithError*

Explanation: A request list that contains restart requests and other requests was encountered. This is an indication of a programming error on the client side.

System action: The automation manager ignores the request list.

Operator response: Collect the traces of the automation JEE framework.

EEZJ0050E One or multiple restart requests are issued to resources that cannot be restarted at this time: *listOfResourceNamesWithAssociatedErrorReasons*

Explanation: The restart requests are invalid.

System action: The automation manager ignores the invalid requests and processes the valid requests.

Operator response: Resolve the problems indicated in the message text. Retry the operation.

EEZJ0051E A restart request by " *userName* **" failed for resource "** *resourceId* **". The following exception was encountered while trying to stop the resource:** *errorReason*

Explanation: The restart was interrupted because the automation domain returned an exception during the stop request.

System action: Terminates the restart cycle of the resource.

Operator response: Review the exception details. Resolve the problem and issue the restart request again.

EEZJ0052E A restart request by " *userName* **" failed for resource "** *resourceId* **" after** *durationSeconds* **seconds. The following exception was encountered while trying to start the resource:** *errorReason*

Explanation: The restart was interrupted because the automation domain returned an exception during the start request.

System action: Terminates the restart cycle of the resource.

Operator response: Review the exception details. Resolve the problem and issue the restart request again.

EEZJ0053E A restart request by " *userName* **" failed for resource "** *resourceId* **" after** *durationSeconds* **seconds. The state of the restart cycle is "** *previousState* **". The reason code is: "** *errorReason* **".**

Explanation: The restart cycle was interrupted by an event.

System action: Terminates the restart cycle of the resource.

Operator response: Check the status of the affected resource. If needed issue a new request.

EEZJ0054E A restart request to resource " ***resourceId*** **" already exists.**

Explanation: A resource that is currently restarting cannot be restarted.

System action: Rejects the restart request.

Operator response: Wait until the previous restart request finishes. If needed, cancel the previous request and issue a new restart request.

EEZJ0055E The automation framework cannot contact the database manager. Details about the exception: *ExceptionDetails*

Explanation: A connection to the database manager could not get established or an existing connection got disconnected.

System action: The current task ends. The transaction is rolled back.

Operator response: Ensure that the database manager is running. Verify the configuration of the data source that is used by the automation framework. If the problem persists, restart the automation framework.

EEZJ0056E The operation " *operationName* **" is not supported as a synchronous request.**

Explanation: Only the operations "Online", "Offline", "Restart", "CancelRequest", "Suspend", "Resume", and "SetRole" are supported as synchronous requests.

System action: The current task ends.

Operator response: Do not specify the operation as a synchronous request.

EEZJ0057E The timeout value " *timeoutValue* **" is too small. The timeout value must be at least equal to "** *pollIntervalValue* **".**

Explanation: The timeout value must be at least equal to the polling interval length. The polling interval length is defined by the JVM property "com.ibm.eez.aab.monitor-interval-seconds". Default: 5, minimum: 2, maximum: 60 seconds.

System action: The current task ends.

Operator response: Adjust the timeout value for the request. If needed, set or modify the property com.ibm.eez.aab.monitor-interval-seconds.

EEZJ0058E Unable to retrieve the current status of resource " *resourceId* **". Monitoring of request "** *requestName* **" ends.**

Explanation: The request has been issued successfully but now the resource cannot be found any more. Therefore it is no longer possible to monitor its state.

System action: The current task ends.

Operator response: Check if the resource has been removed in the meantime.

EEZJ0059E The request " *requestName* **" for resource "** *resourceId* **" did not finish within the specified timeout of "** *timeout* **" seconds.**

Explanation: The request has been issued successfully. The resource did not reach the expected state within the specified timeout interval.

System action: The synchronous monitoring of the resource ends. The resource might reach the expected state later.

Operator response: Increase the timeout value for future requests against this resource.

EEZJ0060E The request " *requestName* **" for resource "** *resourceId* **" has been forwarded to the automation domain but the response is empty.**

Explanation: The request has been issued without an exception but the automation domain did not return the updated request data.

System action: The synchronous monitoring of the resource ends. The resource might reach the expected state later.

Operator response: Check the status of the resource. If needed, issue the request again.

EEZJ0061E An authentication exception occurred while looking up the JNDI name *jndiName***:** *exceptionDetails*

Explanation: The client program uses invalid user credentials to access the Java Naming and Directory Interface (JNDI).

System action: The current task ends.

Operator response: Ensure that the JNDI client uses valid credentials. For example if the JNDI client is the end-to-end automation engine or the end-to-end automation manager configuration tool then verify that the System Automation Application Manager functional user credentials are valid.

EEZJ0062E The resource " *resourceName* **" cannot be stored because it is not a node resource. Its resource type is "** *resourceType* **".**

Explanation: Only node resources can be stored by the operation.

System action: The current task ends. The resource does not get stored.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0063E The automation framework has not yet received an event from automation domain " *domainName* **". The automation framework does not allow access to that domain because the event path from the automation domain to the automation framework is not yet established. The end-to-end automation management host of the automation domain is "** *managementHostName* **".**

Explanation: After the automation framework has been restarted it is required to receive an event from each automation domain. This ensures that the automation adapter has acknowledged the connection to this management server. The automation adapter might not be configured correctly to send events to this management server. In a DR setup, the adapter might be sending events to the management server instance on the other site, or it might have a version that does not support a site switch of the management server. If the value of the end-to-end automation management host is "undefined" this is a strong indication that the automation adapter version does not yet support a site switch.

System action: Access to the automation domain is rejected until an event is received from the respective automation adapter, except for viewing the domain log file. If the automation framework does not receive an event within the domain removal timeout (as defined by com.ibm.eez.aab.domain-removal-hours), the automation domain will be removed from the scope of this management server.

Operator response: Check if the automation adapter has been configured for the correct management server IP address and port. Check the adapter log. If you have a DR setup with an System Automation Application Manager at each site, ensure that the System Automation Application Manager at the other site is offline. Refer to the System Automation Application Manager documentation for the minimum required automation adapter version. Upgrade the automation adapter and configure it for System Automation Application Manager toggle.

EEZJ0064E The policy directory name " *directoryName* **" contains a path separator character.**

Explanation: The policy directory name must be a relative directory name. The system appends this directory name to the "snippets" subdirectory within the end-to-end automation policy pool directory. The system does not support further nesting of subdirectories.

System action: The current task ends.

Operator response: Specify a relative directory name without any path separator characters.

EEZJ0065E The policy file name " *fileName* **" contains a path separator character.**

Explanation: The policy file name must be a relative file name.

System action: The current task ends.

Operator response: Specify a policy file name without any path separator characters.

EEZJ0066E The policy file name " *fileName* **" does not end with ".xml".**

Explanation: The policy file name must end with ".xml".

System action: The current task ends.

Operator response: Specify a valid XML policy file name suffix.

EEZJ0067E Event publishing failed for at least one subscriber: *failureDetailsPerSubscriberId*

Explanation: Publishing an event has failed for at least one event subscriber.

System action: The current task ends.

Operator response: Evaluate the message, which contains failure details for each subscriber the event could not be published to. Check if just before this message, other messages appear that may provide additional information on how to solve the problem.

EEZJ0068E User " *wasUserName* **" could not be authenticated in first-level automation domain "** *automationDomainName* **" using the first-level automation domain user "** *automationUserName* **".**

Explanation: The automation domain requires user authentication, but no valid user credential has been supplied with the request.

System action: The current task ends.

Operator response: Case 1: If user authentication checking is enabled in the automation domain, ensure that user credential information for the automation domain is supplied. If the failing task was invoked from the System Automation operations console, the operations console asks for a new valid user credential. Enter the new credential directly and store it to the Domain Credential store, or navigate to "Settings - Stored Domain Credentials" and edit the credentials as needed. If the failing task was invoked from the end-to-end automation manager (either automation engine or automation framework within WebSphere Application Server), ensure that a user credential for the first-level automation domain is correctly defined in the configuration utility. After you modified the credentials use the Refresh function of the configuration utility. Case 2: If user authentication checking has been disabled in the automation domain, restart the adapter for that automation domain. Case 3: If you use the configuration utility to verify user credentials, either the user ID is not known in the first-level automation domain or the password is not correct.

EEZJ0069E **Creating the EIF event publisher based on the configuration file** *publisherConfigurationFile* **failed with exception** *exceptionDetails*

Explanation: The EIF event publisher could not be created.

System action: The current task ends.

Operator response: Review the details of the exception. Use the configuration tool to modify EIF event publisher properties.

EEZJ0070E **The EIF event publisher configuration file "** *publisherConfigurationFile* **" for EIF event target "** *eifTargetName* **" does not exist.**

Explanation: The EIF event publisher cannot be created since the required configuration file cannot be found in the file system.

System action: The current task ends.

Operator response: Verify the EIF event publisher configuration file path.

EEZJ0071E **The EIF event publisher configuration file "** *publisherConfigurationFile* **" for EIF event target "** *eifTargetName* **" cannot be read.**

Explanation: The EIF event publisher configuration file exists but the automation JEE framework cannot read the file.

System action: The current task ends.

Operator response: Verify the file access permissions of the EIF event publisher configuration file.

EEZJ0072E **Reading the EIF event publisher configuration file "** *publisherConfigurationFile* **" for EIF event target "** *eifTargetName* **" failed with exception** *exceptionDetails*

Explanation: The EIF event publisher configuration file exists but the automation JEE framework cannot read the file.

System action: The current task ends.

Operator response: Review the details of the exception. Use an editor to verify that the file is readable. Use the configuration tool to modify the content of the configuration file.

EEZJ0073E **The publisher for EIF event target "** *eifTargetName* **" failed to send an event with reason "** *eventReason* **" and message** *eventMessage*

Explanation: The EIF event publisher method "sendEvent" returned error code "TECAgent.SEND_FAILURE".

System action: The current task ends. In order to avoid that failing attempts to send events block the event sender for a long time period, sending automation events to the EIF event target is disabled. The automation framework periodically tries to send an event to the EIF event target in order to check if it is available again.

Operator response: Check if the EIF event target is available. Use the configuration tool to check if the event target hostname and port are set to the correct values.

EEZJ0074E **The publisher for EIF event target "** *eifTargetName* **" with exception** *exceptionDetails*

Explanation: The EIF event publisher failed to send the event.

System action: The current task ends.

Operator response: Check if the EIF event target is available.

EEZJ0075E **The publisher for EIF event target "** *eifTargetName* **" failed to send an event with reason "** *eventReason* **" and message** *eventMessage* **within** *timeoutSeconds* **seconds.**

Explanation: The EIF event publisher method "sendEvent" did not complete within the expected time.

System action: The current task ends. In order to avoid that failing attempts to send events block the event sender for a long time period, sending automation events to the EIF event target is disabled. The automation framework periodically tries to send an event to the EIF event target in order to check if it is available again.

Operator response: Check if the EIF event target is available. Use the configuration tool to check if the event target hostname and port are set to the correct values.

EEZJ0076E **The functional user "** *userName* **" can not access the automation domain "** *domainName* **" because of the security issue "** *securityExceptionMessage* **".**

Explanation: A security problem occurred while accessing the domain with the first-level automation domain credentials that are stored for the functional user.

System action: The system blocks all attempts of the functional user to retrieve data from the first-level automation domain until the security issue is cleared.

Operator response: Open the configuration utility and verify the credentials for the functional user and this first-level automation domain. Save the changes and refresh the end-to-end automation configuration. Review the adapter configuration for the affected first-level automation domain. For example, verify that the appropriate Pluggable Authentication Module (PAM) service is defined. Restart the automation adapter after having changed the adapter configuration.

EEZJ0100E The processing of an event resulted in an exception: *exceptionDetails*

Explanation: The EventHandlerBean received an exception when processing an event.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0101E Cannot create or use a connection to the first-level automation domain *domainName***. Details about the exception:** *exceptionDetails***.**

Explanation: The EventHandlerBean received an exception when processing an AdapterJoin event. It was not able to create or use a connection to a first-level automation domain.

System action: The processing of the AdapterJoin event ends.

Operator response: Resolve the problem that is described in the original exception.

EEZJ0102E Not able to add a subdomain to the domain *domainName***. Details about the exception:** *exception***.**

Explanation: The EventHandlerBean tried to locate this automation domain, but it received an exception. Therefore it is not able to add a subdomain to this automation domain.

System action: The current task ends but event processing continues.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0103E Encountered a FinderException for the domain *domainName***.**

Explanation: The EventHandlerBean tried to locate this automation domain, but it received a FinderException, because the automation domain is unknown in the scope of the automation framework.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0104E Received an exception related to a transaction when processing an event of domain *domainName***. Details about the exception:** *exception***.**

Explanation: The transaction that was started when processing an event resulted in an exception.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0105E Not able to communicate with automation domain *domainName***. Details about the exception:** *exception***.**

Explanation: The EventHandlerBean received a domain join event of an automation domain, but it was not able to communicate with this automation domain. An exception was thrown instead.

System action: The processing of the domain join event ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0106E Received a CreateException trying to create a domain for the domain name *domainName***.**

Explanation: The EventHandlerBean received a CreateException while trying to create an automation domain object.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0107E Forwarding an event to the end-to-end automation domain *domainName* **failed. Details about the exception:** *exception***.**

Explanation: The EventHandlerBean tried to forward an event to the automation engine. This operation failed.

System action: The current task ends. But the event processing continues.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0108E **Activating policy** *policyName* **failed. Details about the exception:** *exception*

Explanation: The EventHandlerBean tried to activate an end-to-end automation policy on an automation engine. This operation failed.

System action: The current task ends. But the event processing continues.

Operator response: Try to activate the policy using the operations console.

EEZJ0109E **Resynchronizing the end-to-end automation domain** *domainName* **failed. Details about the exception:** *exception***.**

Explanation: The EventHandlerBean tried to resynchronize the automation engine. This operation failed.

System action: The current task ends. But the event processing continues.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0110E **FinderException received while trying to find subscriptions for entity** *entityName***.**

Explanation: The EventHandlerBean tried to find subscriptions for this entity, but it received a FinderException.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0111E **CreateException received while trying to create a connection to the end-to-end automation domain** *domainName***.**

Explanation: The EventHandlerBean received a CreateException while trying to create a connection to the automation engine.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0112E **RemoteException received when communicating with the end-to-end automation domain** *domainName***.**

Explanation: The EventHandlerBean received a RemoteException when it called a function of the automation engine.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0113E **Calling checkHealth returned a null object for domain** *domainName***.**

Explanation: The EventHandlerBean received a null object when calling checkHealth for an automation domain that just sent a domain join event. The domain join processing failed for this automation domain.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0114E **The domain object returned by checkHealth has a different domain name than the according domain join event. The event domain name is** *domainName***.**

Explanation: The EventHandlerBean received an incorrect object from checkHealth. The domain join processing failed for this automation domain.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0115E **Exception received while trying to publish an event. Details about the exception:** *exception details***.**

Explanation: The EventHandlerBean received an exception when it tried to publish an event.

System action: Processing continues.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0116E **Exception received while trying to create the SSL session to connect to the OSLC registry. Details about the exception:** *exception details***.**

Explanation: While trying to setup a secure connection to the OSLC registry, an error occurred which prevented the successful creation of the connection.

System action: Automation engine continues to work, but OSLC registration is aborted.

Operator response: Use the exceptions details to correct the configuration for OSLC registration. Re-activate the automation policy to trigger a new OSLC registration action.

EEZJ0117E Exception received while trying to (de-)register the resource *resourceKey*. at the OSLC registry. Details about the exception: *exception details*.

Explanation: While trying to register or deregister a resource to the OSLC registry, an error occurred which prevented the OSLC services to correctly register the resource.

System action: Automation engine continues to work, but the resource in question will not be registered.

Operator response: Use the exceptions details to learn more about the failure. Either re-activate the automation policy to trigger a new OSLC registration action or register the resource manually.

EEZJ0118E The request list for the automation domain " *domainName* " contains the command " *nativeCommand* " and other requests.

Explanation: Lists of requests that contain a platform-specific command must have one element only.

System action: All requests in the list are ignored.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0119E The automation domain " *domainName* " on host " *hostName* " and port " *portNumber* " can not be contacted. At least *numberOfAttempts* connection attempts have failed.

Explanation: Several subsequent attempts to contact the automation domain are either hanging or have timed out.

System action: The automation domain is set to the communication state "domain has left". As a consequence, the end-to-end automation manager does not try to contact the automation domain any more until its automation adapter is restarted.

Operator response: Ensure that the network and firewall setup allow establishing connections from the end-to-end automation manager host to the first-level automation host. Ensure that the first-level automation adapter gets sufficient operating system resources to perform well. Restart the end-to-end adapter for the first-level automation domain.

EEZJ0501W An exception was encountered and ignored in order to continue operation. Details about the exception: *exceptionString*

Explanation: The invoked method is designed to ignore exceptions and continue operation. It logs the exception for problem determination purposes.

System action: Processing continues.

Operator response: Evaluate the exception details.

EEZJ0509W One or multiple restart requests for automation domain " *domainName* " have been interrupted. The reason code is " *eventReason* ". The following resources are affected: *resourceList*

Explanation: The cause of the event leads to terminating the restart cycle.

System action: Terminates the restart cycle of the resources regardless of their individual restart status.

Operator response: Check the status of the automation domain as mentioned in the reason code. Check the status of the affected resources.

EEZJ0510W A restart request to resource " *resourceId* " requested by operator " *userName* " has timed out after *timeoutHours* hour(s). The state of the restart cycle is " *previousState* ".

Explanation: The restart request has timed out. The timeout value is defined by the environment variable com.ibm.eez.aab.resource-restart-timeout-hours.

System action: Terminates the restart cycle of the resource.

Operator response: Check the status of the resource. For more information on how to change the timeout value refer to the Reference and Problem Determination Guide.

EEZJ0511W Found *numberOfMatchingNodes* automation domain nodes for hostname *hostname*. All of these nodes are mapped to the virtual server *virtualServerName*. The nodes exist within automation domains *listOfDomainNames*.

Explanation: Hostnames should be uniquely be mapped to automation domain nodes, so the automation domain nodes can be uniquely mapped to virtual servers.

System action: The system maps multiple automation domain nodes to a single virtual server.

Operator response: Check which nodes can be addressed using the same hostname. Verify if these nodes should be mapped to the same virtual server. If the mapping is not correct then reconfigure the nodes such that their hostnames are distinct. If the mapping is correct and if you want to suppress this message from being logged again, create a WebSphere Application Server JVM custom property with name "com.ibm.eez.aab.suppress_EEZJ0511W" and value "1". Restart WebSphere Application Server to enable the property.

EEZJ0514W An exception for automation domain *domainName* **was encountered and ignored. Details about the exception:** *exceptionString*

Explanation: The invoked method is designed to ignore exceptions and continue operation. It logs the exception for problem determination purposes.

System action: Processing continues.

Operator response: Evaluate the exception details.

EEZJ0515W A user security exception for first-level automation domain *domainName* **has been encountered.**

Explanation: The automation domain requires user authentication, but no valid user credential has been supplied with the request.

System action: The current task ends.

Operator response: Case 1: If user authentication checking is enabled in the automation domain, ensure that user credential information for the automation domain is supplied. If the failing task was invoked from the System Automation operations console, the operations console asks for a new valid user credential. Enter the new credential directly and store it to the Domain Credential store, or navigate to "Settings - Stored Domain Credentials" and edit the credentials as needed. If the failing task was invoked from the management server (either automation engine or automation framework within WebSphere Application Server), ensure that a user credential for the first-level automation domain is correctly defined in the configuration. After you modified the credentials use the Refresh of the configuration utility. Case 2: If user authentication checking has been disabled in the automation domain, restart the adapter for that automation domain.

EEZJ0516W The EIF event publisher failed to disconnect from EIF event target " *eifTargetName* **" with exception** *exceptionDetails*

Explanation: The automation JEE framework tries to disconnect from the EIF event target while the session that owns the EIF event publisher is removed.

System action: The current task ends.

Operator response: No operator action required.

EEZJ0600W A RemoveException was received while trying to remove an entity from the database when processing an event received from automation domain *domainName***.**

Explanation: The EventHandlerBean received a RemoveException while trying to remove an entity after processing an event.

System action: Processing continues.

Operator response: Evaluate the exception details.

EEZJ0601W The policy name stored in the JEE framework and the policy name supplied by a policy changed event are not equal. The policy name stored in the JEE framework is *aab policyName***. The policy name supplied by the event is** *event policyName***.**

Explanation: The JEE framework received a policy changed event that contains a policy name that does not match the policy name that was stored previously in the JEE framework.

System action: Processing continues.

Operator response: Verify that the policy names are set correctly. If necessary, activate the policy again.

EEZJ0602W Not able to communicate with automation domain *domainName***.**

Explanation: The EventHandlerBean tried to communicate with an automation domain, but it received an exception.

System action: Processing continues.

Operator response: Evaluate the exception details.

EEZJ0603W Automation domain *oldDomainName* **has left and automation domain** *newDomainName* **has joined. These domains have the same access data. Apparently the domain has been renamed.**

Explanation: The EventHandlerBean received a domain join event. The access data of this event, such as the hostname and port, is the same as that of an existing automation domain with a different name. The EventHandlerBean created a new object for the automation domain that joined and will soon remove the object for the automation domain that left.

System action: Processing continues.

Operator response: Verify that the automation domain has not been renamed by mistake.

EEZJ0604W There are *numberOfThreads* **active threads that are managed by component** *componentName* **and may be hung.**

Explanation: The component has detected that several of its threads did not terminate within the expected time frame and are still active.

System action: The component continues to create new threads as needed.

Operator response: Evaluate the message log for potential reasons why the threads do not terminate within the expected time frame. If the number of potentially hanging threads continues to increase consider to restart the WebSphere application server in order to avoid the server reaching its memory limitations eventually. Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZJ0605W Ignoring a domain leave event for domain " *domainName* **" since the stored host name or IP address "** *ipAddressStored* **" does not match the host name or IP address "** *ipAddressInEvent* **" that is defined within the event.**

Explanation: The domain leave event of the automation domain contains a different host name or IP address than the stored domain data. A domain leave event is published when a first-level domain's adapter is stopped, for example, when it moves from one node to another node in the first-level automation domain.

System action: The leave event is ignored.

Operator response: Check the first-level adapter configuration and verify that the adapter can be reached by using a single host name or IP address even if the adapter is made highly available. In this case, a virtual IP address should be used. Additionally check if there exist multiple first-level automation domains that use the same end-to-end domain name.

EEZJ1604I All of the threads that are managed by component *componentName* **have terminated.**

Explanation: The component has previously detected that several of its threads did not terminate within the expected time frame. In the meantime, all of them have terminated.

System action: The component continues to create new threads as needed.

Operator response: No operator action required.

EEZJ1000I Application *productName* **has started working.**

Explanation: The application starts its asynchronous work.

System action: No system action required.

Operator response: No operator action required.

EEZJ1001I Application *productName* **was shut down by the JEE container and has stopped working.**

Explanation: The application stops its asynchronous work.

System action: No system action required.

Operator response: If required, restart the application.

EEZJ1002I Domain *domainName* **has been inactive for a long period of time and has been removed from the automation scope.**

Explanation: The timeout defined by the environment variable com.ibm.eez.aab.domain-removal-hours has been reached for this automation domain.

System action: No system action required.

Operator response: No operator action required. When the automation domain that has been removed from the automation scope joins the automation scope again, it is recreated.

EEZJ1003I The communication state of automation domain *domainName* **has changed from** *previousCommState* **to** *newCommState***.**

Explanation: The communication health state has changed.

System action: The system publishes a related event.

Operator response: Depending on the current state values and the desired communication state of the automation domain, it might be necessary to restart the automation adapter.

EEZJ1004I The timeout for backend automation calls is *timeoutValue* **seconds.**

Explanation: Controls how many seconds each call to the backend may take at most. Default: 60, minimum: 30, maximum: 3600.

System action: No system action required.

Operator response: If needed, set or modify the environment variable com.ibm.eez.aab.invocation-timeout-seconds.

EEZJ1005I The timeout to determine domain communication health state is *timeoutValue* seconds.

Explanation: Controls the number of seconds of inactivity after which the health of the communication to the automation domain is checked automatically. Default: 300, minimum: 60, maximum: 86400.

System action: No system action required.

Operator response: If needed, set or modify the environment variable com.ibm.eez.aab.watchdog-interval-seconds.

EEZJ1006I The timeout before removing domains that have left is *timeoutValue* hour(s).

Explanation: Controls the number of hours of inactivity after which the automation domain's representation in the management server is removed automatically. Default: 48, minimum: 1, maximum: 1000.

System action: No system action required.

Operator response: If needed, set or modify the environment variable com.ibm.eez.aab.domain-removal-hours.

EEZJ1008I The domain state of domain *domainName* has changed from *previousDomainState* to *newDomainState*

Explanation: The state of the automation domain has changed.

System action: The system publishes a related event.

Operator response: Depending on the current state values and the desired state of the automation domain, it might be necessary to restart the domain.

EEZJ1013I The automation framework does not send events to IBM Tivoli Netcool/OMNIbus as defined in the configuration.

Explanation: The property that contols OMNIbus event creation is set to a value that prevents event creation.

System action: The automation framework does not send events to OMNIbus.

Operator response: If events should be sent to OMNIbus, start the configuration tool and enable the OMNIbus event generation checkbox.

EEZJ1014I The automation framework sends events to IBM Tivoli Netcool/OMNIbus as defined in the configuration.

Explanation: The property that contols OMNIbus event creation is set to a value that enables event creation.

System action: The automation framework sends events to OMNIbus.

Operator response: If events should not be sent to OMNIbus, start the configuration tool and disable the OMNIbus event generation checkbox.

EEZJ1015I Restart of resource " *resourceId* " starts as requested by " *userName* ".

Explanation: The restart request is validated successfully. The stopping phase of the restart cycle begins.

System action: The automation manager sends a stop request to the resource.

Operator response: No action required.

EEZJ1016I The resource " *resourceId* " has reached the state "observed offline" after *durationSeconds* seconds. The starting phase of the restart cycle begins as requested by " *userName* ".

Explanation: The stopping phase of the restart cycle is completed successfully. The starting phase of the restart cycle begins.

System action: The automation manager sends a start request to the resource.

Operator response: No action required.

EEZJ1017I Restart of resource " *resourceId* " is completed successfully after *durationSeconds* seconds as requested by " *userName* ".

Explanation: The resource is restarted successfully.

System action: None.

Operator response: No action required.

EEZJ1018I The timeout before interrupting resource restart requests is *timeoutValue* hour(s).

Explanation: Controls how many hours the resource restart workflow waits for the expected sequence of events. Default: 1, minimum: 1, maximum: 3600.

System action: When the timeout occurs, then the system interrupts the resource restart workflow. The system does not send any online or offline requests to the resource based on the timeout.

Operator response: When the timeout occurs, check the status and the request list of the affected resource in order to determine why either the stopping phase or the starting phase of the resource restart did not complete. To control the timeout value, set or modify the environment variable com.ibm.eez.aab.resource-restart-timeout-hours.

EEZJ1019I The automation framework has connected successfully to the database manager.

Explanation: Previously reported problems to connect to the database manager are resolved.

System action: Processing continues.

Operator response: No action required.

EEZJ1020I The status of the EIF event target " *eifTargetName* **" changed: Address=***Address***, Port=***Port***, Status=***Status*

Explanation: This message occurs if the status of the EIF connection changed. The reason could be that a new EIF connection is created or an existing EIF connection is lost. The reason can be found in the status. A status='connection timed out' is expected if the EIF event target is stopped, e.g. if the EIF event target moves to another system and therefore the EIF publisher needs to change the EIF destination. The following status values are supported: 1 - connection created, 2 - connection changed, 4 - connection closed, 8 - connection timed out.

System action: None.

Operator response: No action required.

EEZJ1100I Attributes of domain *domainName* **have changed:** *listOfChangedAttributes*

Explanation: The domain join event of the automation domain contains different attribute values than the domain object. The domain object will be updated with the values of the event.

System action: Processing continues with the updated domain object.

Operator response: Review the modified attributes. If you find inappropriate values reconfigure the related automation adapter and restart the automation adapter.

EEZJ1101I The host name or IP address of domain " *domainName* **" has changed from "** *ipAddressOld* **" to "** *ipAddressNew* **".**

Explanation: The domain join event of the automation domain contains a different host name or IP address than the stored domain data. A domain join event is published when a first-level domain's adapter is started, for example, when it moves from one node to another node in the first-level automation domain.

System action: The stored domain data will be updated with the data of the event. Processing continues with the updated domain object.

Operator response: Verify that this change of the host name or IP address is expected and authorized. For example, check if there exist multiple first-level automation domains with the same domain name.

Prefix EEZK

This section contains messages with prefix EEZK.

EEZK0003E String *someString* **is too long: the maximum length of** *nameOfTheString* **strings is** *maxLength***.**

Explanation: Setting the string to the specified value did not succeed due to string length.

System action: The current task ends.

Operator response: Verify the input parameters.

EEZK0004E String named *someStringName* **must not be null and must not exceed the maximum length of** *maxLength***.**

Explanation: Setting the string to null is not allowed.

System action: The current task ends.

Operator response: Verify the input parameters.

EEZK0005E An exception that is not an instance of EEZApplicationException has been passed to the EEZApplicationTransientException. The type of the message is *exceptionType***. The exception message is:** *exceptionMessage***.**

Explanation: This is an unexpected behavior.

System action: The current task will continue. The exception will be processed.

Operator response: If any other error occurs, please provide the logs and traces as an aid to analysis.

EEZK0006E A string has been encountered that cannot be decomposed to a valid System Automation source token. The internal reason is: *internalReason*

Explanation: System Automation supports the concept of source tokens in order to identify automation domains and automation resources. Generally, source tokens are strings used to uniquely identify objects within the scope of a particular software product. For this purpose, source tokens have to conform to product-specific syntactical rules. In this case, at least one of the syntactical rules is violated.

System action: The current task ends.

Operator response: Evaluate the internal reason.

EEZK0007E A problem occurred handling the encryption of a user credential. The original exception was: *original exception***.**

Explanation: System Automation uses credentials (user and password pairs) to authenticate actions against other components. Passwords are encrypted or decrypted as needed. One of these functions failed.

System action: The current task ends. System Automation is unable to use this credential for accessing another component.

Operator response: Evaluate the original exception. Ensure that you have correctly set up the user encryption for this System Automation component. Ensure that user name and password have been correctly specified and files storing credentials have not been modified.

EEZK0008E A problem occurred handling the encryption of the credential for user with name *user***. The original exception was:** *original exception***.**

Explanation: System Automation uses credentials (user and password pairs) to authenticate actions against other components. Passwords are encrypted or decrypted as needed. One of these functions failed for the specified user name.

System action: The current task ends. System Automation is unable to use this credential for accessing another component.

Operator response: Evaluate the original exception. Ensure that you have correctly set up the user encryption for this System Automation component. Ensure that user name and password have been correctly specified and files storing credentials have not been modified.

EEZK0009E The input string *inputString* **is too long. The maximum length of a string of type "** *typeOfString* **" is** *maxLength* **after it has been encoded to UTF-8. The number of characters of the input string is** *numberOfCharacters***. The number of characters of the encoded input string is** *numberOfUTF8Characters***.**

Explanation: The UTF-8 encoded input string is larger than the maximum supported length for strings of this type. The maximum length is defined by the end-to-end automation database table that is designed to store the input string in UTF-8 encoding format.

System action: The current task ends.

Operator response: Modify the input string such that it becomes shorter and repeat the current task.

Prefix EEZL

This section contains messages with prefix EEZL.

EEZL0001E The WebSphere infrastructure has reported a severe error situation: *runtimeExceptionMessage*

Explanation: The application was interrupted by a RuntimeException and cannot complete its task.

System action: The current task ends. The transaction is rolled back.

Operator response: Check the description of the error situation if it indicates that the server database or another subsystem is unavailable. If the problem persists, check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0002E The WebSphere infrastructure has reported an error situation: *exceptionMessage*

Explanation: The application was interrupted by an unexpected exception or error that is not a RuntimeException.

System action: The current task ends, but the database operations that have been performed already remain valid (no transaction rollback).

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0003E A critical error has occurred in class: *className***, method:** *methodName***. The logger object could not be initialized.**

Explanation: This component could not initialize and access a logger object. This indicates either a configuration or programming error.

System action: The process cannot be completed. All parts of this component are affected. The system is not operational.

Operator response: Check that the path settings are correct and all required libraries exist.

EEZL0004E An error has occurred in class: ***className*****, method:** ***methodName*****, parameter** ***parameterName*****.**

Explanation: The method has been invoked with an empty or null parameter list. The method must be invoked with a parameter list that is not null and filled. This indicates a programming error.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0005E An error has occurred in class: ***className*****, method:** ***methodName*****, parameter** ***parameterName*****.**

Explanation: The method has been invoked with an empty or null parameter list. The method must be invoked with a parameter list that is not null and filled. This indicates a programming error.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0015E An error has occurred in class: ***className*****.**

Explanation: Configuration data object is null.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0016E An error has occurred in class: ***className*****.**

Explanation: First-level automation name has not been set.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0017E An error has occurred in class: ***className*****.**

Explanation: Host address has not been set.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0018E An error has occurred in class: ***className*****.**

Explanation: Adapter plugin class has not been set.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0019E An error has occurred in class: ***className*****.**

Explanation: Port has not been set.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0020E An error has occurred in class: ***className*****.**

Explanation: Timeout value has not been set.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0021E An error has occurred in class: ***className*****.**

Explanation: User Credentials object is null.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0022E An error has occurred in class: ***className*****.**

Explanation: Username has not been set.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0023E An error has occurred in class: ***className*****.**

Explanation: Password has not been set.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0024E An error has occurred in class: *className*, method: *methodName*. Illegal return object.

Explanation: The JCA has returned an illegal argument to the EJB, which has caused a ClassCastException.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0025E An error has occurred in class: *className*, method: *methodName*. Illegal parameter at invocation of this method.

Explanation: The method has been invoked with a null parameter. The method must be invoked with a parameter that is not null. This indicates a programming error.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0030E An *exception* has occurred in class: *className*, method *methodName*. The nested exception is null.

Explanation: No exception object was linked to the `ResourceException` that has been caught. This is an unexpected behavior and indicates a programming error on the J2C side.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0031E An error has occurred in class: *className*, method *methodName*. Invalid nested exception: *nestedException*.

Explanation: An invalid exception object was linked to the `ResourceException` that has been caught. This is an unexpected behavior and indicates a programming error on the J2C side.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0032E An error has occurred in class: *className*, method *methodName*. No Connection object could be obtained.

Explanation: The call to `EEZConnectionFactory.getConnection(..)` returned null. This is an unexpected behavior and indicates a programming error at J2C side.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0033E An error has occurred in class: *className*, method *methodName*. No Interaction object could be obtained.

Explanation: The call to `EEZConnection.createInteraction()` returned null. This is an unexpected behavior and indicates a programming error at J2C side.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0034E An error has occurred in class: *className*, method *methodName*. JNDI name: *jndiName* did not return a `ConnectionFactory` object.

Explanation: The JNDI lookup of this J2C has encountered an internal error. The `ConnectionFactory` object could not be retrieved. This indicates a JNDI configuration error.

System action: The current task ends. No connection to the first-level automation will be possible until this problem is fixed.

Operator response: Ensure the JNDI settings for the J2C connection factories are correct and restart the server.

EEZL0040E Error occurred during XML (de)serialization process. Exception: *exception* detected in *className*, method *methodName*.

Explanation: The XML decoder has received an XML string that contained unsupported encoding.

System action: The method terminates with an `ExecutionFailedException`.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZL0501W An exception was encountered and ignored in order to continue operation. Exception string: *exceptionString***.**

Explanation: The invoked method is designed to ignore exceptions and continue operation. It logs the exception for problem determination purposes.

System action: Ignores the exception.

Operator response: Evaluate the exception details.

EEZL0510W An exception was encountered at XML serialization in class *className***, method:** *methodName***. Exception string:** *exceptionDetails*

Explanation: This might be subject to back-level toleration and can be ignored.

System action: The exception is ignored. The process will be continued.

Operator response: Evaluate the exception details.

Prefix EEZP

This section contains messages with prefix EEZP.

EEZP0001E The specified <Source> " *source* **" in the <Relationship> "** *source* **" "** *relationshipType* **" "** *target* **" does not exist as a <ResourceReference>, <ResourceGroup> or <ChoiceGroup>.**

Explanation: The <Source> and <Target> of a <Relationship> must exist as exactly one <ResourceReference>, <ResourceGroup> or <ChoiceGroup>.

System action: This policy cannot be activated.

Operator response: Verify this <Relationship> in the policy.

EEZP0002E The specified <Target> " *target* **" in the <Relationship> "** *source* **" "** *relationshipType* **" "** *target* **" does not exist as a <ResourceReference>, <ResourceGroup> or <ChoiceGroup>.**

Explanation: The <Source> and <Target> of a <Relationship> must exist as exactly one <ResourceReference>, <ResourceGroup> or <ChoiceGroup>.

System action: This policy cannot be activated.

Operator response: Verify this <Relationship> in this policy.

EEZP0003E The specified <*policyElement***> name "** *nameOfElement* **" was found more than once as the name of a <ResourceReference>, <ResourceGroup> or <ChoiceGroup>.**

Explanation: The value of the name attributes of <ResourceReference>, <ResourceGroup> and <ChoiceGroup> must be unique.

System action: This policy cannot be activated.

Operator response: Verify this name attribute in this policy.

EEZP0004E The specified member " *groupMember* **" of the <***groupElement***> name "** *groupName* **" does not exist as a <ResourceReference>, <ResourceGroup> or <ChoiceGroup>.**

Explanation: The member in a group must exist as exactly one <ResourceReference>, <ResourceGroup> or <ChoiceGroup>.

System action: This policy cannot be activated.

Operator response: Verify this member name in this policy.

EEZP0005E Syntax error in line *lineNumber* **column** *columnNumber***. Original parser exception:** *errorMessage*

Explanation: A syntax error occurred while parsing this policy.

System action: This policy cannot be activated.

Operator response: Correct the syntax error in this policy.

EEZP0006E The specified policy file " *policyFile* **" cannot be found.**

Explanation: The policy cannot be loaded from this location.

System action: This policy cannot be activated.

Operator response: Verify the policy XML file name and its path.

EEZP0007E Original Parser Exception: *exceptionMessage*

Explanation: An internal problem occurred while parsing this policy.

System action: This policy cannot be activated.

Operator response: Verify that the product is correctly installed.

EEZP0008E **An unsupported character *character* was found in the string " *completeString* ". This string was found in the element <*elementName*> of the parent element <*parentElement*>.**

Explanation: The character found in the string is not supported.

System action: This policy cannot be activated.

Operator response: Remove the unsupported character from this string in this policy.

EEZP0009E **The specified name " *nameOfElements* " was found in the elements <*policyElement*> and <*otherPolicyElement*>.**

Explanation: The value of the name attribute must be unique.

System action: This policy cannot be activated.

Operator response: Verify this name attribute in this policy.

EEZP0010E **The specified <ResourceReference> " *referenceName* " was found as a member of multiple <ChoiceGroup> elements.**

Explanation: A <ResourceReference> can only be a member of one <ChoiceGroup>.

System action: This policy cannot be activated.

Operator response: Check that the <ResourceReference> is a member of at most one <ChoiceGroup> element in this policy.

EEZP0011E **The specified <*groupForm*> " *groupName* " was found as a member of multiple other groups.**

Explanation: A group can only be a member of one group.

System action: This policy cannot be activated.

Operator response: Check that the group is a member of at most one group element in this policy.

EEZP0012E **The two <ResourceReference> or <ReplicationReference> elements " *reference* " and " *otherReference* " point to the same referenced resource " *resource* ".**

Explanation: A first level resource cannot be referenced by more than one <ResourceReference> or <ReplicationReference> at a time.

System action: This policy cannot be activated.

Operator response: Check that every <ResourceReference> or <ReplicationReference> references a separate <ReferencedResource> or <ReferencedReplicationResource> as child element in this policy.

EEZP0013E **The specified member " *memberName* " was found multiple times in the same <*groupForm*> " *groupName* ".**

Explanation: All <Members> child elements must be unique in one group.

System action: This policy cannot be activated.

Operator response: Check that the group has no duplicate <Members> child elements in this policy.

EEZP0014E **The specified <ResourceReference> " *reference* " was found as a member of the <ResourceGroup> " *resourceGroupName* " and the <ChoiceGroup> " *choiceGroupName* ".**

Explanation: A <ResourceReference> can only be a member of multiple <ResourceGroup> elements or one <ChoiceGroup> element.

System action: This policy cannot be activated.

Operator response: Check that the <ResourceReference> is not a member of a <ResourceGroup> and a <ChoiceGroup> at the same time in this policy.

EEZP0015E **The specified <Relationship> <Type> " *relationType* " with <Source> " *Source* " and <Target> " *Target* " was found in a loop.**

Explanation: <Relationship> elements of the same <Type> where one <Relationship> element <Target> is the next <Relationship> element <Source> must not form a loop.

System action: This policy cannot be activated.

Operator response: Check that the <Relationship> elements are not defined as a loop in this policy.

EEZP0016E **The specified element <*childElement*> was found more than once as a child element of <*parentElement*> name " *parentName* ".**

Explanation: At most one element of this type is allowed in this group.

System action: This policy cannot be activated.

Operator response: Check that at most one element of this type is specified in this group in this policy.

EEZP0017E The specified element <*parentElement*> name " *parentName* " was found without <Members> child elements.

Explanation: At least one <Members> child element must be specified in this group.

System action: This policy cannot be activated.

Operator response: Check that at least one <Members> child element is specified in this group in this policy.

EEZP0018E The policy document does not contain a <ResourceReference> or <include> element.

Explanation: At least one <ResourceReference> element or an <include> element must be specified in this policy.

System action: This policy cannot be activated.

Operator response: Check that at least one <ResourceReference> element is specified in this policy or that another policy is included using an <include> element.

EEZP0019E The specified element <ChoiceGroup> name " *groupName* " was found with more than one <Members> child element with the "preferred" attribute equal to "true".

Explanation: One <ChoiceGroup> member must have the "preferred" attribute equal to "true".

System action: This policy cannot be activated.

Operator response: Check that exactly one <ChoiceGroup> member has the "preferred" attribute equal to "true".

EEZP0020E The specified <Relationship> with the <Type> " *relationType* ", the <Source> " *source* " and the <Target> " *target* " was found multiple times in the policy document.

Explanation: All <Relationship> elements must be unique.

System action: This policy cannot be activated.

Operator response: Check that at most one <Relationship> of this type is specified in this policy.

EEZP0021E A 'UTFDataFormatException' was caughed in method *methodName* of class *className*. The received message was *message*.

Explanation: The processing was interrupted by this exception and cannot complete.

System action: The policy cannot be loaded.

Operator response: Ensure the correct data format of the policy document by only using editors which create UTF-8-compliant documents.

EEZP0022E The specified <*groupType*> name " *groupName* " was found in a loop.

Explanation: Group elements cannot form a loop with their members.

System action: This policy cannot be activated.

Operator response: Check that the group <Members> child elements are not defined as a loop in this policy.

EEZP0023E The specified element <ChoiceGroup> name " *groupName* " has no <Members> child element with the "preferred" attribute equal to "true".

Explanation: One <ChoiceGroup> member must have the "preferred" attribute equal to "true".

System action: This policy cannot be activated.

Operator response: Check that exactly one <ChoiceGroup> member has the "preferred" attribute equal to "true".

EEZP0024E The specified element <ResourceReference> name " *reference* " point to the same <AutomationDomainName> value specified for the element <PolicyInformation> in this policy.

Explanation: A <ResourceReference> child element <AutomationDomain> cannot point to the same <AutomationDomainName> value specified for the element <PolicyInformation> in this policy.

System action: This policy cannot be activated.

Operator response: Check that no <ResourceReference> child element <AutomationDomain> has the same value as the <PolicyInformation> child element <AutomationDomainName> in this policy.

EEZP0025E There is no <Site> specified with index "1".

Explanation: There has to be specified a <Site> with index "1", which is the initially primary site.

System action: This disaster recovery policy cannot be activated.

Operator response: Specify a <Site> with attribute "index" set to "1" in this disaster recovery policy.

EEZP0026E There are multiple <Site> elements specified with the same index " *siteIndex* **" named** *listOfSiteNames***.**

Explanation: <Site> indices have to be unique.

System action: This disaster recovery policy cannot be activated.

Operator response: Change the "index" attributes of <Site> elements in this disaster recovery policy so that they are unique or remove redundant <Site> specifications.

EEZP0027E There are multiple <Domain> elements specified with the same name " *FLADomainName* **".**

Explanation: <Domain> names have to be unique.

System action: This disaster recovery policy cannot be activated.

Operator response: Change the <Domain> names in this disaster recovery policy so that they are unique or remove the redundant <Domain> specifications.

EEZP0029E More than one <Domain> is specified on <Site> with index " *siteIndex* **" in the Cluster Set "** *ClusterSetName* **". Found:** *listOfFLADomainNames***.**

Explanation: At most one <Domain> is allowed per <Site> in a Cluster Set.

System action: This disaster recovery policy cannot be activated.

Operator response: Ensure that in this disaster recovery policy, at most one <Domain> located at this <Site> specifies this Cluster Set in its attribute "clusterSetName".

EEZP0030E There are multiple <Node> elements specified with the same name " *nodeName* **" in the <Domain> "** *FLADomainName* **".**

Explanation: The names for <Node> elements defined in a <Domain> have to be unique.

System action: This disaster recovery policy cannot be activated.

Operator response: Ensure that there are not multiple <Node> elements specified with equal pairs of "name" attributs and <Domain> subelements in this disaster recovery policy.

EEZP0032E The <Site> which is referenced by <Node> " *nodeName* **" in <Domain> "** *FLADomainName* **" is not defined.**

Explanation: Cannot assign a <Node> to a <Site> which is not specified in the disaster recovery policy.

System action: This disaster recovery policy cannot be activated.

Operator response: Ensure that the "index" attribute of the <Site> subelement of the <Node> matches with the "index" attribute of the corresponding <Site> in this disaster recovery policy.

EEZP0033E The <Domain> " *FLADomainName* **" which is referenced by <Node> "** *nodeName* **" is not specified in the disaster recovery policy.**

Explanation: The <Domain> referenced by a <Node> has to be specified in the disaster recovery policy.

System action: This disaster recovery policy cannot be activated.

Operator response: Add a specification for the <Domain> to this disaster recovery policy.

EEZP0034E The <Domain> " *FLADomainName* **" which is referenced by the member "** *memberName* **" of the disaster recovery choice group "** *nodeName* **" is not specified in the disaster recovery policy.**

Explanation: Each <Domain> referenced by a disaster recovery choice group member has to be specified in the disaster recovery policy.

System action: This disaster recovery policy cannot be activated.

Operator response: Add a specification to the disaster recovery policy for this <Domain>.

EEZP0035E <ResourceReference> named " *resourceReferenceName* **" is specified as "businessCritical", but its <Domain> "** *FLADomainName* **" is not associated with a Cluster Set.**

Explanation: Each <ResourceReference> specified in the disaster recovery scope has to be associated with a Cluster Set via its supporting <Domain>.

System action: This disaster recovery policy cannot be activated.

Operator response: Ensure that the supporting

<Domain> is specified in the disaster recovery policy and that its "clusterSetName" attribute is set properly or remove the "businessCritical" attribute from the <ResourceReference>.

EEZP0036E The members of the disaster recovery choice group " ***DRChoiceGroupName*** **" are not all associated with the same Cluster Set. Members are associated with the following Cluster Sets:** ***listOf(ClusterSetName)*****.**

Explanation: A disaster recovery choice group can only switch between the resource references of a single Cluster Set.

System action: This disaster recovery policy cannot be activated.

Operator response: Ensure in this disaster recovery policy that the same value is set in the "clusterSetName" attribute of every <Domain> providing a member of this disaster recovery choice group.

EEZP0037E There are multiple members in the disaster recovery choice group " ***DRChoiceGroupName*** **" that belong to the <Site> with index "** ***siteIndex*** **". Found members** ***listOf(resRefName at clusterSetName)*****.**

Explanation: There is at most one <ResourceReference> allowed for each <Site> in an disaster recovery choice group.

System action: This disaster recovery policy cannot be activated.

Operator response: Remove redundant members located at this <Site> from the disaster recovery choice group in this disaster recovery policy.

EEZP0038E The member named " ***MemberName*** **" of disaster recovery choice group named "** ***choiceGroupName*** **" is not provided by a <Domain> that has a Cluster Set and <Site> specified.**

Explanation: Each member of a disaster recovery choice group has to be associated to a Cluster Set and to a <Site> via its <Domain>.

System action: This disaster recovery policy cannot be activated.

Operator response: Ensure in this disaster recovery policy that the <ChoiceGroup> member is provided by a <Domain> that has the "clusterSetName" attribute set and that has at least one <Node> defined at a <Site>.

EEZP0039E The member named " ***MemberName*** **" of disaster recovery choice group named "** ***choiceGroupName*** **" is not a <ResourceReference>.**

Explanation: Only <ResourceReference> elements are allowed as members of an disaster recovery choice group.

System action: This disaster recovery policy cannot be activated.

Operator response: Ensure in this disaster recovery policy that each member of the disaster recovery choice group is a <ResourceReference>.

EEZP0040E The preferred member named " ***MemberName*** **" of disaster recovery choice group named "** ***choiceGroupName*** **" is not located at <Site> with index "1".**

Explanation: The preferred member of a disaster recovery choice group has to be located at initially primary <Site>.

System action: This disaster recovery policy cannot be activated.

Operator response: Ensure in this disaster recovery policy that the preferred member of this disaster recovery choice group is located at <Site> with index "1".

EEZP0041E The drml file " ***DRMLFileName*** **" could not be found in the policy pool.**

Explanation: The file does not exist or access rights are not set properly.

System action: The disaster recovery policy cannot be parsed. The automation engine is not able to activate the disaster recovery policy including this drml file and will continue to run with the currently activated policy.

Operator response: Ensure that the specified drml file can be accessed in the policy pool.

