NetApp® OnCommand® Unified Manager Installation and Setup Guide

For Use with Core Package 5.1 and Host Package 1.2

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Contents

Core Package and Host Package installation and configuration checklists

It is helpful to use checklists to verify that you have completed each task in the installation and configuration process, including reviewing system requirements; downloading and installing a variety of software; and, if your environment includes virtual objects, configuring the host service.

Plan for, download, and install the software

This checklist provides an overview of the installation process for OnCommand Core Package and OnCommand Host Package. The OnCommand Host Package software is required only for a virtual environment. If you are installing in a purely physical environment and are not managing VMware virtual objects, you need not install the Host Package software or configure the host service.

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   - License requirements
   - Network storage requirements
   - Core Package hardware and software requirements
   - Host Package hardware and software requirements
     Required if installing in a virtual environment
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3. *Optional: Download the OnCommand Host Package software* on page 49.
   Required if installing in a virtual environment.
4. *Download the Host Agent software* on page 24.
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6. Install the Core Package software: *Windows,* on page 38 *Linux,* on page 41 or *by script* on page 42.
7. Install the Host Package software: *VMware* on page 50 or *by script* on page 54.
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8. *Install the Host Agent software* on page 24.
9. *Install the Open Systems SnapVault software* on page 24.
10. Configure the host service: *Standard installation* on page 60 or *Express installation* on page 56.

Configure the host service

If you selected the Express edition during the Core Package installation, you can use the Express Configuration wizard to configure your software. The wizard can be accessed from the

Administration menu in the OnCommand console. After completing the wizard, you can use the following checklist to verify the results.

If you selected the Standard edition during the OnCommand Core Package installation, use this checklist to verify that you have completed all of the configuration tasks:

1. *Verify that the host service is registered with the DataFabric Manager server* on page 61.
2. *Authorize the host service to access storage system credentials* on page 62.
3. *Associate the host service with the vCenter Server* on page 63.
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5. *Associate storage systems with the host service* on page 67.
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When the configuration tasks are complete, you can create backup jobs from the Datasets tab.

Related concepts

Overview of OnCommand Unified Manager manageability software components on page 11

Overview of OnCommand Unified Manager manageability software components

The OnCommand Unified Manager suite is composed of two installation packages. The OnCommand Core Package provides backup and restore capabilities, monitoring, and provisioning for a physical storage environment. It also provides basic support for virtual storage environments. If you need to discover your virtual environment and want to take advantage of the full range of management and monitoring capabilities for virtual storage environments, you must install the OnCommand Host Package as well.

OnCommand Unified Manager 5.1 supports Data ONTAP running in either 7-Mode or Cluster-Mode; however, it does not support management of both modes from the same OnCommand Unified Manager instance. During the OnCommand Unified Manager 5.1 installation process, you are prompted to select either 7-Mode or Cluster-Mode.

OnCommand Unified Manager installation scenarios for different storage environments

Depending on your storage environment, you must choose between installing only OnCommand Core Package or both the OnCommand Core Package and the OnCommand Host Package.

There are two basic installation scenarios:

- If your storage environment includes physical storage objects, you should install just the Core Package.
- If you have a VMware environment and want to manage both physical and virtual objects, then you must install both the Core and Host Packages.

If you are installing both Core and Host Packages, you should install Core Package software prior to installing Host Package software. If you install Host Package software first, you must start the Configuration wizard after you finish installing Core Package software unless you already have an earlier version of DataFabric Manager server in your environment.

You can install Core Package software and Host Package software on either a 32-bit or 64-bit Microsoft Windows system. You can also install Core Package software on a 32-bit or 64-bit Linux system. Your Windows and Linux hosts must meet minimum hardware requirements before you can install either the Core Package or the Host Package. The hardware requirements vary depending on the operating system being used and the number of nodes in the environment.

Related concepts

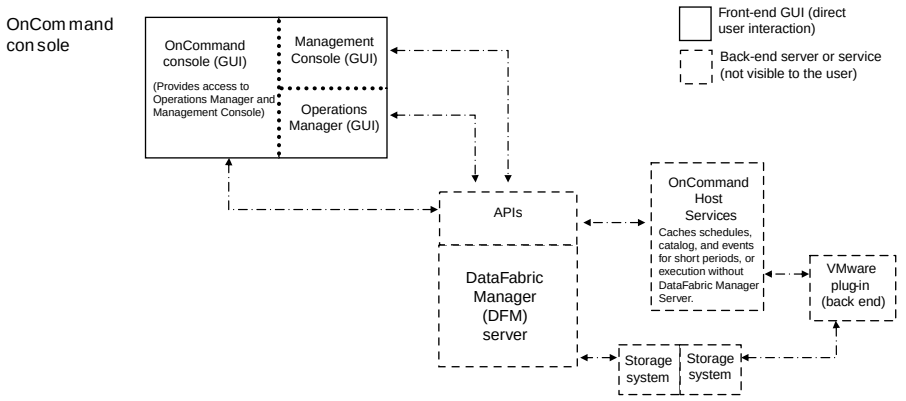
Installing the OnCommand Core Package on page 36
OnCommand Core Package hardware and software requirements on page 24

Installing the OnCommand Host Package on page 49
OnCommand Host Package hardware and software requirements on page 31

OnCommand Unified Manager architecture

OnCommand Unified Manager Core and Host Packages include interaction among front-end user interfaces (such as the OnCommand console, the NetApp Management Console, and the Operations Manager console) and back-end servers or services (such as the DataFabric Manager server, host services, VMware services plug-in, and storage systems).

You can launch the Operations Manager console and the NetApp Management Console to manage your physical environment.



Related concepts

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Comparison of OnCommand Unified Manager Express edition and Standard editions (7-Mode only) on page 17
What a host service is (7-Mode only) on page 12

What a host service is (7-Mode only)

A host service runs on physical or virtual machines and includes plug-ins that enable the DataFabric Manager server to discover, back up, and restore virtual objects, such as virtual machines and datastores. A host service also enables you to view virtual objects in the OnCommand Unified Manager.

When you make changes to your virtual infrastructure, automatic notification is sent from the host service to the DataFabric Manager server. You can manually start a rediscovery job to see your

changes. You might need to refresh the host service information to see the updates in the OnCommand console.

The host service software is included as part of the installation of the OnCommand Host Package. You can install multiple host services on multiple vCenter Servers or virtual machines.

You must register at least one host service with the DataFabric Manager server before you can back up or restore data. Registration can be done during the installation process or after installation, from the Host Services tab accessible from the Administration menu in the OnCommand console. After registration, you can monitor and manage host services from the Host Services tab.

Host services notify the DataFabric Manager server about the progress of operations. If the DataFabric Manager server goes down, the host service caches messages and pushes the messages to the server as soon as the server is available. The DataFabric Manager server reviews the messages, and if any operations are incomplete or have failed, the server might restart these operations.

In addition, if the DataFabric Manager server is unavailable, you can still perform backup and restore operations from the host service by using the OnCommand Unified Manager Windows PowerShell cmdlets.

Guidelines for managing host services

Following are some guidelines to consider when managing host services:

- Messages from host services are stored persistently in the DataFabric Manager server database hsNotifications table. This table continues to grow over time and can quickly become huge in a large environment. You can use the following global options to manage the size of this table:
  - `hsNotificationsMaxCount`
  - `hsNotificationsPurgingInterval`
- When you register a host service with the DataFabric Manager server, you can type the fully qualified domain name (FQDN) or IP address in the IPv4 format.
- If you change the certificate on a host service or uninstall a host service and then reinstall it, you must unregister the host service from DataFabric Manager server using the -f flag. See the `unregister` man page for more information.
- The OnCommand Host Package upgrade does not force host services to re-register with the DataFabric Manager server. Therefore, if you unregister a host service from the DataFabric Manager server prior to an OnCommand Host Package upgrade, you must manually register the host service to the DataFabric Manager server after the upgrade is finished.

Related tasks

Installing the OnCommand Host Package on page 50

Contents of the OnCommand Core Package

Understanding what components compose the OnCommand Core Package and what these components enable you to do helps you determine which components you want to enable during the installation and setup process.

Related concepts

Comparison of OnCommand Unified Manager Express edition and Standard editions (7-Mode only) on page 17

Components installed with the OnCommand Core Package

Understanding the different components of the OnCommand Core Package helps you determine which components you want to enable during the installation and setup process.

The following components are installed on your system:

DataFabric Manager server	Enabled by default.
DataFabric Manager server services	Enabled by default.
NetApp Management Console with protection, provisioning, and Performance Advisor capabilities	Bundled with the Core Package but must be installed separately.
OnCommand Windows PowerShell cmdlets	Downloaded with the Core Package but must be installed separately. Perform local backup and restore operations of virtual objects, as well as mount and unmount operations, using the Windows PowerShell interface.

Related tasks

Downloading the OnCommand Core Package on page 37
Installing the OnCommand Core Package on Windows on page 38
Installing the OnCommand Core Package on Linux on page 41

Functionality available with the OnCommand Core Package

You can manage physical storage objects on primary and secondary storage after installing OnCommand Core Package software using OnCommand console, Operations Manager console, NetApp Management Console, and separate PowerShell Cmdlets for OnCommand Unified Manager, which all are installed with OnCommand Core Package.

The Core Package includes the OnCommand Unified Manager graphical user interface (GUI) console from which you can access storage management functionality that was previously accessible through separate NetApp software products. OnCommand Unified Manager delivers access to this

functionality through three GUI consoles and separate set of PowerShell Cmdlets for OnCommand Unified Manager:

OnCommand console

The OnCommand console enables you to perform the following tasks:

- View a set of dashboard panels that provide high-level status of physical and virtual objects and support drill-down capabilities.
- Create and edit datasets for protecting virtual objects.
- Initiate backup and recovery of virtual objects, which is executed by the host service plug-ins.
- Launch other capabilities in the Core Package.
- Export, share, schedule, sort, filter, hide, and print data in the reports for physical objects.

Operations Manager console

The Operations Manager console enables you to perform the following tasks:

- Manage users and roles.
- Monitor clusters, nodes, and vFiler units.
- Monitor physical objects for performance issues and failures.
- Manage storage systems, vFiler units, and virtual servers.
- Schedule and manage scripts.
- Track storage usage and available capacity.

NetApp Management Console

The NetApp Management Console enables you to perform the following tasks:

- Provision physical resources.
- Back up and restore physical objects.
- Manage space on secondary storage.
- Provide disaster recovery for physical objects (automated failover and manual failback).
- Monitor performance.
- View dashboards for physical objects.
- Create and edit storage services.

PowerShell Cmdlets for OnCommand

The PowerShell Cmdlets for OnCommand enable you to manage OnCommand Unified Manager protection-related capabilities through the command-line interface.

Related tasks

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Contents of the OnCommand Host Package

Understanding what components compose the OnCommand Host Package and what these components enable you to do helps you determine which components you want to enable during the installation and setup process.

Related concepts

What a host service is (7-Mode only) on page 12

Components installed with the OnCommand Host Package

Understanding the different components of the OnCommand Host Package helps you prepare for installing the Host Package on your system.

The following components are installed on your system:

OnCommand Unified Manager host service VMware plug-in	A plug-in that receives and processes events in a VMware environment, including discovering, restoring, and backing up virtual objects such as virtual machines or datastores. This plug-in executes the events received from the host service.
Host service	Software that enables the DataFabric Manager server to forward requests, such as the request for a restore operation, to the appropriate plug-in and to send the final results of the specified job to that plug-in.
Host service Windows PowerShell cmdlets	Cmdlets that perform virtual object discovery, local restore operations, and host configuration when the DataFabric Manager server is unavailable.

Related tasks

Downloading the OnCommand Host Package on page 49
Installing the OnCommand Host Package on page 50

Functionality available with the OnCommand Host Package in a VMware environment

You can discover and manage virtual objects after installing OnCommand Host Package software.

OnCommand Host Package enables you to perform the following tasks in a VMware environment:

- Create a dataset and then add virtual machines or datastores to the dataset for data protection
- Assign local protection and optionally remote protection policies to the dataset
- View storage details and space details about a virtual object
- Perform an on-demand backup of a dataset

- Mount existing backups onto an ESX server, to support tasks such as backup verification, single file restore, and restoration of a virtual machine to an alternate location
- Restore data from local and remote backups, as well as restoring data from backups made before the introduction of OnCommand Unified Manager management software

Related tasks

Downloading the OnCommand Host Package on page 49
Installing the OnCommand Host Package on page 50

Comparison of OnCommand Unified Manager Express edition and Standard editions (7-Mode only)

During an initial OnCommand Core Package installation in 7-Mode environments, you can choose to install either the Express edition or the Standard edition of the DataFabric Manager server, depending on your deployment requirements.

The DataFabric Manager server is included as part of the OnCommand Core Package installation and provides infrastructure services such as discovery, monitoring, role-based access control (RBAC), auditing, and logging. If you are upgrading from a previous version of the DataFabric Manager server, the same edition you previously installed is automatically selected.

Express edition

The OnCommand Unified Manager Express edition is intended for smaller environments of no more than four storage systems and no more than one vCenter Server.

Because of the reduced software footprint, the Express edition can be installed on a shared system. If you are also installing the OnCommand Host Package for your virtualized environment, you can install the Core and Host packages on the same system. After installation is successfully completed, you can use the Express Configuration wizard to set up the services installed on your system. The wizard simplifies configuration by automating aspects of the configuration process.

The Express edition has the same level of data protection capability as the Standard edition, but with reduced monitoring capabilities for storage. Smaller environments generally do not require all of the functionality needed for large-scale environments. Eliminating unnecessary monitoring increases the performance levels in a small environment.

After installation of the Express edition, you must configure your environment before you can create backups. The simplest way to complete the configuration is to use the Express Configuration wizard, accessed from the Administration menu in the OnCommand console. The wizard configures your host service (required for virtual environments), discovers storage on your system, and groups that storage into a logical entity called a resource pool.

You can upgrade from the Express edition to the Standard edition if you later determine that you want to use the additional monitoring functionality provided by the Standard edition.

Standard edition

The OnCommand Unified Manager Standard edition provides functionality in the DataFabric Manager server that is needed for larger deployments. This additional functionality requires that OnCommand Unified Manager and its DataFabric Manager server must be installed on a dedicated system.

The Standard edition does not offer a configuration wizard because its additional functionality requires more configuration considerations. You can do the post-installation configuration from the OnCommand console graphical user interface.

After the Standard edition is installed, you cannot downgrade to the OnCommand Unified Manager Express edition without losing the content of your existing database. The extended functionality and server database cannot be downsized to work with the Express edition.

Related tasks

Installing the OnCommand Core Package on Windows on page 38
Installing the OnCommand Core Package on Linux on page 41

Functionality available in the Standard and Express editions

Specific DataFabric Manager server functionality is automatically enabled or disabled in the Standard and Express editions of the OnCommand Core Package.

Functionality	Availability in Standard edition	Availability in Express edition
Chargeback reports	Y	Y
All DataFabric Manager services	Y	Y
Discovery of agents, and SAN in 7-Mode Discovery of clusters, agents, and SAN in Cluster-Mode	Y	N
Discovery of storage systems	Y	Y
Events and alerts	Y	Y
Capability to manage the Cluster-Mode environment	Y	N
Monitoring of agents, host RBAC, quotas, SAN hosts, SRM, and Vservers in 7-Mode Monitoring of clusters, agents, host RBAC, quotas, SAN hosts, SRM, and Vservers in Cluster-Mode	Y	N

Functionality	Availability in Standard edition	Availability in Express edition
Monitoring of multiple storage system configurations	Y	N
Performance Advisor, in the NetApp Management Console	Y	N
Protection capability, in the NetApp Management Console	Y	Y
Provisioning capability, in the NetApp Management Console	Y	Y
Role-based access control (RBAC)	Y	Y
Schedule pre-configured for DataFabric Manager server database backups	N	Y
SOAP and ZAPI Interfaces	Y	Y
Storage services and resource pools configured automatically	N	Y
Web UI reporting	Y	Y

Functionality	Availability in Standard edition	Availability in Express edition
Capability to edit monitoring intervals, in the Operations Manager console and the CLI	All the monitoring intervals can be edited	The following monitoring intervals are read-only; however, the default is set to a higher interval than those in the Standard edition: • Snapshot monitoring interval • File system monitoring interval • LUN monitoring interval • SnapMirror monitoring interval • SnapVault monitoring interval • Discovery interval • shareMonInterval (CLI-only) • dpReaperInterval (CLI-only)

System requirements

Before you install the software, you must ensure that your storage system conforms to all supported platform requirements. Servers running OnCommand Core Package or OnCommand Host Package must meet specific software, hardware, and operating system requirements.

Browser requirements and limitations

To ensure that you can install and launch the software successfully, you must follow the requirements and limitations for the Microsoft Internet Explorer and Mozilla Firefox browsers supported by the OnCommand Unified Manager management software.

Supported browsers

The OnCommand Unified Manager management software supports the following browsers, based on the operating system and the GUI console used:

Operating system	OnCommand package installed	OnCommand GUI console used	Supported browser
Windows	Core Package only	OnCommand console only	Microsoft Internet Explorer 8 and 9, or Mozilla Firefox versions 9.0, 10.0, and 11.0
Windows	Core Package and Host Package	OnCommand console and OnCommand Plug-in for VMware	Windows Internet Explorer versions 8 and 9, or Mozilla Firefox versions 9.0, 10.0, and 11.0
Linux	Core Package only	OnCommand console only	Mozilla Firefox 11 only

See the Interoperability Matrix Tool for possible updates to this information.

Browser requirements and limitations

Mozilla Firefox	Not all versions of Firefox are supported. You should disable the automatic upgrade feature in Firefox to avoid installing an unsupported version.
Microsoft Internet Explorer, version 8	• To avoid browser display issues, you must disable the Compatibility View feature before launching the OnCommand console. For details, see the Microsoft support site.

	• To ensure that OnCommand console can launch, you must ensure that active scripting and that binary and script behaviors are enabled. • If enhanced security is enabled in Internet Explorer 8, you might have to add http://*DataFabric Manager server IP address*:8080 to the browser's list of trusted sites so that you can access the server. You might also have to add port 8443 to the list of trusted sites if you are using SSL. You can add ports and URLs in the Security tab under **Tools > Internet Options**.
Microsoft Internet Explorer, version 9	If enhanced security is enabled, you must disable it. If enhanced security is enabled in Internet Explorer 9, the OnCommand console might not load.

Related references

Required ports for the Core Package on page 30

Related information

Microsoft Support - http://support.microsoft.com/
NetApp Interoperability Matrix Tool - support.netapp.com/NOW/products/interoperability/

Accessing the OnCommand console on a Linux-based PC

If you install and run DataFabric Manager server on a Linux workstation or server, you must launch the OnCommand console GUI using the Internet Explorer 8 or Firefox browser on a separate Windows system to manage the DataFabric Manager server, which is running on a Linux-based computer.

Steps

1. Install the OnCommand Core Package on a Linux workstation or server.
2. Install the NetApp Management Console on a Windows machine.
3. Install the Firefox or Internet Explorer browser on the same Windows machine as the NetApp Management Console.
4. Configure the NetApp Management Console and the browser to point to the Linux workstation or server where the DataFabric Manager server is installed.
5. Launch the OnCommand console GUI using the Internet Explorer or Firefox browser that is running on the Windows machine where it can communicate with the DataFabric Manager server that is running on the Linux workstation or server.

License requirements

Each of the OnCommand Unified Manager components has specific licensing requirements.

Core Package	The OnCommand Core Package does not require a license.
Host Package	The OnCommand Unified Manager Host Package requires one license per storage system, but it does not generate any license key.
DataFabric Manager server	The DataFabric Manager server requires one core license key, which is free and is used only to establish a unique serial number for the server.
Data ONTAP requirements	Certain OnCommand Unified Manager functionality requires other types of licenses for Data ONTAP. • NetApp has announced the end of availability for SAN licenses. DataFabric Manager server customers should check with their NetApp sales representative regarding other NetApp SAN management solutions. • Because NetApp has announced the end of availability for the Business Continuance Option (BCO) license, BCO customers should migrate their environment to the OnCommand console and use the protection capability of the NetApp Management Console.

See the Interoperability Matrix Tool for details.

Related information

NetApp Interoperability Matrix Tool - support.netapp.com/NOW/products/interoperability/

Network storage requirements for database files

To enable optimal database access and performance results, DataFabric Manager server requires that DataFabric Manager server database files be installed on a server using either SAN or iSCSI to connect to the network.

Sybase and DataFabric Manager server do not support accessing DataFabric Manager server Sybase database files on NAS because database recovery cannot be guaranteed and because of the potential impact to performance.

You should not delete the SQL files that are installed in the /tmp directory. If SQL files are deleted from the /tmp directory, DataFabric Manager server cannot start.

Related information

Running a SQL Anywhere database file that is stored remotely from the server machine
Starting the database server

OnCommand Core Package hardware and software requirements

Before installing the OnCommand Core Package, ensure that your system meets the hardware and software requirements.

Software required prior to installing the OnCommand Core Package

Before installing OnCommand Core Package, you must preinstall Adobe Flash Player 8 or later on the server where the Core Package is to be installed, or your install job cannot succeed.

You can download the software from the Adobe downloads site.

Before you download Flash Player, you should ensure that file downloads are enabled in your web browser and, if you are using Microsoft Internet Explorer, verify that the security settings for ActiveX controls are enabled.

You must install Adobe Flash Player from each browser type that you intend to use with the OnCommand console, even if the browsers are on the same system. For example, if you have both Mozilla Firefox and Microsoft Internet Explorer on the same system and you think you might use both browsers to access the OnCommand console, install Adobe Flash Player using the Firefox browser, and then install Adobe Flash Player using the Internet Explorer browser.

Related information

Adobe Downloads

Software required for Open Systems SnapVault

You must separately download and install Open Systems SnapVault software if you intend to back up and restore data residing on non-NetApp physical storage systems; otherwise, you cannot back up and restore data on those storage environments.

OnCommand Core Package supports the use of Open Systems SnapVault to back up and restore virtual machines in a non-NetApp storage environment, but it is not required. OnCommand Core Package supports Open Systems SnapVault 2.6.1, 3.0, and 3.0.1.

Software required for NetApp Host Agent (7-Mode only)

You must separately download and install NetApp Host Agent software if you want OnCommand Unified Manager to monitor SAN hosts or FSRM-generated file system data.

The Host Agent software collects information such as operating system name and version, HBA port details, and file-system metadata, and then sends that information to the DataFabric Manager server. The NetApp Host Agent software must be installed on any Windows or Linux hosts from which you want to monitor SAN host or FSRM data with NetApp OnCommand management software.

NetApp Host Agent is also required if you want to remotely start, stop, or restart Open Systems SnapVault software by using NetApp Management Console. In this case, the Host Agent must be installed on the same machine as Open Systems SnapVault.

The minimum version supported by OnCommand Core Package is NetApp Host Agent version 2.7.

Hardware requirements for Windows Server 2008 with 1 to 25 storage systems

You must follow certain software and hardware requirements when you use systems running Windows 32-bit OS on x86 hardware and Windows 64-bit OS on x64 hardware.

Operating system requirements

The software requirements are as follows:

- Microsoft Windows Server 2008, Enterprise or Standard edition
- Microsoft Windows 2008 R2, Enterprise or Standard edition
- Microsoft Windows Server 2008 or 2008 R2 running on VMware ESX 3.5, 4.0, or 5.0

Note: If you want to use rsh and are installing DataFabric Manager server on Windows Server 2008, install Subsystem for UNIX-based Applications (SUA) or Service for UNIX (SFU) to support execution of rsh commands.

Hardware requirements

The hardware requirements are as follows:

Hardware	Requirements
Processor	• Intel or AMD x64 processor • 2 GHz or faster CPU
Memory	• 32-bit OS: 3 GB RAM (minimum) • 64-bit OS: 4 GB RAM (minimum)
Disk space	• 10 GB (minimum) • 40 GB (recommended)
Temporary disk space for installation	• 4 GB

Requirements for Windows Server 2008 with 25 or more storage systems

You must follow certain hardware and software requirements when you use systems running Windows 32-bit OS on x86 hardware and Windows 64-bit OS on x64 hardware.

Operating system requirements

The software requirements are as follows:

- Microsoft Windows Server 2008, Enterprise or Standard edition
- Microsoft Windows 2008 R2, Enterprise or Standard edition
- Microsoft Windows Server 2008 or 2008 R2 running on VMware ESX 3.5, 4.0, or 5.0

Note: Windows 32-bit OS does not support the use of more than 4 GB of RAM. Therefore, using Windows 64-bit OS is recommended with configurations that support more than 25 storage systems.

Note: If you want to use rsh and are installing DataFabric Manager server on Windows Server 2008, install Subsystem for UNIX-based Applications (SUA) or Service for UNIX (SFU) to support execution of rsh commands.

Hardware requirements

The hardware requirements are as follows:

Hardware	Requirements
Processor	• Intel or AMD x64 processor • 2 GHz or faster CPU
Memory	• 32-bit OS: 4 GB RAM minimum • 64-bit OS: 6 GB RAM minimum 12 GB RAM recommended
Disk space	• 12 GB (minimum) • 60 GB (recommended)
Temporary disk space for installation	• 4 GB

Windows Server 2003 with 1 to 25 storage systems

You must meet certain software and hardware requirements when you use systems running Windows 32-bit OS on x86 hardware and Windows 64-bit OS on x64 hardware.

Operating system requirements

The software requirements are as follows:

- Microsoft Windows Server 2003, Enterprise or Standard edition
- Microsoft Windows Server 2003 running on VMware ESX 3.5 or later

Hardware requirements

The hardware requirements are as follows:

Hardware	Requirements
Processor	• Intel or AMD x64 processor • 2 GHz or faster CPU
Memory	• 32-bit OS: 3 GB RAM (minimum) • 64-bit OS: 4 GB RAM (minimum)
Disk space	• 10 GB (minimum) • 40 GB (recommended)
Temporary disk space for installation	• 4 GB

Windows Server 2003 with 25 or more storage systems

You must meet certain software and hardware requirements when you use systems running Windows 32-bit OS on x86 hardware and Windows 64-bit OS on x64 hardware.

Operating system requirements

The software requirements are as follows:

- Microsoft Windows Server 2003, Enterprise or Standard edition
- Microsoft Windows Server 2003 running on VMware ESX 3.5 or later
- Support for Physical Address Extension (PAE). See the documentation for your operating system for details about enabling PAE.

Note: Windows 32-bit OS does not support the use of more than 4 GB of RAM. Therefore, using Windows 64-bit OS is recommended with configurations that support more than 25 storage systems.

Hardware requirements

The hardware requirements are as follows:

Hardware	Requirements
Processor	• Intel or AMD x64 processor • 2 GHz or faster CPU
Memory	• 32-bit OS: 4 GB RAM minimum • 64-bit OS: 6 GB RAM minimum 12 GB RAM recommended
Disk space	• 12 GB (minimum) • 60 GB (recommended)
Temporary disk space for installation	• 4 GB

Linux workstation or server with 1 to 25 storage systems

To ensure that your installation succeeds, you must follow certain software and hardware requirements when you use systems running Linux workstation or server. These requirements apply to both 32-bit and 64-bit environments.

Operating system requirements

The software requirements for Linux workstation or server are as follows:

- Oracle Enterprise Linux 5.6, 6.0, or 6.1; x86; 32-bit or 64-bit
- Red Hat Enterprise Linux Server 5.6, 5.7, 5.8, 6, 6.1, or 6.2; x86; 32-bit or 64-bit
- SUSE Linux Enterprise Server 10 SP3, 10 SP4, 11, 11 SP1, or 11 SP2; x86; 32-bit or 64-bit

The software requirements for Linux server on VMware ESX 4.0, ESX 4.1, ESXi 4.0, ESXi 4.1, or ESXi 5.0 are as follows:

- Red Hat Enterprise Linux Server 5.6, 5.7, 5.8, 6, or 6.1; x86; 32-bit or 64-bit
- SUSE Linux Enterprise Server 10 SP3, 10 SP4, 11, 11 SP1, or 11 SP2; x86; 32-bit or 64-bit

Hardware requirements

The hardware requirements for Linux workstation or server and Linux server on VMware ESX or ESXi are as follows:

Hardware	Requirements
Processor	• Intel or AMD x64 processor • 2 GHz or faster CPU
Memory	• 32-bit OS: 3 GB RAM (minimum) • 64-bit OS: 4 GB RAM (minimum)
Disk space	• 4 GB of free disk space (minimum) • 8 GB (recommended)
Temporary disk space for installation	• 4 GB

Linux workstation or server with 25 or more storage systems

To ensure that your installation succeeds, you must meet certain software and hardware requirements when you use systems running Linux workstation or server. These requirements apply to both 32-bit and 64-bit environments.

Operating system requirements

The software requirements for Linux workstation or server are as follows:

- Oracle Enterprise Linux 5.6, 6.0, or 6.1; x86; 32-bit or 64-bit
- Red Hat Enterprise Linux Server 5.6, 5.7, 5.8, 6, 6.1, or 6.2; x86; 32-bit or 64-bit
- SUSE Linux Enterprise Server 10 SP3, 10 SP4, 11, 11 SP1, or 11 SP2; x86; 32-bit or 64-bit

The software requirements for Linux server on VMware ESX 4.0, ESX 4.1, ESXi 4.0, ESXi 4.1, or ESXi 5.0 are as follows:

- Red Hat Enterprise Linux Server 5.6, 5.7, 5.8, 6, or 6.1; x86; 32-bit or 64-bit
- SUSE Linux Enterprise Server 10 SP3, 10 SP4, 11, 11 SP1, or 11 SP2; x86; 32-bit or 64-bit

Note: A 32-bit OS does not support the use of more than 4 GB of RAM. Therefore, using a 64-bit OS is recommended with configurations that support more than 25 storage systems.

Hardware requirements

The hardware requirements for Linux workstation or server are as follows:

Hardware	Requirements
Processor	• Intel or AMD x64 processor • 2 GHz or faster CPU

Hardware	Requirements
Memory	• 32-bit OS: 4 GB RAM minimum • 64-bit OS: 6 GB RAM minimum 12 GB RAM recommended
Disk space	• 4 GB of free disk space (minimum) • 8 GB (recommended)
Temporary disk space for installation	• 4 GB

Required ports for the Core Package

You might need to configure your firewall to open default ports that enable communication between DataFabric Manager server and various components, such as managed storage systems, agents, and so on. If a port is not open, communication fails between DataFabric Manager server and the storage system or other component.

The following default ports must be open on your firewall:

Default port number	Description
22	The port used for initiating, on storage systems, a secure cluster console, secure storage system takeover and giveback, and secure remote command execution The port is also used for vFiler unit monitoring and management.
23	The port used to initiate a Telnet session to managed storage systems
25	The SMTP port used by DataFabric Manager server to send email for alarms and AutoSupport notification when the `autosupportProtocol` option is set to SMTP
80	The port used for storage system management
161	The port used to communicate with storage systems
162	The port used by managed storage systems to send SNMP traps to DataFabric Manager server to speed up monitoring of important events This port is configurable.

Default port number	Description
443	The port used for SecureAdmin-based storage system management
514	The port used for initiating, on storage systems, a cluster console, storage system takeover and giveback, and remote command execution, as well as for vFiler unit monitoring and management
4092	The port used to connect to the NetApp Host Agent
4093	The port used for a secure connection to the NetApp Host Agent
8080	The port used for Operations Manager console access **Note:** If you install the OnCommand Unified Manager Express edition on the same system on which the vCenter Server and vSphere are installed, you might get a message indicating that port 8080 is already in use and that you must select a different port. Follow the directions in the message to set a different port, and start the service manually.
8088	The port used for NetApp Management Console access
8443	The port used for secure Operations Manager console access
8488	The port used for secure NetApp Management Console access.
10000	The port used by Backup Manager, Disaster Recovery Manager, and Protection Manager to monitor and manage storage system SnapVault and SnapMirror relationships, and SnapVault relationships from Open Systems SnapVault agents

Related references

Designated ports for the OnCommand Host Package on page 34

OnCommand Host Package hardware and software requirements

Before installing the OnCommand Host Package, ensure that your system meets the hardware and software requirements.

Hardware requirements

Your Windows system must meet minimum hardware requirements before you can install the OnCommand Host Package. These requirements apply to all virtual environments. The actual requirements depend on your system configuration.

Hardware	Requirements
Processor	• Intel or AMD x64 processor • 2 GHz or faster Intel or AMD x86 processor
Memory	• 1 GB RAM (minimum for 32-bit environments) • 2 GB RAM (recommended for 32-bit environments) • 2 GB RAM (minimum for 64-bit environments) • 4 GB RAM (recommended for 64-bit environments)
Disk space	• 2 GB (minimum) • 3 GB (recommended)
Temporary disk space for installation	• 4 GB Required for the Windows drive

Operating system requirements

You must ensure that the OnCommand Host Package supports your operating system.

Operating systems

The Host Package supports the following operating systems:

- Microsoft Windows Server 2003 or 2003 R2
- Microsoft Windows Server 2008 or 2008 R2 running on VMware ESX 3.5 or later

See the Interoperability Matrix Tool for details.

Related information

NetApp Interoperability Matrix Tool - support.netapp.com/NOW/products/interoperability/
Interoperability Matrix: support.netapp.com/NOW/products/interoperability

Software required prior to installing the OnCommand Host Package

Before installing OnCommand Host Package for the first time, you must have certain Microsoft software already installed on each system on which Host Package is to be installed.

Microsoft .NET Framework

OnCommand Unified Manager supports Microsoft .NET 3.5 SP1 but not 4.0. If you have 4.0 installed, you do not need to downgrade; you can just install 3.5 SP1. If both .NET versions are installed on the system, OnCommand Unified Manager uses 3.5 by default.

Microsoft Net.TCP Port Sharing Service

This service is not enabled by default; it must be manually enabled prior to installing Host Package. See the *Microsoft MSDN library* for more information.

Microsoft Windows PowerShell

You can search using the text string "powershell" on the Microsoft Support site and select the appropriate version for your system. The minimum required version is PowerShell 1.0, but PowerShell 2.0 is required to use the DataFabric Manager server PowerShell cmdlets.

Note: On Windows Server 2008, PowerShell 1.0 is installed by default, but you must enable it on the server. You must download and install PowerShell 2.0.

Note: On Windows Server 2003, you must download and install PowerShell.

Windows Installer 4.5 or later (Windows Server 2003)

You can connect to the console session of Windows 2003 by using one of the following commands: `mstsc /v:<vmip> /admin` or `mstsc /v:<vmip> /console`.

Microsoft Visual C++ 2008 SP Redistributable Package on Windows Server 2008 Server Core installations

The following software packages are required only for the server core or minimal installation option for Windows Server 2008. You can view information about and download the software from the Microsoft Download Center.

- For 32-bit systems, you must install the Microsoft Visual C++ 2008 SP Redistributable Package (x86).
- For 64-bit systems, you must install the Microsoft Visual C++ 2008 SP Redistributable Package (x86) and the Microsoft Visual C++ 2008 SP Redistributable Package (x64).

Microsoft Hotfixes

The following hotfixes are required and can be downloaded from the Microsoft Support site:

- KB 886695
- KB 925336
- KB 968730
- KB 981929
- KB 983280

The following Windows Server 2003 hotfixes are required when you install OnCommand Host Package on VMs for RDM LUN creation and management:

- KB 919117
- KB 931300
- KB 932755
- KB 937382

Related information

Microsoft Support site
Microsoft Download Center

Designated ports for the OnCommand Host Package

The OnCommand Host Package uses designated ports to enable communication between components. If the Windows Firewall is enabled, you must ensure that the firewall is set to allow exceptions for the designated ports.

For firewalls other than Windows, you must manually grant access to the designated ports that are to be used for the Host Package installation. The installer attempts to create the necessary exceptions to designated ports in your Windows firewall; if you have other types of firewalls in place, verify that these ports are available.

Note: The installer automatically creates firewall exceptions for the first seven ports listed in the table.

All of the ports except those so noted in the following table can be used to install the OnCommand Host Package with a script.

Designated port number	Description
8699	The port used by the OnCommand Unified Manager host service administrator
808	The OnCommand Unified Manager TCP/IP endpoint
8799	The port used by the OnCommand Unified Manager host service agent
8897	The port used by the OnCommand Unified Manager file service

Designated port number	Description
8044	The port used by the OnCommand Unified Manager host service VMware plug-in
8043	The port used by SnapManager for Virtual Infrastructure
8480	The port used by the DataFabric Manager server
8488	The DataFabric Manager server HTTPS port, which is used for HTTP connections
443	The port used by the vCenter Server **Note:** This port is used only for installing the OnCommand Host Package with a script.

Related references

Required ports for the Core Package on page 30

Installing the OnCommand Core Package

The OnCommand Core Package provides management capabilities for your physical storage environment and, when the OnCommand Host Package is also installed, the OnCommand console can display the physical-to-virtual mapping as well as provide policy-based local and remote backup and recovery for virtual objects.

Installation requirements specific to 7-Mode environments

Some OnCommand Unified Manager installation and setup features are specific to 7-Mode environments and are noted as 7-Mode only in the documentation. All other installation information, requirements, and instructions apply to both 7-Mode and Cluster-Mode environments.

When you begin installing OnCommand Unified Manager in a 7-Mode environment, you must select 7-Mode when prompted.

When you install OnCommand Unified Manager in a 7-Mode environment, you can choose either the Express edition or the Standard edition of the software. If you are upgrading OnCommand Unified Manager from a version earlier than 5.0, Express edition is not supported.

If you change your environment from Cluster-Mode to 7-Mode, you must delete the Cluster-Mode objects from the DataFabric Manager server by using the `dfm host delete -f filer_name` command.

Related concepts

What a host service is (7-Mode only) on page 12
Comparison of OnCommand Unified Manager Express edition and Standard editions (7-Mode only) on page 17
Software required for NetApp Host Agent (7-Mode only) on page 24

Related tasks

Configuring the OnCommand Standard edition server with host services (7-Mode only) on page 60
Configuring the OnCommand Unified Manager Express edition server (7-Mode only) on page 56

Installation requirements specific to Cluster-Mode environments

Unified Manager supports both Cluster-Mode and 7-Mode environments, however; there are some minor distinctions in the Cluster-Mode installation process of which you should be aware.

When you begin installing OnCommand Unified Manager in a Cluster-Mode environment, you must select Cluster-Mode when prompted.

If you are installing or upgrading OnCommand Unified Manager in a Cluster-Mode environment, you can install only the Standard edition of the software.

When you upgrade your 7-Mode environment to a Cluster-Mode environment, you must delete the 7-Mode objects from the DataFabric Manager server by using the `dfm host delete -f` *`filer_name`* command.

Upgrading from the Express edition of OnCommand Unified Manager to a Cluster-Mode environment is not allowed. If you currently have the Express edition of OnCommand Unified Manager installed, you must first upgrade to the Standard edition of OnCommand Unified Manager 5.0. See the instructions for upgrading the OnCommand Core Package in the *OnCommand 5.0 Installation and Administration Guide*.

Host services and NetApp Host Agent are not supported in a Cluster-Mode environment. If you are managing host services when upgrading to a Cluster-Mode environment, you are notified that the host services will be purged. Information related to host services and NetApp Host Agent features are noted as 7-Mode only in the documentation. All other installation information, requirements, and instructions apply to both 7-Mode and Cluster-Mode environments.

Downloading the OnCommand Core Package

Before installing the OnCommand Core Package, you must download the software package from the NetApp Support Site.

Before you begin

- You must have an account on the NetApp Support Site.

About this task

You can choose from four executable files:

- Windows 64-bit
- Windows 32-bit
- Linux 64-bit
- Linux 32-bit

Steps

1. Using your browser, locate and select the OnCommand Core Package on the software download page of the NetApp Support Site.
2. From the drop-down list, select the operating system platform on which you are installing and click **Go!**
3. Click **View & Download** for the software version that you want to install.
4. On the **Description** page, click **Continue**.
5. Review and accept the license agreement.
6. On the **Download** page, click the link for the installation file:
   - For 32-bit Windows systems, click **occore-setup-5-1-win32.exe**.
   - For 64-bit Windows systems, click **occore-setup-5-1-win-x64.exe**.
   - For 32-bit systems, click **occore-setup-5-1-linux.sh**
   - For 64-bit systems, click **occore-setup-5-1-linux-x64.sh**
7. Click **Save File** to download the software to the default installation directory.

   Note: Do not change the default location of the local TempFolder directory or the installation will fail. The installer automatically extracts the installation files to the %TEMP% location.

Related tasks

Downloading the OnCommand Host Package on page 49

Installing the OnCommand Core Package on Windows

After you have met the guidelines and requirements, and you are aware of the restrictions for installing the OnCommand Core Package, you can follow the prompts in the installation wizard to install the software.

Before you begin

- You must have administrator privileges for the Windows computer on which you are installing the Core Package.
- You must have downloaded the setup file, based on whether your Windows server is 32-bit or 64-bit.
- You must have the following items:
  - The DataFabric Manager server license key
  - Credentials for network access
  - The IP address of the server on which you are installing the software
  - The path of the directory on which you want to install, if different from the default location

- In addition, your antivirus software must include the following changes:
  - Either the antivirus software is disabled or an exclusion is added for the DataFabric Manager server.
    If this condition is not met, the installation fails.
  - The Sybase ASA files are excluded to avoid both DataFabric Manager server performance issues and the possibility of database corruption.

About this task

If you have to manage both 7-Mode and Cluster-Mode server environments for Data ONTAP, you must install two separate Core Packages on two Windows servers.

During the Core Package installation, if you select the Standard edition in the installation wizard, you configure it manually. If you select the Express edition, you can use the Express Configuration wizard to configure a host service.

Note: The Express edition is available only when you choose 7-Mode as your environment.

For optimal performance, you should install the Core Package software on a dedicated system, especially if you are managing more than 30 storage systems with the DataFabric Manager server.

Steps

1. Start the Core Package installation wizard by running the appropriate setup file.
2. Choose the environment: 7-Mode or Cluster-Mode.

   Attention: After the installation of the Core Package is complete, you cannot change the environment.

3. Depending on your environment, perform the appropriate action:

If you selected ...	Then...
7-Mode environment	**a.** Select Standard edition or Express edition to specify which version of the DataFabric Manager server you want to install: • If you select the Standard edition, you can configure your environment information, and your future backup and recovery operations manually in the OnCommand console after the installation. • If you select the Express edition, you can use the Express Configuration wizard to simplify the setup of your environment, and your future backup and recovery operations. **b.** Continue responding to the prompts.
Cluster-Mode environment	Continue responding to the prompts.

4. Select the installation location, if different from the default.

Note: Do not change the default location of the local TempFolder directory, or the installation fails. The installer automatically extracts the installation files to the `%TEMP%` location.

5. Review the summary screen and consider whether you want to make changes before completing the install process, and then click **Install**.
6. When the Installation Complete screen is displayed, click **Next** to continue.
7. If you want to start the OnCommand console, clear your browser cache, and then select Launch OnCommand console.

   If you have not yet installed the OnCommand Host Package, download and install the Host Package on the same server or on a different server, clear your browser cache, and then start the OnCommand console from your browser.
8. Click **Finish**.

After you finish

- During the installation process, the installer creates some temporary folders that are automatically deleted the next time you reboot the system.

  You can delete these folders without adversely affecting the installation of the Core Package.
- When you finish installing the Core Package, you can install the Host Package and use the configuration wizard to configure a host service.

Related concepts

OnCommand Core Package hardware and software requirements on page 24
Installing the OnCommand Host Package on page 49
Comparison of OnCommand Unified Manager Express edition and Standard editions (7-Mode only) on page 17

Related tasks

Downloading the OnCommand Core Package on page 37
Determining whether a storage system belongs to a workgroup or a domain on page 71

Related references

Software required prior to installing the OnCommand Core Package on page 24

Installing the OnCommand Core Package on Linux

After you have met the guidelines, requirements, and restrictions for installing the OnCommand Core Package, you can follow the prompts in the installation wizard to install the software.

Before you begin

- You must have downloaded the setup file, based on whether your Linux server is 32-bit or 64-bit.
- You must have the following items:
  - The DataFabric Manager server license key
  - Credentials for network access
  - The IP address of the server on which you are installing the software
  - The path of the directory on which you want to install, if different from the default location
- In addition, your antivirus software must include the following changes:
  - The antivirus software is either disabled or an exclusion is added for the DataFabric Manager server before you install OnCommand Core Package, or the installation fails.
  - Sybase ASA files are excluded to avoid both DataFabric Manager server performance issues and the possibility of database corruption.
- If you are installing the Core Package on Red Hat Enterprise Linux Advanced Platform 5.x, the SELinux status must be disabled.

About this task

If you have to manage both 7-Mode and Cluster-Mode server environments for Data ONTAP, you must install two separate Core Packages on two Linux servers.

During the Core Package installation, if you select the Standard edition, you configure it manually. If you select the Express edition in the Setup wizard, you can use the Express Configuration wizard to simplify the setup of your environment.

Note: The Express edition is available only when you choose 7-Mode as the environment.

For optimal performance, you should install the Core Package software on a dedicated system, especially if you are managing more than 30 storage systems with the DataFabric Manager server.

Steps

1. Start the Core Package installation wizard by running the appropriate setup file.
2. Follow the prompts and then select the environment: 7-Mode or Cluster-Mode.

   Attention: After the installation of the Core Package is complete, you cannot change the environment.

3. Depending on your environment type, perform the appropriate action:

If you selected...	Then...
7-Mode environment	**a.** Select Standard edition or Express edition to specify which version of DataFabric Manager server you want to install. • If you select the Standard edition, you can configure your environment information, and your future backup and recovery operations manually in the OnCommand console after the installation. • If you select the Express edition, you can use the Express Configuration wizard to simplify the setup of your environment, and your future backup and recovery operations. **b.** Continue responding to the prompts.
Cluster-Mode environment	Continue responding to the prompts.

When the URL for opening the OnCommand console is displayed, the installation is complete.

4. Copy and paste the URL to a browser to open the OnCommand console.

Related concepts

Installing the OnCommand Host Package on page 49

OnCommand Core Package hardware and software requirements on page 24

Comparison of OnCommand Unified Manager Express edition and Standard editions (7-Mode only) on page 17

Related tasks

Downloading the OnCommand Core Package on page 37

Related references

Software required prior to installing the OnCommand Core Package on page 24

Installing the OnCommand Core Package with a script

You can quickly deploy the OnCommand Core Package using a scripted, unattended installation. The installation script contains the installation settings for the Core Package.

Before you begin

- You must have administrator privileges for the Windows computer on which you are installing the Core Package.
- The script must contain the following required information:

- OnCommand Unified Manager server license key
- Credentials for network access
- IP address of the server on which you are installing
- Directory path where you want to install if different from the default location

About this task

The installation script can reside in one of the following locations:

- Default installation script
- FTP
- HTTP/HTTPS
- NFS
- Local disk
- USB flash drive

Steps

1. Create a script using the supported commands.
2. Edit the installation script as needed to change the options that are unique for each installation.
3. Save the script to the location from which you want to run it.
4. Run the scripted installation or set a schedule for when the script is to run.

After you finish

- If you selected the Express edition in the Setup wizard during the installation process, you can use the Express Configuration wizard to simplify the setup of your environment for initial backup and recovery operations.
- If you selected DataFabric Manager server Standard edition during the installation process, you must configure your environment manually before backup and recovery operations can take place.

Related references

Required ports for the Core Package on page 30

Options you can use for the Windows installation script

You can use the options to configure the settings in the installation script when installing the Core Package on Windows.

You can use the following options in the script:

Script	Description
`/S`	Performs the installation silently, without any installation screens appearing.
`/OPMOD=7-Mode` `/OPMOD=Cluster-Mode`	Specifies whether the environment is 7-Mode or Cluster-Mode. If the option is set to `7-Mode`, the Core Package for a 7-Mode environment is instaled. If the option is set to `Cluster-Mode`, the Core Package for a Cluster-Mode environment is installed.
`/EXPRESS_EDITION=YES` `/EXPRESS_EDITION=NO`	Specifies whether the Express edition or Standard edition is installed. If the option is set to `YES`, the Express edition is installed. If the option is set to `NO`, the Standard edition is installed. **Note:** If you do not specify this option, for a new install, the Standard edition is installed; for an upgrade, the installer checks the previous edition that is in use, and then upgrades that edition.
`/LICENSEKEY=`*`license_key`*	Specifies the license key.
`/UPGRADE`	Specifies that an upgrade is required.

No options are available for the following situations:

- Accepting or rejecting the AutoSupport agreement from the CLI.
  When a silent installation is performed, the installation assumes that you accept the AutoSupport agreement.
- Specifying whether you want to perform a backup during the upgrade.
  In a silent upgrade, a backup is performed by default.
- Specifying the installation directory or database backup location directory; otherwise, the default DataFabric Manager server paths are used.

Options you can use for the Linux installation script

You can use the options to configure the settings in the installation script when installing the Core Package on Linux.

You can use the following options in the script:

Option	Description
`-a yes` `-a no`	Specifies that the AutoSupport notice agreement is accepted. If the option is not specified, the AutoSupport notice is displayed, which prompts you to accept or decline.
`-d` *`installation_directory`*	Specifies the path of the installation directory. If the option is not specified, the Core Package is installed in the default directory, for example, `/opt/NTAPdfm/`
`-l` *`licenses_key`*	Specifies the license key. If the option is not specified, a message is displayed during the installation that prompts you to enter the license key.
`-b yes` `-b no`	Specifies whether to perform a database backup during the upgrade.
`-B`*`backup_file_name`*	Specifies the backup file name. If the option is not specified, the default backup file name is stored in the `data` directory of the installation directory.
`-n`	Removes NetCache support if you upgrade your DataFabric Manager server. **Note:** You should use this option only for upgrades from DataFabric Manager server versions earlier than 3.8. If the option is not specified and you are upgrading from a version earlier than 3.8, a message is displayed about the removal of NetCache support for DataFabric Manager server.
`-m 7-Mode` `-m Cluster-Mode`	Specifies whether the environment is 7-Mode or Cluster-Mode. If the option set is to `7-Mode`, the Core Package for a 7-Mode environment is installed. If the option set is to `Cluster-Mode`, the Core Package for a Cluster-Mode environment is installed. If you do not specify a mode and if you have the Express edition installed, your server is upgraded to the Express edition.

Option	Description
`-s yes` `-s no`	Specifies whether the Express edition or the Standard edition is installed. If the option set is to `yes`, the Express edition is installed; if the option set is `no`, the Standard edition is installed. **Note:** You cannot use the Express edition if you are installing in a Cluster-Mode environment. However, if you upgrade to Cluster-Mode with the Express edition, you are prompted to select the edition. If you do not specify the option, for a new installation, you are prompted to select an option; for an upgrade, the installer checks the previous edition that is in use, and then upgrades that edition.
`-w` *`wrapper_directory`*	Specifies the path for installing the DataFabric Manager server CLI wrappers.

Setting up Web security after restoring a database on a new OnCommand Core Package installation

You can restore a database backup from another DataFabric Manager server instance to the new DataFabric Manager server installation, for instance, when you want to upgrade your hardware; however, database backups do not include the key and certificate file, so these must be generated or imported, and HTTPS must be enabled if it was set on the old system.

About this task

Perform these steps from a console session on the new DataFabric Manager server after you install the OnCommand Core Package.

Steps

1. Perform one of the following actions:
   - Enter the `dfm ssl service setup` command to create new client certificates.
   - Enter `dfm ssl server import` to import an existing certificate.
2. If the HTTPS service was enabled on the system from which the database backup was made, you must also enable the HTTPS service on the new system by entering `dfm option set httpsEnabled=Yes`.

Installing NetApp Management Console

You can download and install NetApp Management Console through the OnCommand console. NetApp Management Console is required to perform many of your physical storage tasks.

Before you begin

You must be authorized to perform all the steps of this task; your RBAC administrator can confirm your authorization in advance.

About this task

During this task, the OnCommand console launches the Operations Manager console. Depending on your browser configuration, you can return to the OnCommand console by using the Alt-Tab key combination or clicking the OnCommand console browser tab. After the completion of this task, you can leave the Operations Manager console open, or you can close it to conserve bandwidth.

Steps

1. Log in to the OnCommand console if necessary.
2. Click the **File** menu, then click **Download Management Console**.

   A separate browser tab or window opens to the Management Console Software page in the Operations Manager console.
3. Click the download link for the Linux or Windows installation.
4. In the download dialog box, click **Save File**.

   The executable file is downloaded to your local system, from the system on which the OnCommand Core Package was installed.
5. From the download directory, run the nmconsole-setup-xxx.xxx executable file.

   The NetApp Management Console installation wizard opens.
6. