Install Unified Manager on VMware vSphere systems

Active IQ Unified Manager 9.8

NetApp
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Introduction to Active IQ Unified Manager

Active IQ Unified Manager (formerly OnCommand Unified Manager) enables you to monitor and manage the health and performance of your ONTAP storage systems from a single interface. You can deploy Unified Manager on a Linux server, on a Windows server, or as a virtual appliance on a VMware host.

After you have completed the installation and have added the clusters that you want to manage, Unified Manager provides a graphical interface that displays the capacity, availability, protection, and performance status of the monitored storage systems.

Related information

NetApp Interoperability Matrix Tool

What the Unified Manager server does

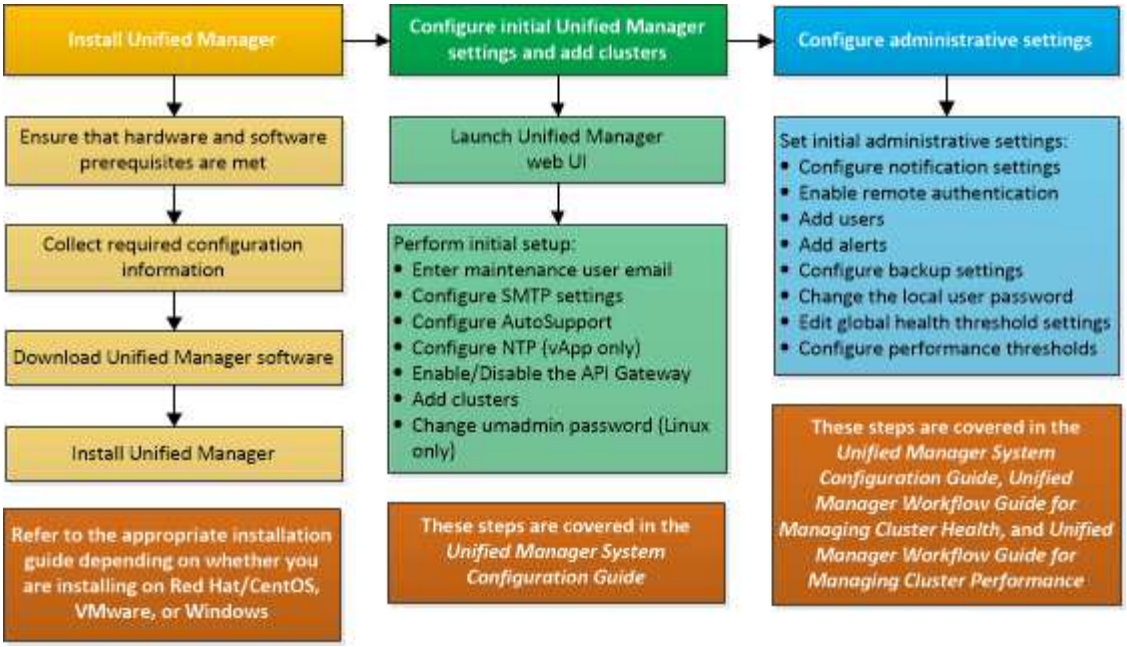
The Unified Manager server infrastructure consists of a data collection unit, a database, and an application server. It provides infrastructure services such as discovery, monitoring, role-based access control (RBAC), auditing, and logging.

Unified Manager collects cluster information, stores the data in the database, and analyzes the data to see if there are any cluster issues.

Overview of the installation sequence

The installation workflow describes the tasks that you must perform before you can use Unified Manager.

The chapters of this installation guide describe each of the items shown in the workflow below.



Requirements for installing Unified Manager

Before you begin the installation process, ensure that the server on which you want to install Unified Manager meets the specific software, hardware, CPU, and memory requirements.

NetApp does not support any modification of the Unified Manager application code. If you need to apply any security measures to the Unified Manager server, you should make those changes to the operating system on which Unified Manager is installed.

For more details about applying security measures to the Unified Manager server, see the Knowledge Base article.

Supportability for Security Measures applied to Active IQ Unified Manager for Clustered Data ONTAP

Related information

NetApp Interoperability Matrix Tool

Virtual infrastructure and hardware system requirements

Installing Unified Manager on virtual infrastructure or a physical system should meet the minimum requirements for memory, CPU, and disk space.

The following table displays the values that are recommended for memory, CPU, and disk space resources. These values have been qualified so that Unified Manager meets acceptable performance levels.

Hardware configuration	Recommended settings
RAM	12 GB (minimum requirement 8 GB)
Processors	4 CPUs

Hardware configuration	Recommended settings
CPU cycle capacity	9572 MHz total (minimum requirement 9572 MHz)
Free disk space	• 5 GB (thin provisioned) • 152 GB (thick provisioned)

Unified Manager can be installed on systems with a small amount of memory, but the recommended 12 GB of RAM ensures that enough memory is available for optimal performance, and so that the system can accommodate additional clusters and storage objects as your configuration grows. You should not set any memory limits on the VM where Unified Manager is deployed, and should not enable any features (for example, ballooning) that hinder the software from utilizing the allocated memory on the system.

Additionally, there is a limit to the number of nodes that a single instance of Unified Manager can monitor before you install a second instance of Unified Manager. For more information, see the *Best Practices Guide*.

Technical Report 4621: Unified Manager Best Practices Guide

Memory-page swapping negatively impacts the performance of the system and the management application. Competing for CPU resources that are unavailable because of overall host utilization can degrade performance.

Requirement for dedicated use

The physical or virtual system on which you install Unified Manager should be used exclusively for Unified Manager and should not be shared with other applications. Other applications might consume system resources and can drastically reduce the performance of Unified Manager.

Space requirements for backups

If you plan to use the Unified Manager backup and restore feature, allocate additional capacity so that the “data” directory or disk has 150 GB of space. A backup can be written to a local destination or to a remote destination. The best practice is to identify a remote location that is external to the Unified Manager host system that has a minimum of 150 GB of space.

Requirements for host connectivity

The physical system or virtual system on which you install Unified Manager should be configured in such a way that you can successfully `ping` the host name from the host itself. In case of IPv6 configuration, you should verify that `ping6` to the host name is successful to ensure that the Unified Manager installation succeeds.

You can use the host name (or the host IP address) to access the product web UI. If you configured a static IP address for your network during deployment, then you designated a name for the network host. If you configured the network using DHCP, you should obtain the host name from the DNS.

If you plan to allow users to access Unified Manager by using the short name instead of using the fully qualified domain name (FQDN) or IP address, then your network configuration has to resolve this short name to a valid FQDN.

VMware software and installation requirements

The VMware vSphere system on which you install Unified Manager requires specific

versions of the operating system and supporting software.

Operating system software

The following versions of VMware ESXi are supported:

- ESXi 6.5, 6.7, and 7.0.

> For information about the versions of the virtual machine hardware that these versions of ESXi servers can support, refer to the VMware documentation.

The following versions of vSphere are supported:

- VMware vCenter Server 6.5, 6.7, and 7.0.

See the Interoperability Matrix for the complete and most current list of supported ESXi versions.

mysupport.netapp.com/matrix

The VMware ESXi server time should be the same as the NTP server time for the virtual appliance to function correctly. Synchronizing the VMware ESXi server time with the NTP server time prevents a time failure.

Installation requirements

VMware High Availability for the Unified Manager virtual appliance is supported.

If you deploy an NFS datastore on a storage system that is running ONTAP software, use the NetApp NFS Plug-in for VMware VAAI to use thick provisioning.

If deployment fails using your High Availability-enabled environment because of insufficient resources, you might need to modify the Cluster Features Virtual Machine Options by disabling the VM Restart Priority, and leaving the Host Isolation Response powered on.

Supported browsers

To access the Unified Manager web UI, use a supported browser.

The Interoperability Matrix has the list of supported browser versions.

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For all browsers, disabling pop-up blockers ensures that software features are displayed properly.

If you plan to configure Unified Manager for SAML authentication, so that an identity provider (IdP) can authenticate users, you should check the list of browsers supported by the IdP as well.

Protocol and port requirements

The required ports and protocols enable communication between the Unified Manager server and the managed storage systems, servers, and other components.

Connections to the Unified Manager server

In typical installations you do not have to specify port numbers when connecting to the Unified Manager web UI, because default ports are always used. For example, because Unified Manager always attempts to run on its default port, you can enter `https://<host>` instead of `https://<host>:443`.

The Unified Manager server uses specific protocols to access the following interfaces:

Interface	Protocol	Port	Description
Unified Manager web UI	HTTP	80	Used to access the Unified Manager web UI; automatically redirects to the secure port 443.
Unified Manager web UI and programs using APIs	HTTPS	443	Used to securely access the Unified Manager web UI or to make API calls; API calls can only be made using HTTPS.
Maintenance console	SSH/SFTP	22	Used to access the maintenance console and retrieve support bundles.
Linux command line	SSH/SFTP	22	Used to access the Red Hat Enterprise Linux or CentOS command line and retrieve support bundles.
Syslog	UDP	514	Used to access subscription-based EMS messages from ONTAP systems and to create events based on the messages.
REST	HTTPS	9443	Used to access realtime REST API-based EMS events from authenticated ONTAP systems.

The ports used for HTTP and HTTPS communication (ports 80 and 443) can be changed using the Unified Manager maintenance console. For more information, see Configuring Active IQ Unified Manager.

Configuring Active IQ Unified Manager

Connections from the Unified Manager server

You should configure your firewall to open ports that enable communication between the Unified Manager server and managed storage systems, servers, and other components. If a port is not open, communication fails.

Depending on your environment, you can choose to modify the ports and protocols used by the Unified Manager server to connect to specific destinations.

The Unified Manager server connects using the following protocols and ports to the managed storage systems, servers, and other components:

Destination	Protocol	Port	Description
Storage system	HTTPS	443/TCP	Used to monitor and manage storage systems.
Storage system	NDMP	10000/TCP	Used for certain Snapshot restore operations.
AutoSupport server	HTTPS	443	Used to send AutoSupport information. Requires Internet access to perform this function.
Authentication server	LDAP	389	Used to make authentication requests, and user and group lookup requests.
LDAPS	636	Used for secure LDAP communication.	Mail server
SMTP	25	Used to send alert notification emails.	SNMP trap sender
SNMPv1 or SNMPv3	162/UDP	Used to send alert notification SNMP traps.	External data provider server
TCP	2003	Used to send performance data to an external data provider, such as Graphite.	NTP server

Completing the worksheet

Before you install and configure Unified Manager, you should have specific information about your environment readily available. You can record the information in the worksheet.

Unified Manager installation information

The details required to install Unified Manager.

System on which software is deployed	Your value
ESXi server IP address	
Host fully qualified domain name	
Host IP address	
Network mask	
Gateway IP address	
Primary DNS address	
Secondary DNS address	
Search domains	
Maintenance user name	
Maintenance user password	

Unified Manager configuration information

The details to configure Unified Manager after installation. Some values are optional depending on your configuration.

Setting	Your value
Maintenance user email address	
NTP server	
SMTP server host name or IP address	
SMTP user name	
SMTP password	
SMTP port	25 (Default value)
Email from which alert notifications are sent	

Setting	Your value
Authentication server host name or IP address	
Active Directory administrator name or LDAP bind distinguished name	
Active Directory password or LDAP bind password	
Authentication server base distinguished name	
Identity provider (IdP) URL	
Identity provider (IdP) metadata	
SNMP trap destination host IP addresses	
SNMP port	

Cluster information

The details for the storage systems that you manage using Unified Manager.

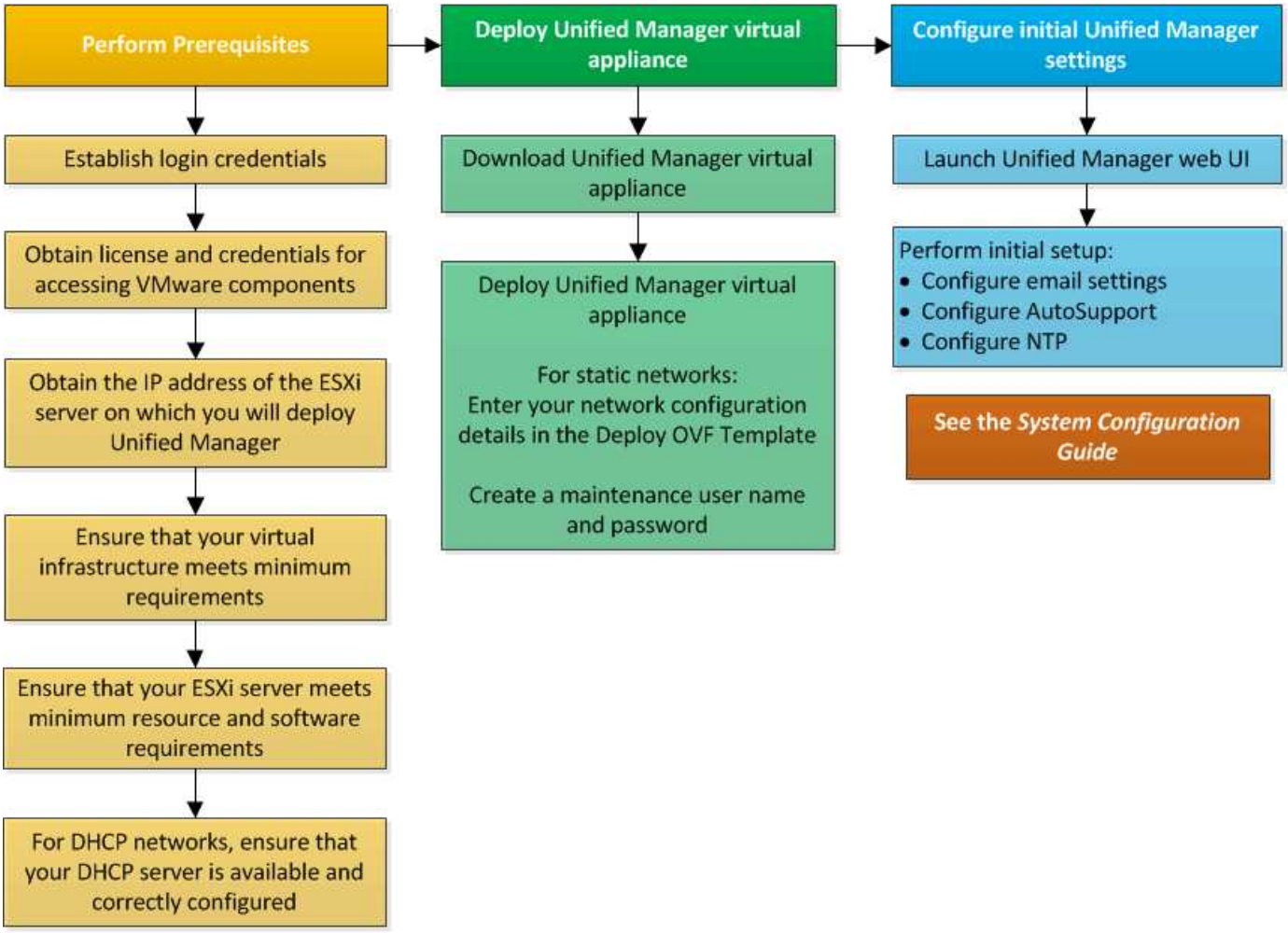
Cluster 1 of N	Your value
Host name or cluster-management IP address	
ONTAP administrator user name The administrator must have been assigned the “admin” role.	
ONTAP administrator password	
Protocol	HTTPS

Installing, upgrading, and removing Unified Manager software

On VMware vSphere systems, you can install Unified Manager software, upgrade to a newer version of software, or remove the Unified Manager virtual appliance.

Overview of the deployment process

The deployment workflow describes the tasks that you must perform before you can use Unified Manager.



Deploying Unified Manager

Deploying Unified Manager includes downloading software, deploying the virtual appliance, creating a maintenance user name and password, and performing the initial setup in the web UI.

Before you begin

- You should verify and complete the system requirements for deployment.

  System requirements

- Ensure that you have the following information:
  - Login credentials for the NetApp Support Site
  - Credentials for accessing the VMware vCenter Server and vSphere Web Client
  - IP address of the ESXi server on which you are deploying the Unified Manager virtual appliance
  - Details about the data center, such as storage space in the datastore and memory requirements
  - IPv6 should be enabled on the host if you are planning to use IPv6 addressing.

About this task

You can deploy Unified Manager as a virtual appliance on a VMware ESXi server.

You should access the maintenance console by using the VMware console, and not by using SSH.

> Starting with Unified Manager 9.8, VMware Tools has been replaced with Open VM Tools (`open-vm-tools`). You no longer have to install VMware Tools as part of the installation because `open-vm-tools` is included with the Unified Manager installation package.

After you finish

After finishing the deployment and initial setup, you can either add clusters, or configure additional network settings in the maintenance console, and then access the web UI.

Downloading the Unified Manager installation file

Download the Unified Manager installation file from the NetApp Support Site to deploy Unified Manager as a virtual appliance.

Before you begin

You should have the login credentials for the NetApp Support Site.

About this task

The installation file is an `OVA` file that contains the Unified Manager software configured in a virtual appliance.

Steps

1. Log in to the NetApp Support Site, and navigate to the **Download** page for Unified Manager: NetApp Support Site
2. Select the required version of Unified Manager and accept the end-users license agreement (EULA).
3. Download and save the `OVA` file for VMware VSphere installation to a local directory or network directory that is accessible to your vSphere Client.
4. Verify the checksum to ensure that the software downloaded correctly.

Deploying the Unified Manager virtual appliance

After downloading the installation file, you deploy Unified Manager as a virtual appliance. Use the vSphere Web Client to deploy the virtual appliance on an ESXi server. When you deploy the virtual appliance, a virtual machine is created.

Before you begin

You should review the system requirements. make the necessary changes before deploying the Unified Manager virtual appliance.

Virtual infrastructure requirements

VMware software and installation requirements

If you use Dynamic Host Configuration Protocol (DHCP), ensure that the DHCP server is available, and that the DHCP and virtual machine (VM) network adapter configurations are correct. DHCP is configured by default.

If you use a static networking configuration, ensure that the IP address is not duplicated in the same subnet, and that the appropriate DNS server entries have been configured.

Obtain the following information before deploying the virtual appliance:

- Credentials for accessing the VMware vCenter Server and vSphere Web Client
- IP address of the ESXi server on which you are deploying the Unified Manager virtual appliance
- Details about the data center, such as availability of storage space
- If you are not using DHCP, obtain the IPv4 or IPv6 addresses for the networking devices to which you are planning to connect:
  - Fully qualified domain name (FQDN) of the host
  - IP address of the host
  - Network mask
  - IP address of the default gateway
  - Primary and secondary DNS addresses
  - Search domains

About this task

Starting with Unified Manager 9.8, VMware Tools has been replaced with Open VM Tools (`open-vm-tools`). You do not have to install VMware Tools as part of the installation process because `open-vm-tools` is included with the Unified Manager installation package.

When the virtual appliance is deployed, a unique self-signed certificate for HTTPS access is generated. When accessing the Unified Manager web UI, you might see a browser warning about untrusted certificates.

VMware High Availability for the Unified Manager virtual appliance is supported.

Steps

1. In the vSphere Client, click **File** > **Deploy OVF Template**.
2. Complete the **Deploy OVF Template** wizard to deploy the Unified Manager virtual appliance.

   On the Networking Configuration page:

   - Leave all the fields blank when using DHCP and IPv4 addressing.
   - Check the “Enable Auto IPv6 addressing” box, and leave all the other fields blank when using DHCP and IPv6 addressing.
   - If you want to use a static network configuration, you can complete the fields on this page and these settings are applied during deployment. Ensure that the IP address is unique to the host on which it is deployed, that it is not already in use, and that it has a valid DNS entry.
3. After the Unified Manager virtual appliance is deployed to the ESXi server, power on the VM by right-clicking the VM, and then selecting **Power On**.

If the Power On operation fails because of insufficient resources, add resources and then retry the installation.

4. Click the **Console** tab.

   The initial boot process takes a few minutes to complete.

5. To configure your time zone, enter your geographic area and your city or region as prompted in the VM **Console** window.

   All the date information that is displayed uses the time zone that is configured for Unified Manager, regardless of the time zone setting on your managed devices. If your storage systems and the management server are configured with the same NTP server, they refer to the same instant in time, even if they appear differently. For example, if you create a Snapshot copy using a device that is configured using a different time zone than that of the management server, the time stamp is the management server time.

6. If no DHCP services are available, or if there is an error in the details for the static network configuration, select one of the following options:

If you use…	Then do this…
DHCP	Select **Retry DHCP**. If you plan to use DHCP, you should ensure that it is configured correctly. If you use a DHCP-enabled network, the FQDN and DNS server entries are given to the virtual appliance automatically. If DHCP is not properly configured with DNS, the host name “UnifiedManager” is automatically assigned and associated with the security certificate. If you have not set up a DHCP-enabled network, you should manually enter the networking configuration information.
A static network configuration	a. Select **Enter the details for static network configuration**. The configuration process takes a few minutes to complete. b. Confirm the values that you entered, and select **Y**.

7. At the prompt, enter a maintenance user name, and then click **Enter**.

   The maintenance user name should start with a letter from a-z, followed by any combination of -, a-z, or 0-9.

8. At the prompt, enter a password, and then click **Enter**.

   The VM console displays the URL for the Unified Manager web UI.

After you finish

You can access the web UI to perform the initial setup of Unified Manager, as described in *Configuring Active IQ Unified Manager*.

Configuring Active IQ Unified Manager

Upgrading Unified Manager

You can upgrade to Unified Manager 9.8 only from instances of 9.6 or 9.7.

About this task

During the upgrade process, Unified Manager is unavailable. You should complete any running operations before upgrading Unified Manager.

If Unified Manager is paired with an instance of OnCommand Workflow Automation, and there are new versions of software available for both products, you must disconnect the two products and then set up a new Workflow Automation connection after performing the upgrades. If you are performing an upgrade to only one of the products, then you should log into Workflow Automation after the upgrade and verify that it is still acquiring data from Unified Manager.

Downloading the Unified Manager upgrade file

Before upgrading Unified Manager, download the Unified Manager upgrade file from the NetApp Support Site.

Before you begin

You should have login credentials for the NetApp Support Site.

Steps

1. Log in to the NetApp Support Site: NetApp Support Site
2. Navigate to the **Download** page for upgrading Unified Manager on VMware vSphere.
3. Download the `.iso` image for upgrade, and save it to a local directory or network directory that is accessible to your vSphere Client.
4. Verify the checksum to ensure that the software has downloaded correctly.

Upgrading the Unified Manager virtual appliance

You can upgrade the Unified Manager virtual appliance from the 9.6 and 9.7 releases to 9.8.

