Deploying Avaya Fabric Orchestrator

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Contents

Chapter 1: Introduction

Purpose

This document contains concepts, operations, and tasks related to the deployment and configuration of the Avaya Fabric Orchestrator (AFO) appliance.

Chapter 2: New in this document

The following sections detail what is new in *Deploying Avaya Fabric Orchestrator*, NN48100–101. See *Avaya Fabric Orchestrator Release Notes* for a list of supported features.

High Availability

AFO provides a High Availability (HA) framework to support redundancy at the hardware, hypervisor, and application levels. AFO HA requires two physical appliances inter-connected through appliance port NIC3, and a HA license. AFO HA provides active-standby redundancy, all data on the Leader server is replicated to the Standby server to support failover.

Out of Band device management option

The AFO deployment configuration provides an option to create and configure an out of band device network. The out of band network devices connect to appliance port NIC2. If you do not create an out of band device network, all devices must connect in band through appliance port NIC1.

Upgrade solution

New content and procedures are provided for you to perform a software upgrade from AFO Release 1.0 to AFO Release 1.1.

Chapter 3: End-to-end process overview

AFO end-to-end process workflow

The following section depicts end-to-end pre and post deployment high-level process workflow of Avaya Fabric Orchestrator (AFO) at a customer location.

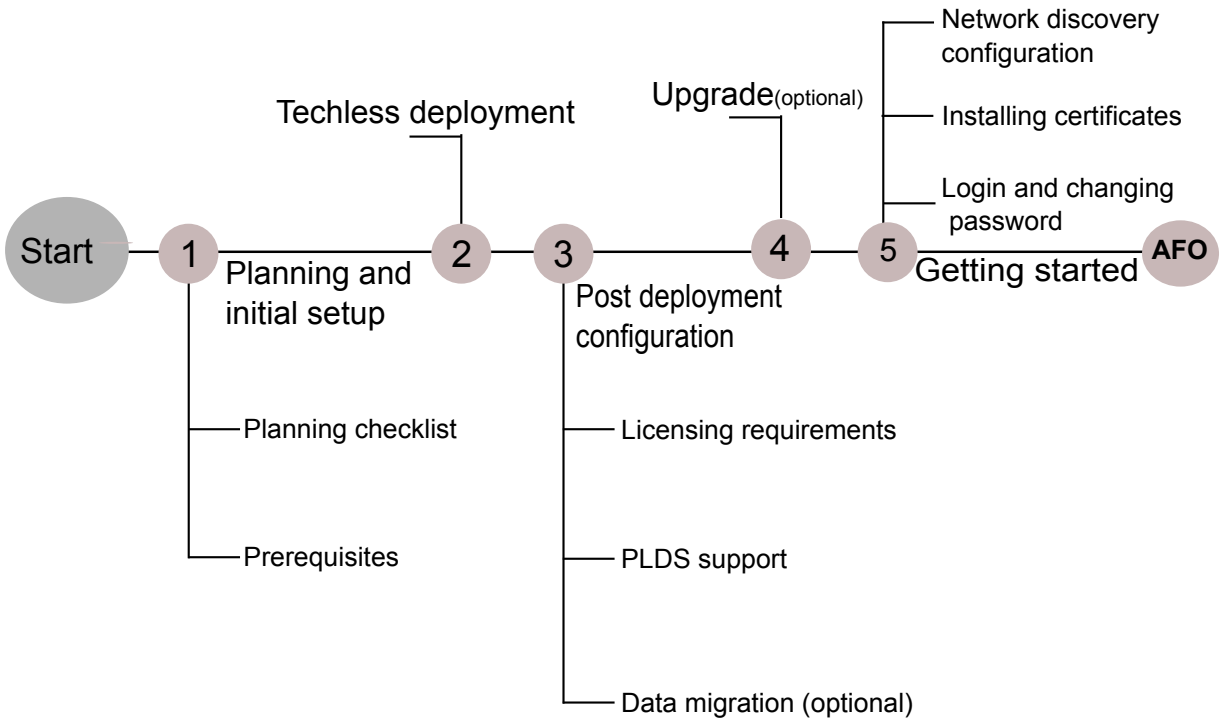


Figure 1: AFO process workflow diagram

Chapter 4: Planning and initial setup

Planning checklist

Use this checklist to track each step required to deploy an Avaya Fabric Orchestrator (AFO). See *Avaya Fabric Orchestrator Release Notes* for feature support.

Before you start a new Avaya Fabric Orchestrator (AFO) configuration, print the checklist. Check the steps as you complete them to make sure that you do not overlook any important task.

Table 1: Planning checklist

No.	Task	Comments	✔
1	Assemble the appliance and read the enclosed *HP ProLiant DL360 Gen9 Server* setup overview information.	AFO is a hardware appliance that operates virtualized management modules on a RHEL KVM Hypervisor. For more information and instructions on installing and commissioning a factory-supplied Avaya Fabric Orchestrator (AFO) appliance, see *Getting Started and Locating the latest software and Release Notes for Avaya Fabric Orchestrator*, NN48100–102.	
2	Gather the necessary cables and equipment.	• Minimum of two Ethernet cables (minimum of three for High Availability) for each appliance • Monitor • Keyboard	
3	When installing the appliance in a rack, select a location that meets the environment standards described in *HP ProLiant DL360 Gen9 Server User Guide*.	To ensure continued safe and reliable equipment operation, install or position the system in a well ventilated, climate-controlled environment.	

Chapter 5: Techless deployment

Deploying AFO Standalone

About this task

Perform the following procedure to deploy an AFO appliance as a Standalone Leader node. You can configure the appliance with a keyboard, video, and mouse locally.

Procedure

1. Ensure the AFO appliance NIC1 is connected to the management network, and power on.

   Note:

   The appliance is configured to boot into the installer. Do not press any keys until the Avaya software license terms display.

2. Click `Enter` to read the Avaya software license terms.
3. On the **End User License Agreement (EULA)** screen, review the EULA and press `space` to continue until prompted to accept the Avaya Software License Terms. Enter `Y` to accept the license agreement and proceed with the installation.

   Note:

   If you enter `N`, the installation aborts and the AFO appliance cannot be deployed.

4. On the **Appliance Network configuration** section, Enter `1` to select a New/Standalone Node.

   Note:

   If you want to enable High Availability (HA), you must complete a Standalone configuration first. Then you can install a HA license and proceed to deploy the second appliance to join HA cluster as standby node, see Deploying AFO High Availability on page 14.

5. Choose and enter a **Networking Configuration type**:

Choice Option	Choice Description
1	Same Network for AFO Services and HP Integrated Lights-Out (iLO)
2	Different Network for AFO Services and HP Integrated Lights-Out (iLO)

Note:

If you select Option 2, you must provide an IP address range, then enter the iLO IP address, iLO netmask, and iLO gateway addresses as prompted.

6. In the **KVM Configuration Parameter** section, do the following:
   a. Enter the prefix name for the appliance for auto generating the FQDN.
   b. Enter the domain name for the appliance for auto generating the FQDN.

      Note:

      The FQDN length must not exceed 40 characters.

   c. Enter the IP address of your DNS server (Optional).
   d. Enter the IP address of your NTP server (Optional).
   e. Select a continent or ocean to configure the time zone.
   f. Select a country.
7. In the **Application Network Configuration Details** section, do the following:
   a. Enter an IP address range of at least ten unused IP addresses for configuring the list of applications displayed. You can enter multiple IP addresses separated by a comma, or an IP range separated with a dash. See the example provided on screen.

      Note:

      If you chose option 2 in step 5, enter an IP address range of at least nine unused IP addresses.

      The system automatically assigns the IP addresses in sequence and appends the domain name to the auto-generated short hostname.

   b. Enter the Netmask, typically `255.255.255.0`.
   c. Enter the IP address for the default gateway.

      Note:

      If you chose option 2 in step 5, you are prompted to enter a separate iLO IP address, netmask, and default gateway.
8. A choice to configure a second network displays. `Do you want to configure separate network than the appliance management network for managing devices? [y/n]:`

Choice Option	Choice Description
N	One applications and devices network (Proceed to Step 9)
Y	Creates two applications and devices networks (Perform Step 8 substeps to configure the second network)

   a. In the **Application Second Network Configuration Details** section, enter an IP range of at least six unused IP addresses for configuring the list of applications displayed. You

can enter multiple IP addresses separated by a comma, or an IP range separated with a dash. See the example provided on screen.

b. Enter the Netmask, typically `255.255.255.0`

c. Enter the IP address for a second gateway (Optional)

9. The **Appliance Network Configuration** summary screen displays the IP addresses, FQDNs for the applications, and (if a second network was selected) the managed device network.

   Important:

   After completing the configuration, add the listed **IP Addresses** and **FQDNs** on your DNS server.

10. On the **Appliance Network Configuration** summary screen review the network configuration summary and choose the appropriate option:

Choice Option	Choice Description
y	Enter `y` to proceed with the configuration.
e	Enter `e` to edit configuration parameters.
x	Enter `x` to exit configuration and shutdown the server.

11. If you choose `y` to start the configuration, the system starts the reboot. It takes approximately 45 minutes to complete the configuration.

    The system displays the configuration status as `Deployment Successful` or `Deployment Failure`.