EEZP0042E A SAXException was caught while parsing the policy " ***fullQualifiedPolicyPath*** **" from the policy pool.**

Explanation: The policy is not compliant to the corresponding XML Schema.

System action: The policy cannot be parsed. The automation engine is not able to activate this policy and will continue to run with the currently activated policy.

Operator response: Ensure that the policy is conformant with the XML Schema.

EEZP0043E Disaster recovery specific attributes like "businessCritical" and "switchableByDROnly" were found in the policy, but the policy is not disaster recovery enabled.

Explanation: The attributes "businessCritical" and "switchableByDROnly" are only allowed if the policy is disaster recovery enabled.

System action: This policy cannot be activated.

Operator response: Either remove the disaster recovery specific attributes from this policy or add the <DRPolicy> subelement in the <PolicyInformation> specifying the corresponding drml file.

EEZP0044E The <Domain> named " *domainName* **" is stretched across more than two sites. Found <Node> elements with site indices** *listOfIndices***.**

Explanation: Spread of domains is restricted to at most two sites.

System action: This disaster recovery policy cannot be activated.

Operator response: Limit the <Node> elements of this <Domain> to at most two <Site> elements in this disaster recovery policy.

EEZP0045E The <HardwareDevice> of <Node> " *nodeName* **" in <Domain> "** *domainName* **" references a non-existing <Box> / <Slot> pair.**

Explanation: In order to provide <HardwareManagementTasks> for HardwareDevices, the referenced pair of <Box> and <Slot> has to be specified in the disaster recovery policy.

System action: This disaster recovery policy cannot be activated.

Operator response: Add the <Box> and <Slot> specifications with names corresponding to the names referenced in the <HardwareDevice> of the <Node> to this disaster recovery policy.

EEZP0047E There is no corresponding <ResourceReference> specified for <Site> with index " *siteIndex* **" in disaster recovery choice group "** *DRChoiceGroupName* **".**

Explanation: This disaster recovery choice group cannot switch to a member at this <Site> and thus cannot be recovered at that <Site>.

System action: This disaster recovery policy cannot be activated.

Operator response: To ensure disaster recovery capability of the <ChoiceGroup> also at this <Site>, specify a proper <ResourceReference> and add it to the group in this disaster recovery policy.

EEZP0050E The discretionary group named " *GroupName* **" contains a business critical member named "** *MemberName* **".**

Explanation: Business critical resource references or groups are not allowed as members of discretionary groups.

System action: This disaster recovery policy cannot be activated.

Operator response: In this disaster recovery policy, either remove the "businessCritical" attribute consistently in all of the group's members or set the group "businessCritical".

EEZP0051E Syntax error in line *lineNumber* **column** *columnNumber* **of policy file "** *filePath* **". Original parser exception:** *errorMessage*

Explanation: A syntax error occurred while parsing this policy.

System action: This policy cannot be activated.

Operator response: Correct the syntax error in this policy.

EEZP0052E The number of specified <Site> elements in the disaster recovery policy is not two.

Explanation: Only setups with exatcly two sites are supported.

System action: This disaster recovery policy cannot be activated.

Operator response: Make sure that there are exactly two <Site> elements in the disaster recovery policy.

EEZP0053E The <Site> indices are not set as required. Found indices *listOf(siteIndex)***.**

Explanation: The <Site> indices have to be a sequence of increasing numbers starting with "1".

System action: This disaster recovery policy cannot be activated.

Operator response: Set the "index" attributes in the <Site> elements properly in this disaster recovery policy.

EEZP0054E There is no corresponding <Domain> specified on <Site> with index " *siteIndex* **" for the Cluster Set "** *clusterSetName* **".**

Explanation: The resources of a Cluster Set cannot be recovered at a <Site> that has no corresponding <Domain> specified supporting a corresponding <ResourceReference>.

System action: This disaster recovery policy cannot be activated.

Operator response: To ensure disaster recovery capability of the Cluster Set in this disaster recovery policy, assign a <Domain> located at the missing <Site> to the Cluster Set by properly setting the "clusterSetName" attribute.

EEZP0055E Found a " *relationshipName* **" <Relationship> with a business critical <Source> named "** *sourceName* **" and a discretionary <Target> named "** *targetName* **".**

Explanation: It is recommended that a business critical resource is not dependent on a discretionary resource.

System action: This disaster recovery policy cannot be activated.

Operator response: Remove the <Relationship> or change the "businessCritical" attribute of either the <Source> or the <Target> in this disaster recovery policy.

EEZP0056E The business critical group named " *groupName* **" has a member named "** *memberName* **" that is explicitly set to discretionary.**

Explanation: Discretionary members are not allowed in business critical groups.

System action: This disaster recovery policy cannot be activated.

Operator response: Remove the "businessCritical" attribute of either the group from where it was propagated or of its member in this disaster recovery policy.

EEZP0058E The member named " *memberName* **" of the disaster recovery choice group "** *choiceGroupName* **" participates directly in a Relationship named "** *relationshipName* **".**

Explanation: The members of disaster recovery choice groups are not allowed to participate directly in relationships.

System action: This disaster recovery policy cannot be activated.

Operator response: Use the disaster recovery choice group instead of its member to model the relationship in this disaster recovery policy.

EEZP0059E The member named " *memberName* **" of the disaster recovery choice group "** *choiceGroupName* **" is also member of a group named "** *groupName* **".**

Explanation: The members of a disaster recovery choice group are not allowed to be direct members of other groups.

System action: This disaster recovery policy cannot be activated.

Operator response: In this disaster recovery policy, put the disaster recovery choice group instead of its member in the group.

EEZP0060E The business critical <ResourceReference> " *resourceReferenceName* **" is not member of a disaster recovery choice group, but its <Domain> does not cover all sites.**

Explanation: Business critical leaf resources that do not cover all sites, i.e. that are provided by a <Domain> that is not stretched across all sites, have to be placed in disaster recovery choice groups.

System action: This disaster recovery policy cannot be activated.

Operator response: In this disaster recovery policy, put the <ResourceReference> into a proper disaster recovery choice group.

EEZP0061E The disaster recovery choice group " *choiceGroupName* **" with the attribute "switchableByDROnly" is discretionary.**

Explanation: Disaster recovery choice groups have to be business critical.

System action: This disaster recovery policy cannot be activated.

Operator response: Either put the <ChoiceGroup> into a business critical group, specify the disaster recovery choice group explicitly as "businessCritical", or remove the "switchableByDROnly" attribute in this disaster recovery policy.

EEZP0062E A *exceptionClassName* **was caught in rule** *ruleClassName* **of the policy checker.**

Explanation: The policy check was interrupted by this exception and failed.

System action: This policy contains errors and cannot be activated.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZP0063E No SNMP agent for: *key of the resource*

Explanation: Mechanism SNMP is specified for a hardware management task though no SNMP agent has been defined for the enclosing box.

System action: The request to activate the policy is rejected.

Operator response: Correct and reactivate your automation policy.

EEZP0064E Inconsistent hardware management task definition for: *key of the resource*

Explanation: Mechanism SNMP is specified for a hardware management task with a Script element.

System action: The request to activate the policy is rejected.

Operator response: Correct and reactivate your automation policy.

EEZP0065E Inconsistent hardware management task definition for: *key of the resource*

Explanation: Mechanism Script is specified for a hardware management task though no Script element has been defined for it.

System action: The request to activate the policy is rejected.

Operator response: Correct and reactivate your automation policy.

EEZP0066E Inconsistent hardware management task definition for: *key of the resource*

Explanation: No timeout is defined for synchroneous execution of the script command.

System action: The request to activate the policy is rejected.

Operator response: Correct and reactivate your automation policy: Either define a timeout for the script command, or specify asynchroneous execution by setting attribute runCommandSync to 0 or 2 in the drml file.

EEZP0067E The <ResourceReference> " *ResourceReferenceName* **" references a fixed resource in <Domain> "** *DomainName* **" whose hosting <Node> "** *NodeName* **" is not specified.**

Explanation: Workload on a <Domain> with an incomplete <Node> specification cannot be controlled.

System action: This disaster recovery policy cannot be activated.

Operator response: Add the missing <Node> specification to this drml file.

EEZP0068E The value " *value* **" of the attribute "** *attributeName* **" in the element <***ElementName***> is not allowed.**

Explanation: This value is reserved.

System action: This disaster recovery policy cannot be activated.

Operator response: Change the value.

EEZP0069E The name " *name* **" is used as domain name and as cluster set name.**

Explanation: Names for domains and cluster sets are used as identifier and must be unique.

System action: This disaster recovery policy cannot be activated.

Operator response: Change the either the domain name or the cluster set name.

EEZP0070E The specified <*groupForm***> "** *groupName* **" was found as member of itself.**

Explanation: A group cannot be member of itself.

System action: This policy is not valid.

Operator response: Check that no group is member of itself in this policy.

EEZP0071E Not able to create an object of type *Object-type***. The name of the tree-node is** *node-name***.**

Explanation: There is a problem when building an internal object of the input XML.

System action: The current task ends.

Operator response: Check for related messages.

EEZP0072E An empty string was found for a mandatory element. This empty string was found in the element <*elementName***> of the parent element <***parentElement***> with name "** *name* **".**

Explanation: The empty string value is not supported for this element.

System action: This policy cannot be activated.

Operator response: Add a valid value for this element in this policy.

EEZP0073E An unsupported character *character* was found in the string " *completeString* ". This string was found in the attribute " *attributeName* " of the element <*element*>.

Explanation: The character found in the string is not supported.

System action: This policy cannot be activated.

Operator response: Remove the unsupported character from this string in this policy.

EEZP0074E An empty string was found for a mandatory element. This empty string was found in the element <*elementName*> of the parent element <*parentElement*>.

Explanation: The empty string value is not supported for this element.

System action: This policy cannot be activated.

Operator response: Add a valid value for this element in this policy.

EEZP0075E The member " *member name* " has parent groups with different <DesiredState>.

Explanation: Groups having the same member must have the same <DesiredState>.

System action: This policy cannot be activated.

Operator response: Ensure that all parent groups of this member have the same <DesiredState> specified in the policy.

EEZP0076E The workloadSetup attribute of the <Domain> element with name " *domain name* " is not allowed for this domain.

Explanation: The workloadSetup attribute must not be defined in non-stretched domains.

System action: This policy cannot be activated.

Operator response: Remove the workloadSetup attribute of the <Domain> element in the policy.

EEZP0077E Found <ReplicationReference> elements in the disaster recovery policy.

Explanation: <ReplicationReference> elements are not supported in disaster recovery enabled policies.

System action: This policy cannot be activated.

Operator response: Either remove the <ReplicationReference> elements from the policy or remove the <DRPolicy> subelement in the <PolicyInformation> specifying the policy as disaster recovery enabled.

EEZP0078E Found <Resource> elements of class "IBM.ITMResource" in the policy, but integration with IBM Tivoli Monitoring is not enabled in the Universal Automation Adapter configuration.

Explanation: <Resource> elements of class "IBM.ITMResource" are only supported if the integration with IBM Tivoli Monitoring has been configured and enabled using the configuration utility.

System action: This policy cannot be activated.

Operator response: Use the Universal Automation Adapter configuration task in the configuration utility to enable and configure the integration with IBM Tivoli Monitoring.

EEZP0079E The element <MonitorAttribute> is specified in an invalid format. It must contain a dot separating the attribute group of an IBM Tivoli Monitoring agent and the name of the attribute within that attribute group that should be used to determine the observed state of the resource. The specified value of the <MonitorAttribute> element is " *MonitorAttributeValue* " and was found in the parent element <*parentElement*> with name " *name* ".

Explanation: In order to determine the observed state of the resource, the agent attribute specified in the policy element MonitorAttribute is queried periodically. The attribute is specified in the form <AttributeGroup>.<AttributeName> in the policy element MonitorAttribute. The attribute group and the attribute name within that group must be separated by exactly one dot.

System action: This policy cannot be activated.

Operator response: Modify the value of the MonitorAttribute element in the policy, so that a valid attribute group and attribute name are specified. Then reactivate the policy.

EEZP0080E The "node" attribute of a resource of class "IBM.ITMResource" is specified in an invalid format. It must contain a valid managed system name as known to the IBM Tivoli Monitoring environment. A valid managed system name contains two or three name components which are separated by colons. The specified value of the "node" attribute is " *node value* " and was found in the <Resource> element named " *resource name* ".

Explanation: For resources of class "IBM.ITMResource", the node attribute must contain a valid managed system name corresponding to the

Tivoli Monitoring agent that manages the resource. A valid managed system name contains two or three name components which are separated by colons. For example, a valid managed system name is "Apache:host1:KHTP".

System action: This policy cannot be activated.

Operator response: Modify the node attribute value of the Resource element in the policy, so that it contains a valid managed system name. Then reactivate the policy.

EEZP0081E No <UserName> has been specified for the <IBM.ITMResourceAttributes> element which is named " *name* **" and no generic IBM Tivoli Monitoring user has been configured in the SA Application Manager configuration utility.**

Explanation: You can configure a generic user to log in to the IBM Tivoli Monitoring SOAP server using the SA Application Manager configuration utitlity. This generic user is used if no <UserName> is specified in the <IBM.ITMResourceAttributes> element within the policy. If no generic user is configured, you must specify a <UserName> element in the policy for the <IBM.ITMResourceAttributes> element. For this Universal Automation Adapter instance no generic user has been configured, and this policy contains <IBM.ITMResourceAttributes> elements that do not contain a <UserName> element.

System action: This policy cannot be activated.

Operator response: Add <UserName> elements to all <IBM.ITMResourceAttributes> elements in the policy, or define a generic IBM Tivoli Monitoring user using the SA Application Manager configuration utility.

EEZP0082E The availability target of <ServerGroup> " *server group name* **" is not in the valid range of 1 to "** *member count* **".**

Explanation: The availability target of a ServerGroup has to be greater than zero and not greater than the member count.

System action: This policy cannot be activated.

Operator response: Adjust the value of the availabilityTarget attribute of the <ServerGroup> element in this policy.

EEZP0083E The satisfactory target of <ServerGroup> " *server group name* **" is not in the valid range of 1 to "** *member count* **".**

Explanation: The availability target of a ServerGroup has to be greater than zero and not greater than the member count.

System action: This policy cannot be activated.

Operator response: Adjust the value of the availabilityTarget attribute of the <ServerGroup> element in this policy.

EEZP0084E The availability target of <ServerGroup> " *server group name* **" is not in the valid range. The availability target must be equal to or greater than the satisfactory target, which is "** *satisfactory target* **".**

Explanation: The availability target of a ServerGroup has to be equal to or greater than the satisfactory target.

System action: This policy cannot be activated.

Operator response: Adjust the values of the availabilityTarget attribute and/or the satisfactoryTarget of the <ServerGroup> element in this policy.

EEZP0085E The <ResourceReference> " *resource reference name* **" is the source of a relationship and also member of the <ServerGroup> "** *server group name* **". Only one of both is allowed.**

Explanation: The members of a <ServerGroup> must not be the source of relationships.

System action: This policy cannot be activated.

Operator response: Either remove all relations starting from the <ResourceReference> or remove the <ResourceReference> from the <ServerGroup>

EEZP0086E The <ResourceReference> " *resource reference name* **" is the target of a relationship and also member of the <ServerGroup> "** *server group name* **". Only one of both is allowed.**

Explanation: The members of a <ServerGroup> must not be the target of relationships.

System action: This policy cannot be activated.

Operator response: Either remove all relations pointing to the <ResourceReference> or remove the <ResourceReference> from the <ServerGroup>

EEZP0087E The ServerGroup " *server group name* **" has more members than the maximum allowed value ("** *maximum server group members* **").**

Explanation: The amount of members of a <ServerGroup> is limited.

System action: This policy cannot be activated.

Operator response: Reduce the number of members from the <ServerGroup>

EEZP0088E The <Relationship> " *relationshipName* **" between <Source> "** *sourceResourceName* **" and <Target> "** *targetResourceName* **" links two dynamic resource references.**

Explanation: Relationships between two dynamic resource references are not supported.

System action: This policy cannot be activated.

Operator response: Change the relationship to include at most one dynamic resource reference.

EEZP0089E The <ChoiceGroup> " *choiceGroupName* **" contains the dynamic resource reference "** *dynamicResourceReferenceName* **" in its <Members> list.**

Explanation: Dynamic resource references are not supported as members of choice groups. A dynamic resource reference can be a member of a <ResourceGroup>.

System action: This policy cannot be activated.

Operator response: Remove the dynamic resource reference from the member list of the choice group. Add one or multiple static resources instead. The static resource can be a <ResourceGroup> which contains the dynamic resource reference.

EEZP0090E The <ServerGroup> " *serverGroupName* **" contains the dynamic resource reference "** *dynamicResourceReferenceName* **" in its <Members> list.**

Explanation: Dynamic resource references are not supported as members of server groups. A dynamic resource reference can be a member of a <ResourceGroup>.

System action: This policy cannot be activated.

Operator response: Remove the dynamic resource reference from the member list of the server group. Add one or multiple static resources instead. The static resource can be a <ResourceGroup> which contains the dynamic resource reference.

EEZP0500W The specified member " *memberName* **" of the <ChoiceGroup> "** *choiceGroupName* **" was also found as a <Source> or <Target> of a <Relationship>.**

Explanation: The member of a <ChoiceGroup> should not be the <Source> or <Target> of a <Relationship> at the same time.

System action: Application continues.

Operator response: To avoid complexity, delete the <Relationship> or delete this <ChoiceGroup> member in this policy.

EEZP0502W The two <Relationship> elements with <Type> "StartAfter" and <Type> "StopAfter" were found with the same <Source> " *source* **" and <Target> "** *target* **".**

Explanation: The two <Relationship> elements with <Type> "StartAfter" and <Type> "StopAfter" should not have the same <Source> and <Target>. With this configuration the <Target> is started before the <Source> and the <Target> is stopped before the <Source>.

System action: Application continues.

Operator response: Verify this behavior. The common usage of "StartAfter" together with "StopAfter" is the following: 1. The <Source> of the "StartAfter" is the <Target> of the "StopAfter". 2. The <Target> of the "StartAfter" is the <Source> of the "StopAfter".

EEZP0503W The <DesiredState> " *Reference State* **" of the <ResourceReference> with name "** *Reference Name* **" does not match the <DesiredState> "** *Group State* **" of its parent group with name "** *Group Name* **".**

Explanation: The <DesiredState> of the group member will be ignored.

System action: The <DesiredState> of this <ResourceReference> will be set to the <DesiredState> of its parent group. Application continues.

Operator response: To avoid this warning specify the same <DesiredState> for this <ResourceReference> and its parent group.

EEZP0504W The <DesiredState> " *member group State* **" of the group with name "** *member group Name* **" does not match the <DesiredState> "** *hosting group state* **" of its parent group with name "** *hosting group name* **".**

Explanation: The <DesiredState> of the group member will be ignored.

System action: The <DesiredState> of this group will be set to the <DesiredState> of its parent group. Application continues.

Operator response: To avoid this warning specify the same <DesiredState> for this group and its parent group.

EEZP0505W The <ChoiceGroup> " *choiceGroupName* **" was found as member of the <ChoiceGroup> "** *choiceGroupName* **".**

Explanation: The member of a <ChoiceGroup> should not be another <ChoiceGroup>.

System action: Application continues.

Operator response: To avoid complexity, delete the <ChoiceGroup> from the <ChoiceGroup> in this policy.

EEZP0506W **The resource group with name** *resourceGroupName* **has linked more than 100 resources.**

Explanation: The numbers of resources linked by a resource group is limited to 100.

System action: Application continues.

Operator response: Reduce the number of resources linked by this group.

EEZP0507W **Found a StartAfter relationship with source "** *Source Name* **" having <DesiredState> "Online" and target "** *Target Name* **" having <DesiredState> "Offline".**

Explanation: An online request will be propagated along this relationship. Therefore, the <DesiredState> of the target resource will be ignored.

System action: The <DesiredState> of the target resource will be set to "Online". Application continues.

Operator response: To avoid this warning, specify the <DesiredState> "Online" also for the target of this relationship.

EEZP2013I **Setting the <DesiredState> of the top-level resource "** *Resource Name* **" to "Online", because it is not specified in the policy.**

Explanation: Top-level resources require a default <DesiredState>.

System action: The <DesiredState> for this resource is set to "Online". Application continues.

Operator response: No action required.

Prefix EEZQ

This section contains messages with prefix EEZQ.

EEZQ0001E **Unable to create the URL for "** *URL name* **". Exception details:** *exceptionDetails*

Explanation: The system failed to build an URL object from the the URL name.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZQ0002E **Unable to connect to the IBM Tivoli Enterprise Monitoring Server (TEMS) at "** *connectionName* **". Exception details:** *exceptionDetails*

Explanation: The system failed to connect to the TEMS server.

System action: The current task ends.

Operator response: Verify that the target system and the TEMS application are available.

EEZQ0003E **Unable to create an SSL socket factory. Exception details:** *exceptionDetails*

Explanation: The system failed to create or to initialize a transport layer security (TLS) context.

System action: The current task ends.

Operator response: Verify that the TLS protocol is available within this Java virtual machine.

EEZQ0004E **Communicating with the IBM Tivoli Enterprise Monitoring Server (TEMS) at "** *connectionName* **" failed. Exception details:** *exceptionDetails*

Explanation: An exception occured while sending or receiving data.

System action: The current task ends.

Operator response: Evaluate the exception details. Retry the operation.

EEZQ0005E **Unable to parse the response that was received from the IBM Tivoli Enterprise Monitoring Server (TEMS) at "** *connectionName* **". Exception details:** *exceptionDetails*

Explanation: An exception occured while processing the XML data that were received from TEMS.

System action: The current task ends.

Operator response: Evaluate the exception details. Retry the operation.

EEZQ0006E **Did not receive a "Result" object within the response to the remote system command "** *commandName* **" for target "** *targetName* **" that was sent to the IBM Tivoli Enterprise Monitoring Server (TEMS). The following data have been returned instead:** *returnedData*

Explanation: The TEMS accepted the command but did not return a proper "Result" return code.

System action: The current task ends.

Operator response: Evaluate the command and the returned data. Retry the operation.

EEZQ0007E A SOAP fault was received as response to request " *requestName* **" for target "** *targetName* **" that was sent to the IBM Tivoli Enterprise Monitoring Server (TEMS). The following SOAP fault data have been returned:** *returnedData*

Explanation: The TEMS returned a SOAP fault response to the request.

System action: The current task ends.

Operator response: Evaluate the command and the returned fault data. Retry the operation.

EEZQ0008E Expected nonempty input but received no input in class: *className***, method:** *methodName***, parameter:** *parameterName*

Explanation: A parameter with a null or empty value was encountered. This is an indication of a programming error on the client side of the ITM facade.

System action: The method ends without processing the request.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

Prefix EEZR (Universal Automation Adapter)

This section contains messages with prefix EEZR.

EEZR0020E Resource: *resource* **does not exist.**

Explanation: A request was submitted against a resource that does not exist.

System action: The request was not processed.

Operator response: Check whether the resource exists. If it does not exist, the resource was removed. If it exists, re-submit the request.

EEZR0021E The domain name *domain_policy* **specified in the policy file does not match the domain name** *domain_configured* **configured in the end-to-end automation manager configuration utility.**

Explanation: The policy was not activated, because the domain names do not match.

System action: The policy was not activated.

Operator response: Make sure that the domain name in the policy file matches the configured domain name.

EEZR0036E The request *request* **is not implemented.**

Explanation: The request is currently not supported.

System action: The request was not accepted.

Operator response: Check whether a more recent version of the automation adapter is available that supports the request.

EEZR0038E The request *request* **submitted against resource "** *resource* **" failed. The remote command returned with return code** *return_code***.**

Explanation: The remote command that is defined for the request in the policy failed with a non-zero return code.

System action: The request was not processed successfully.

Operator response: Check the preceding messages to determine why the command failed.

EEZR0039E It is currently not allowed to submit the request *request* **against resource "** *resource* **". Reset the resource before you re-submit the request.**

Explanation: It is currently not allowed to submit the request against the resource.

System action: The request was not processed.

Operator response: Reset the resource before you re-submit the request.

EEZR0040E The authentication for user ID *user* **failed. The authentication error message is:** *message*

Explanation: The user ID and password could not be authenticated on the system where the Universal Automation Adapter is running for a reason other than credential validation or expiration.

System action: No requests will be accepted for this user ID.

Operator response: Check the authentication error message to determine the reason for the failure.

EEZR0041E The credential validation for user ID *user* **failed. The authentication error message is:** *message*

Explanation: The user ID and password validation failed on the system where the Universal Automation Adapter is running.

System action: No requests will be accepted for this user ID.

Operator response: Check the authentication error message to determine the reason for the failure. Make sure that the specified the user ID and password which is configured for the Universal Automation Adapter domain is correct. Note that those entries are case-sensitive.

EEZR0042E The login for user ID *user* **failed, because the user account expired. The authentication error message is:** *message*

Explanation: The user account is expired.

System action: No requests will be accepted for this user ID.

Operator response: Ask the system administrator to reactivate the user account.

EEZR0043E The login for user ID *user* **failed, because the password expired. The authentication error message is:** *message*

Explanation: The password is expired.

System action: No requests will be accepted for this user ID.

Operator response: Ask the system administrator to reset the password.

EEZR0044E An unexpected error occurred. The error message is: *error-message***.**

Explanation: The automation adapter detected an error that cannot be handled.

System action: The request may not have been processed.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZR0051E The request *request* **was submitted against resource** *resource***. The request was ignored, because another request against this resource is already currently being processed.**

Explanation: Only one request at a time can be processed against a resource.

System action: The request was not processed.

Operator response: Wait for the request that is currently being processed to complete. Check the state of the resource to determine whether the request was successful. Otherwise check the log file.

EEZR0060E Authentication failed when establishing a connection from local node " *localNode* **" to remote node "** *remoteNode* **" with user ID "** *userID* **" using "** *authenticationMode* **" authentication for resource "** *resource name* **".**

Explanation: The user credentials used are incorrect. The remote operation could not be completed successfully.

System action: The resource status is set to non-recoverable error. The processing is stopped until the resource is reset.

Operator response: Make sure that the user credentials used to perform the remote operation are correctly defined in the configuration utility. In the System Automation operations console reset the resource.

EEZR0061E A connection from local node " *localNode* **" to remote node "** *remoteNode* **" could not be established for resource "** *resource name* **". The original error was: "** *excMessage* **"**

Explanation: A connection between the local and remote node could not be established. Possible problem reasons are: 1) The hostname specified in the policy file is incorrect. 2) The remote node is not online. 3) A firewall between the local node and the remote node blocks the connection. The command on the remote node could not be executed.

System action: For monitor commands, the attempt to establish the connection is repeated periodically.

Operator response: Make sure that the local as well as the remote node are known host names and that IP connectivity between those two systems is correctly set up. Check whether network problems were reported at the time where the failure occured.

EEZR0062E The connection from local node " *localNode* **" to remote node "** *remoteNode* **" was lost for resource "** *resource name* **". The original error was: "** *excMessage* **"**

Explanation: An error occurred when attempting to execute a command on a remote node. The connection between the local node and the remote target node was lost during the operation. The operation could not be completed successfully.

System action: For monitor commands, the attempt to establish the connection is repeated periodically.

Operator response: Make sure that IP connectivity between the local node and the remote node is set up correctly. The failure may also occur due to timeouts. Check the original exception message to determine the root cause of the problem.

EEZR0063E An unexpected I/O Exception occurred when attempting to execute the command " *cmdName* **" on remote node "** *remoteNode* **" for resource "** *resource name* **". The original error was: "** *excMessage* **"**

Explanation: An error occurred when attempting to execute a command on a remote node. Executing the command on the remote target node failed with an unexpected I/O exception. The remote execution could not be completed successfully.

System action: The resource status is set to non-recoverable error. The processing is stopped until the resource is reset.

Operator response: Make sure that the command on the target node is defined correctly and accessible in read and execute mode. Check the original exception message to determine the root cause of the problem.

EEZR0064E An unexpected file not found exception occurred when attempting to execute the command " *cmdName* **" on remote node "** *remoteNode* **" for resource "** *resource name* **". The original error was: "** *excMessage* **"**

Explanation: An error occurred when attempting to execute a command on a remote node. The execution of the command on the remote target node failed with an unexpected file not found exception. The remote execution could not be completed successfully.

System action: The resource status is set to non-recoverable error. The processing is stopped until the resource is reset.

Operator response: Make sure that the command on the target node is defined correctly and accessible in read and execute mode. Check the original exception message to determine the root cause of the problem.

EEZR0065E An unexpected timeout occurred while executing the command " *cmdName* **" on remote node "** *remoteNode* **" with the timeout** *timeout* **seconds for resource "** *resource name* **".**

Explanation: An error occurred while executing a command on a remote node. The execution of the command on the remote target node failed with an unexpected timeout. The remote execution could not be completed successfully.

System action: For monitor commands, the attempt to establish the connection is repeated periodically.

Operator response: Make sure that the command on the target node and the timeout value are defined correctly.

EEZR0066E An unexpected permission denied exception occurred when attempting to execute the command " *cmdName* **" on remote node "** *remoteNode* **" for resource "** *resource name* **". The original error was: "** *excMessage* **"**

Explanation: An error occurred when attempting to execute a command on a remote node. Executing the command on the remote target node failed with an unexpected permission denied exception. The remote execution could not be completed successfully.

System action: The resource status is set to non-recoverable error. The processing is stopped until the resource is reset.

Operator response: Make sure that the command on the target node is defined correctly and accessible in read and execute mode. Check the original exception message to determine the root cause of the problem.

EEZR0071E An error occurred while storing the policy file " *fileName* **" on local node "** *localNode* **". The original error was: "** *errMessage* **"**

Explanation: The policy file could not be stored successfully in the policy pool on the node where the Universal Automation Adapter is located.

System action: No policy file was saved.

Operator response: Check if there is enough disk space on the node where the Universal Automation Adapter is located. Check the original exception message to determine the root cause of the problem.

EEZR0072E An error occurred while reading the policy file " *fileName* **" on local node "** *localNode* **". The original error was: "** *errMessage* **"**

Explanation: The policy file could not be read successfully from the policy pool on the node where the Universal Automation Adapter is located.

System action: No policy file was read.

Operator response: Check if the file exists on the node where the Universal Automation Adapter is located. Check the original exception message to determine the root cause of the problem.

EEZR0073E The policy could not be activated because the policy file " *policyFile* **" could not be found.**

Explanation: The policy file does not exist in the policy pool on the node where the Universal Automation Adapter is located.

System action: The policy is not activated.

Operator response: Verify that the policy file exists in the policy pool.

EEZR0074E No automation policies are available in the policy pool directory " *directory* **" for automation domain "** *domain* **".**

Explanation: There are no policy files with the domain name mentioned above in the policy pool directory.

System action: No policies are found.

Operator response: Check if the policy pool contains policy files for the mentioned domain.

EEZR0075E The policy file " *fileName* **" cannot be deleted because the policy is currently active.**

Explanation: The file of the currently active policy cannot be deleted.

System action: The policy file is not deleted.

Operator response: Deactivate the current policy. Then try to delete the policy file again.

EEZR0076E An error occurred when intialization the remote node access information. The configuration file " *ConfigurationFile* **" cannot be opened or has syntax errors.**

Explanation: The adapter requires this configuration file in order to set up connections to other nodes.

System action: Initializing the remote node access information failed.

Operator response: Make sure that the adapter configuration file exists and is correctly configured.

EEZR0077E No user credentials are configured for the resource " *resource name* **".**

Explanation: A user and password must be defined for the node on which the resource is running or the corresponding SSH private and public keys must be configured.

System action: The remote command is not executed.

Operator response: Locate the resource in the policy. Either define a user and password value for the node that is related to that resource using the configuration utility or configure the SSH private and public keys for that node and user.

EEZR0079E Unable to activate the policy file " *policyFile* **" in the policy pool directory "** *policyPool* **" using the user ID "** *request userid* **".**

Explanation: Either the policy does not comply to the XML syntax or the policy did not pass the policy semantics checks.

System action: The policy cannot be activated. The adapter will continue operation with its currently activated policy.

Operator response: Check error messages logged for this policy before this message. Resolve the error(s) and then activate the policy again.

EEZR0080E Unable to determine the observed state for resource " *resource name* **" because the attribute name "** *attribute name* **" does not exist in attribute group "** *attributeGroup* **". The managed system name of the corresponding IBM Tivoli Monitoring resource is: "** *ITM managed system name* **".**

Explanation: In order to determine the observed state of the resource, the agent attribute specified in the policy element MonitorAttribute is queried periodically. The attribute is specified in the form <AttributeGroup>.<AttributeName> in the policy element MonitorAttribute. The AttributeGroup was queried successfully but the specified AttributeName does not exist in the attribute group.

System action: The observed state cannot be determined. The resource is set to a fatal error state. The processing is stopped until the resource is reset.

Operator response: Modify the value of the MonitorAttribute element in the policy, so that a valid attribute group and attribute name are specified. Then reactivate the policy.

EEZR0081E Unable to determine the observed state for resource " *resource name* **". The query that was sent to the IBM Tivoli Enterprise Monitoring Server (TEMS) in order to retrieve the value for the specified agent attribute "** *attribute name* **" failed. The managed system name of the corresponding IBM Tivoli Monitoring resource is: "** *ITM managed system name* **".**

Explanation: In order to determine the observed state of the resource, the agent attribute specified in the policy element MonitorAttribute is queried periodically. The attribute is specified in the form <AttributeGroup>.<AttributeName> in the policy element MonitorAttribute. The corresponding SOAP request against the hub monitoring server to retrieve the value of the attribute failed. Check previous messages to determine the reason.

System action: The observed state cannot be determined. The resource is set to a fatal error state. The processing is stopped until the resource is reset.

Operator response: Check the messages to determine the reason why the SOAP request failed.

EEZR0082E Unable to determine the observed state for resource " *resource name* **". The query that was sent to the IBM Tivoli Enterprise Monitoring Server (TEMS) in order to retrieve the value for the specified agent attribute "** *attribute name* **" failed. The following attribute filter has been specified: "** *attribute filter* **". The managed system name of the corresponding IBM Tivoli Monitoring resource is: "** *ITM managed system name* **".**

Explanation: In order to determine the observed state of the resource, the agent attribute specified in the policy element MonitorAttribute is queried periodically. The attribute is specified in the form <AttributeGroup>.<AttributeName> in the policy element MonitorAttribute. In addition there is an attribute filter specified in the policy that limits the data returned by the query. The corresponding SOAP request against the hub monitoring server to retrieve the value of the attribute failed. Check previous messages to determine the reason.

System action: The observed state cannot be determined. The resource is set to a fatal error state. The processing is stopped until the resource is reset.

Operator response: Check the messages to determine the reason why the SOAP request failed.

EEZR0083E Unable to determine the observed state for resource " *resource name* **" because the query to retrieve the specified agent attribute returned multiple results. The query that was sent to the IBM Tivoli Enterprise Monitoring Server (TEMS) in order to retrieve the contents of the specified agent attribute group "** *attribute group* **" succeeded. However, the result set has multiple rows and an attribute value cannot be determined unambiguously. The following attribute filter has been specified: "** *attribute filter* **". The rows returned by the query are: "** *query results* **" The managed system name of the corresponding IBM Tivoli Monitoring resource is: "** *ITM managed system name* **".**

Explanation: In order to determine the observed state of the resource, the agent attribute specified in the policy element MonitorAttribute is queried periodically. The attribute is specified in the form <AttributeGroup>.<AttributeName> in the policy element MonitorAttribute. In addition there is an attribute filter specified in the policy that limits the data returned by the query. The AttributeGroup was queried successfully but the query returned multiple rows. The query must return only one row in order to be able to map an attribute value to an observed state for the resource.

System action: The observed state cannot be determined. The resource is set to a fatal error state. The processing is stopped until the resource is reset.

Operator response: Modify the policy and use the MonitorQueryAttrFilter element to limit the data returned by the query to a maximum of one row. Then reactivate the policy.

EEZR0084E In order to start or stop resource " *resource name* **", the command "** *remoteSystemCommand* **" was issued against "** *ITM managed system name* **" but returned with error code "** *rc* **".**

Explanation: The policy elements StartCommand and StopCommand specify the command that should be used to start or stop the resource using an IBM Tivoli Monitoring agent. The command has been successfully submitted to the target managed system via the SOAP interface provided by the IBM Tivoli Enterprise Monitoring Server (TEMS). However, the command returned with a non zero return code. The command may have been rejected because the resource is in a state for which the specified command is not valid.

System action: The command has not been executed successfully. The resource is set to a fatal error state. The processing is stopped until the resource is reset.

Operator response: Check the log file of the IBM Tivoli Monitoring agent to determine why the command did not return successfully. Reset the resource before resending the command.

EEZR0085E Unable to determine the observed state for resource " *resource name* **" because the attribute "** *attribute name* **" specified in the MonitorAttribute policy element has an invalid format.**

Explanation: In order to determine the observed state of the resource, the agent attribute specified in the policy element MonitorAttribute is queried periodically. The attribute is specified in the form <AttributeGroup>.<AttributeName> in the policy element MonitorAttribute. The attribute group and the attribute name within that group must be separated by exactly one dot.

System action: The observed state cannot be determined. The resource is set to a fatal error state. The processing is stopped until the resource is reset.

Operator response: Modify the value of the MonitorAttribute element in the policy, so that a valid attribute group and attribute name are specified. Then reactivate the policy.

EEZR0086E Unable to determine the observed state for resource " *resource name* **" because the IBM Tivoli Monitoring agent is not running. The managed system name of the corresponding IBM Tivoli Monitoring resource is: "** *ITM managed system name* **".**

Explanation: In order to determine the observed state of the resource, the agent attribute specified in the policy element MonitorAttribute is queried periodically. The query returned no results because the corresponding IBM Tivoli Monitoring agent was offline.

System action: The observed state cannot be determined. The resource is set to an error state.

Operator response: Start the IBM Tivoli Monitoring agent corresponding to the specified managed system name.

EEZR0087E Unable to determine the observed state for resource " *resource name* **" because the specified managed system name does not exist. The managed system name of the corresponding IBM Tivoli Monitoring resource is: "** *ITM managed system name* **".**

Explanation: In order to determine the observed state of the resource, the agent attribute specified in the policy element MonitorAttribute is queried periodically. The corresponding SOAP request against the hub monitoring server failed because the managed system name of the IBM Tivoli Monitoring resource does not exist. The managed system name is specified in the policy in the node attribute of the Resource element.

System action: The observed state cannot be determined. The resource is set to a fatal error state. The processing is stopped until the resource is reset.

Operator response: Modify the managed system name of the resource in the policy, so that an existing managed system name is specified. Then reactivate the policy.

EEZR0504W The location of the automation policy pool *location* **was not found on node** *node***.**

Explanation: When trying to show the list of available policies, the policy pool location was not found on the node where the adapter currently runs.

System action: No policies for activation are provided.

Operator response: Use the configuration utility to specify the correct 'Policy pool location', which is the directory where the automation policy files are stored for activation.

EEZR0601I The resource *resource* **has already the requested state** *requested state***.**

Explanation: The request failed, because the requested resource state and the current resource state are the same.

System action: The request was not processed.

Operator response: No further action is required, because the resource is already in the requested state.

EEZR0602I The resource " *resource* **" can only be reset if the compound state is "Fatal". The compound state of the resource is currently "** *compound state* **" and the operational state is "** *operational state* **".**

Explanation: The reset request was rejected because the resource can only be reset if the compound state is "Fatal". The compound state is "Fatal" if the operational state implies that an operator intervention is required.

System action: The reset request was not processed.

Operator response: No further action is required, because the resource is not in compound state "Fatal".

EEZR0610I The reset request was submitted against resource " *resource* **" by user ID "** *userid* **" to resolve a non-recoverable error.**

Explanation: A resource in a non-recoverable error state is not monitored until the resource is reset. The user submitted a reset request for the resource to make it eligible for monitoring again.

System action: The reset request was submitted against the resource and monitoring of the resource was started again.

Operator response: Verify that the resource does not show any errors in the System Automation operations console.

EEZR0611I The request *request* **was submitted against resource "** *resource* **" using remote user ID "** *target userid* **" and requesting user ID "** *request userid* **". Comment: "** *comment* **"**

Explanation: A user submitted a request to change the resource state.

System action: The request was submitted against the resource on the target node.

Operator response: Verify that the resource changes its state in the System Automation operations console.

EEZR0612I The policy was activated by user ID " *request userid* **" using the policy file "** *policyFile* **" located in the policy pool directory "** *policyPool* **".**

Explanation: A user activated a new policy.

System action: The requested policy is activated. The adapter starts monitoring the resources that are defined in the policy.

Operator response: Verify that the resources defined in the policy are displayed in the System Automation operations console.

EEZR0613I The policy was deactivated by user ID " *request userid* **". The active policy file was "** *policyFile* **" located in the policy pool directory "** *policyPool* **".**

Explanation: A user deactivated the currently active policy.

System action: The active policy is deactivated. The adapter no longer monitors the resources that are defined in the deactivated policy.

Operator response: Verify that no resources defined in the deactivated policy are displayed in the System Automation operations console.

EEZR0614I During the adapter startup, a policy was automatically activated using the policy file " *policyFile* **" located in the policy pool directory "** *policyPool* **".**

Explanation: When the adapter was started, it automatically activated the policy that was previously active.

System action: The requested policy is activated. The adapter starts monitoring the resources that are defined in the policy.

Operator response: Verify that the resources defined in the policy are displayed in the System Automation operations console.

Prefix EEZU

This section contains messages with prefix EEZU.

EEZU0001E The following RuntimeException occurred: *Exception text*

Explanation: The processing was interrupted by a RuntimeException and cannot complete correctly.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZU0002E The following error occurred while writing file *filename* **:** *Exception text*

Explanation: The processing was interrupted by an error and cannot complete correctly.

System action: The current task ends.

Operator response: Check the error details and retry the operation.

EEZU0003E The following error occurred while reading file *filename* **:** *Exception text*

Explanation: The processing was interrupted by an error and cannot complete correctly.

System action: The current task ends.

Operator response: Check the error details and retry the operation.

EEZU0004E An error has occurred while accessing the automation framework: *Exception text*

Explanation: An error has occurred while accessing the automation framework running on the management server. The requested action could not be processed. Possible causes: 1) The management server is down. 2) The automation framework (Enterprise application EEZEAR) is not started. 3) The are some inconsistencies regarding the level of the operations console and the automation framework.

System action: The requested action is cancelled.

Operator response: Ensure that the management server is up and running. Check that the enterprise application EEZEAR is started. Verify that the levels of the operations console and the automation framework are appropriate. Refer to the 'Related errors' section for more details about the problem. If the problem persists, contact your system administrator.

EEZU0005E The credential vault service was not found or could not be loaded: *Exception text*

Explanation: The credential vault cannot be accessed because the corresponding service was not found or could not be loaded due to an initialization error.

System action: The current task ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZU0006E The page with the ID *Page UID* **could not be found:** *Exception text*

Explanation: The application tried to load the page with the specified ID to display the log data. However, the page with this ID could not be found.

System action: The application continues, but the log data cannot be displayed.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZU0007E The credential vault cannot be accessed: *Exception text*

Explanation: Possible causes: 1) The credential vault is not accessible for technical reasons. 2) The credential vault is not accessible for security reasons.

System action: The current task ends.

Operator response: Evaluate the error details and check if one of the possible causes applies.

EEZU0008E The credential secret for automation domain *Automation domain name* **is not set:** *Exception text*

Explanation: A user credential for a certain automation domain was requested but is not set for the user.

System action: The current task ends.

Operator response: Logout and login again.

EEZU0010E Unable to receive events from the automation framework. The following error occurred while trying to read an event: *Exception text*

Explanation: An error has occurred while trying to access the event path to the management server. The operations console is not able to receive any events and is therefore not able to update the status information for resources if the status changes. Possible causes: 1) The management server is down. 2) The JMS service of the management server is not working properly. 3) The JMS topic used for sending events is not available

System action: Processing continues, but no events can be received.

Operator response: Ensure that the management server is up and running. Check that the JMS service of the management server is setup correctly and that the JMS topic used for sending events is available. If the problem persists, contact your system administrator.

EEZU0011E Unable to set up the event path between the operations console and the automation framework: *Exception text*

Explanation: The connection to the right JMS service on the management server could not be established. This connection is used to receive events about status changes from connected automation domains. Possible causes: 1) The management server is down. 2) The JMS service of the management server is not working properly. 3) The JMS topic used for sending events is not available

System action: Processing ends.

Operator response: Ensure that the management server is up and running. Check that the JMS service of the management server is setup correctly and that the JMS topic used for sending events is available. If the problem persists, contact your system administrator.

EEZU0012E An error occurred trying to look up the JMS service on the management server to establish the event path: *Exception text*

Explanation: An error has occurred while trying to access the management server. Possible causes: 1) The management server is down. 2) The JMS service of the management server is not working properly. 3) The JMS topic used for sending events is not available

System action: Processing ends.

Operator response: Ensure that the management server is up and running. Check that the JMS service of the management server is setup correctly and that the JMS topic used for sending events is available. If the problem persists, contact your system administrator.

EEZU0013E An error has occurred while trying to establish the connection to the automation framework: *Exception text*

Explanation: An error has occurred while connecting to the automation framework running on the management server. Possible causes: 1) The management server is down. 2) The automation framework (Enterprise application EEZEAR) is not started. 3) The are inconsistencies regarding the level of the operations console and the automation framework. 4) You are not authorized to access the automation framework.

System action: Processing ends.

Operator response: Ensure that the management server is up and running. Check that the enterprise application EEZEAR is started. Ensure that you have the right permissions. Also verify that the levels of the operations console and the automation framework are appropriate. Refer to the 'Related errors' section for more details about the problem. If the problem persists, contact your system administrator.

EEZU0015E The log data cannot be displayed because the service to launch a new page was not found or could not be loaded

Explanation: The log data is normally displayed on a new page within the Dashboard Application Services Hub, but the service to launch a new page was not found or could not be loaded due to an initialization error.

System action: The application continues, but the log data cannot be displayed.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/.

EEZU0016E An error occurred trying to look up the automation framework to connect to automation domains: *Exception text*

Explanation: An error has occurred while trying to look up the automation framework's Session Beans that are part of the Enterprise application EEZEAR. Possible causes: 1) The management server is down. 2) The automation framework (Enterprise application EEZEAR) is not started or is not deployed correctly.

System action: Processing ends.

Operator response: Ensure that the management server is up and running. Check that the enterprise application EEZEAR is started. If the problem persists, contact your system administrator.

EEZU0017E There is no log data available for automation domain *Automation domain*

Explanation: No log file exists for the automation domain. The log file is normally located on the node where the automation domain's automation adapter is running, or if it is the end-to-end automation domain, where the end-to-end automation engine is running.

System action: The application continues without displaying log data.

Operator response: Ensure that logging is set up correctly for this automation domain; for example, check the eezjlog.properties file. If the problem persists, contact your system administrator.

EEZU0018E Creating EIF event receiver failed, error message is: *Exception text*

Explanation: The operations console accesses first-level automation domains directly (direct access mode). To be able to receive events from first-level automation domains an Event Integration Facility (EIF) event receiver must be created. Creating the event receiver failed.

System action: The operations console will not receive events.

Operator response: Examine the error message to find the cause of failure.

EEZU0019E The operations console was notifed of new domain *new domain* **that has the same name as the known domain** *known domain*

Explanation: The operations console accesses first-level automation domains directly (direct access mode). It was notifed about a new domain that has the same name as a domain that is already known by the operations console. However, the connection information of the of the form 'domainname@ip-address:port' suggest that the new domain automates a different cluster than the known domain. Every domain operated from an operations console must have a unique name.

System action: The domain is not allowed to join and therefore, will not show up in the topology view.

Operator response: Try to determine from the information of new domain where the domain is located. If the new domain automates a different cluster than the known domain, have the name of the new domain changed, and its automation adapter restarted to notify the operations console.

EEZU0020E The operations console was notified of domain *domain* **from adapter** *adapter* **with version** *adapter version* **that is lower than the required minimum version** *minimum version*

Explanation: The operations console accesses first-level automation domains directly (direct access mode). It was notified about a domain from an adapter with a version that is too low for reliable operation.

System action: The domain is not allowed to join and therefore, will not show up in the topology view.

Operator response: Try to locate the adapter that tried to join the domain and have it upgraded to a version that is equal or higher than the required minimum version. Then have the automation adapter restarted to notify the operations console.

EEZU0021E The operations console contacted a domain *domain* **with adapter** *adapter* **at version** *adapter version* **that is lower than the required minimum version** *minimum version*

Explanation: The operations console accesses first-level automation domains directly (direct access mode). It contacted a domain from an adapter with a version that is too low for reliable operation.

System action: The operations console must not communicate with the domain which has a too low version and therefore, the domain will remain disabled in the topology view.

Operator response: Try to locate the adapter of the domain and have it upgraded to a version that is equal or higher than the required minimum version. Then have the automation adapter restarted to notify the operations console.

EEZU0022E The resource with resource name *resource* **and resource class** *resource class* **does not exist on domain** *domain*

Explanation: The operations console was launched from another component passing resource context information. The specified resource cannot be found. Reasons can be that the resource does not exist anymore, the corresponding automation adapter is not running, the host name or the event port used by the automation adapter are configured incorrectly or the domain name is mapped to a different name by the automation adapter.

System action: The current task ends. The operations console starts without navigating to the specified resource.

Operator response: Press OK to continue working with the operations console.

EEZU0023E The domain *domain* **does not exist**

Explanation: The operations console was launched from another component passing a domain name as context information. The specified domain cannot be found. Reasons can be that the corresponding automation adapter is not running, the host name or the event port used by the automation adapter are configured incorrectly or the domain name is mapped to a different name by the automation adapter.

System action: The current task ends. The operations console starts without navigating to the specified domain.

Operator response: Press OK to continue working with the operations console.

EEZU0024E The resource with resource name *resource* **and resource class** *resource class* **located on node** *resource node* **does not exist on domain** *domain*

Explanation: The operations console was launched from another component passing resource context information. The specified resource cannot be found. Reasons can be that the resource does not exist anymore, the corresponding automation adapter is not running, the host name or the event port used by the automation adapter are configured incorrectly or the domain name is mapped to a different name by the automation adapter.