Before you begin

Ensure the following:

- You have downloaded the upgrade file, the `ISO` image from the NetApp Support Site.
- The system on which you are upgrading Unified Manager meet the system and software requirements.

  Virtual infrastructure requirements

VMware software and installation requirements

- For vSphere 6.5 and later users, you have installed the VMware Remote Console (VMRC).
- During upgrade, you may be prompted to confirm on whether you want to keep the previous, default settings for retaining performance data for 13 months or to change it to 6 months. On confirming, the historical performance data is purged after 6 months.
- You have the following information:
  - Login credentials for the NetApp Support Site
  - Credentials for accessing the VMware vCenter Server and vSphere Web Client
  - Credentials for the Unified Manager maintenance user

About this task

During the upgrade process, Unified Manager is unavailable. You should complete any running operations before upgrading Unified Manager.

If you have paired Workflow Automation and Unified Manager, you should manually update the host name in Workflow Automation.

Steps

1. In the vSphere Client, click **Home** > **Inventory** > **VMs and Templates**.
2. Select the virtual machine (VM) on which the Unified Manager virtual appliance is installed.
3. If the Unified Manager VM is running, navigate to **Summary** > **Commands** > **Shut Down Guest**.
4. Create a backup copy, such as a snapshot or a clone, of the Unified Manager VM to create an application-consistent backup.
5. From the vSphere Client, power on the Unified Manager VM.
6. Launch the VMware Remote Console.
7. Click the **CDROM** icon, and select **Connect to Disk Image File (.iso)**.
8. Select the `ActiveIQUnifiedManager-<version>-virtual-update.iso` file, and click **Open**.
9. Click the **Console** tab.
10. Log in to the Unified Manager maintenance console.
11. In the **Main Menu**, select **Upgrade**.

    A message is displayed that Unified Manager is to be unavailable during the upgrade process, and is to resume after completion.

12. Type `y` to continue.

    A warning is displayed, reminding you to back up the virtual machine on which the virtual appliance resides.

13. Type `y` to continue.

    The upgrade process and the restart of Unified Manager services can take several minutes to complete.

14. Press any key to continue.

You are automatically logged out of the maintenance console.

15. Log in to the maintenance console, and verify the version of Unified Manager.

After you finish

You can log in to the web UI to use the upgraded version of Unified Manager. Note that you need to wait for the discovery process to finish before performing any task in the UI.

Restarting the Unified Manager virtual machine

You can restart the Unified Manager virtual machine (VM) from the maintenance console. You should restart the VM after generating a new security certificate, or if there is a problem with the VM.

Before you begin

- The virtual appliance should be powered on.
- You should be logged in to the Unified Manager maintenance console as the maintenance user.

About this task

You can also restart the virtual machine from vSphere by using the VMware **Restart Guest** option.

Steps

1. In the maintenance console, select **System Configuration** > **Reboot Virtual Machine**.
2. Start the Unified Manager web UI from your browser, and log in.

Related information

VMware vSphere PowerCLI Cmdlets Reference: Restart-VMGuest

Removing Unified Manager

You can uninstall Unified Manager by removing the virtual machine (VM) on which the Unified Manager software is installed.

Before you begin

- You should have credentials for accessing VMware vCenter Server and vSphere Web Client.
- Any active connection of the Unified Manager server to a Workflow Automation server should be closed.
- All clusters (data sources) should be removed from the Unified Manager server before you remove the virtual machine (VM).

Steps

1. Use the Unified Managermaintenance console to verify that the Unified Manager server does not have an active connection to an external data provider.
2. In the vSphere Client, click **Home** > **Inventory** > **VMs and Templates**.

3. Select the VM that you want to remove, and click the **Summary** tab.
4. If the VM is running, click **Power** > **Shut Down Guest**.
5. Right-click the VM that you want to remove, and click **Delete from Disk**.

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