    - If the configuration status is `Deployment Successful`, the system displays the service FQDN details to launch the AFO application in the web browser.

Next steps

Perform a health check to ensure all the applications are configured successfully and everything is functional. For more information, see *Administration using Avaya Fabric Orchestrator*, NN48100–600.

Configuration flowchart

The following flowchart depicts the initial steps for configuring Avaya Fabric Orchestrator (AFO).

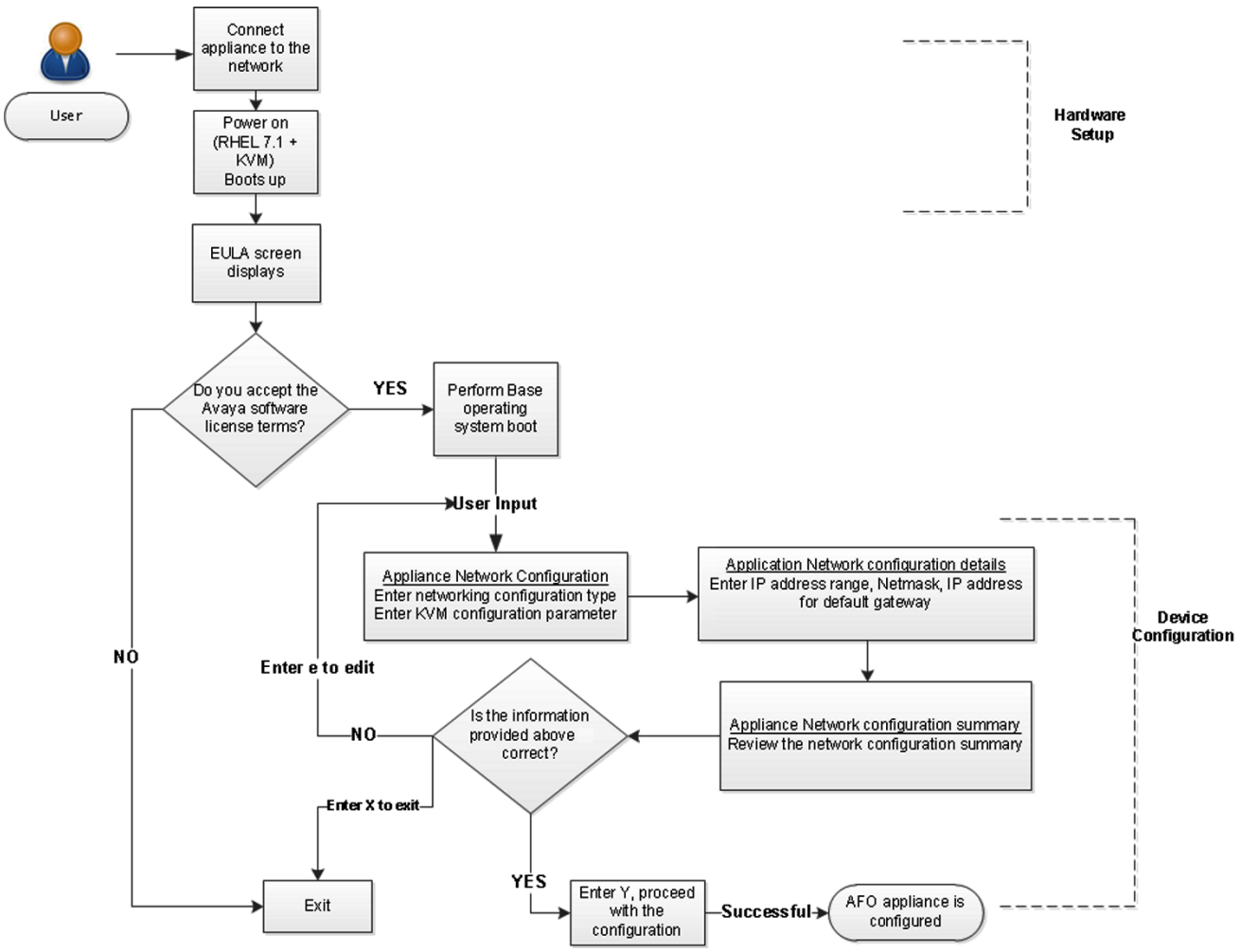


Figure 2: AFO Configuration flowchart

Deploying AFO High Availability

About this task

Perform the following procedure to deploy an AFO appliance as a Standby Master node for an AFO High Availability (HA) configuration. You can configure the appliance with a keyboard, video, and mouse locally, or with an iLO connection configured for remote console access.

Before you begin

- You must deploy and configure the AFO Standalone Leader node before you can deploy HA. See Deploying AFO Standalone on page 11.
- You must purchase and install an AFO High Availability license on the Standalone Leader node before you can deploy the Standby Master node.
- Ensure the AFO Standalone Leader node is powered on and AFO is operating.

- Ensure the AFO dashboard password is reset from default.
- Ensure both AFO appliances have NIC1 connected to the same management network.
- Ensure both AFO appliances have NIC3 connected to each other, either directly with a crossover Ethernet cable, or through a private network.
- (Optional) Ensure both AFO appliances have NIC2 connected to the device network.

Procedure

1. Power on the AFO Standby Master appliance and wait for boot sequence to complete.

   Note:

   The appliance is configured to boot into the installer. Do not press any keys until the Avaya software license terms display.

2. Click `Enter` to read the Avaya software license terms.
3. On the **End User License Agreement (EULA)** screen, review the EULA and press `space` to continue until prompted to accept the Avaya Software License Terms. Enter `Y` to accept the license agreement and proceed with the installation.

   Note:

   If you enter `N`, the installation aborts and the AFO appliance cannot be deployed.

4. On the **Appliance Network configuration** section, Enter `2` to choose to join HA cluster as standby.
5. Enter the **Integration IP** of the Leader KVM Server. Default is `10.10.10.1`. Press `Enter`.

   Communication with the AFO Leader node is established and the AFO HA license is validated. If no HA license is detected you are prompted to install the license before you can continue the configuration. If the HA license is detected, the configuration continues.

   Note:

   A Standalone Leader node with an AFO HA license installed is required to deploy the Standby node for a HA configuration.

6. Enter a **Management Network** IP address for the Standby node. A subnet is shown based on the Leader node configuration. Enter an `<A.B.C.D>` IP address valid for the subnet range shown.
7. Enter a **HP Integrated Lights Out (iLO) Network** IP address for the Standby node. Enter an `<A.B.C.D>` IP address valid for the subnet range of the Management Network.
8. Enter a **Netmask** IP address. Default is `255.255.255.0`. Press `Enter`.
9. Enter a **Default Gateway** IP address. A default is shown based on the Leader node configuration. Press `Enter`.
10. Enter the **AFO Dashboard Administrator Password**. Enter the Leader node `<password>` for the administrator account of AFO.

11. The **Appliance Network Configuration** summary screen displays the IP addresses and FQDNs for the applications.

    Important:

    After completing the configuration, add the listed **IP Addresses** and **FQDNs** on your DNS server.

12. On the **Appliance Network Configuration** summary screen review the network configuration summary and choose the appropriate option:

Choice Option	Choice Description
y	Enter `y` to proceed with the configuration.
e	Enter `e` to edit configuration parameters.
x	Enter `x` to exit configuration and shutdown the server.

13. If you choose `y` the system starts the Standby node configuration. It takes approximately 20 minutes to complete the initial configuration.

    Important:

    Once the Standby node configuration is complete, the data replication process begins. Data replication takes approximately 20 minutes to complete. HA failover is not available until the data replication is completed.

14. Check the High Availability status. Establish an SSH or console connection to the KVM hypervisor and login as root. Execute the following command `bash /usr/local/infra/bin/ha_status.sh` and view the replication status.

Next steps

Perform a health check to ensure all the applications are configured successfully and everything is functional. For more information, see *Administration using Avaya Fabric Orchestrator*, NN48100–600.

Chapter 6: Post-deployment configuration

AFO licensing

Licensing in AFO uses the System Manager WebLM as the license server to add or remove licenses.

Each AFO appliance requires a license. The licenses are node locked to the appliance and the WebLM server, hence they cannot be transferred from one appliance to the other. The type of license you purchase determines the device count and features available for each application. The Advanced Monitoring license includes all of the applications and features.

Important:

High Availability (HA) requires a HA license installed on the leader AFO appliance. For HA the standby AFO appliance does not require additional stand-alone node licenses.

License activations in PLDS require the HostID of the WebLM server and Monitoring VM HostID for inclusion in the license file. The HostID of the WebLM server is displayed on the Server Properties page of the WebLM.

License type

The following list outlines the types of AFO licenses:

- 250-Node

  Important:

  - Carefully consider your starting license. You cannot go from the 250–Node license to the 1500–Node license by way of an AFO upgrade. If you know that you will need more than 250 nodes, start with the 1500–Node license.
  - AFO supports upgrade from 1500–Node license to 5000–Node license.

- 1500-Node
- 5000-Node
- Additional 10000–Node for Monitoring
- High Availability

The following table outlines the device count for each module.

Table 2: Device count for modules

Application	250-Node	1500-Node	5000-Node
Configuration	250	1,500	5,000
Monitoring	1,000	6,000	• The device count is 20,000 (without +10000 Monitoring add-on license) • The device count is 30,000 (with +10000 Monitoring add-on license)
IP Flow	10	10	10
Virtualization	220	220	220

The following table outlines the device count for the AFO Monitoring module.

Table 3: Device counts for Monitoring

Managed Devices	250-Node	1500-Node	5000-Node
Avaya Networking Switches	250	1,500	5,000
UC, CC, phones, Avaya solution (EMC, HP), Servers, VMs, 3rd party Switches, other managed objects	750	4,500	• The device count is 15,000 (without +10000 Monitoring add-on license) • The device count is 25,000 (with +10000 Monitoring add-on license)
Total	1,000	6,000	• 20,000 (5,000+15,000) • 30,000 (25,000+5,000)

Additional features

At the time of acquiring a license, you must select any additional features you wish to access along with the license type. This include the Advanced Monitoring features.

The Advanced Monitoring feature is available for all license types and can be enabled or disabled based on your requirement.

If you wish to purchase any additional features after you acquire a license, you can contact Avaya support to receive a new license for AFO from PLDS. You must replace the existing license with the new license on the WebLM server.

Trial version

AFO provides a trial version of 15 days which will be available soon after the configuration of AFO on the hardware appliance for the first time. You do not require any trial license file to run the trial version. The standard license will be active during the trial period.

Grace Period

A grace period of 30 days is available in case of any of the following scenarios :

- The absence of a valid license after the trial period expires or at any given time.
- If after installing license there is any loss of connectivity to the license (WebLM) server.

For more information about licenses, see *Administration using Avaya Fabric Orchestrator*, NN48100–600.

PLDS support

Avaya Product Licensing and Distribution System (PLDS) enables you to perform licensing and entitlement management.

For more information about how to generate a license file, see *Getting Started with Avaya PLDS for Avaya Networking Products*, NN46199-300. All licensing activities are performed through the Avaya PLDS Portal at http://plds.avaya.com.

License procurement workflow

About this task

This work flow shows you the sequence of tasks you perform to generate a new license for Avaya Fabric Orchestrator (AFO).

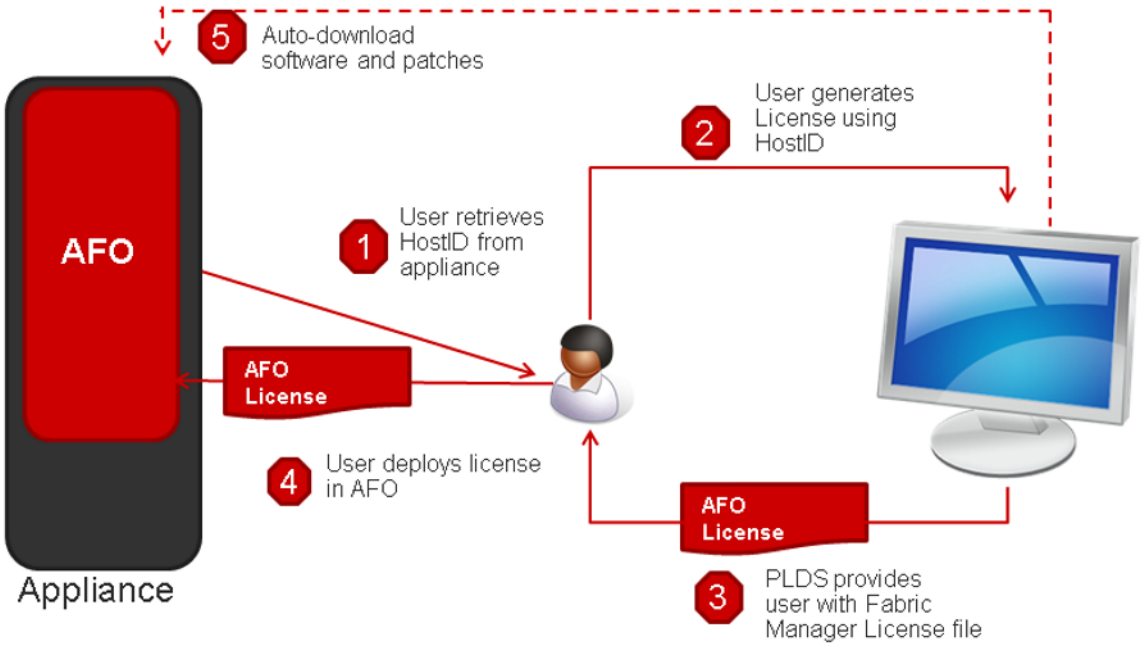


Figure 3: License Procurement workflow

Before you begin

- Login to KVM as a root user using the Command Line Interface (CLI).

Procedure

1. Run the **`afo-hostid`** command to generate the HostID for the WebLM server.

   You can obtain the HostID from MSC CLI as well as from AFO's About dialog.

2. Using this HostID, generate a license in Avaya Product Licensing and Distribution System (PLDS).

   For more information about how to generate a license file, see *Getting Started with Avaya PLDS for Avaya Networking Products*, NN46199-300. All licensing activities are performed through the Avaya PLDS Portal at http://plds.avaya.com.

3. PLDS provides a Fabric Manager License file.
4. Use this license file to install the licenses in AFO.
5. **(Optional)** You can auto-download entitlements from PLDS. You can also auto-download patches and new software from PLDS using Management Server Console (MSC).

Next steps

For more information about obtaining and installing a web-based license manager (WebLM) from Avaya Fabric Orchestrator (AFO), see *Administration using Avaya Fabric Orchestrator*, NN48100–600.

Chapter 7: Upgrade Solution

Upgrade overview and considerations

This chapter provides the process and procedures for upgrading Avaya Fabric Orchestrator (AFO) Release 1.0 to Release 1.1.

Supported upgrade paths

The following table lists the supported options to upgrade to Avaya Fabric Orchestrator (AFO) Release 1.1.

Current version	Upgrade using
Avaya Fabric Orchestrator (AFO) Rel 1.0	CLI, for more information see, Upgrade process on page 23.

Supported migration paths

Avaya supports the platform, and application migration and upgrade from legacy applications. For information related to data migration from the supported legacy application versions to a newer version of Avaya Fabric Orchestrator (AFO), see Overview of Migration on page 29.

Pre-upgrade tasks and requirements

To successfully upgrade the AFO system to Release 1.1, you must complete all tasks and requirements as listed below.

Pre-upgrade tasks

The table contains the key tasks that are required to upgrade AFO to Release 1.1.

Task	Note
Ensure that you perform backup of Release 1.0, using **`/opt/avaya/smgr/backuprestore/backupRestoreAFO.sh --backup`** command and save the backup on the remote server.	For more information, see Performing Backup for Release 1.0 on page 52.
Ensure that you perform backup of the WebLM license and save the copy on the remote server.	1. Log on to the AFO web user interface, as an administrator.

Table continues…

Task	Note
	2. On the menu bar, click **Administration** > **Licenses**. The system displays the WebLM Home page. 3. In the product name table, select the product license to be exported. 4. Click **Export All Licenses**. The system exports the license file on the platform VM to the file path `/tmp/all_licenses.zip`. 5. Copy the `/tmp/all_licenses.zip` license file from the platform VM to the remote server.
Ensure that the maximum session time-out is set to 120 minutes.	1. Log on to the AFO web user interface, as an administrator. 2. On the menu bar, click **Administration** > **Policies** > **Session Properties**. 3. Enter **Maximum Session Time** and **Maximum Idle Time** to `120 minutes`.
Ensure that you are able to access the iLO Remote console.	1. Login to iLO, and verify if you can launch and use either of the .Net IRC or the Java IRC. For more information, read the enclosed *HP ProLiant DL360 Gen9 Server* setup overview information.

Pre-upgrade requirements

- Ensure that your system has the following hardware, supported browsers, and applications.

Hardware

- Minimum of two Ethernet cables (minimum of three for High Availability) for each appliance
- Monitor
- Keyboard

Applications

- **Base Operating System:**
  - RHEL 7.1, 64-Bit
- **Hypervisor:**
  - Redhat KVM version 7.1
- **Virtual Network:**
  - OpenvSwitch bridge

Supported Browser

- Internet Explorer, version 11
- Mozilla Firefox, versions 47 and later

- Safari, versions macOS v10.8 Mountain Lion, and later

Note:

Ensure that you connect a monitor to Hypervisor console (AFO server).

Upgrade Process

The following workflow diagram depicts the key upgrade sequence for upgrade to Release 1.1, that start with a system running Avaya Fabric Orchestrator (AFO) Release 1.0:

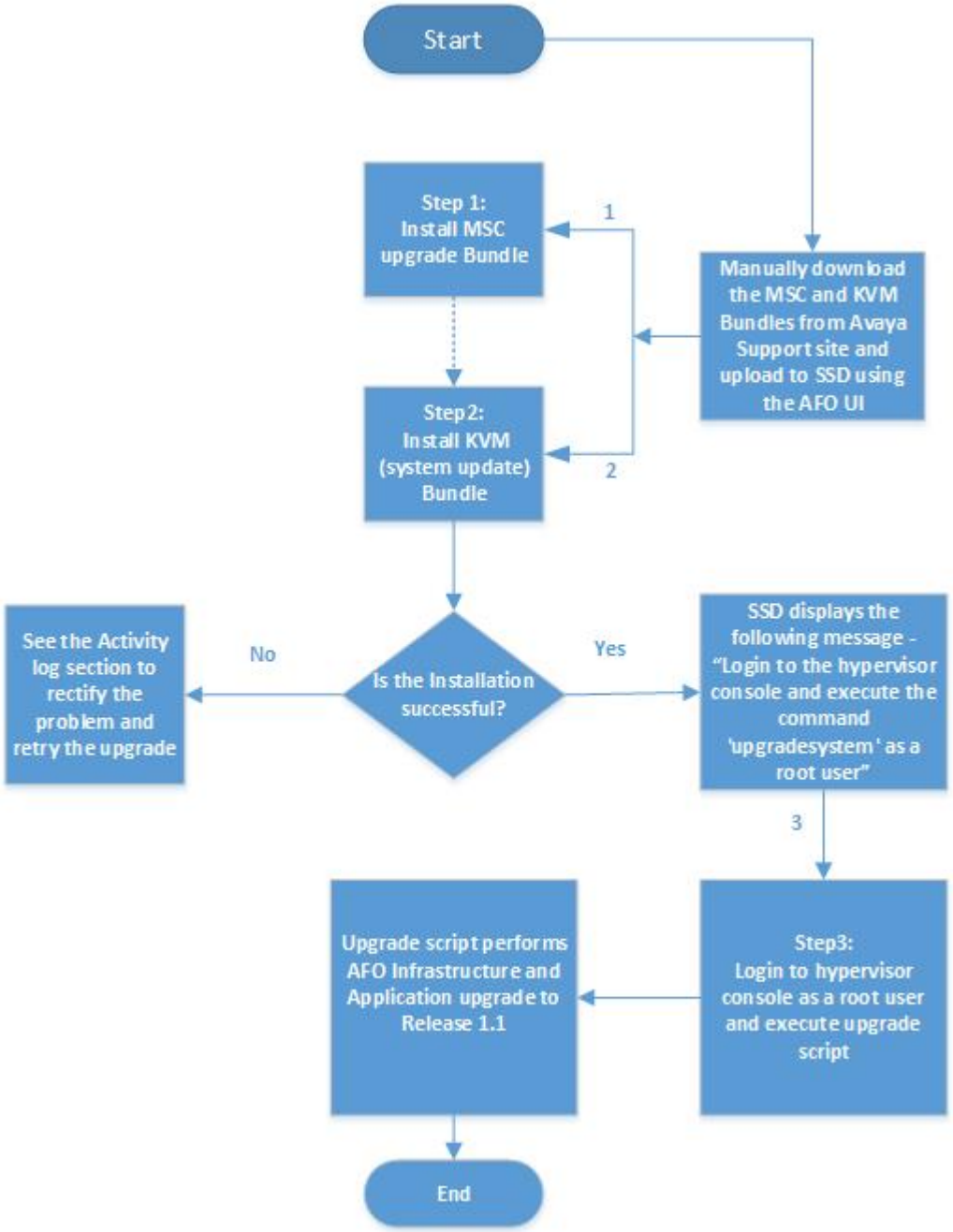


Figure 4: Avaya Fabric Orchestrator (AFO) Upgrade workflow diagram

Related links

[Upgrading Bundles using Avaya Solution Software Director (SSD)](#) on page 25
[Upgrading AFO Infrastructure to Release 1.1](#) on page 26

Upgrading Bundles using Avaya Solution Software Director (SSD)

About this task

Use the following procedure to upgrade MSC and KVM (system update) bundles from Release 1.0 to Release 1.1.

Before you begin

- Ensure that you copy and save the AFO Rel 1.0 backup and WebLM license on a remote server. For more information, see Preupgrade tasks and requirements on page 21.
- Ensure that you are logged on to AFO web user interface as an administrator.

  Note:

  SSD runs on the Management Server Console (MSC) virtual machine of the system and is only accessible for authorized users.
- Locate and download the AFO 1.0 to 1.1 software upgrade binary zip file and Compatibility Matrix from the Avaya Support site or PLDS. Unzip the file to your computer to extract the following:
  - MSC bundle
  - KVM bundle

  Tip:

  For the latest information about release specific files, see *Avaya Fabric Orchestrator Release Notes*.

Note:

For more information on software upgrade and patching using the Solution Software Director, see *Administration using Avaya Fabric Orchestrator*, NN48100–600.

Procedure

1. On the menu bar, click **Administrator** > **Solution Software director** and click **Perform Upgrade in Advanced mode** .
2. On the **Inventory** page, click **Upload Matrix** .

   The system displays the End User License Agreement window.
3. Select the license terms and click **OK** to agree the license agreement to upload files pertaining to Avaya software upgrades.
4. Browse to the Compatibility matrix file, and click **Open**, and perform **Upload** of the file downloaded earlier from the Avaya PLDS.

   The system displays a `success` and `failure` message for the file uploaded.
5. Click **Analysis** after successful completion of the upload, to perform the analysis to retrieve the latest available releases for the upgrade and select the latest **Release**.

6. On the **Upload** page, browse and select the following bundles:
   a. MSC bundle
   b. KVM bundle (System update bundle)

   and click **Upload Bundle**.
7. Click **Precheck** to perform the prerequisite check of the downloaded **MSC bundle**.

   The **Precheck** page displays the result on a per service basis as `Pass` or `Fail` along with the description.
8. On the **Precheck** page, click **Upgrade** after successful completion of the pre-check to upgrade the system.

   The system displays the following message:

   ```
   As a self-upgrade application bundle, 'common-bundle-1.0.0.x.xx-SNAPSHOT-upg-bundle' is run on msc,there will be connectivity issues to the server. Reload current application to continue upgrading remaining services.
   ```
9. After successful completion of the MSC upgrade, perform upgrade to the **KVM (System update bundle)** :
   a. Login back to AFO user interface, as an administrator and navigate to **Administrator** > **Solution Software director**.

      The system displays the following message:

      ```
      SSD performed a partial upgrade for release 1.1.0.0.xxx. Click on one of the upgrade modes to proceed with rest of the upgrade.
      ```
   b. Click **Perform Upgrade in Advanced mode** .
   c. Perform step 2 to step 5.
   d. Click **Precheck** to perform the prerequisite check of the downloaded KVM (System update bundle).
   e. Click **Upgrade**.

   After successful upgrade, the system displays the following status message:

   ```
   Login to the hypervisor console and run the command 'upgradesystem' as a root user.
   ```

Next steps

Login as a root user on the Hypervisor console (AFO server).

Related links

Upgrade Process on page 23

Upgrading AFO Infrastructure to Release 1.1

About this task

Use this procedure to upgrade AFO Infrastructure from Release 1.0 to Release 1.1.

Before you begin

- Ensure that you perform MSC and KVM (System update) bundles upgrade to Release 1.1.
- Login as a root user on the Hypervisor console (AFO server).

Note:

If you are already logged in as a root user on the iLO or Hypervisor console, you need to exit to log in back as a root user on the iLO or Hypervisor console.

Procedure

1. Run the following upgrade command on the Hypervisor console (AFO server) to perform the AFO Infrastructure and application upgrade:

   ```
   upgradesystem
   ```

   The system displays the following message:

2. Enter the AFO system administrator password.
   - The system performs AFO infrastructure and application upgrade to Release 1.1.
3. After successful upgrade to Release 1.1, the system performs the automatic restore of the backup.

   Note:

   The upgrade process takes approximately 120 minutes to complete.

Next steps

1. Copy the WebLM license from the remote server to your computer.

   Note:

   Ensure to copy the license to the same computer that you are using to access the AFO web user interface.
2. Unzip the WebLM license file.
3. Login to the AFO web user interface using the existing system administrator credentials.
4. Navigate to the **Administration** > **Licenses** page.
5. Install the WebLM license file.
6. Navigate to the **Administration** > **Appliance Device Manager** page.
7. Select the **Monitoring VM** and click the **Restart Services** button.

Note:

Discovery and Monitoring services are unavailable while the kbmd service restarts.

Related links

Upgrade Process on page 23

Chapter 8: Data migration

Overview of migration to AFO

Migration is the process of carrying over data from an older application to a newer version of Avaya Fabric Orchestrator (AFO). You can choose to migrate to AFO if you are currently using any legacy application as mentioned in the table below.

AFO enables you to migrate device credentials and other platform data such as users, roles from legacy applications.

Supported migration versions

AFO supports migration from the following legacy application versions.

Table 4: Supported migration

Applications	Version number
Configuration & Orchestration Manager (COM)	3.0.2, 3.1, 3.1.1, 3.1.2, and 3.1.3
Virtualization Provisioning Service (VPS)	1.0.2, 1.0.3, and 1.1
IP Flow Manager (IPFM)	2.0.2 and 2.1
Visualization, Fault & Performance Manager (VPFM)	3.0.3.1, 3.0.3.2, 3.0.3.3, and 3.0.4

Migration process

1. Back up the older applications (legacy cluster) data.
2. Migrate data from the older applications (legacy cluster) to AFO.

Backup methods

Backup of legacy cluster to AFO is performed using the manual backup. For more information on manual backup, see Performing manual backup on page 29.

Performing manual backup

About this task

You can perform this task manually on the following Windows or Linux based legacy clusters:

- Unified Communications Manager (UCM)
- System Manager (SMGR)

Before you begin

- Ensure that you have the `Migration_From_Legacy_To_AFO_PLUS.zip` file.

  Tip:

  Download the latest file from the Avaya support site.

- Extract and check for the following list of files in the `Migration_From_Legacy_To_AFO_PLUS.zip` file:

  - `LegacyDataCollector.pl`
  - `Migration_From_32Bit_UCM_To_SMGR-CS.zip`
    - `ucm-to-smgr-migration-linux.zip`
      - `bin - > backupDataMigration.sh, ucmcsexport.sh`
      - `lib -> ecc-module-backup.jar`
    - `ucm-to-smgr-migration-windows.zip`
      - `bin -> backupDataMigration.bat, ucmcsexport.bat`
      - lib -> ecc-module-backup.jar
    - `README.txt`

Procedure

1. Login to the legacy cluster (UCM or SMGR) using the Command Line Interface (CLI).

   Note:

   For more information on how to perform legacy applications backup, see Performing Backup for Legacy applications on page 31.

2. Run **`LegacyDataCollector.pl`** on your legacy cluster, to generate an archive of the legacy data.

   The following table lists the files that are generated on the legacy cluster:

Legacy Cluster	Files
On UCM based system	The archive of legacy cluster is available on `/opt/avaya/UCM/backups` and include the following list of files: • `JbossQuantumMigration.zip` • a *<date>_<time>*`.jar file` • `MetaData.properties file`
On SMGR based system	The archive of legacy cluster is available on `/opt/avaya/smgr/backups` and include the following list of files: • `MgmtBackup_6.3.8.tar.gz` • a *<date>_<time>*`.jar file` • `MetaData.properties file`

Note:

The properties file generated by the legacy cluster includes the legacy application details.

3. Copy the backup archives on the AFO MSC server to restore the data. For more information, see Migrating and restoring data on page 32.

Related links

Performing backup of legacy applications on page 31

Performing backup of legacy applications

About this task

Use this procedure to perform backup of the legacy applications for UCM and SMGR based legacy system.

Note:

- If the legacy application is a Windows machine, extract `ucm-to-smgr-migration-windows.zip`
- If the legacy application is a Linux machine, extract `ucm-to-smgr-migration-linux.zip`

Procedure

1. For UCM based legacy system,

   If the legacy application machine is Windows based :

   a. Login to Windows based machine.
   b. Unzip the zip files in the UCM directory.
   c. Copy the script files in the `bin directory`.
   d. Copy the jar files in the `lib directory`.
   e. On the UCM home directory, execute the command :**`LegacyDataCollector.pl`** and enter the `admin` password.

   If the legacy application machine is Linux based :

   a. Login to Linux based machine.
   b. Unzip the zip files in the UCM directory.
   c. Copy the script files in the `bin directory`.
   d. Copy the jar files in the `lib directory`.
   e. Grant permissions to execute the following commands:
      - `chmod +x ucmcsexport.sh`
      - `chmod +x backupDataMigration.sh`

f. On the UCM home directory, execute the command :**LegacyDataCollector.pl** and enter the `admin` password.

2. After successful completion of the command, following files are generated in the `UCM_HOME/backups` for the Windows based machine and `/opt/avaya/ucm/backups` for the Linux based machine:
   - `<date>_<time>.jar`
   - `JbossQuantumMigration.zip`
   - `MetaData.properties file`
3. For SMGR based legacy system,

   If the legacy application machine is Windows based :

   a. Login to Windows based machine.

   b. Copy **LegacyDataCollector.pl** to the `SMGR_HOME/bin folder`, here SMGR_Home is Product installation directory.

   c. Execute the **LegacyDataCollector.pl** command.

   If the legacy application machine is Linux based :

   a. Login to Linux based machine.

   b. Copy **LegacyDataCollector.pl** to the `SMGR_HOME/bin folder` , here SMGR_Home is `/opt/avaya/smgr` directory.
4. After successful completion of the command, following files are generated in the `/opt/avaya/smgr/backups` folder:
   - MgmtBackup_6.3.8.tar.gz
   - `<date>_<time>.jar`
   - `MetaData.properties`

Next steps

Perform migration of the legacy data on AFO Release 1.1.

Related links

Performing manual backup on page 29

Migrating and restoring data

About this task

After you back up the legacy cluster, perform this task to migrate and restore data. You can migrate the following data on the AFO cluster:

- Users

Note:

The system migrates users associated with the system administrator, UCM system administrator, UCM operator, and Network administrator.

- Device credentials

Note:

The system automatically does not restore the device credentials file from the backed up file. You need to perform a manual restore.

- Application data

Before you begin

- You must successfully complete the backup of the legacy cluster.
- Ensure that you have reset the default password on the AFO web user interface.
- Ensure that you are able to launch AFO and you have added the AFO WebLM licenses.
- Ensure that you login as a root user on the AFO Management Server Console (MSC).

Procedure

1. Create the backup directory on the AFO MSC server.
   a. Create sub-folders for the respective applications under the newly created backup directory for data migration.

```
[root@Sdn1-Server-AFO-afo ~]# cd /tmp
[root@Sdn1-Server-AFO-afo tmp]# mkdir backup
[root@Sdn1-Server-AFO-afo tmp]# cd backup/
[root@Sdn1-Server-AFO-afo backup]# mkdir com-mem
[root@Sdn1-Server-AFO-afo backup]# cd com-mem
[root@Sdn1-Server-AFO-afo com-mem]# pwd
/tmp/backup/com-mem
[root@Sdn1-Server-AFO-afo com-mem]#
```

   Example:

```
/tmp/backup/vpfm-mem
/tmp/backup/ipfm-mem
/tmp/backup/com-mem
```

   b. Copy the backup files from the legacy cluster to their respective sub-folders.

```
[root@Sdn1-Server-AFO-afo ~]# cd /tmp/backup/
[root@Sdn1-Server-AFO-afo backup]# ls
com-mem
[root@Sdn1-Server-AFO-afo backup]# cd com-mem/
[root@Sdn1-Server-AFO-afo com-mem]# ll
total 1668
-rw-r--r--. 1 admin admin 770460 Oct  6 03:55 2016-10-05_15.25.jar
-rw-r--r--. 1 admin admin    854 Oct  4 18:03 ExportedCredentials.xml
-rw-r--r--. 1 admin admin    351 Oct  6 03:55 MetaData.properties
-rw-r--r--. 1 admin admin 922657 Oct  6 03:55 MgmtBackup_6.3.8.tar.gz
[root@Sdn1-Server-AFO-afo com-mem]#
```

c. **(Optional)** Export device credentials set from the legacy cluster (UCM or SMGR) to a local XML file and copy that file to the respective sub-folder along with the archives.

Note:

You need to rename the exported device credentials XML file in the format `ExportedCredentials.xml`.

2. Login as a root user on the MSC server.
3. Run the following command:

   `/opt/avaya/smgr/dataMigration/DataMigration.sh`

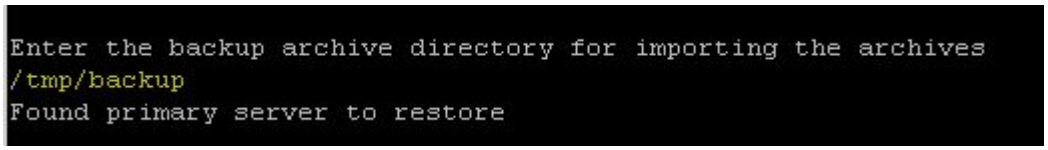
4. Enter the AFO admin password to start the restore on AFO cluster.

Note:

You can restore the cluster back to the previous stable point in case a failure occurs during data migration.

5. Enter the backup directory path (exclude sub-folders) that you have created for importing the archives.

   The system displays the list of available applications to restore in an numbered list.



6. Enter the application number of the selected application to restore the data.

   The system displays the data migration summary of the selected application.

7. Enter `Y` to restore the archives mentioned in step 6. Otherwise, enter `N` to exit data migration.

Example

The following example depicts the data migration restore process.

- Login as a root user on MSC:.

```
******************** Starting data migration into AFO cluster *****************
Enter the System manager login password:

Backup of the current AFO setup is in progress, please wait...
.............................
Backup of the current AFO setup is complete
```

- Enter the backup archive directory path to copy the archive from the legacy cluster:

```
/opt/avaya/archives
```

Sample Output:

```
Found back up data from the below primary servers, Please choose one of the below to
restore session policies and jboss data.Users and roles information will be merged
and migrated.

1: flow-vm10.sv.avaya.com
1
```

```
Found back up data from the below flow servers, Please choose one of the below for
restore.

1: flow-vm10.sv.avaya.com
1

----------------------------------------------------------------------------------
----------
```

- The sample output displays the data migration summary of the selected application:

```
----------------------------------------------------------------------------------
----------


Data Migration Summary:


Module          Archive                         Directory

PLATFORM        2015-05-14_12.14.jar            /opt/avaya/smgr/dataMigration/manual/
archives/RestoreDirectory/PRIMARY-SERVERS/Instance1

FLOW            2015-05-14_12.14.jar            /opt/avaya/smgr/dataMigration/manual/
archives/RestoreDirectory/MEMBER-SERVERS/IPFM-SERVERS/Instance1

CONFIG

MONITORING
```

Chapter 9: Getting started with AFO

Logging on to the web interface

About this task

Use this procedure to log on to the web interface for the first time.

Before you begin

Ensure that you have:

- Installed and configured the appliance.
- A computer with a supported web browser and access to the network where the appliance is installed.
- The MSC server Fully Qualified Domain Name (FQDN) details.

Note:

Make sure that the FQDN is registered on your DNS server or add an entry in the hosts file of the machine that you use to access the system.

Procedure

1. On the web browser, enter the MSC server URL `https://<Fully Qualified Domain Name>`.
2. In the **User ID** field, enter the default user name `admin`.
3. In the **Password** field, enter the default password `admin123`.
4. Click **Log On**.

   The system validates the user name and password with the user account. Depending on the validity, the system displays one of the following screens:

   - If the user name and password match, the system displays the web interface with the system `<version_number>`. The web interface displays the menu bar. The menu bar provides access to shared services to perform various operations that the system supports. The tasks that you can perform depend on your user role.
   - If the user name and password does not match, the system displays an error message and prompts you to re-enter the user name and password.

Next steps

- Change the default password.

Note:

You must change the password when you log on to the system using the default password for the first time.

The password must contain a combination of alphanumeric and special characters.

Changing the password

About this task

Use this procedure to change the default password for the web interface.

Important:

You must change the password when you log on to the system using the default password for the first time.

Before you begin

Ensure that you have:

- Installed and configured the appliance.
- A computer with a supported Internet Explorer, Firefox, or Safari web browser, and access to the network where the appliance is installed.
- The MSC server Fully Qualified Domain Name (FQDN) details.

Procedure

1. On the web browser, enter the MSC server URL `https://<Fully Qualified Domain Name>`.
2. On the login page, click **Change Password**.

   The Password change page is displayed.
3. In the **User ID** field, enter the user name.
4. In the **Current password** field, enter the current password.
5. In the **New password** field, enter the new password.
6. In the **Confirm new password** field, re-enter the new password.
7. Click **Save** to change the password.

Next steps

Install the system certificates.

Installing AFO certificates

About this task

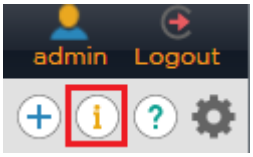
Perform this procedure to install AFO certificates using the web interface.

Before you begin

Ensure that you are logged into the AFO web interface, using any one of the following supported browser:

- Internet Explorer, version 11
- Mozilla Firefox, versions 47, 48
- Safari, versions MacOS v10.8 Mountain Lion and later

Procedure

1. From the menu bar, click the 

icon from the quick access toolbar.

   The system displays the About Avaya Fabric Orchestrator pop-up window.

Figure 5: About Avaya Fabric Orchestrator window

2. Click **Install AFO Certificates** .

The system displays the Install AFO Certificates page.

- The following image shows a sample of the Install AFO Certificates page on an IE browser:

Note:

For IE browser, you must select the **Trusted Root Certification Authorities** store to install the certificate.

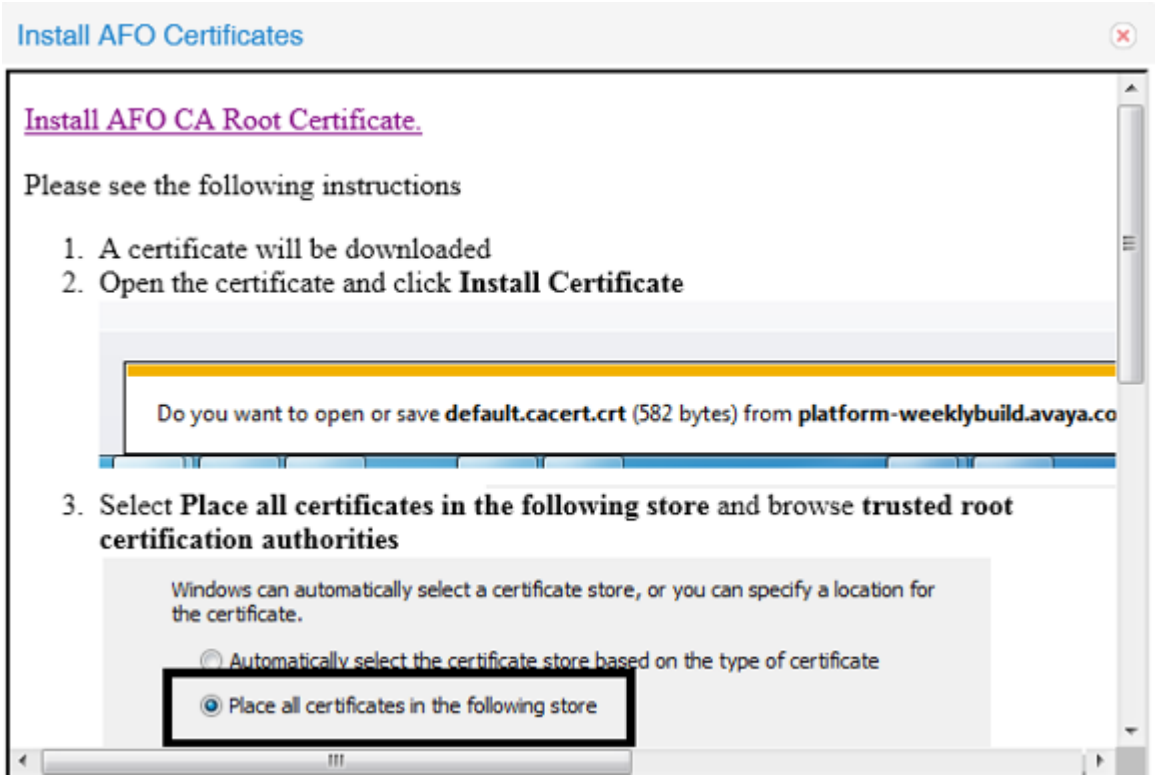


Figure 6: Sample IE browser : Install AFO Certificates

- The following image shows a sample of the Install AFO Certificates page on a Mozilla Firefox browser:

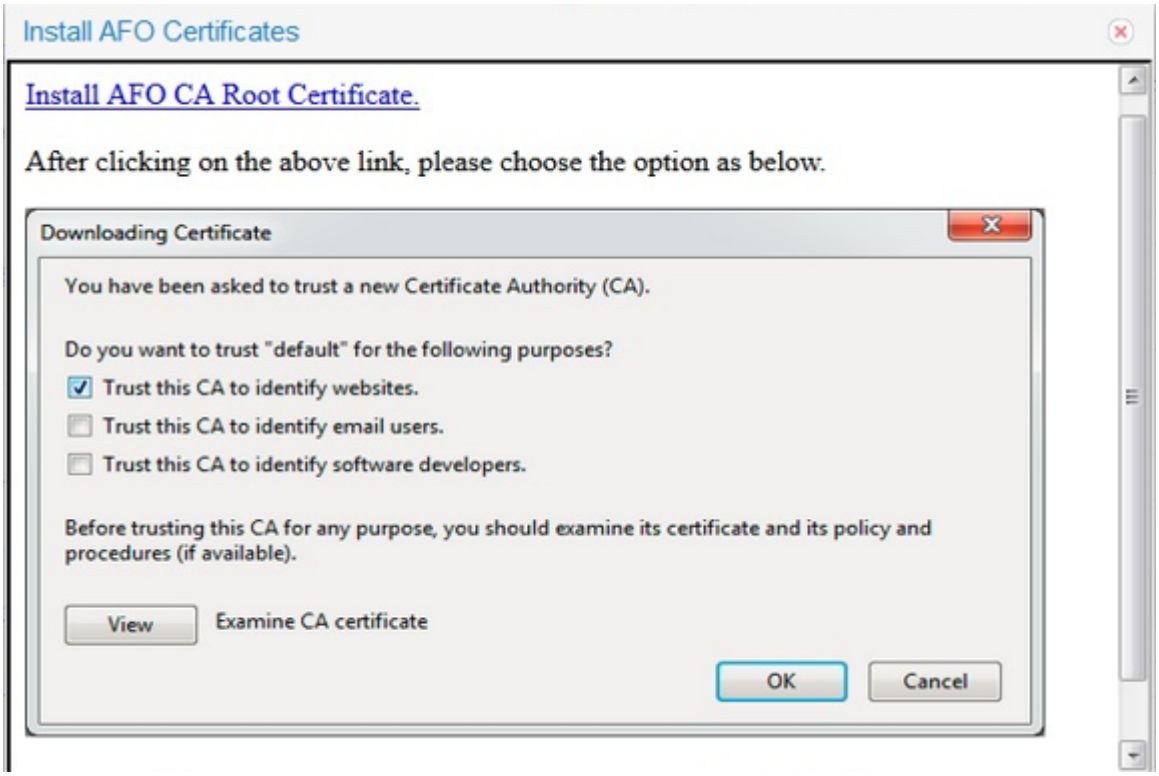


Figure 7: Sample Mozilla Firefox browser: Install AFO Certificates

3. Click **Install AFO CA Root Certificate** and follow the instructions as given on your screen to install the certificate.
4. **Refresh** the web page to view the updated information.

Network Discovery

You must configure Network Discovery to run network auto-discoveries. A discovery is a snapshot taken of a part or a complete network. Select **Network** > **Discovery** to access the Network Discovery options.

You must complete the following steps after you log on to the system for the first time, and before you can browse your network.

- Configure device credentials using the Device and Server Credentials Editor available from **Administration** > **Credentials**.
- Select the Default discovery domain, or add a new discovery domain.
- Configure the discovery options for the discovery domain.
- Discover the domain.

Important:

A device must have SNMP credentials and be able to respond to SNMP for the system to add the device to the Device and Service Credentials Editor. If a device changes from Unmanaged to Managed by either adding credentials for the device or by enabling SNMP on the device after the discovery is completed, you must run rediscovery on the domain, or create a new domain to discovery the device.

On the Network Discovery page, you can work with discovery domains, configure discovery options, perform discoveries, and view discovery status.

Default discovery options

The system ships with a default domain. You cannot remove the domain or tab from Monitoring, but you can delete the content, seeds, and discovery data from this domain, and refine a new seed, and then run discovery. To access the options, go to **Network** > **Discovery**, and go to the options on the bottom left. The **Configuration** tab uses the domain information for network elements.

By default, the discovery has the following options:

- Wide Area Network (WAN) Crawl (not selected)—Monitoring discovers devices on the far side of every router interface, regardless of the interface type. If the WAN Crawl option is not selected then Monitoring Discovery does not go beyond any interface that is considered to be a WAN interface. You need an Advanced license to access the Wide Area Network (WAN) Crawl option.
- VPN Crawl (not selected)—Monitoring discovers VPN clients even if this option is not selected. If this option is checked, then the discovery algorithm augments the discovered data with the information from vendor-specific VPN Tables. You need an Advanced license to access the VPN Crawl option.
- DNS Lookup (not selected)—Monitoring performs DNS lookup on all devices.
- Service by Port Scan (not selected)—Monitoring discovery scans for well known service ports on servers. The option looks for services running on a server at the time of discovery. You need an Advanced license to access the Service by Port Scan option.
- For All Devices (not selected)—Monitoring performs a service by PortScan for all devices. You need an Advanced license to access the For All Devices option.
- Avaya Only Discovery (selected)—Monitoring ignores any devices that are not on the approved Avaya list.
- Storage Discovery (not selected)—Monitoring discovers file systems based on Linux log-in and scan of file systems on a server.

The options above exist at the bottom left of the screen for **Network** > **Discovery**.

Chapter 10: Resources

Support

Go to the Avaya Support website at http://support.avaya.com for the most up-to-date documentation, product notices, and knowledge articles. You can also search for release notes, downloads, and resolutions to issues. Use the online service request system to create a service request. Chat with live agents to get answers to questions, or request an agent to connect you to a support team if an issue requires additional expertise.

Training

Ongoing product training is available. For more information or to register, you can access the Web site at http://avaya-learning.com/.

Viewing Avaya Mentor videos

Avaya Mentor videos provide technical content on how to install, configure, and troubleshoot Avaya products.

About this task

Videos are available on the Avaya Support website, listed under the video document type, and on the Avaya-run channel on YouTube.

Procedure

- To find videos on the Avaya Support website, go to http://support.avaya.com and perform one of the following actions:
  - In **Search**, type `Avaya Mentor Videos` to see a list of the available videos.
  - In **Search**, type the product name. On the Search Results page, select **Video** in the **Content Type** column on the left.

- To find the Avaya Mentor videos on YouTube, go to www.youtube.com/AvayaMentor and perform one of the following actions:
  - Enter a key word or key words in the **Search Channel** to search for a specific product or topic.
  - Scroll down Playlists, and click the name of a topic to see the available list of videos posted on the website.

Note:

Videos are not available for all products.

Documentation

The following table lists the documents related to this product. Download the documents from the Avaya Support website at http://support.avaya.com.

Document title	Use this document for:	Audience
Avaya Network Management Solution Description, NN48100–100	Description of each verified reference configuration.	System administrator
Deploying Avaya Fabric Orchestrator, NN48100–101	Installing, configuring, initial administration, and basic maintenance checklist and procedures.	System administrator
Getting Started and Locating the latest software and Release Notes for Avaya Fabric Orchestrator, NN48100–102	Locating the latest software and product release notes.	System administrator
Network Monitoring using Avaya Fabric Orchestrator, NN48100–500	Monitoring the managed objects.	System administrator
Network Configuration using Avaya Fabric Orchestrator, NN48100–501	Configuring and managing Avaya Enterprise family of devices from discovered network.	System administrator
Bulk Device Configuration Management using Avaya Fabric Orchestrator, NN48100–502	Performing a variety of management tasks across multiple device types using a web-based interface.	System administrator
Virtualization Configuration using Avaya Fabric Orchestrator, NN48100–503	Connecting the vCenter server to the system, to help the data center administrator to configure the network changes that apply to the data center.	System administrator

Table continues…

Document title	Use this document for:	Audience
IP Flow Configuration using Avaya Fabric Orchestrator, NN48100–504	Collecting and analyzing IP flows from IPFIX-, NetFlow v5-, and NetFlow v9- enabled devices.	System administrator
Administration using Avaya Fabric Orchestrator, NN48100–600	System administration procedures.	System administrator
Avaya Network Management Traps and Trends Reference, NN48100–700	Viewing a list of supported traps and trends.	System administrator
Avaya Network Management Supported Devices, Device MIBs, and Legacy Devices Reference, NN48100–701	Confirming support for devices and MIBs.	System administrator
Troubleshooting Avaya Fabric Orchestrator, NN48100–702	Troubleshooting information for the system.	System administrator

Searching a documentation collection

On the Avaya Support website, you can download the documentation library for a specific product and software release to perform searches across an entire document collection. For example, you can perform a single, simultaneous search across the collection to quickly find all occurrences of a particular feature. Use this procedure to perform an index search of your documentation collection.

Before you begin

- Download the documentation collection zip file to your local computer.
- You must have Adobe Acrobat or Adobe Reader installed on your computer.

Procedure

1. Extract the document collection zip file into a folder.
2. Navigate to the folder that contains the extracted files and open the file named <*product_name_release*>.pdx.
3. In the Search dialog box, select the option **In the index named <*product_name_release*>.pdx**.
4. Enter a search word or phrase.
5. Select any of the following to narrow your search:
   - Whole Words Only
   - Case-Sensitive
   - Include Bookmarks
   - Include Comments
6. Click **Search**.

The search results show the number of documents and instances found. You can sort the search results by Relevance Ranking, Date Modified, Filename, or Location. The default is Relevance Ranking.

Subscribing to e-notifications

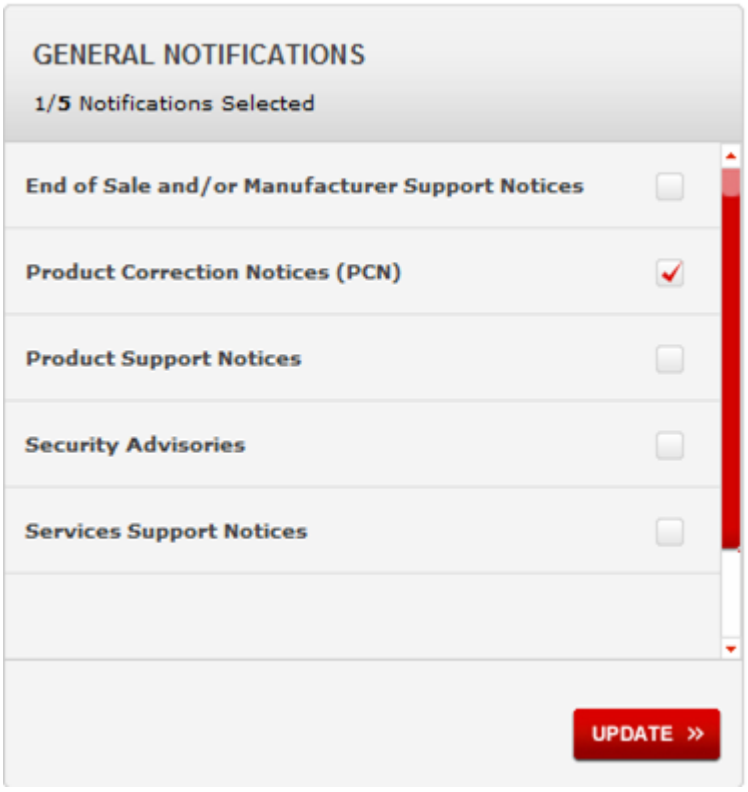
Subscribe to e-notifications to receive an email notification when documents are added to or changed on the Avaya Support website.

About this task

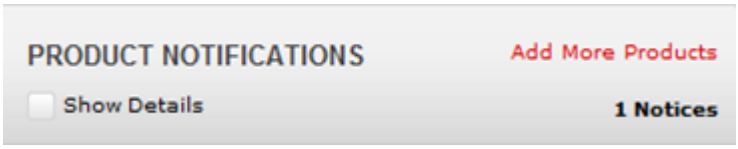
You can subscribe to different types of general notifications, for example, Product Correction Notices (PCN), which apply to any product or a specific product. You can also subscribe to specific types of documentation for a specific product, for example, Application & Technical Notes for Virtual Services Platform 7000.

Procedure

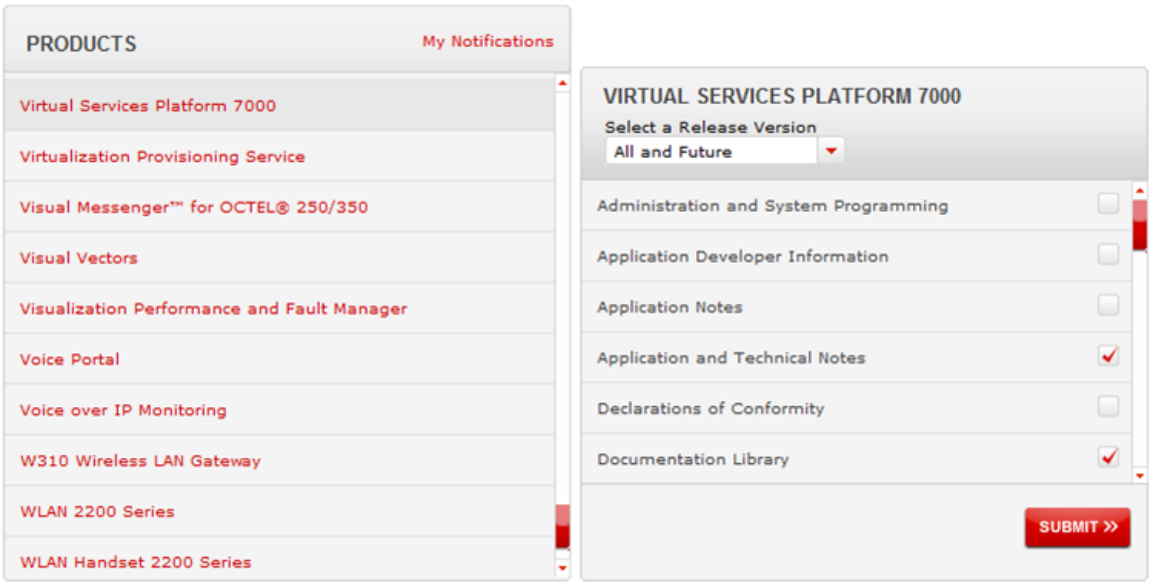
1. In an Internet browser, go to https://support.avaya.com.
2. Type your username and password, and then click **Login**.
3. Under **My Information**, select **SSO login Profile**.
4. Click **E-NOTIFICATIONS**.
5. In the GENERAL NOTIFICATIONS area, select the required documentation types, and then click **UPDATE**.



6. Click **OK**.
7. In the PRODUCT NOTIFICATIONS area, click **Add More Products**.



8. Scroll through the list, and then select the product name.
9. Select a release version.
10. Select the check box next to the required documentation types.



11. Click **Submit**.

Appendix A: IP addresses and ranges reference

This section provides details about the valid IP addresses and IP ranges used for device credentials.

Note:

The current release of AFO supports IPv4 only. IPv6 is not supported.

Valid IP addresses and ranges

- IPv4 addresses must be in the same subnet range. IP addresses must be in the following format

  `A.B.C.x-A.B.C.y (e.g, 192.168.100.21-192.168.100.30)`

- Multiple IP Addresses must be separated by a comma (,). For example, the following are valid IPv4 addresses:

  `[192.168.100.21-192.168.100.30] or [192.168.100.21-192.168.100.23, 192.168.100.223])`

Invalid IP addresses and ranges

Do not use the following IP addresses, the following IP addresses are used for integration.

- IP range 10.10.10.1 to 10.10.10.11
- IP range 10.10.11.1 and 10.10.11.9

Appendix B: AFO server specifications

The following table lists the AFO server specifications.

Table 5: AFO server specifications

Quantity	Description
1	HP DL360 Gen9 4LFF CTO Server
1	755259-B21 HP DL360 Gen9 4LFF CTO Server
1	Opt. ABA U.S. - English localization
1	755394-L21 HP DL360 Gen9 E5-2680v3 FIO Kit
8	726719-B21 HP 16GB 2Rx4 PC4-2133P-R Kit
4	765424-B21 HP 600GB 12G SAS 15K 3.5in ENT SCC HDD
1	726536-B21 HP 9.5mm SATA DVD-ROM Jb Gen9 Kit
1	766211-B21 HP DL360 Gen9 LFF P440ar/H240ar SAS Cbl
1	749974-B21 HP Smart Array P440ar/2G FIO Controller
1	663202-B21 HP 1U LFF Ball Bearing Rail Kit
2	720478-B21 HP 500W FS Plat Ht Plg Pwr Supply Kit
1	663203-B21 HP 1U CMA for Ball Bearing Rail Kit
1	339779-B21 HP Raid 5 Drive 1 FIO Setting
1	H4396B HP No Additional Support Required
1	TA850AAE HP iLO Adv E-LTU inc 1yr TS&SW

Appendix C: Compatibility matrix for AFO 1.1

The following table lists the compatibility matrix for Avaya Fabric Orchestrator (AFO) 1.0.

The following table lists the compatibility matrix for COM Plus and VPFM Plus 1.0.

Compatibility Matrix — Supported devices

Note:

For a complete list of supported devices, see *Avaya Network Management Supported Devices, Device MIBs, and Legacy Devices Reference*, NN48100–701.

Table 6: Supported devices in COM Plus and VPFM Plus release 1.0

Device	Software releases
APLS (Private Label Switch)	4.3.1
Avaya Aura	7.0.1
Belden	6.0.2
Ethernet Routing Switch 1600	2.1.5.x, 2.1.6.x
Ethernet Routing Switch 2500	4.1.x, 4.2, 4.3, 4.4
Ethernet Routing Switch 3500	5.0, 5.0.1, 5.0.2, 5.1, 5.1.1, 5.1.3, 5.2, 5.2.3, 5.3, 5.3.1, 5.3.2
Ethernet Routing Switch 4500	5.2 , 5.3, 5.4, 5.5, 5.6, 5.6.1, 5.6.2, 5.7, 5.7.2, 5.7.3
Ethernet Routing Switch 4800	5.2 , 5.3, 5.4, 5.5, 5.6, 5.6.1, 5.6.2, 5.7, 5.7.2, 5.7.3, 5.8, 5.8.2, 5.8.3, 5.9, 5.9.2
Ethernet Routing Switch 4900	7.1, 7.2
Ethernet Routing Switch 5500	5.1, 6.0, 6.1, 6.2, 6.3, 6.6, 6.3.4, 6.3.5, 6.3.6, 6.6.1, 6.6.2, 6.6.3
Ethernet Routing Switch 5600	5.1, 6.0, 6.1, 6.2, 6.3, 6.6, 6.3.4, 6.3.5, 6.3.6, 6.6.1, 6.6.2, 6.6.3
Ethernet Routing Switch 5900	7.0, 7.0.1, 7.1, 7.2
Ethernet Routing Switch 8600 & 8800 including the following hardware: 8681XLW module, 8681XLR module, 8616GTE module, 8672ATME MDA, 8608GBM module, 8608GTMmodule, 8632TXM	4.0, 4.1, 5.0, 5.1, 7.0, 7.1, 7.1.3, 7.1.5, 7.2, 7.2.10, 7.2.13, 7.2.14.x, 7.2.15

Table continues…

Device	Software releases
module, 8648TXM module, 8672ATMMmodule, 8683POSM module.	
Virtual Services Platform 4000	3.0, 3.0.1, 3.1, 4.0, 4.0.40, 4.0.50, 4.1, 4.2, 4.2.1, 4.2.2, 4.2.3, 5.0, 5.1, 5.1.1
Virtual Services Platform 7000 (70XX)	10.1, 10.2, 10.2.1, 10.3, 10.3.1, 10.3.2, 10.3.3, 10.4
Virtual Services Platform 7200	4.2.1, 4.2.2, 4.2.3, 5.0, 5.1, 5.1.1
Virtual Services Platform 8000	4.0, 4.0.1.1, 4.1, 4.2, 4.2.1, 4.2.2, 4.2.3, 5.0, 5.1, 5.1.1
Virtual Services Platform 9000	3.0, 3.1, 3.2, 3.3, 3.4, 3.4.5.0, 4.0.1, 4.1, 4.1.1
WLAN	23xx, AP 23xx
WLAN WC8100, AP8120	1.0, 1.1, 1.2

Appendix D: Performing Backup for Release 1.0

About this task

Use the following procedure to perform backup of the previous AFO release (Release 1.0).

Before you begin

- Ensure that you are logged on to the MSC server.
- Enter `root username` and `password`.

Procedure

1. Login as a root user on the MSC server.
2. Run the backup command:

   ```
   /opt/avaya/smgr/backuprestore/backupRestoreAFO.sh --backup
   ```

3. Enter password for the archive.
4. System validates the AFO cluster for backup procedure.
   - If validation is successful go to step 5.
   - Else, see the error message and rectify and go to step 1.
5. The system proceeds with a backup of AFO when the validation is successful.
6. The system displays the status of the backup and creates an archive at:`/opt/avaya/afo/shared/commonstorage/backups/`, if the status is `Successful`.

   Archive does not include backup of any add-ons deployed on the AFO cluster.

   Note:

   Refer to the log file located at `/opt/avaya/smgr/log/AFOBackupRestore.log` for more details if the system `Failed` to take backup.