System action: The current task ends. The operations console starts without navigating to the specified resource.

Operator response: Press OK to continue working with the operations console.

EEZU0025E Unable to contact the automation framework using the specified server name *Server name* **and port** *Port*

Explanation: Before the connection properties are stored, it is verified that the automation framework can be accessed using the specified server name and port. However, the connection to the automation framework could not be established. Possible causes: 1) You specified incorrect values for server name and port. 2) The automation framework (Enterprise application EEZEAR) is not started. 3) You are not authorized to access the automation framework

System action: The connection properties are not stored.

Operator response: Verify that your entries for server name and port are correct. This is the BOOTSTRAP_ADDRESS configured for the application server to accept Web client requests. Ensure that you have the right permissions. Also check that the enterprise application EEZEAR is started. Refer to the 'Related errors' section for more details about the problem. If the problem persists, contact your system administrator.

EEZU0026E Unable to launch the page with the name *Page name* **. Error details:** *Exception text*

Explanation: An internal error occurred while trying to launch a new page in the Dashboard Application Services Hub. This might be related to an installation or setup problem.

System action: The new page is not launched.

Operator response: Verify that your environment is set up correctly, re-start the WebSphere Application Server and try again.

EEZU0027E Error while writing preference settings to disk. Error details: *Exception text*

Explanation: Some preferences are stored in properties files on the system where the WebSphere Application Server runs. These properties files are located in a product specific directory below the current Application Server profile. An error occurred while trying to write the preferences to disk.

System action: The application continues without storing the preference values.

Operator response: Ensure that the mentioned directory exists and that you have the rights to write into this directory.

EEZU0028E Node *node* cannot be included, because site *site* is in maintenance mode

Explanation: Site maintenance was started for the nodes of this site by a disaster recovery manager. This involves excluding this node from automation.

System action: The node is not included.

Operator response: Wait until the site maintenance period is over.

EEZU0029E The resource reference *resource name* referring to first-level automation domain *firstLevelDomain* does not exist on end-to-end automation domain *e2eDomain*

Explanation: The operations console was launched from another component passing resource context information. The specified resource cannot be found. Reasons can be that the resource does not exist anymore or the end-to-end automation engine is not running.

System action: The current task ends. The operations console starts without navigating to the specified resource.

Operator response: Press OK to continue working with the operations console.

EEZU0030E You are not authorized to perform the operation *methodName*. The user ID needs to be granted one of the following user roles: *List of required roles*

Explanation: Authorization failed while trying to invoke an operation for which a specific user role is required. The user ID used to log in to the Dashboard Application Services Hub is not granted any of the required user roles.

System action: The requested operation is cancelled.

Operator response: Ensure that the permissions and user roles defined in the WebSphere Application Server are set up correctly. User IDs can be granted specific rights by adding them to one of the predefined user groups. For example add a user ID to the user group EEZAdministratorGroup to assign the user role EEZAdministrator to this user ID. User Management can be performed using the 'Users and Groups' > 'Manage Users' task.

EEZU0031E The virtual server for node *nodename* could not be found. The requested operation will not be performed

Explanation: The virtual server for the node could not be found. Neither a shutdown nor a startup operation can be performed against the node.

System action: The requested operation is cancelled.

Operator response: Ensure that the hardware adapter is running and the connection to zEnterprise® HMC is established.

EEZU0032E The end-to-end automation management server on *hostname* has been stopped

Explanation: The automation JEE framework has been stopped. Either the enterprise application EEZEAR or the WebSphere Application Server hosting it has been stopped. The operations console cannot communicate with any automation backend without the automation JEE framework.

System action: The operations console will be closed.

Operator response: Ensure that the management server is up and running. Check that the enterprise application EEZEAR is started. Then restart the operations console.

EEZU0033E Unexpected behavior from end-to-end adapter: *Exception text*

Explanation: The end-to-end adapter answers with an unexpected response. No further processing of the adapter's response is possible.

System action: The response cannot be handled and is rejected. It is not guaranteed that the command was executed.

Operator response: Ensure that the version of the end-to-end adapter matches the requirements and if it is configured properly.

EEZU0034E Malformed response from end-to-end adapter: *Exception text*

Explanation: The end-to-end adapter response does not match its specification and cannot be parsed. No further processing of the adapter's response is possible.

System action: The response cannot be parsed and is rejected. It is not guaranteed that the command was executed.

Operator response: Ensure that the version of the end-to-end adapter matches the requirements and that it is configured properly.

EEZU0035E Command execution on end-to-end adapter failed with reason code *reason code*: *Exception text*

Explanation: Execution of a command on the end-to-end adapter failed.

System action: The command is not executed.

Operator response: Check the log of the end-to-end adapter and verify that it is configured properly.

EEZU0036E Execution of command exits with non-zero return code *return code*

Explanation: The execution of a command with the end-to-end adapter returned a non-zero return code. If the command was executed in parallel on several systems, the execution on the other systems may return with another return code.

System action: The command was executed but is likely to be failed.

Operator response: Analyze the reason of the non-zero return code.

EEZU0037E INGRCANZ version *version number* **from the end-to-end adapter not supported**

Explanation: The version of the INGRCANZ command, coming with the end-to-end adapter, is not supported and its response cannot be handled.

System action: No output from INGRCANZ will be available.

Operator response: Ensure the INGRCANZ version is supported.

EEZU0038E Unexpected behavior from INGRCANZ: *Exception text*

Explanation: The INGRCANZ command, included in the end-to-end adapter, answers with an unexpected response. No CANZLOG messages can be fetched.

System action: The response cannot be handled and is rejected.

Operator response: Ensure that the version of the end-to-end adapter including the INGRCANZ command matches the requirements and that it is configured properly.

EEZU0039E Correlation ID of response from INGRCANZ does not match. Expected is *expected corr ID***, received was** *received corr ID*

Explanation: The INGRCANZ command, included in the end-to-end adapter, answers with an unexpected correlation ID. Therefore the response does not match its request. No CANZLOG messages are fetched.

System action: The response cannot be handled and is rejected.

Operator response: Ensure that the version of the end-to-end adapter including the INGRCANZ command matches the requirements and that it is configured properly.

EEZU0040E Collection of system log messages for system *system name* **failed:** *Exception text*

Explanation: The collection of system log messages failed for a specific system.

System action: The collection failed for various reasons.

Operator response: Analyze the reason of the failure.

EEZU0041E Collection of system log messages for system *system name* **not supported**

Explanation: The collection of system log messages is not supported on the specified system.

System action: No system log messages are collected.

Operator response: Retry on a supported system.

EEZU0042E No system log messages available for the requested point in time

Explanation: CANZLOG messages are only kept for a limited period of time. If system log messages are requested for a time in the past, they might not be available anymore.

System action: No system log messages are collected.

Operator response: Retry with a more recent time.

EEZU0044E Invalid regular expression for filtering of system log messages: *Exception text*

Explanation: The specified regular expression for the filtering of system log messages is invalid.

System action: No system log messages are collected.

Operator response: Retry with a valid regular expression.

EEZU0045E System or resource *resource name* **does not exist**

Explanation: The system log was launched from another component passing resource context information. The specified resource cannot be found. Reasons can be that the resource does not exist anymore, the corresponding automation adapter is not running, the host name or the event port used by the automation adapter are configured incorrectly or the domain name is mapped to a different name by the automation adapter.

System action: No system log messages are collected.

Operator response: Retry with a valid system or resource name.

EEZU0046E Cannot load system log for resource *resource name* near its last state change

Explanation: The system log near the resource's last state change cannot be loaded because the specified resource is not a valid resource or does not exist.

System action: No system log messages are collected.

Operator response: Retry with a valid resource name.

EEZU0047E Cannot execute command on system *system name*

Explanation: The command cannot be executed because the specified resource is not a system node or does not exist. The command execution was launched from another component passing resource context information. The specified resource cannot be found. Reasons can be that the resource does not represent a system, the resource does not exist anymore, the corresponding automation adapter is not running, the host name or the event port used by the automation adapter are configured incorrectly or the domain name is mapped to a different name by the automation adapter.

System action: The command is not executed.

Operator response: Retry with a valid system resource name.

EEZU0048E Execution of commands on system *system name* not supported

Explanation: The execution of commands is not supported on the specified system.

System action: The command is not executed.

Operator response: Retry on a supported system.

EEZU0049E User *user name* not authorized to execute command *command name* on system *system name*

Explanation: End-to-end Adapter security context switch successful. But user is not authorized to execute the command.

System action: The command is not executed.

Operator response: Provide the necessary authorization for the user.

EEZU0050E Command *command name* does not exist on system *system name*

Explanation: End-to-end Adapter security context switch successful. But the command does not exist.

System action: The command is not executed.

Operator response: None.

EEZU0051E Operator task *task name* is not defined on *system name*

Explanation: End-to-end Adapter security context switch failed. Operator task is not defined.

System action: The command is not executed.

Operator response: Define the operator task.

EEZU0052E Empty command

Explanation: An empty command cannot be executed.

System action: No command is executed.

Operator response: None.

EEZU0053E Cannot execute command on system with SMFID *system identifier* on Sysplex *sysplex name*

Explanation: The command cannot be executed because the specified resource is not a system node or does not exist. The command execution was launched from another component passing resource context information. The specified resource cannot be found. Reasons can be that the resource does not represent a system, the resource does not exist anymore, the corresponding automation adapter is not running, the host name or the event port used by the automation adapter are configured incorrectly or the domain name is mapped to a different name by the automation adapter.

System action: The command is not executed.

Operator response: Retry with a valid SMFID and Sysplex name.

EEZU0054E Cannot execute command without context of a domain and/ or system

Explanation: The command cannot be executed because the context of the domain and/ or system is missing, on which the command should be executed. The command execution was launched from another component without passing resource context information.

System action: The command is not executed.

Operator response: Retry and provide the necessary context by a resource ID or with a SMFID and Sysplex name.

EEZU0055E Command execution response needs too long. Timeout exceeded

Explanation: The End-to-end Adapter needs too long to respond for the execution of a command. The request's timeout is exceeded.

System action: It is not clear if the command was executed, partly executed or not executed at all.

Operator response: Analyze the End-to-end adapter and its log files to see why the command execution needs so long of if there is another problem.

EEZU0056E Unknown misbehavior during execution of *command name* **on system** *system name*

Explanation: End-to-end Adapter security context switch successful. The command was executed but the response signals a misbehavior which cannot be exactly identified by the end-to-end adapter.

System action: It is not clear if the command was executed, partly executed or not executed at all.

Operator response: Analyze the End-to-end adapter and its log files to see why the response signals a misbehavior.

EEZU0057E Required parameter *parameter name* **is missing**

Explanation: A required parameter was not provided for a data set. Without this parameter, the data set cannot be loaded.

System action: The data set cannot be loaded.

Operator response: Verify why the data set was not provided. E.g. a DASH widget uses the data set without providing the necessary parameter.

EEZU0058E No page header information available for page *page id*

Explanation: Page header information was requested for a specific page, but no such information is available.

System action: The data set cannot be loaded.

Operator response: Retry and provide a page ID for which page header information is available.

EEZU0059E Invalid regular expression

Explanation: The provided regular expression is not valid.

System action: No matching entries can be found.

Operator response: Correct the regular expression. A description of the correct syntax can be found in the Online Help.

EEZU0080E Captured messages are not supported on *resource name*

Explanation: Captured messages are not supported on the specified resource.

System action: No captured messages can be displayed.

Operator response: Retry with a supported resource.

EEZU0081E Unexpected response from INGCAPT: *Exception text*

Explanation: The INGCAPT command returns with an unexpected response. Desired action cannot be performed.

System action: The response cannot be handled and is rejected.

Operator response: Analyze the reason of the failure.

EEZU0082E Invalid arguments provided for INGCAPT: *arguments*

Explanation: The arguments provided for INGCAPT are invalid. Without valid arguments, the captured messages cannot be read.

System action: The captured messages cannot be read.

Operator response: Verify why invalid arguments were provided.

EEZU0083E INGCAPT routed to wrong (sub)system: *system name*

Explanation: The INGCAPT command returns with an unexpected response, because it was routed to the wrong (sub)system. Desired action cannot be performed.

System action: The response cannot be handled and is rejected.

Operator response: Analyze the reason of the failure.

EEZU0090E Monitoring history not supported on *resource name*

Explanation: Monitoring history not supported on the specified resource.

System action: No monitoring history messages can be displayed.

Operator response: Retry with a supported resource.

EEZU0091E Invalid arguments provided for INGCAPT: *arguments*

Explanation: The arguments provided for INGCAPT are invalid. Without valid arguments, the monitoring history messages cannot be read.

System action: The monitoring history messages cannot be read.

Operator response: Verify why invalid arguments were provided.

EEZU0100E Memory shortage exception

Explanation: It was detected that there is less than 20 percent of WebSphere heap size still available. To avoid an out of memory situation which could cause the management server not to function anymore, the current task has been interrupted.

System action: The current task ends. The displayed policy may be incomplete.

Operator response: Increase the WebSphere heap size. It is recommended that you close this policy editor session.

EEZU0101E An unexpected error occured: *situation description*

Explanation: The processing was interrupted because an unexpected error occurred.

System action: Processing ends.

Operator response: Check IBM Electronic Support for additional information - http://www.ibm.com/support/entry/portal/

EEZU0102E Cannot overwrite the currently active policy

Explanation: You selected the policy file which is currently the domain's active policy as target to store your current policy. For an end-to-end automation domain or for a UAA domain, it is not allowed to overwrite the active policy.

System action: The policy is not stored.

Operator response: Store the current policy under a different file name.

EEZU0103E Received empty policy from JEE framework

Explanation: The received policy was empty. This may happen if the user tried to open the currently active policy from a domain which does not have any policy activated.

System action: The policy is not received.

Operator response: Verify that the policy you try to open exists.

EEZU0110E Failed to parse XML response from `INGWHY`: *Exception text*

Explanation: The response to the `INGWHY` command is unexpected causing an XML parsing error. No problem isolation information can be fetched.

System action: The response cannot be handled and is rejected.

Operator response: Check IBM Electronic Support for additional information: http://www.ibm.com/support/entry/portal/.

EEZU0603E The resource with resource name *resource* **and resource class** *resource class* **contains an invalid property. Property** *property* **cannot be empty**

Explanation: The property is required.

System action: In order to avoid creating an invalid policy, the policy XML is not changed.

Operator response: Type in some value for the property.

EEZU0604E The resource with resource name *resource* **and resource class** *resource class* **contains an invalid property. For the property** *property***, a valid integer value with a maximum allowed value of** *maxValue* **is expected**

Explanation: The input value is above the maximum allowed value.

System action: In order to avoid creating an invalid policy, the policy XML is not changed.

Operator response: Type in a valid value which is below the maximum allowed value.

EEZU0605E The resource with resource name *resource* **and resource class** *resource class* **contains an invalid property. For the property** *property***, a valid integer value with a minimum allowed value of** *minValue* **is expected**

Explanation: The input value is below the minimum allowed value.

System action: In order to avoid creating an invalid policy, the policy XML is not changed.

Operator response: Type in a valid value which is above the minimum allowed value.

EEZU0606E The resource with resource name *resource* **and resource class** *resource class* **contains an invalid property. For the property** *property***, a valid integer value with a value between** *minValue* **and** *maxValue* **expected**

Explanation: The property value is outside of the allowed range.

System action: In order to avoid creating an invalid policy, the policy XML is not changed.

Operator response: Type in a value which is within the valid range.

EEZU0607E The resource with resource name *resource* and resource class *resource class* has a non-unique resource name

Explanation: All resources have to have a unique resource name.

System action: In order to avoid creating an invalid policy, the policy XML is not changed.

Operator response: Choose a unique resource name.

EEZU0608E Attempt to create multiple references to the resource with resource key *resource key*

Explanation: It is not possible to create multiple resource references referencing the same referenced resource.

System action: In order to avoid creating an invalid policy, the policy XML is not changed.

Operator response: Only create one resource reference per base resource.

EEZU0609E Failed to parse XML policy file *fileName*

Explanation: The specified file does not contain a parsable XML policy, or it cannot be opened.

System action: The requested operation is aborted.

Operator response: Make sure to specify a valid policy file which is accessible and which contains valid XML data.

EEZU0610E Empty policy file name

Explanation: Policy file name entry field cannot be empty.

System action: The file load operation is not executed.

Operator response: Specify a file name.

EEZU0611E The resource with resource name *resource* and resource class *resource class* contains an invalid property. Property *property* must be a valid IPv6 address

Explanation: The property should contain a valid IPv6 address.

System action: In order to avoid creating an invalid policy, the policy XML is not changed.

Operator response: Type in a valid IPv6 address for the property.

EEZU0612E The policy name or policy file name exists

Explanation: The policy name and policy file name must be unique in the domain.

System action: The save operation is not executed.

Operator response: Specify a different policy name or policy file name.

EEZU0613E The resource name exists

Explanation: The resource name must be unique to the other resources in the domain.

System action: The save operation is not executed.

Operator response: Specify a different resource name.

EEZU0614E The policy pool cannot be accessed

Explanation: The processing is interrupted by a parameter error and cannot complete correctly.

System action: The current task ends.

Operator response: Check and make sure the policy pool exists.

EEZU0615E The automation policy or automation resource cannot be updated: *Exception text*

Explanation: The update processing is interrupted by a parameter error and cannot complete correctly.

System action: The update task ends.

Operator response: Refer to the exception text to correct parameters and try again.

EEZU0616E The original policy file cannot be loaded

Explanation: The processing is interrupted by an unexpected error and cannot complete correctly.

System action: The current task ends.

Operator response: Check and make sure the file exists in the policy pool.

EEZU0618E The automation policy is not valid

Explanation: The automation policy in the policy pool contains errors or warnings that can't pass the validity check.

System action: None.

Operator response: View the errors or warnings, and correct the properties of the policy.

EEZU0619E Required parameter *parameter name* is missing

Explanation: A required parameter is not provided for a policy. Without this parameter, the policy information cannot be updated.

System action: The policy information cannot be updated.

Operator response: Verify why the parameter is not provided, reload the page and try again later.

EEZU0620E The resource can not be found

Explanation: The specified resource doesn't exist.

System action: None.

Operator response: Retry with a resource that exists.

EEZU1000E Resource *resource name* does not exist

Explanation: The specified resource cannot be found. Reasons can be that the resource does not exist anymore, has been deleted or the corresponding automation adapter is not running.

System action: Desired action cannot be completed.

Operator response: Retry with a valid resource.

EEZU0111E Missing data in response from `INGWHY`

Explanation: The response to the **`INGWHY`** command misses required data.

No problem isolation information can be fetched.

System action: The response cannot be handled and is rejected.

Operator response: Check IBM Electronic Support for additional information: http://www.ibm.com/support/entry/portal/.

EEZU0112E Problem isolation not supported on *resource name*

Explanation: Problem isolation is not supported on the specified resource.

System action: No problem isolation can be performed.

Operator response: Retry with a supported resource.

EEZU1001E System *system name* does not exist

Explanation: The specified system cannot be found. Reasons can be that the resource id does not represent a system, the system does not exist anymore, has been deleted or the corresponding automation adapter is not running.

System action: Desired action cannot be completed.

Operator response: Retry with a valid system.

EEZU1002E Domain *domain name* does not exist

Explanation: The specified domain cannot be found. Reasons can be that the resource id does not represent a domain, the domain does not exist anymore, has been deleted or the corresponding automation adapter is not running.

System action: Desired action cannot be completed.

Operator response: Retry with a valid domain.

EEZU1003E UTC offset for domain *domain name* not available

Explanation: The UTC offset for the specified domain is not available, because the corresponding automation adapter does not support querying the UTC offset.

System action: Desired action cannot be completed.

Operator response: Ensure the corresponding automation adapter supports querying the UTC offset.

EEZU1004E Operation not supported on *resource name*

Explanation: The desired operation is not supported on the specified resource.

System action: Operation cannot be performed.

Operator response: Retry with a supported resource.

EEZU1100E Invalid time format:*Exception text*

Explanation: The specified time format is invalid.

System action: Desired action cannot be completed.

Operator response: Retry with a valid time format.

EEZU1101E Invalid interval: *Exception text*

Explanation: The specified interval is invalid.

System action: Desired action cannot be completed.

Operator response: Retry with a valid interval.

EEZU0500W The automation domain *domain name* no longer exists

Explanation: You specified an automation domain that no longer exists. Possible reasons are that the automation domain has been deleted in the meantime.

System action: The current task continues.

Operator response: Check if the adapter for the specified domain is running properly. If the domain is deleted in the meantime, remove the corresponding widget from the dashboard.

EEZU0501W The selected resource *resource name* no longer exists

Explanation: You selected a resource that no longer exists. Possible reasons are that the resource has been deleted in the meantime or the automation policy has been changed or deactivated.

System action: The current task continues.

Operator response: If the resource is still displayed, use menu item 'Refresh all' to obtain the currently available resources.

EEZU0502W The selected node *node name* no longer exists

Explanation: You selected a node that no longer exists. Possible reasons are that the node has been deleted in the meantime.

System action: The current task continues.

Operator response: If the node is still displayed, use menu item 'Refresh all' to obtain the currently available nodes.

EEZU0503W The request has been submitted but has not been processed yet

Explanation: A request has been submitted but was not processed by the corresponding automation manager. Reasons for this can be a slow network or an automation manager that is not responding.

System action: The application continues.

Operator response: If the request is not processed soon, send the request again. If the problem persists, check the connections to the automation manager and inspect the log files of the automation manager for problems.

EEZU0504W The order to cancel the operator request has been submitted, but the request is still not canceled yet

Explanation: A cancel request has been submitted but was not processed by the corresponding automation manager. Reasons for this can be a slow network or an automation manager that is not responding.

System action: The application continues.

Operator response: If the request is not processed soon, cancel the request again. If the problem persists, check the connections to the automation manager and inspect the log files of the automation manager for problems.

EEZU0505W The order to change the automation policy has been submitted, but the policy change has not been completely processed yet

Explanation: The order to change the automation policy has been submitted to the corresponding automation manager, but the processing of this change has not finished yet. Reasons for this can be a slow network or an automation manager that is not responding.

System action: The application continues. When the processing of the policy change has been completed the screen will automatically refresh to reflect the change.

Operator response: If the problem persists, check the connections to the automation manager and inspect the log files of the automation manager for problems.

EEZU0506W Domain *Domain name* became unavailable

Explanation: The operations console accesses first-level automation domains directly (direct access mode). A domain that had been contacted successfully before, became unavailable when the operations console tried to perform a request on a first-level automation domain. The automation adapter or the node of the domain may have shut down without being able to notify the operations console.

System action: The request and any further request will not be performed on the domain until it becomes available.

Operator response: If you are using the operations console and the automation domain is still displayed, use menu item 'Refresh all' to obtain the currently available domains. If 'Refresh all' is not available, close and restart the current task to obtain the currently available domains.

EEZU0507W The management server is no longer available

Explanation: The session may be no longer valid (e.g. timed out or logged off).

System action: None

Operator response: Logout and login again. If the problem persists, restart the WebSphere Application Server.

EEZU0508W The automation resource with resource ID *resource id* no longer exists

Explanation: You specified an automation resource that no longer exists. Possible reasons are that the automation resource has been deleted in the meantime.

System action: The current task continues.

Operator response: Check if the specified resource still exists in your automation topology. If the resource is deleted in the meantime, remove the corresponding widget from the dashboard.

EEZU0509W No automation policies are available for domain *domain name*

Explanation: The specified automation domain did not return any policy to display.

System action: The current task ends.

Operator response: Check if the specified domain supports to list policies and has a proper policy pool defined. Check that policies with correctly specified domain name exist in this policy pool.

EEZU0510W Automation domain *domain name* is not accessible at this moment

Explanation: The specified automation domain cannot be accessed.

System action: The current task ends.

Operator response: Check if the specified domain is in a state `available` and the communication state is `OK`.

Check if the Universal Automation Adapter (UAA) is started. Go to SMU server and run the command in terminal: **`eezuaadapter`**.

EEZU0511W Automation domain *domain name* does not support policy activation with this product

Explanation: The specified automation domain does not support to list or activate policies through this product.

System action: The current task ends.

Operator response: This product cannot be used to handle policies of this domain.

EEZU0512W The automation JEE framework (Enterprise application EEZEAR) is not fully initialized yet and refuses to accept requests. Wait until the EEZEAR application is fully initialized, then re-open the dashboard

Explanation: The automation JEE framework (Enterprise application EEZEAR) is not fully initialized yet. The communication with attached domains is not possible until all components of the EEZEAR application are initialized.

System action: The system waits until the automation JEE framework is initialized before processing requests.

Operator response: Re-open the dashboard.

EEZU0513W No automation policy resource is available

Explanation: The policy does not contain any resource to display.

System action: None.

Operator response: Add new resources to the policy.

EEZU0520W The adapter log file of automation domain *domain name* requires operator attention

Explanation: The adapter log file contains errors or warnings which require operator attention.

System action: The current task ends.

Operator response: View the adapter log and look for warning or error messages to be resolved by human interaction.

EEZU0550W Automation domain *domainName* is not accessible at this time

Explanation: The automation domain exists, but it is currently not possible to communicate with it.

System action: You can continue using the policy editor, however it is not possible to use the harvesting functionality against the offline domain or to make use of that domain's policy pool while the domain is offline.

Operator response: If you want to use the harvesting functionality or the policy pool of the offline domain, make sure that the automation domain is running. If it is a first-level automation domain, verify that the automation adapter is running. Retry the operation after the timeout period defined by the environment variable com.ibm.eez.aab.watchdog-interval-seconds. If the problem persists, restart the automation adapter (in case of a first-level automation domain) or the end-to-end automation engine (in case of an end-to-end automation domain). Note that you can save your policy temporarily to local file instead of to the policy pool.

EEZU0601W The policy contains XML comments. XML comments will be removed

Explanation: The policy XML file contains XML comments which are not supported. These XML comments will be lost when the policy is loaded into the policy editor.

System action: The policy editor continues to load the policy file, but XML comments are removed.

Operator response: If editing policy XML files manually, you should not use XML comments. You can use the Description field of resources instead.

EEZU0602W The version of this policy file or of the used connected domain does not match the version of the policy editor. Version of policy file or used domain: *version in policy file* **. Version of policy editor:** *policy editor version*

Explanation: The version of the policy XML file does not match the version of the policy editor. This may result in incompatibilities. In case you have connected the policy editor to a domain running a different level, it might be impossible to activate the policy generated with this version of the policy editor.

System action: If the version of the policy XML is higher than the version of the policy editor, some elements unknown to this policy editor version may be accidentally removed if saving the policy. If the version of the policy XML is lower than the version of the policy editor and you save it, down-level versions of the corresponding automation product may reject to activate that policy. If you save a policy to a domain with a lower level than the policy editor, that domain might not be able to activate that policy.

Operator response: After saving the policy with this version of the policy editor, please check manually whether any expected component is missing. Use a policy editor with the corresponding version whenever possible.

EEZU0603W While trying to read history data from the automation database, it was detected that no schema name has been specified for the automation database

Explanation: The parameter 'database-schema-name' is missing in the file eez.automation.engine.properties.

System action: The default schema name 'EAUTOUSR' will be used.

Operator response: If you use another schema name than 'EAUTOUSR', ensure that the parameter 'database-schema-name' exists in the file eez.automation.engine.properties.

EEZU1000I No policy is activated

Explanation: No resources are displayed because no policy is activated.

System action: None.

Operator response: Activate a policy.

EEZU1001I No System Log Messages available that match the executed query

Explanation: The queried System Log does not contain any messages, that match the executed query.

System action: No System Logs can be displayed.

Operator response: None.

EEZU1002I No response

Explanation: The executed command returns no response.

System action: None.

Operator response: None.

EEZU1080I No captured messages available for resource *resource name*

Explanation: There are no captured message available for the specified resource. Either there are no messages captured for this resource yet or message capturing is not configured in the policy.

System action: No captured messages can be displayed.

Operator response: Verify that message capturing is configured for this resource in the policy.

EEZU1090I No monitoring history messages available for monitor *monitor name*

Explanation: There are no monitoring history message available for the specified monitor. Either there are no history messages captured for this monitor yet or monitoring history is not configured in the policy.

System action: No monitoring history messages can be displayed.

Operator response: Verify that monitoring history is configured for this monitor in the policy.

EEZU2000I Domain State for domain *domain name* **is** *domain state*

Explanation: The domain changed its state to the specified value.

System action: The system will handle this change. Resource References to this domain will change their state accordingly.

Operator response: None.

EEZU2001I Domain *domain name* **joined successfully**

Explanation: The domain is now available and ready for being managed.

System action: The system will handle this change. Resource References to this domain will change their state accordingly.

Operator response: None.

EEZU2002I Domain Communication State for domain *domain name* **is** *domain communication state*

Explanation: The domain has a new communication state.

System action: The system will handle this change. Resource References to this domain will change their state accordingly.

Operator response: None.

EEZU2003I Request event for *request type* **request has been received from domain** *domain name* **for resource** *resource name*

Explanation: A request has been added on the specified resource.

System action: The system will handle this change.

Operator response: None.

EEZU2004I Request deleted event has been received from domain *domain name* **for resource** *resource name*

Explanation: A request has been added on the specified resource.

System action: The system will handle this change.

Operator response: None.

EEZU2005I Policy changed event has been received from domain *domain name*

Explanation: The policy containing resource, group and relationship definitions has changed for this domain.

System action: The system will handle this change.

Operator response: None.

EEZU2000W Domain *domain name* **left**

Explanation: The domain is not available anymore for being managed.

System action: The system will handle this change. Resource References to this domain will change their state accordingly.

Operator response: None.

EEZU2002W Domain Communication State for domain *domain name* **is** *domain communication state*

Explanation: The domain has a new communication state.

System action: The system will handle this change. Resource References to this domain will change their state accordingly.

Operator response: None.

EEZU2002E Domain Communication State for domain *domain name* **is** *domain communication state*

Explanation: The domain has a new communication state.

System action: The system will handle this change. Resource References to this domain will change their state accordingly.

Operator response: None.

SMU Performance Management messages

All messages that are generated by Service Management Unite Performance Management installation and configuration are included in this section, including the appropriate user responses.

This section also includes messages for any problems related to launching or using the Service Management Unite dashboard console or the dashboard console online help.

Note: For all other administrative, user and other console-related messages, refer to the dashboard console online help.

KWU0001W Error while running the Prerequisite Scan. The Prerequisite Scan cannot proceed.

Operator response: The scan cannot be run for different reasons: the temporary directory does not have at least 5 MB, or the system registries are corrupted. Analyze the Installation Manager log files to see more details on the error. Check the troubleshooting information for a solution.

KWU0002W You did not install the WebSphere Application Server V 8.5.5.4 or higher. Installation of DASH extensions disabled.

Operator response: Install the WebSphere Application Server at a supported level and rerun the installation.

KWU0003W You did not install Core services in Jazz for Service Management 1.1.2 or higher. Installation of DASH extensions disabled.

Operator response: Install the Core services in Jazz for Service Management and rerun the installation.

KWU0004W You did not install the IBM Dashboard Application Services Hub 3.1.2 or higher. Installation of DASH extensions disabled.

Operator response: Install the IBM Dashboard Application Services Hub 3.1.2 and rerun the installation.

KWU0005W The program cannot verify the system prerequisites.

Operator response: Before proceeding with the installation, verify that your workstation meets all the required prerequisites by reading the IBM Workload Scheduler System Requirements.

KWU0006W You did not install IBM Tivoli Directory Integrator V7.1.1.4 or higher. Installation of TDI extensions disabled.

Operator response: Install TDI at a supported level and rerun the installation.

KWU0007E Internal error encountered in prerequisite checking.

Operator response: Check Installation Manager logs for information on the error.

KWU0101E Missing value for the "{0}" field.

Explanation: The specified input field has been left blank.

Operator response: Supply a value for the missing field.

KWU0102E DASH profile directory not found in JazzSM profile.

Explanation: The properties/.tipinfo properties file was not found in the DASH profile directory.

Operator response: Check the value specified for the DASH directory.

KWU0103E Websphere security credentials invalid.

Explanation: A WSADMIN command failed because of invalid security credentials.

Operator response: Check the Websphere user ID and password.

KWU0104E Unable to connect to WAS server.

Explanation: A WSADMIN command failed because a connection could not be established to a server.

Operator response: Ensure that the WAS server is active.

KWU0105E Specified TDI install directory does not exist.

Explanation: The directory specified as the TDI install directory could not be found.

Operator response: Ensure that the directory location is correct.

KWU0106E Missing or invalid value supplied for TDI server port.

Explanation: The TDI server port field is blank or contains a non-numeric value.

Operator response: Enter the correct port.

KWU0107E The TDI keystore file cannot be found.

Explanation: The TDI keystore file location is blank or invalid.

Operator response: Supply the location of the TDI keystore file.

KWU0108E The TDI truststore file cannot be found.

Explanation: The TDI truststore file location is blank or invalid.

Operator response: Supply the location of the TDI truststore file.

KWU0109E Unable to connect to the TDI server.

Explanation: The TDI server may not be active or the supplied security credentials are invalid.

Operator response: Check that the TDI server is active and the credentials are valid.

KWU0110E The specified JazzSM profile node directory is invalid.

Explanation: The JazzSM profile node directory is blank or does not exist.

Operator response: Supply the location of the JazzSM profile node directory.

KWU0111E The specified TDI trust store directory is invalid.

Explanation: The TDI trust store directory is blank or does not exist.

Operator response: Supply the location of the TDI trust store directory.

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