

# HP Cloud Service Automation for Matrix

Software Version: 2011, June

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## Configuration Guide

Document Release Date: September 2011  
Software Release Date: June 2011



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# 1 Installation Overview

This guide provides high-level information on installing HP Cloud Service Automation for Matrix (CSA for Matrix), high-level information on the processes involved in setting up an integrated environment, and specific information on installing and configuring CSA for Matrix within that environment.

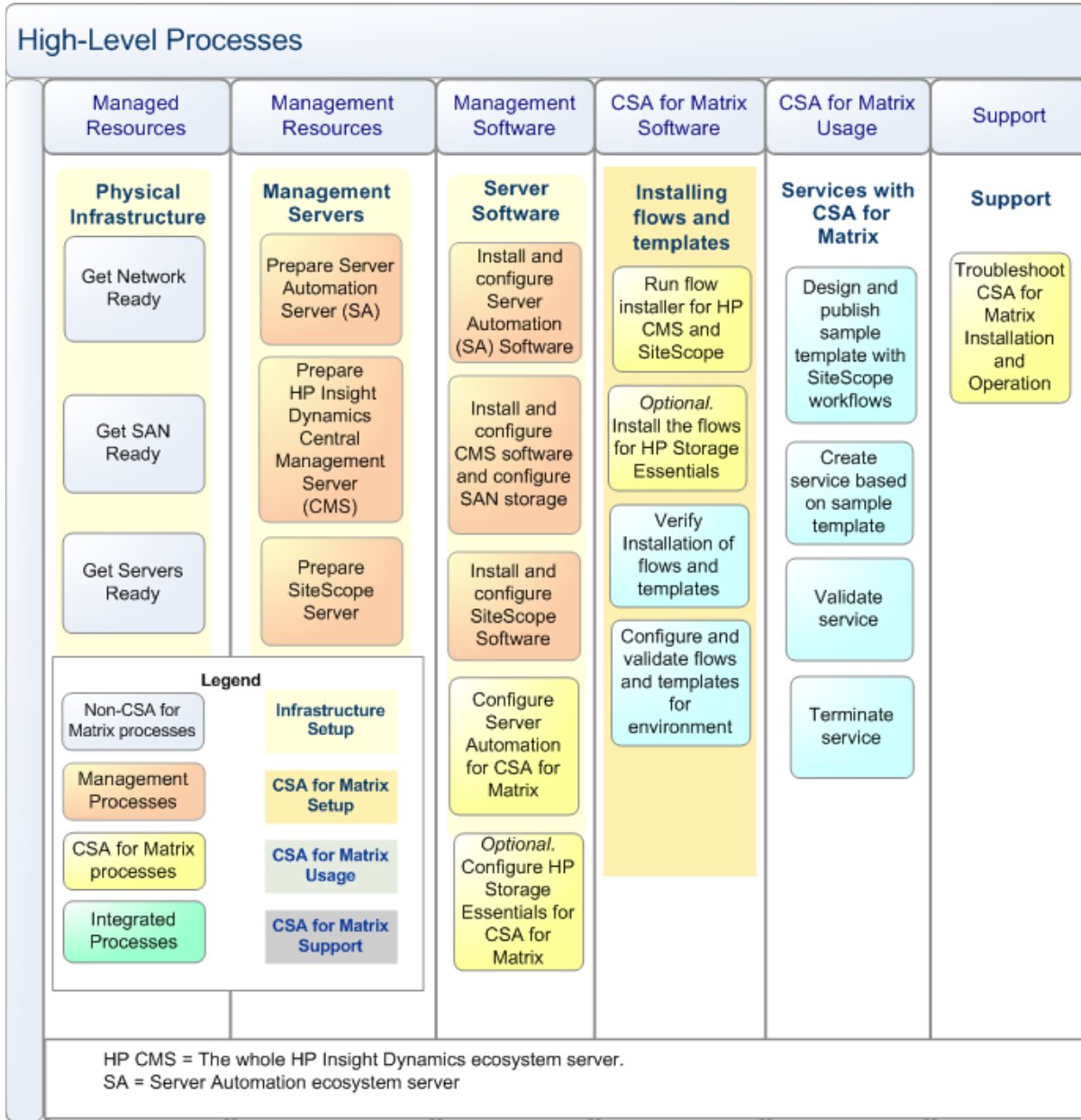
Successful implementation of CSA for Matrix requires knowledge of the component products, as well as the CSA for Matrix solution. Information in this guide augments information provided in the component product documentation, but is not intended to replace that documentation.

[Table 1](#) identifies the high-level processes required to set up an integrated cloud environment. This figure provides the context for the primary integration processes listed in the CSA for Matrix Software column in the [Figure 1](#).

**Table 1 Overview of High-Level Tasks**

<b>Task</b>	<b>Description</b>
Prepare managed resources	Prepare the network, SAN, and server infrastructure for the CSA for Matrix installation.
Prepare management resources	Set up the HP Insight Dynamics CMS, SiteScope server, Server Automation (SA) server, ( <i>optional</i> ) HP Storage Essentials infrastructure.
Install and configure management software	Install, configure, and integrate the HP Insight Dynamics CMS, SiteScope, SA. CSA for Matrix includes optional content to integrate Insight Dynamics with HP Storage Essentials to access a variety of non-Virtual Connect-enabled SAN arrays. For this integration to work, you must purchase and install HP Storage Essentials separately.
Install and configure CSA for Matrix workflows and templates	Install and configure the CSA for Matrix workflows.

**Figure 1 High-Level Processes**





## Required Information Before Installation

Before installing CSA for Matrix, refer to the information in the following table.

**Table 2 Required Documentation**

<b>Product</b>	<b>Go to...</b>
CSA for Matrix	<b>Release Notes:</b> <a href="http://support.openview.hp.com/selfsolve/manuals">http://support.openview.hp.com/selfsolve/manuals</a>
	<b>Support matrix:</b> <a href="http://support.openview.hp.com/selfsolve/manuals">http://support.openview.hp.com/selfsolve/manuals</a>
	<b>Manuals:</b> <a href="http://support.openview.hp.com/selfsolve/manuals">http://support.openview.hp.com/selfsolve/manuals</a>
HP Server Automation	<b>Support matrix:</b> <a href="http://support.openview.hp.com/selfsolve/manuals">http://support.openview.hp.com/selfsolve/manuals</a> NOTE: Search on Server Automation; select Version 9.02 or 9.03 along with the target operating system.
	<b>Manuals:</b> <a href="http://support.openview.hp.com/selfsolve/manuals">http://support.openview.hp.com/selfsolve/manuals</a>
HP Insight Software,	<b>Support Matrix:</b> <a href="http://www.hp.com/go/insightsoftware/docs">http://www.hp.com/go/insightsoftware/docs</a>
	<b>Manuals:</b> <a href="http://www.hp.com/go/insightsoftware/docs">http://www.hp.com/go/insightsoftware/docs</a>
HP SiteScope	<b>Support matrix:</b> <a href="http://support.openview.hp.com/sc/support_matrices.jsp">http://support.openview.hp.com/sc/support_matrices.jsp</a>
	<b>Manuals:</b> <a href="http://support.openview.hp.com/selfsolve/manuals">http://support.openview.hp.com/selfsolve/manuals</a>



## 2 Assessing Your Environment

Before installing and configuring the CSA for Matrix solution, you must assess the resources in your environment that you want to manage with CSA for Matrix. The infrastructure that is used and managed by CSA for Matrix includes network, physical and virtual servers, and storage arrays.

### Task 1: Review the Support matrix

The CSA for Matrix Support Matrix lists the versions HP Software products that are supported with CSA for Matrix 2011 June. The document also provides a list of supported hardware types for managed systems. The Support Matrix document is available here:

**[http://h20230.www2.hp.com/sc/support\\_matrices.jsp](http://h20230.www2.hp.com/sc/support_matrices.jsp)**

### Task 2: Assess and Prepare the Network

Getting the network ready is a prerequisite for installing and configuring CSA for Matrix, and involves installing the necessary hardware and software, and creating the connections (physical or logical) between switches and managed devices. Setting up the network involves installing physical components, configuring the logical network, and documenting and verifying connections. Perform the following tasks to make sure the network is ready for installation.

- 1 Plug in cables and switches.
- 2 Set up VLANs.
- 3 Record physical connections.
- 4 Verify connections and VLANs.

### Task 3: Assess the Storage Area Network (SAN)

SAN preparation, if a SAN is used, involves installing hardware and creating the physical connections between switches and storage arrays.

#### **SAN Prerequisites**

Enterprise Virtual Array (EVA) is required for physical SAN support. In addition, you can use the “Dynamic” SAN volume automation feature for the HP EVA, HP XP, EMC CLARiiON, and HDS SAN arrays if you choose to use the optional integration between HP IO and HP Storage Essentials available with CSA for Matrix.

#### **Supported SAN Arrays**

- HP EVA
- HP XP arrays (If integrated with Storage Essentials)
- EMC-CLARiiON (If integrated with Storage Essentials)
- HDS (If integrated with Storage Essentials)


If you use EMC-CLARiiON, make sure the following requirements are met:

- An initiator port must be registered with the CLARiiON storage array before you use the initiator port while creating the Storage Pool Entry (SPE).
- If a server has multiple initiator ports, each initiator port must be registered with the CLARiiON storage array with a unique IP address. If multiple initiator ports are registered with the same IP address, the Selective Storage Presentation or creation of SPE will fail.

### Set up the SAN Environment

Logical connections can be discovered after management software has been installed, if you are using Virtual Connect (VC). Some configuration of VSANs, zones, and switch fabrics may be required at this stage. The storage management interface needs to be ready during the discovery setup of configuration and before the first OS provision. The following steps are a high-level summary; component documentation should be used for specific instructions.

- 1 Set up SAN components.
  - a Set up EVA for physical SAN support. If you want to use the “Dynamic” SAN volume automation feature, set up the SAN arrays of your choice (HP EVA, HP XP, EMC CLARiiON, or HDS).
  - b Set up SAN switches (such as Brocade, Cisco, or Mcdada).
- 2 Set up VC-enabled components (optional).
  - a Set up blade servers.
  - b Set up HBAs.
  - c Set up switches.
- 3 Configure VSANs, zones, and switch fabrics, as needed.
- 4 Record physical and logical connections that cannot be discovered by VC and Virtual Connect Enterprise Manager (VCEM).

 Virtual Connect when used with VCEM, allows administrators to discover and manage server connections from a console. When using hardware that is non-VC-enabled, physical and logical connections must be manually recorded in the `ServerInfo.xml` file.

- 5 Verify.
 

CSA for Matrix uses the following approaches:

  - Insight Dynamics Static SAN approach; for more information about this configuration see the white paper: Insight Dynamics —Automated Storage Provisioning: Static SAN volume automation via multi-initiator NPIV at [http:// h18004.www1.hp.com/products/solutions/insightdynamics/ info-library.html](http://h18004.www1.hp.com/products/solutions/insightdynamics/info-library.html).
  - “Dynamic” SAN volume automation approach; for more information about this feature, see the HP Insight Orchestration User Guide.

#### Task 4: Assess and Prepare the Servers

CSA for Matrix operates on VC-enabled blade servers, ProLiant servers, and virtual machine (VM) hosts on ProLiant and Blade servers.

The following steps are a high-level summary; component documentation should be used for specific instructions.

- 1 Set up server components.
- 2 Establish connections between servers and switches.

- 3 Record logical and physical connections.
- 4 Verify.



# 3 Installing and Configuring the Management Server Software

Before installing the CSA for Matrix templates and workflow, make sure all the component products are installed and configured. The CSA for Matrix deployment consists of the following key servers:

- SA (running on one or more servers in a single core installation.)
- HP CMS (which also includes HP Insight Software and HP Operation Orchestration)
- SiteScope
- HP Operation Orchestration (OO) (if you use the version of OO that is embedded with HP Insight Dynamics, you need not include a separate OO server in the deployment)
- *Optional.* HP Storage Essentials (SE) (only when you want to use the optional integration with SE).

## Installing and Configuring SA

This version of CSA for Matrix supports the following configurations:

**Table 3 HP BladeSystem Matrix Topology**

SA Component Topology	Supported
Managed servers on the same subnet of an SA primary core with no Slice Component bundles	Yes
Managed servers on the same subnet of an SA primary core with multiple Slice Component bundles	Yes
Managed servers behind SA Satellites	Yes
Managed servers on the same subnet as that of the HP SA Satellite host (the OS provisioning component must be available on the Satellite host).	Yes
Multimaster Mesh: managed servers on the same subnet as that of the SA primary core <i>that is registered</i> with the HP Insight Dynamics CMS	Yes

**Table 3 HP BladeSystem Matrix Topology**

SA Component Topology	Supported
Multimaster Mesh: managed servers on the same subnet as that of an SA primary core <i>that is not registered</i> with the HP Insight Dynamics CMS	No
Multimaster Mesh: managed servers on the same subnet as that of the HP SA Satellite host <i>that is registered</i> with the HP Insight Dynamics CMS.	Yes
Multimaster Mesh: managed servers on the same subnet as that of the HP SA Satellite host <i>that is not registered</i> with the HP Insight Dynamics CMS.	No

Even though an SA installation may contain multiple cores, the CSA for Matrix installation must be configured to register the primary core with the CMS. In an environment with multiple Slice Component bundle instances, BladeSystem Matrix cannot auto-failover to any Slice Component bundle installation that is not registered with the CMS. If you change the SA primary core that is registered with the HP Insight Dynamics CMS, you must update all existing service templates to correctly identify the new software location.

In addition, if there are create service requests that have been submitted to the system for a future time (a future reservation), these requests must be cancelled explicitly and then re-submitted with an updated service template that contains the new software location. Failure to perform this step results in the request failing when the system tries process the old software location.

## Prerequisites

- When you install SA, you must retain a copy of the `oiresponse.omdb` file after the installation is complete. This file is typically kept in `/usr/tmp`. Be sure to save a copy because the file is deleted upon reboot.
- CSA for Matrix requires that SA act as the DHCP server for the managed environment.
- Determine the account name of the SA user to connect between HP IO and SA. This SA user name is used in the following locations:
  - After SA is installed, you set up an SA account for this user name.
  - You supply this account name during the HP IO or Insight Dynamics installation.
- HP IO can support SA satellite configurations. In addition, network configuration utilizing a DHCP relay (such as IP Helper) can be configured so that the SA build manager no longer has to reside on the same subnet as the target servers.

## Build the SA Environment

- Install `opsware-patch`
- Install `opsware-patch_upload`



## DHCP Configuration

CSA for Matrix assumes that SA acts as a DHCP server for the managed environment. To enable the SA DHCP server functionality, follow these steps:

- 1 Log in to the SA primary core using the root account.
- 2 In any text editor, open the following file:  
`/etc/opt/opsware/dhcpd/dhcpd.conf`
- 3 Uncomment the “authoritative” line by removing the number sign (#).
- 4 Save the file.
- 5 Run the following command:

```
/opt/opsware/dhcpd/sbin/dhcpdtool
```

Follow the prompts to fully enable the DHCP service.

Set up the OS provisioning images and software policies. Consult the *SA User Guide: Application Automation* document for version 9.0x. Validate the SA Installation without CSA for Matrix.

It is strongly recommended that you validate your installation of SA before integrating CSA for Matrix. Follow normal procedures for incorporating an operating system into HP\_Server Automation; then deploy an operating system directly from SA to a target server or servers in your environment.

## Update SA Security and Roles

### Task 1: Create a CSA for Matrix Account Group

- 1 Log in to the SAS Web Client as an HP SA Administrator.
- 2 In the navigation pane, under Administrators, click **Users & Groups**.
- 3 On the **Groups** tab, click **New Group**.
- 4 Enter a group name, for example: **HPIO Administrators**.
- 5 Set the following customer permissions:


Customer Name	Permission
HP Administrators	Read&Write
Not Assigned	Read&Write
Opsware	Read or Read&Write
Any other customers	None

- 6 Save the new group.
- 7 On the **Groups** tab, open the newly created group and apply the following settings:
  - a On the **Facilities** tab, set Read&Write access to the facility where the BladeSystem Matrix managed servers are assigned.
  - b On the **Devices Groups** tab, select the **Select all device groups** check box.

- c On the **Features** tab, select at least the following features:
  - Facilities**
  - Managed Servers and Group**
  - Model: **Opsware**
- d On the **Client Features** tab, set the following permissions. (Leave all other features set to No or None)
  - Policy Management: *<Policy>*
  - Manage Software Policy: **Read**
  - Allow Attach/Detach Software Policy: **Yes**
  - OS Sequence Management: *<OS Sequence Management>*
  - Manage OS Sequence: **Read**
  - Allow Execute OS Sequence: **Yes**
  - Allow Configuration of Networking Booting: **Yes**
  - Servers: *<Servers>*
  - Allow Remediate Servers: **Yes**
  - Manage OS Build Plan: **Yes**
  - Allow Execute OS Build Plan: **Yes**
  - Manage Windows Patch Policy: **Yes**
  - Allow Remediate Audit/Snapshot Results: **Yes**
  - Allow Modification Of Audit Check Metadata: **Yes**
  - Manage Audit: **Read&Write**
  - Manage Audit Result: **Read&Write**
  - Manage Audit Policy: **Read&Write**
- 8 Under **Manage API Permissions** on the **Other Permissions** tab, select the **Manage Virtual Columns** check box.
- 9 Do not set anything on the **OGFS Permissions** tab.

**Task 2:** Create Custom Attributes for OS Build Plans

To make the OS Build Plan available for CSA for Matrix, create the following custom attributes on each OS Build Plan:

- **OSType:** Set this to one of the following values:
  -  The OS Build Plan is supported only on Windows for SA 9.03 and on Windows and Red Hat Enterprise Linux for SA 9.10.
    - Windows Server 2003
    - Windows Server 2003 x64
    - Windows Server 2008
    - Windows Server 2008 x64

- Windows Server 2008 R2 x64

▶ You cannot use the following values if you are using SA 9.03.

- Red Hat Enterprise Linux Server 5

- Red Hat Enterprise Linux Server 5 X86\_64

- Red Hat Enterprise Linux Server 6

- Red Hat Enterprise Linux Server 6 X86\_64

- **archType:** x86 (for 32-bit systems) or x64 (for 64-bit systems).

See the *HP Server Automation User Guide: Application Automation* for more details on creating custom attributes.

### Task 3: Create an Account for HP BladeSystem Matrix to access SA

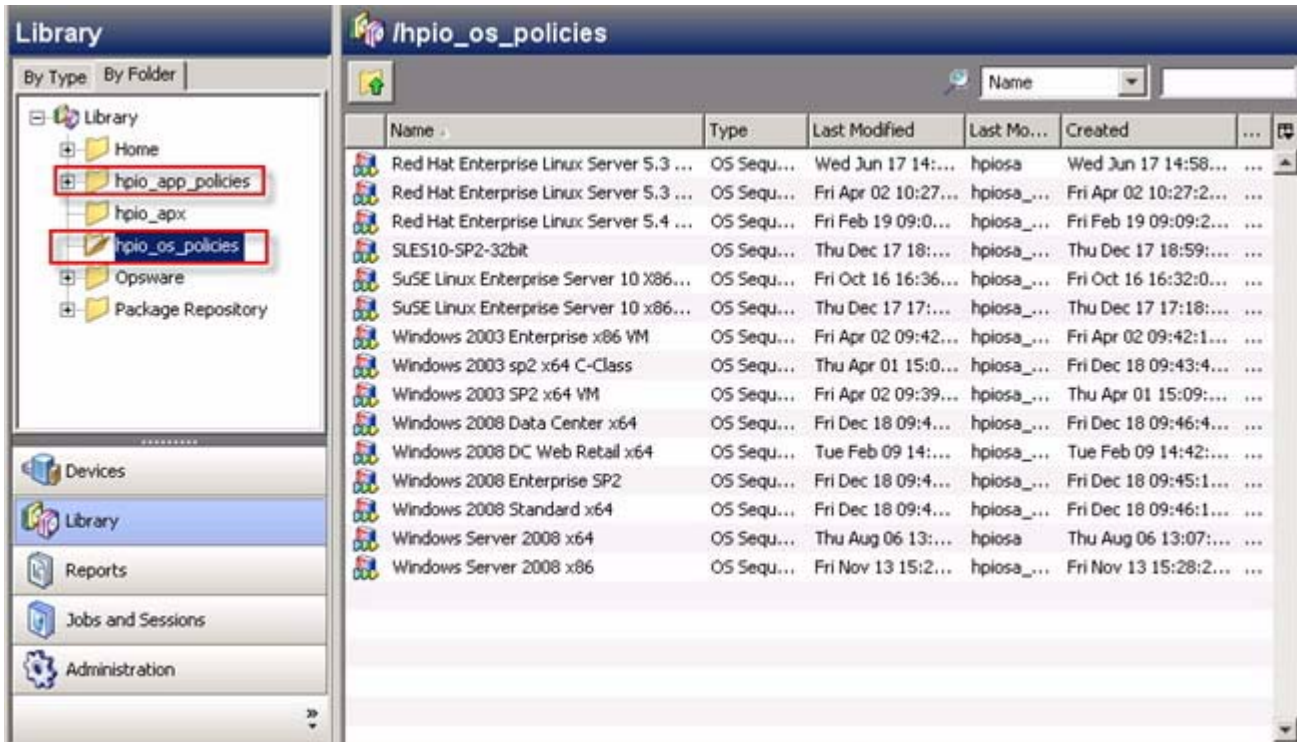
Use this account name when completing the CMS configuration steps below. CSA for Matrix uses this account name during HP SA OS and Application policy provisioning. You must use the *same* account name and password in both HP SA and CSA for Matrix.

- 1 In the SAS Web Client, create a new user, for example: **hpios**.
- 2 Assign this new user to the user group that you created in [Task 1: Create a CSA for Matrix Account Group](#).

## Verify the SA OS Sequence and Application Policy Inventory

To make SA OS Sequences and Application Policies available to CSA for Matrix, you create a basic folder structure to which you assign CSA for Matrix Group Permissions. [Figure 2](#) illustrates one example of this approach.

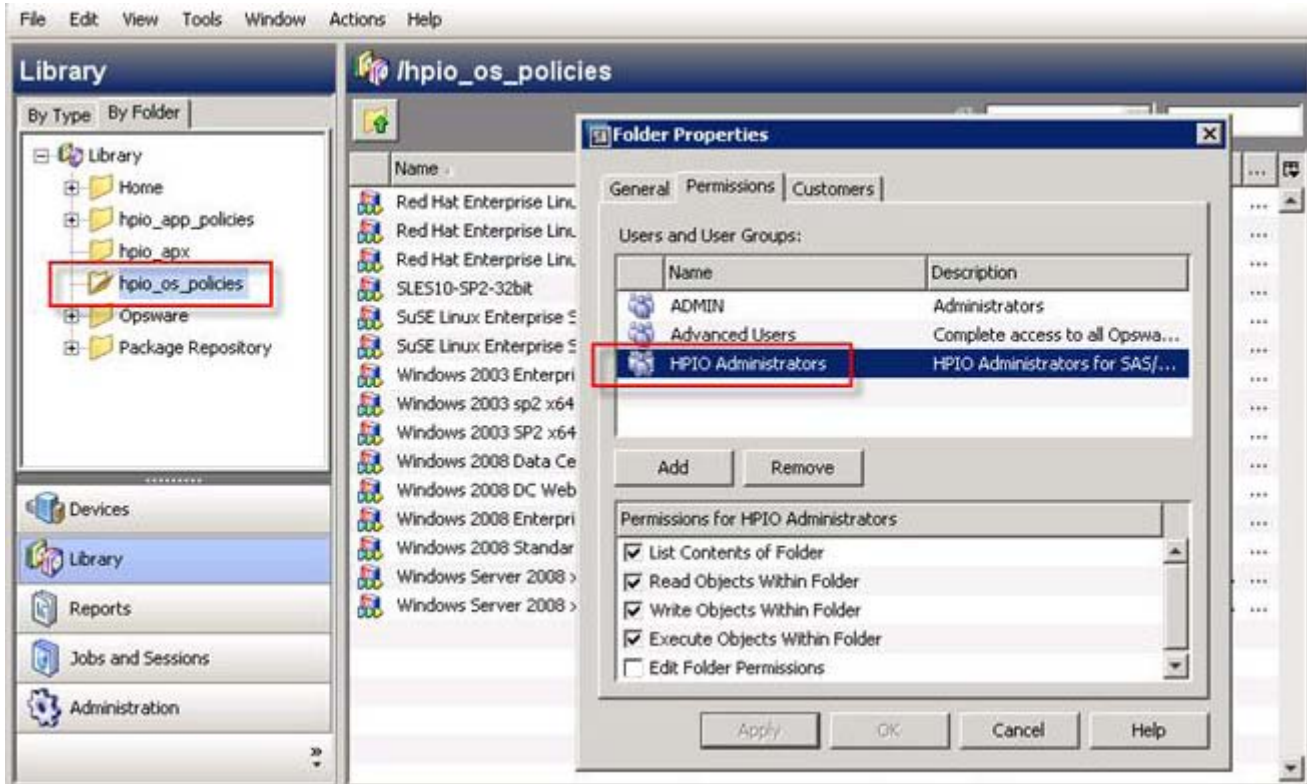
**Figure 2 OS Sequences and Application Policies**



In this example, two folders are created. One to house the OS Sequences and one to house the Application Policies that are accessible to CSA for Matrix. The folder permissions must be set to permit CSA for Matrix Group access. For the example below, the group name used for this purpose is **HPIO Administrators**.

- 1 Right click on the folder name: **hpio\_os\_policies**.
- 2 Add the **HPIO Administrators** group.
- 3 Ensure that the following permissions are selected:
  - a **List Contents of Folder**
  - b **Execute Objects Within Folder**
  - c **Read Objects Within Folder**
  - d **Write Objects Within Folder**

**Figure 3 Setting Group Permissions for a Policy Folder**

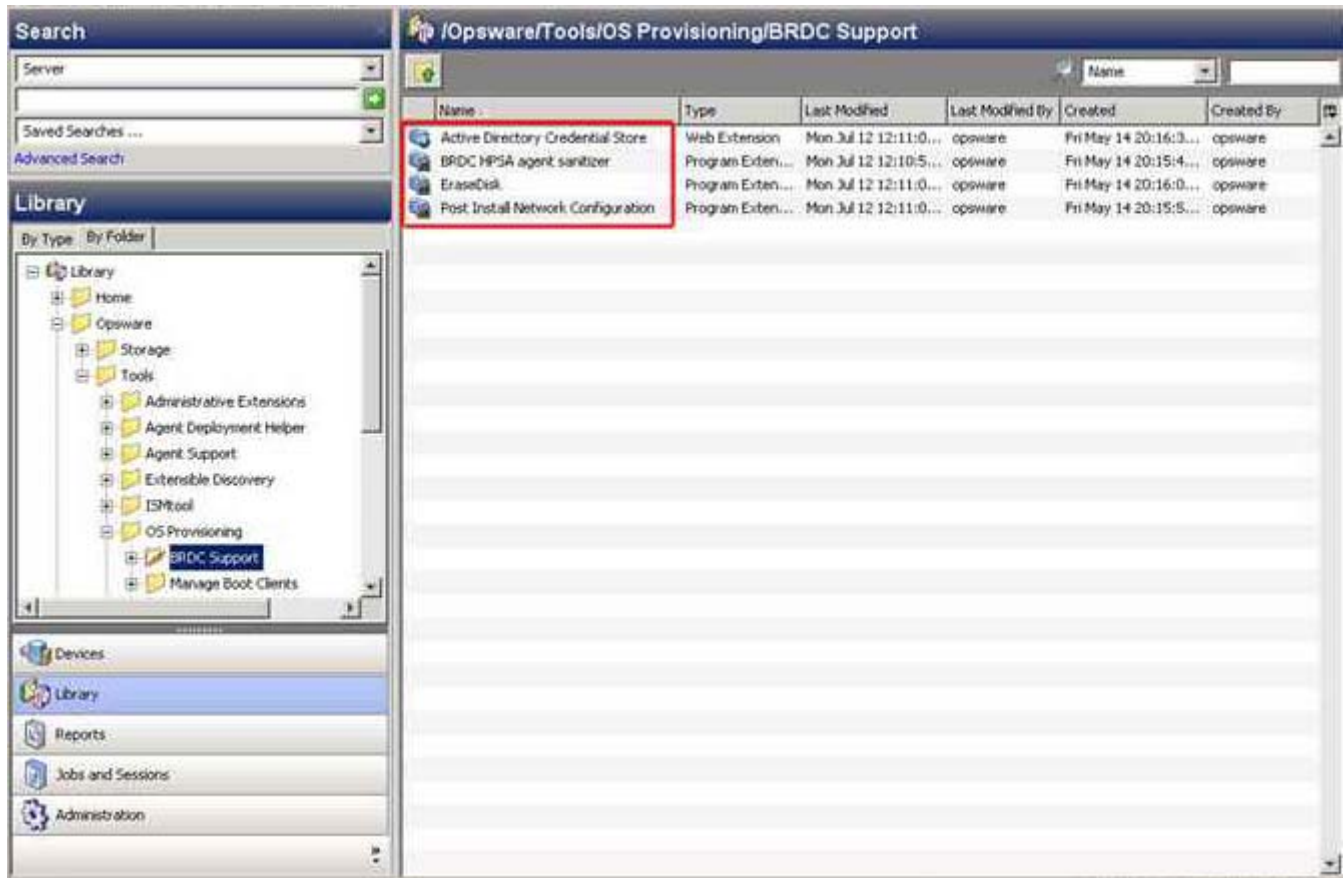


After completing the process above, any OS Sequences or Application Policies that are assigned to the folders become available to CSA for Matrix for use in service provisioning operations. Specifically, OS Sequences and Application Policies begin to show up within CSA for Matrix as available software inventory.

## OS Provisioning APX Extensions

The service provisioning process makes use of several SA APX extensions to perform its lifecycle operations.

Figure 4 Required HP SA APX Extensions

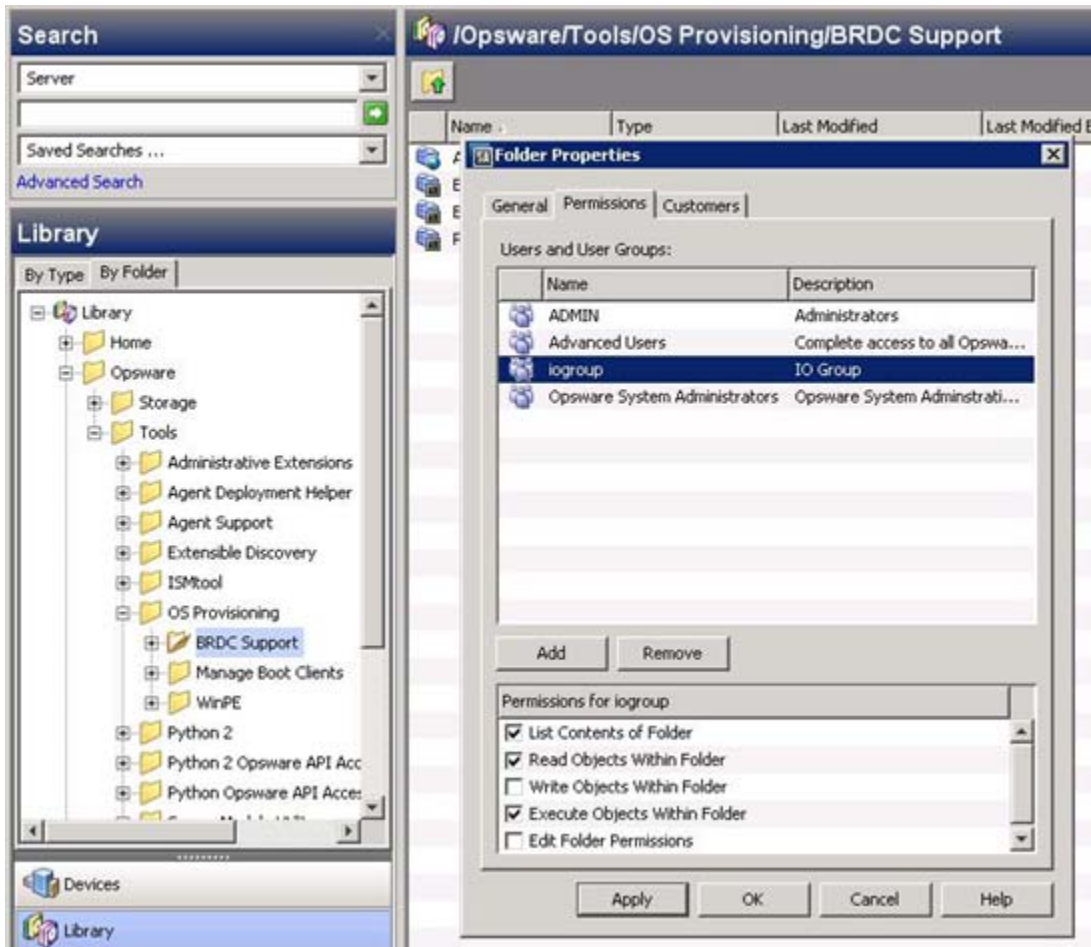


- 1 The EraseDisk APX is used to clean a server during the service delete process. All storage that is visible to the server is erased prior to the server (and its storage) being returned to the inventory for a future provisioning request.
- 2 The Post Install Network Configuration APX is used to perform OS level personalization of the server at the end of the OS provisioning process.

As is the case with OS Build Plans, OS Sequence, and Application Policy folders, it is also necessary to set the folder permissions to permit Group access. For the example below, the group name for this purpose is **HPIO Administrators**.

- 1 Right click on the folder name: **BRDC Support**.
- 2 Add the **HPIO Administrators** group.
- 3 Ensure that the following permissions are selected:
  - a **List Contents of Folder**
  - b **Execute Objects Within Folder**
  - c **Read Objects Within Folder**
- 4 *For OS Build Plans:*
  - a Right click on the folder name: **OS Provisioning**.
  - b Ensure that the **Execute Objects Within Folder** permission is selected.

**Figure 5 Setting Group Permissions for the OS Provisioning APX Extensions**



## Guidelines for Provisioning Operating Systems to Servers on Distinct Networks

You can use CSA for Matrix to provide operating system provisioning and network boot services to distinct networks by using one of the following setups:

- SA Satellite Host
- DHCP Relay

### SA Satellite Host

You can use the SA Satellite host to provision operating systems to servers on multiple distinct networks. Make sure that the CMS and SiteScope server can communicate with the managed systems under the SA Satellite.

### DHCP Relay

You can use DHCP relays to provision operating systems to servers on multiple distinct networks.

If you want to use this method, you must perform the following configuration tasks:

- 1 Configure a Layer 3 switch, router, or dual-homed system to transmit BOOTP and DHCP broadcast to the SA Core or Satellite.

- 2 Configure a single SA Core or Satellite host to run the SA OS Provisioning Boot Server component. This system must be routable by each target network.

Configure the DHCP service to cater to DHCP requests from the remote network.



This can be configured by using the `dhcpd` tool or by manually editing the `/etc/opt/opsware/dhcpd/dhcpd_subnets.conf` file.

For example:

```
subnet 192.168.10.0 netmask 255.255.255.0 {
    range dynamic-bootp 192.168.10.100 192.168.10.250;
    option broadcast-address 192.168.10.255;
    option domain-name "vlan10.example.com";
    option domain-name-servers 192.168.10.2;
    option routers 192.168.10.1;
}

subnet 192.168.11.0 netmask 255.255.255.0 {
    range dynamic-bootp 192.168.11.100 192.168.11.250;
    option broadcast-address 192.168.11.255;
    option domain-name "vlan11.example.com";
    option domain-name-servers 192.168.11.2;
    option routers 192.168.11.1;
}

subnet 192.168.12.0 netmask 255.255.255.0 {
    range dynamic-bootp 192.168.12.100 192.168.12.250;
    option broadcast-address 192.168.12.255;
    option domain-name "vlan12.example.com";
    option domain-name-servers 192.168.12.2;
    option routers 192.168.12.1;
}
```

- 3 Make sure that the CMS, SiteScope server, and SA servers are able to communicate with remote networks.

## Configure HP Insight Dynamics to Work with CSA for Matrix

### Identify Existing SIM MxNode Registrations

During the installation of the Insight Dynamics CMS, a placeholder may have been used to point to an SA server. To see if an SA server was set up, open a command shell and enter the following:

```
mxnodesecurity -l
```



Scan through the list and see if the `PROTOCOL` of `dsc_sas` exists. See [Figure 6](#) on page 26 for an example of the `mxnodesecurity` output.

## Registering an SA Primary Core via SIM MxNode Security

If the protocol exists and the IP address of the SA server is correct, change the credentials to those set up in [Task 3](#) on page 19:

```
mxnodesecurity -a -p dsc_sas -c <username>:<password> -n <SA primary core IP Address>
```

If the protocol exists and the IP address is incorrect, remove the entry with the following command:

```
mxnodesecurity -r -p dsc_sas -n <SA primary core IP Address>
```

If the protocol does not exist or has just been removed, add the SA entry with the following command:

```
mxnodesecurity -a -p dsc_sas -c <username>:<password> -n <SA primary core IP Address>
```



It is important that the same account information that was entered in the [Task 3](#) on page 19 be used for this step. The username and password values of this account grant CSA for Matrix access to the SA primary core OS Sequences and Application Polices and allow basic server operations through SA.

Verify the account that was just added to the CMS using the following command:

```
mxnodesecurity -l
```

To make sure HP Systems Insight Manager uses these new credentials immediately, restart the HP SIM server.

- 1 Make sure there is no activity on the HP SIM server during the restart.
- 2 Restart the HP SIM from the control panel or by running the following commands.

To stop HP SIM:

```
mxstop
```

To start HP SIM:

```
mxstart
```

HP SIM requires some time to restart. To monitor the status of the HP SIM restart run:

```
mxstatus -w -v
```

Upon completion, `mxstatus` returns `SIM status: Ready`.

[Figure 6](#) shows a sample listing. In this case, the account name that was used for CSA for Matrix access is `hpiosa_admin` and the IP address of the SA primary core is `15.6.136.4`.

**Figure 6 mxnodesecurity example**

```

Administrator: Command Prompt
c:\Program Files\HP\Virtual Server Environment\spn>
c:\Program Files\HP\Virtual Server Environment\spn>mxnodesecurity -l

Listing all global credentials...

NODENAME PROTOCOL USERNAME PASSWORD
@default1 snmp public private

Listing all system credentials...

NODENAME PROTOCOL USERNAME PASSWORD TRYOTHERS
KUGEL sign-in Administrator ***** Yes
15.6.142.132 dsc_ignite root ***** No
KUGEL pepoxyurl proxy.corp.hp.com ***** Yes
KUGEL pepoxyport 8088 ***** Yes
KUGEL pepoxyurlprotocol http ***** Yes
viserver1 sign-in Administrator ***** No
UCEM_B92UX0270L66 nvcd 015250159 ***** Yes
ignitel.orca.fc.hp.com sign-in root ***** No
15.2.50.133 vcenterprotocol Administrator ***** Yes
15.6.141.4 dsc_rdp Administrator ***** No
e5-aa sign-in admin ***** No
15.6.136.4 dsc_sas hpiosa_admin ***** No

c:\Program Files\HP\Virtual Server Environment\spn>

```

## Verifying SA Deployment Server Access

Once the SA primary core has been registered the system begins receiving software inventory directly from the SA primary core. Go to the HP IO operations console and refresh the software inventory to verify that HP IO lists the inventory.

Figure 7 shows both operating systems (OS) sequences, build plans, and application policy (App) inventory in the Type column with SA (shown as SA) in the Source column. The Location column (not shown) should show the SA primary core IP address that was registered in Registering an SA Primary Core via SIM MxNode Security on page 25.

**Figure 7 Verifying HP SA Software Inventory**

The screenshot shows the Insight Orchestration interface. On the left is a navigation pane with 'System and Event Collections' expanded to 'Systems' and 'Shared'. The main area displays a table of software resources. A red box highlights a 'Click to refresh software resources.' button and a row in the table with Name 'Suse10sp2\_x32', Source 'SA', Type 'OS', OS Type 'Linux', and Processor Arch 'x86 32-bit'.

Name	Source	Type	OS Type	Processor Arch	Notes
RH4u7_x32	SA	OS	Linux	x86 32-bit	
RH4u7_x64	SA	OS	Linux	x86 64-bit	
RH4u8_x32	SA	OS	Linux	x86 32-bit	
RH4u8_x64	SA	OS	Linux	x86 64-bit	
RH5.3_x32	SA	OS	Linux	x86 32-bit	
RH5.3_x64	SA	OS	Linux	x86 64-bit	
RH5.4_32bit	SA	OS	Linux	x86 32-bit	
RH5.4_64bit	SA	OS	Linux	x86 64-bit	
RH_app1	SA	App	Linux	x86 32-bit	
RH_app2	SA	App	Linux	x86 32-bit	
RH_app3	SA	App	Linux	x86 32-bit	
RH_app4	SA	App	Linux	x86 32-bit	
Suse10sp2_x32	SA	OS	Linux	x86 32-bit	

## Configuration on the SiteScope Server

If you want to monitor Oracle 10g and Microsoft SQL Server 2008 R2 with the help of CSA for Matrix, follow these steps:

- 1 To monitor Oracle 10g:
  - a Go to the Oracle server.
  - b Obtain the `classes12.jar` file from the `$ORACLE_HOME/jdbc/lib` directory.
  - c Place the `classes12.jar` file into the `<SITESCOPE_HOME>\WEB-INF\lib` directory on the SiteScope server.
  - d Restart the SiteScope service.
- 2 To monitor Microsoft SQL Server 2008 R2:
  - a Go to the Microsoft SQL Server.
  - b Obtain the `db2jcc.jar` file. See the *HP SiteScope Monitor Reference* for more information on obtaining the `db2jcc.jar` file
  - c Place the `db2jcc.jar` file into the `<SITESCOPE_HOME>\java\lib\ext` directory on the SiteScope server.
  - d Restart the SiteScope service.



## 4 Installing CSA for Matrix

The *Cloud Service Automation for Matrix Product Software and Documentation* media provides you with installer programs to install the CSA for Matrix solution in your environment.

The CSA for Matrix installer installs the following components:

- CSA for Matrix workflows on the OO system
- CSA for Matrix templates on the SiteScope server
- CSA for Matrix infrastructure monitor deployment script on the CMS

### Workflows

The *Cloud Service Automation for Matrix Product Software and Documentation* CD provides you with the following workflows:

- **Workflows for SiteScope Monitors**

The `CSA4M.zip` file, available on the *Cloud Service Automation for Matrix Product Software and Documentation* CD, includes necessary files to install the workflows.

CSA for Matrix provides pre-configured OO workflows, which are typically paired in an HP IO service template to perform monitoring tasks on managed servers.

#### **Managed system monitoring workflows**

- Deploy/Delete monitors
  - Deploy HP SiteScope monitors to a managed system
  - Delete HP SiteScope monitors from a managed system (to delete every monitor of the service)
- Disable/Enable monitors
  - Disable HP SiteScope monitors from a managed system (when the system is deactivated or powered off)
  - Enable HP SiteScope monitors from a managed system (when the system is activated or powered on)

#### **Infrastructure monitoring workflow**

The Infrastructure Monitor Action workflow enables you to monitor the health and performance of the CMS, SiteScope server, OO system, and SA Core server.

#### **Application monitoring workflow**

These workflows help you deploy SiteScope monitors for monitoring the following applications that run on managed systems:

- Exchange 2007 Monitor Action
- IIS 7 Monitor Action

- Oracle 10g Monitor Action
- MSSQL 2008R2 Monitor Action
- **Compliance and remediation workflows**

These workflows help you use the compliance and remediation feature on the managed systems:

  - Check Server Audit Compliance
  - Check Server Patch Compliance
  - Check Server Software Compliance
  - Remediate Server Non-Compliance
  - Remediate Server Patch Policies
  - Remediate Server Software Policies
- **HP Storage Essentials workflows**

The *Cloud Service Automation for Matrix Product Software and Documentation CD* presents the `OO-SE.zip` file, which includes the necessary files to install the HP Storage Essentials flows.

## Templates

The *Cloud Service Automation for Matrix Product Software and Documentation CD* provides you with necessary templates for the monitors that are deployed on the managed systems. The CSA for Matrix installer installs the following templates on the SiteScope server:

- For monitoring managed systems:
  - WINDOWS
  - LINUX
- For monitoring applications on the managed systems:
  - IIS 7
  - Oracle 10g
  - ▶ CSA for Matrix uses SiteScope’s default solution templates (which are available with the SiteScope installation) for monitoring Microsoft Exchange 2007 and Microsoft SQL Server 2008 R2. To use these monitors, you must obtain a SiteScope extension license.
- For monitoring the CSA for Matrix infrastructure:
  - CMS
  - OO
  - SA
  - SiS

## Infrastructure Monitor Deployment Script

The infrastructure monitor deployment script enables you to deploy the SiteScope monitors for the CSA for Matrix infrastructure monitoring across the OO system, SiteScope server, CMS, and SA Core server.

## Prerequisites

- Verify HP SA is installed.
- Verify HP IO is installed on the CMS.
- Verify OO is installed
- Verify HP SiteScope is installed.
- Verify the Java plug-in is installed for any client browser that runs the HP SiteScope dashboard.
- Complete HP SiteScope licensing configuration, if necessary.
- *Optional.* Verify that HP Storage Essentials 9.4 is installed and configured in the environment.

## Installing Workflows on the OO System

To install CSA for Matrix workflows on the OO system:

- 1 Log on as Administrator to the system where OO is available.
- 2 Make sure you have placed the `CSA4M.zip` file on the OO system from the *Cloud Service Automation for Matrix Product Software and Documentation* media. The file is available in the `content` directory on the media.
- 3 Extract the contents of the `CSA4M.zip` file to a temporary folder on the OO system.
- 4 Configure installation parameters.

The `CSA4M.zip` file provides you with the properties file to set installation parameters.

To configure the properties, follow these steps:

- a Go to the folder where you extracted the ZIP file, and then open the `csa4mInstall.properties` file with a text editor.

- b Configure the properties in the file according to the values specified in the following table:

Property	Value
centralURL	URL of the OO Central. Specify this value in the following format: <code>https:// &lt;OO-Central_FQDN&gt;:&lt;port&gt;</code> In this instance, <code>&lt;OO-Central_FQDN&gt;</code> is the fully qualified domain name of the OO system and <code>&lt;port&gt;</code> is the port used by OO Central.
centralUsername	The administrator user name for OO Central.
centralPassword	The password for the above user.
ooDir	OO installation directory
ioDir	HP IO installation directory
sisDir	SiteScope installation directory



Retain a copy of this file. The installer will require this file while installing SiteScope templates and installing infrastructure monitors.

- 5 In a Command window, change to the temporary folder where you extracted the contents of the CSA4M.zip file.
- 6 Run the following command:

```
install.bat
```

## Installing the CSA for Matrix Templates on the SiteScope Server

*Skip this section if SiteScope is installed on the OO system.*

If HP SiteScope is not installed on the OO system, you must install the templates on the SiteScope server.

To install the SiteScope templates, follow these steps:

- 1 Log on to the SiteScope server as Administrator.



- 2 Make sure you have placed the `CSA4M.zip` file on the SiteScope server from the *Cloud Service Automation for Matrix Product Software and Documentation* media. The file is available in the `content` directory on the media.
- 3 Extract the contents of the `CSA4M.zip` file to a temporary folder on the SiteScope server.
- 4 Configure installation parameters.

The `CSA4M.zip` file provides you with the properties file to set installation parameters.

To configure the properties, follow these steps:

- a Go to the folder where you extracted the ZIP file, and then open the `csa4mInstall.properties` file with a text editor.
- b Configure the properties in the file according to the values specified in the following table:

Property	Value
<code>centralURL</code>	URL of the OO Central. Specify this value in the following format: <code>https://&lt;OO-Central_FQDN&gt;:&lt;port&gt;</code> In this instance, <code>&lt;OO-Central_FQDN&gt;</code> is the fully qualified domain name of the OO system and <code>&lt;port&gt;</code> is the port used by OO Central.
<code>centralUsername</code>	The administrator user name for OO Central.
<code>centralPassword</code>	The password for the above user.
<code>ooDir</code>	OO installation directory
<code>ioDir</code>	HP IO installation directory
<code>sisDir</code>	SiteScope installation directory

Alternatively, transfer the `csa4mInstall.properties` file from the OO system onto the SiteScope server (the file that you configured in [step 4](#) on page 31).

- 5 Save the `csa4mInstall.properties` file into the directory where you extracted the ZIP file.
- 6 Go to the directory where you extracted the ZIP file.
- 7 Run the following command:

```
install.bat
```

# Installing Workflows for HP Storage Essentials

*This is an optional section. Skip this section if you do not want to use HP Storage Essentials with CSA for Matrix.*

Install the HP Storage Essentials workflow if you want to use CSA for Matrix to dynamically provision SAN arrays.

To install the HP Storage Essentials workflows, follow these steps:

- 1 Log on to the OO system as Administrator.
- 2 Make sure you have placed the `OO-SE.zip` file on the OO system from the Cloud Service Automation for Matrix Product Software and Documentation media. The file is available in the `optional` directory on the media.
- 3 Extract the contents of the `OO-SE.zip` file to a temporary folder on the OO system.
- 4 Configure installation parameters.

The `OO-SE.zip` file provides you with the `properties` file to set installation parameters.

To configure the properties, follow these steps:

- a Go to the folder where you extracted the ZIP file, and then open the `OOSEInstall.properties` file with a text editor.
- b Configure the properties in the file according to the values specified in the following table:

Property	Value
<code>centralURL</code>	URL of the OO Central. Specify this value in the following format: <code>https://&lt;OO-Central_FQDN&gt;:&lt;port&gt;</code> In this instance, <code>&lt;OO-Central_FQDN&gt;</code> is the fully qualified domain name of the OO system and <code>&lt;port&gt;</code> is the port used by OO Central.
<code>centralUsername</code>	The administrator user name for OO Central.
<code>centralPassword</code>	The password for the above user.

- 5 Save the file.
- 6 Run the following command:

```
install.bat
```

# Verifying Installation of Workflows and Templates

After installation is complete, check the availability of the following items:

- 1 Check that workflows that you installed on the OO system appear in the OO Studio.
- 2 Check that templates that you installed on the SiteScope server appear in the SiteScope dashboard.

## Check Workflows in the OO Studio

- 1 Log on to OO Studio.
- 2 Navigate to **Library > Hewlett-Packard > Insight Orchestration > Service Actions > Server Monitors**.
- 3 Confirm that the following workflows appear:
  - Delete Monitor
  - Deploy Monitor
  - Enable Monitor
  - Disable Monitor
- 4 Navigate to **Library > Hewlett-Packard > Insight Orchestration > Service Actions > Compliance and Remediation**.
- 5 Confirm that the following workflows appear:
  - Check Server Audit Compliance
  - Remediate Server Non-Compliance
  - Check Server Patch Compliance
  - Check Server Software Compliance
  - Remediate Server Patch Policies
  - Remediate Server Software Policies
- 6 Navigate to **Library > Hewlett-Packard > Insight Orchestration > Service Actions > Application Monitors**.
- 7 Confirm that the following application monitoring workflows appear:
  - IIS7 Monitor Action
  - Exchange 2007 Monitor Action
  - Oracle 10g Monitor Action
  - MSSQL 2008R2 Monitor Action

## Check Workflows for Storage Essentials

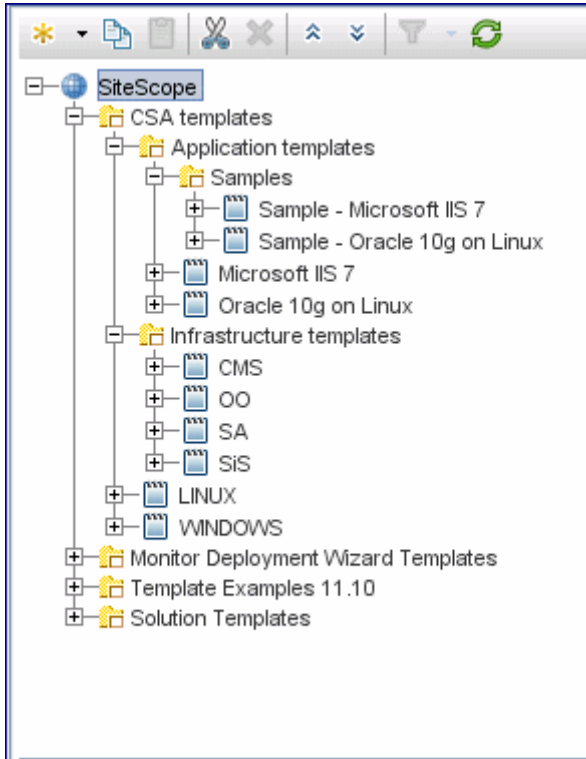
*This is an optional section. Skip this section if you do not want to use HP Storage Essentials with CSA for Matrix.*

- 1 Log on to OO Studio.
- 2 Navigate to **Library > Hewlett-Packard > CSA > SESANStorage > Flows**, and make sure the following flows appear:

- SE Discover Arrays
- SE Enumerate Pools
- SE Enumerate Volumes
- SE Get Device Information
- SE Get Volume Info
- SE Present Volume
- SE Set Host Mode
- SE Un-present Volume

## Check Monitor Templates in SiteScope


- 1 Log on to SiteScope dashboard.
- 2 Click **Templates**. The Templates page opens.
- 3 In the Navigation tree, expand **SiteScope > CSA templates**.
- 4 Check that the CSA template group includes the following items:
  - **Application templates:** This Template Container includes the following templates for application monitoring on managed systems:
    - Microsoft IIS 7
    - Oracle 10g on Linux
  - ▶ An additional Template Container—*Samples*—provides example configuration for the Microsoft IIS 7 and Oracle 10g on Linux templates
  - **Infrastructure templates:** This Template Container includes the following templates for monitoring the CSA for Matrix infrastructure:
    - CMS: For monitoring the CMS
    - OO: For monitoring the OO system
    - SA: For monitoring the SA server
    - SiS: For monitoring the SiteScope server
  - **Templates for managed systems:**
    - WINDOWS: For Windows managed systems
    - LINUX: For Linux managed systems



## Configuring User Credential Profiles

Either a SiteScope specific account needs to be created on each target Windows OS and each target Linux OS, or all response files to install operating systems must include the root password that matches the credentials entered into SiteScope. CSA for Matrix does not support different passwords for each Windows server or for each Linux server within SiteScope.

To configure user credential profiles for CSA for Matrix templates:

- 1 In Preferences context, click **Credential Preference**.
- 2 On the Credential Preferences page, the following user profiles appear:
  - WINDOWS-CSA-TARGETS
  - LINUX-CSA-TARGETS
  - CSA-SiS
  - CSA-SA
  - CSA-OO
  - CSA-CMS
- 3 On the Credential Preferences page, select a user.
- 4 Click **Edit Credential Profile** (  ).

- 5 In the Edit Credential Profile dialog box, type the following information:
  - Login: Specify the name of the administrative user for Windows managed systems, the OO system, SiteScope server, or CMS. Specify root for Linux managed systems and the SA Core server.
  - Password: Specify the password for the above users.
- 6 Click **Save**.

## Configuring Workflows in the OO Studio

After installing the workflows, you must configure them in the OO Studio by providing necessary access information for each server.

To configure workflows in the OO Studio, follow these steps:



At the end of this procedure, account details of CSA for Matrix infrastructure servers, managed systems, and monitored applications are stored in the OO repository in clear text.

- 1 Log on to the OO system.
- 2 Start OO Studio.
- 3 In the Repository pane, expand **Configuration > System Properties**.
- 4 Change the following input properties to values corresponding to your environment:



Before modifying a default property, click **Check Out** (  ) in the Authoring pane.

After saving every property (step 6), click **Check In** (  ) in the Authoring pane.

- **CSA\_DEBUG**: Setting this property to `true` enables CSA for Matrix to log diagnostic messages into a log file on the OO system.
- **CSA\_DEBUG\_LOGDIR**: If you set the **CSA\_DEBUG** property to `true`, set this property to the directory where you want to place the log file.
- **CSA\_DEBUG\_LOGNAME**: If you set the **CSA\_DEBUG** property to `true`, set this property to the log file name.
- **CSA\_NOTIFY\_ONLY\_FAILURE**: If you set this property to `true`, notification is sent only in the event of failure. Otherwise, notification is sent for all events.
- **SiSFQDN**: Fully qualified domain name of your SiteScope server
- **SiUserName**: SiteScope server's administrator user name
- **SiSPassword**: SiteScope server's administrator password
- **SiSIPPort**: Port of your SiteScope service from SiteScope install time
- **SiSProtocol**: HTTP access protocol to your SiteScope server
- **SiSCSATemplateFolder**: CSA templates folder on your SiteScope server
- **SiSDefaultMonitorFrequency**: Monitor frequency in seconds for your CSA monitors
- **CSA\_SA\_AUDIT\_TASKNAME\_LIN**: The name of the SA audit task for Linux servers that will be used for audit compliance and remediation in CSA for Matrix.

- `CSA_SA_AUDIT_TASKNAME_WIN`: The name of the SA audit task for Windows servers that will be used for audit compliance and remediation in CSA for Matrix.
  - `CSA_SA_AUDIT_TIMEOUT`: Time-out duration for an SA audit task.
  - `CSA_SA_FQDN`: Fully qualified domain name or IP address of your SA server
- 5 Change the following input properties for monitoring applications running on managed systems:
- For managed systems with Microsoft Exchange Server
    - `CSA_EXCH2007_DOMAIN`: The name of the domain that contains the Microsoft Exchange host.
    - `CSA_EXCH2007_MAILBOX`: The hostname of the system that hosts the Microsoft Exchange mailbox.
    - `CSA_EXCH2007_PSCONSOLEFILE`: The complete path to the PowerShell Console file on the Microsoft Exchange mailbox system.
  - For managed systems with Microsoft SQL Server
    - `CSA_MSSQL_INSTANCE_LOGIN`: Login name of the Microsoft SQL Server database instance.
    - `CSA_MSSQL_INSTANCE_NAME`: Microsoft SQL Server instance name.
    - `CSA_MSSQL_INSTANCE_PASSWORD`: Password to access the Microsoft SQL Server database instance.
    - `CSA_MSSQL_INSTANCE_PORT`: The port used by the Microsoft SQL Server database instance.
  - For managed systems with Oracle
    - `CSA_ORACLE_DBPASSWORD`: Password to access the Oracle database instance.
    - `CSA_ORACLE_DBPORT`: The port used by the Oracle database.
    - `CSA_ORACLE_DBUSER`: The name of an Oracle user account.
    - `CSA_ORACLE_HOME`: The Oracle home directory on the system that hosts the Oracle database.
    - `CSA_ORACLE_SID`: The system ID of the Oracle database instance.
- 6 Click **File > Save** after modifying every property.
- 7 In the Repository pane, expand **Configuration > System Accounts**.
- 8 Change the following account details to values corresponding to your environment:



Before modifying a default property, click **Check Out** (  ) in the Authoring pane.

After saving every property (step 9), click **Check In** (  ) in the Authoring pane.

- `CSA_EXCH2007_ADMINISTRATOR`: The administrative user name and password of the Exchange 2007 system.
- `CSA_IIS_ADMINISTRATOR`: The administrative user name and password of the IIS system.
- `CSA_MSSQL_ADMINISTRATOR`: The administrative user name and password of the Microsoft SQL Server host.


- HpioCmsCredentials: The administrative user name and password of the CMS.
  - HpioSACredentials: The SA user name and password that were configured with Insight Dynamics ([Create an Account for HP BladeSystem Matrix to access SA](#) on page 19).
- 9 Click **File > Save** after modifying every property.

## Configure HP Storage Essentials Workflows



*This is an optional section. Skip this section if you do not want to use HP Storage Essentials with CSA for Matrix.*




At the end of this procedure, account details of Storage Essentials are stored in the OO repository in clear text.

- 1 Log on to the OO system.
- 2 Start OO Studio.
- 3 In the Repository pane, expand **Configuration > System Properties**.
- 4 Select the SECMSIP input property.
- 5 In the Authoring pane, click **Check Out** (  ).
- 6 Set the property value to the IP address of the HP Storage Essentials management server in the Property Value box. If the HP Storage Essentials management server is configured to use a non-default port, type the IP address in the following format:  

<IP\_Address>:<Port>

In this instance, <IP\_Address> is the IP address of the HP Storage Essentials management server and <Port> is the non-default port.
- 7 Click **File > Save**.
- 8 In the Authoring pane, click **Check In** (  ).
- 9 In the Repository pane, expand **Configuration > System Accounts**.
- 10 Select SECredentials.
- 11 In the Authoring pane, click **Check Out** (  ).
- 12 Change the SECredentials account details:  

In the Authoring pane, type the user name and password of the HP Storage Essentials user.
- 13 Click **File > Save**.
- 14 In the Authoring pane, click **Check In** (  ).



## Additional Configuration for HP Storage Essentials Workflows

*This is an optional section. Skip this section if you do not want to use HP Storage Essentials with CSA for Matrix.*

If you have installed the HP Storage Essentials flows on the CMS, you must edit the `esa.properties` file to add references to the HP Storage Essentials flows.

To edit the `esa.properties` file, follow these steps:

- 1 Log on to the CMS as Administrator.
- 2 Go to the following directory:  
C:\Program Files\HP\Virtual Server Environment\conf
- 3 Open the `esa.properties` file with a text editor program.
- 4 Go to the section `#STORAGE WorkFlows`.
- 5 Edit the following properties:

Property	Set the value to...
<code>esa.oo.get.device.info.flow.path</code>	Hewlett-Packard/CSA/ SESANStorage/Flows/ SE Get Device Informa- tion
<code>esa.oo.enumerate.pools.flow.path</code>	Hewlett-Packard/CSA/ SESANStorage/Flows/ SE Enumerate Pools
<code>esa.oo.enumerate.volumes.flow.path</code>	Hewlett-Packard/CSA/ SESANStorage/Flows/ SE Enumerate Volumes
<code>esa.oo.get.volume.info.flow.path</code>	Hewlett-Packard/CSA/ SESANStorage/Flows/ SE Get Volume Info
<code>esa.oo.get.volume.info.flow.timeout</code>	1200000
<code>esa.oo.present.volume.flow.path</code>	Hewlett-Packard/CSA/ SESANStorage/Flows/ SE Present Volume
<code>esa.oo.present.volume.flow.timeout</code>	2400000
<code>esa.oo.un-present.volume.flow.path</code>	Hewlett-Packard/CSA/ SESANStorage/Flows/ SE Un-present Volume
<code>esa.oo.un-present.volume.flow.timeout</code>	2400000

Property	Set the value to...
esa.oo.set.host.mode.flow.path	Hewlett-Packard/CSA/ SESANStorage/Flows/ SE Set Host Mode
esa.oo.set.host.mode.flow.timeout	2400000
esa.oo.discover.arrays.flow.path	Hewlett-Packard/CSA/ SESANStorage/Flows/ SE Discover Arrays

- 6 Save the file.
- 7 *For XP and HDS only.* If the storage array has four or more ports on the fabric, you must increase the operation time-out value.
  - a On the CMS, open the `wrapper.conf` file with a text editor. The file is available in the directory `C:\Program Files\HP\Operations Orchestration\Central\conf`.
  - b Add the following line in the file:  
`wrapper.java.additional.3=-Dras.client.timeout=24000`
  - c Save the file.
  - d Restart the `RSCentral` service from the Services window.
- 8 Restart the `HP Extensible Storage & Server Adapter` service from the Services window.

## Configuring Insight Dynamics to Work with SA

Insight Dynamics 6.3 works with SA 9.0x by default. If you want to use SA 9.10, or if you want to use the OS Build Plan feature of SA with CSA for Matrix, you must perform this configuration task. Skip this section if you want to use SA 9.03 and do not want to use the OS Build Plan feature.

To use the OS Build Plan feature, follow these steps:

- 1 Log on to the CMS as administrator.
- 2 Stop the `HP System Insight Manager` service.
- 3 Insert the *Cloud Service Automation for Matrix Product Software and Documentation* CD into CD-ROM.
- 4 Go to the `SAPugin` directory on the *Cloud Service Automation for Matrix Product Software and Documentation* CD.
- 5 If you want to use SA 9.03, go to the SA 9.0x support directory, and then run the `SAAL-0.8-setup.exe` file.
- 6 If you want to use SA 9.10, go to the SA 9.1 support directory, and then run the `SAAL-0.8-SA-9.1-setup.exe` file.
- 7 Start the `HP System Insight Manager` service.

If you do not want to use the OS Build Plan feature and want to use SA 9.10, follow these steps:

- 1 On the CMS, go to `<SIM_INSTALL_PATH>\lib`.
- 2 Run the following command:  
`saplugin_helper.bat`

## Installing and Configuring HP Storage Essentials Workflows at a Later Time

You can choose to install HP Storage Essentials workflows at a later time—after installing and configuring other workflows.

To install and configure HP Storage Essentials workflows at a later time, follow these steps:

- 1 Verify that HP Storage Essentials is installed and configured in the environment.
- 2 Follow the steps in [Installing Workflows for HP Storage Essentials](#) on page 34.
- 3 Verify the installation by following the steps in [Check Workflows for Storage Essentials](#) on page 35.
- 4 Follow the steps in [Configure HP Storage Essentials Workflows](#) on page 40.
- 5 Follow the steps in [Additional Configuration for HP Storage Essentials Workflows](#) on page 41.

## Migrating to a Standalone OO Installation

HP IO embeds a special version of HP OO and contains a limited edition of the OO content. You can use the CSA for Matrix solution with the OO installation that is embedded with HP IO. If you like, at a later time, you can migrate to a complete, standalone version of OO (Windows only).

To migrate to a standalone OO installation from the embedded OO, follow these steps:

- 1 Complete the installation of OO on a standalone server (Windows only).
- 2 Migrate the embedded OO configurations to the standalone OO server. For necessary instructions, contact your HP Insight Dynamics representative.
- 3 Install CSA for Matrix workflows on the OO system by following the steps in [Installing Workflows on the OO System](#) on page 31.
- 4 After completing the migration steps, log on to the standalone OO server, and then follow the steps in [Configuring Workflows in the OO Studio](#) on page 38.



# 5 Installing Infrastructure Monitor Deployment Scripts on the CMS

This version of CSA for Matrix provides you with SiteScope monitors that help you monitor the CSA for Matrix infrastructure (the CMS, SiteScope server, OO system, and SA server).

If you use the OO installation available on the CMS (the OO instance embedded with HP IO), [Installing Workflows on the OO System](#) on page 31 ensures that infrastructure monitor deployment scripts are installed and available for use and you can skip this section. If you use a standalone OO system, you must install infrastructure monitoring scripts on the CMS.

To install infrastructure monitor deployment scripts on the CMS:

- 1 Log on to the CMS as Administrator.
- 2 Make sure you have placed the `CSA4M.zip` file on the HP SiteScope server from the Cloud Service Automation for Matrix Product Software and Documentation media. The file is available in the `content` directory on the media.
- 3 Extract the contents of the `CSA4M.zip` file to a temporary folder on the CMS.
- 4 Configure installation parameters.

The `CSA4M.zip` file provides you with the `properties` file to set installation parameters.

To configure the properties, follow these steps:

- a Go to the folder where you extracted the ZIP file, and then open the `csa4mInstall.properties` file with a text editor.
- b Configure the properties in the file according to the values specified in the following table:

Property	Value
<code>centralURL</code>	URL of the OO Central. Specify this value in the following format: <code>https://&lt;OO-Central_FQDN&gt;:&lt;port&gt;</code> In this instance, <code>&lt;OO-Central_FQDN&gt;</code> is the fully qualified domain name of the OO system and <code>&lt;port&gt;</code> is the port used by OO Central.
<code>centralUsername</code>	The administrator user name for OO Central.
<code>centralPassword</code>	The password for the above user.

Property	Value
ooDir	OO installation directory
ioDir	HP IO installation directory
sisDir	SiteScope installation directory

Alternatively, transfer the `csa4mInstall.properties` file from the OO system onto the CMS (the file that you configured in [step 4](#) on page 31).

- 5 Save the `csa4mInstall.properties` file into the directory where you extracted the ZIP file.
- 6 Go to the directory where you extracted the ZIP file.
- 7 Run the following command:

**install.bat**

The installer creates the `<HPIO_Install>\csa4m` directory on the CMS and places the monitor script into the `<HPIO_Install>\csa4m\bin` directory.

## Deploy Infrastructure Monitors

The `install.bat` program enables you to place the infrastructure monitor deployment script on the CMS. The deployment script can deploy the SiteScope monitors on all the servers that CSA for Matrix is comprised of. You must now run the deployment script to deploy SiteScope monitors on the CMS, OO system, SA Core server, and SiteScope server.

- 1 On the CMS, go to the `<HPIO_Install>\csa4m\conf` directory.
- 2 Open the `csa4mInfraMonitors.properties` file with a text editor.
- 3 Configure the properties in the file according to the values specified in the following table:

Property	Value
centralURI	URI of the OO Central. Specify this value in the following format: <code>&lt;OO-Central_FQDN&gt;:&lt;port&gt;</code> In this instance, <code>&lt;OO-Central_FQDN&gt;</code> is the fully qualified domain name of the OO system and <code>&lt;port&gt;</code> is the port used by OO Central.
centralUsername	The administrator user name for OO Central.
centralPassword	The password for the above user.

Property	Value
ooDir	OO installation directory
monitorAction	Deploy
CMSIPs	IP address of the CMS
OOIPs	IP address of the OO system.
SiSIPs	IP address of the SiteScope server.
SAIPs	IP address of the SA Core server.

- 4 Save the file.
- 5 Go to the `<HPIO_Install>\csa4m\bin` directory.
- 6 Run the following command:

```
csa4mRunInfraMonitor.bat
```

The command deploys SiteScope monitors on the OO system, CMS, SA Core, and SiteScope servers.

Alternatively, run the following command on the CMS:

```
<HPIO_Install>\csa4m\bin\csa4mRunInfraMonitor.bat deploy
```

## Disable Monitors

After deploying the monitors on the servers, if you want to disable them, follow these steps:

- 1 On the CMS, go to the `<HPIO_Install>\csa4m\conf` directory.
- 2 Open the `csa4mInfraMonitors.properties` file with a text editor.
- 3 Set the `monitorAction` property to `disable`.
- 4 Save the file.
- 5 Go to the `<HPIO_Install>\csa4m\bin` directory.
- 6 Run the following command:

```
csa4mRunInfraMonitor.bat
```

The command disables SiteScope monitors on the OO system, CMS, SA Core, and SiteScope servers.

Alternatively, run the following command on the CMS:

```
<HPIO_Install>\csa4m\bin\csa4mRunInfraMonitor.bat disable
```

## Enable Monitors

To enable the monitors again, set the `monitorAction` property to `enable` in the `<HPIO_Install>\csa4m\conf\csa4mInfraMonitors.properties` file, and then run the `<HPIO_Install>\csa4m\bin\csa4mRunInfraMonitor.bat` script.

Alternatively, run the following command:

```
<HPIO_Install>\csa4m\bin\csa4mRunInfraMonitor.bat enable
```

## Delete Monitors

If you want to delete the monitors from the servers, follow these steps:

- 1 On the CMS, go to the <HPIO\_Install>\csa4m\conf directory.
- 2 Open the `csa4mInfraMonitors.properties` file with a text editor.
- 3 Set the `monitorAction` property to `delete`.
- 4 Save the file.
- 5 Go to the <HPIO\_Install>\csa4m\bin directory.
- 6 Run the following command:

```
csa4mRunInfraMonitor.bat
```

The command deletes SiteScope monitors on the OO system, CMS, SA Core, and SiteScope servers. To use the infrastructure monitors again, you must follow [Deploy Infrastructure Monitors](#) on page 46.

Alternatively, run the following command on the CMS:

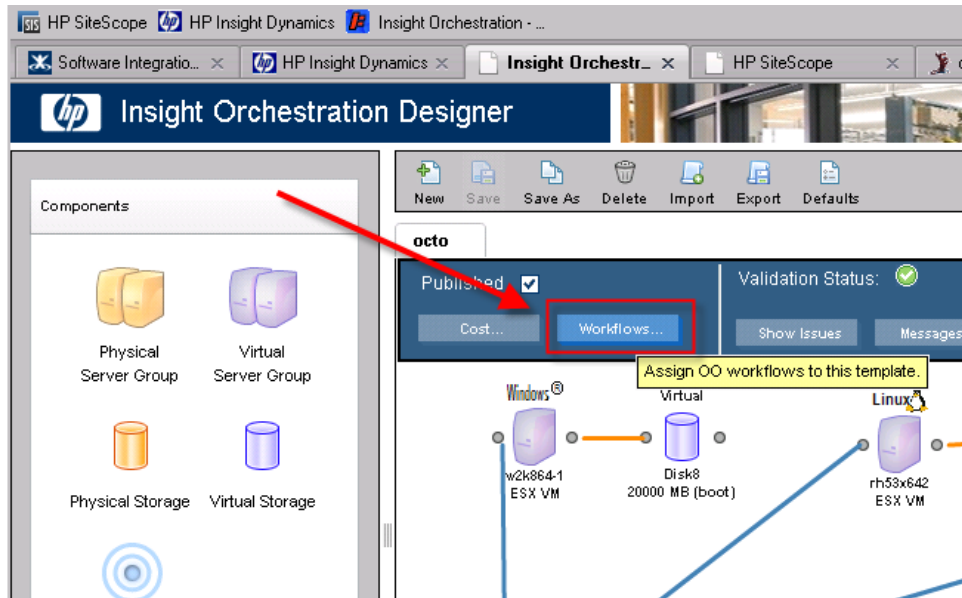
```
<HPIO_Install>\csa4m\bin\csa4mRunInfraMonitor.bat delete
```



# 6 Adding Workflows to the IO Templates

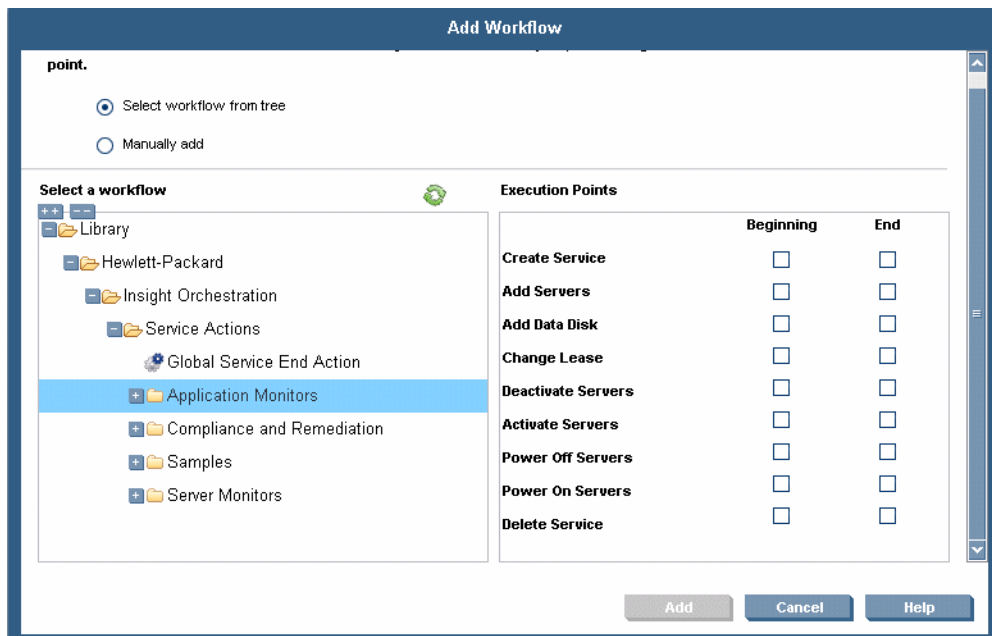
To add workflows to IO Templates, follow these steps:

- 1 In the IO Designer when editing the template, select **Workflows...**



The Workflows dialog box opens.


- 2 In the Workflows dialog box, click **Add**. The Add Workflow dialog box opens.



CSA for Matrix workflows are available under the following groups:

- **Application Monitors:**  
Includes the following workflows:
  - Exchange 2007 Monitor Action
  - IIS 7 Monitor Action
  - MSSQL 2008R2 Monitor Action
  - Oracle 10g Monitor Action
- **Compliance and Remediation**  
Includes the following workflows:
  - Check Server Audit Compliance
  - Check Server Patch Compliance
  - Check Server Software Compliance
  - Remediate Server Non-Compliance
  - Remediate Server Patch Policies
  - Remediate Server Software Policies
- **Server Monitor**  
Includes the following workflows:
  - Delete Monitors
  - Deploy Monitors
  - Disable Monitors
  - Enable Monitors

3 Follow this table while linking these workflows with execution points:

 Follow the given order.

<b>Workflow</b>	<b>Execution Point</b>
Deploy Monitors	<ul style="list-style-type: none"> <li>• Create Service: End</li> <li>• Add Servers: End</li> </ul>
Enable Monitors	<ul style="list-style-type: none"> <li>• Activate Servers: End</li> <li>• Power On: End</li> </ul>
Disable Monitors	<ul style="list-style-type: none"> <li>• Deactivate Servers: Beginning</li> <li>• Power Off: Beginning</li> </ul>
Delete Monitors	Delete Service: Beginning

<b>Workflow</b>	<b>Execution Point</b>
Exchange 2007 Monitor Action	<ul style="list-style-type: none"> <li>• Create Service: End</li> <li>• Add Servers: End</li> <li>• Activate Servers: End</li> <li>• Power On: End</li> <li>• Deactivate Servers: Beginning</li> <li>• Power Off: Beginning</li> <li>• Delete Service: Beginning</li> </ul>
IIS 7 Monitor Action	<ul style="list-style-type: none"> <li>• Create Service: End</li> <li>• Add Servers: End</li> <li>• Activate Servers: End</li> <li>• Power On: End</li> <li>• Deactivate Servers: Beginning</li> <li>• Power Off: Beginning</li> <li>• Delete Service: Beginning</li> </ul>
MSSQL 2008R2 Monitor Action	<ul style="list-style-type: none"> <li>• Create Service: End</li> <li>• Add Servers: End</li> <li>• Activate Servers: End</li> <li>• Power On: End</li> <li>• Deactivate Servers: Beginning</li> <li>• Power Off: Beginning</li> <li>• Delete Service: Beginning</li> </ul>
Oracle 10g Monitor Action	<ul style="list-style-type: none"> <li>• Create Service: End</li> <li>• Add Servers: End</li> <li>• Activate Servers: End</li> <li>• Power On: End</li> <li>• Deactivate Servers: Beginning</li> <li>• Power Off: Beginning</li> <li>• Delete Service: Beginning</li> </ul>
Check Server Audit Compliance	Power On Servers: End Activate Servers: End
Check Server Patch Compliance	Power On Servers: End Activate Servers: End
Check Server Software Compliance	Power On Servers: End Activate Servers: End

<b>Workflow</b>	<b>Execution Point</b>
Remediate Server Non-Compliance	Power On Servers: End Activate Servers: End
Remediate Server Patch Policies	Power On Servers: End Activate Servers: End
Remediate Server Software Policies	Power On Servers: End Activate Servers: End

- 4 Click **Add**.
- 5 Click **OK**.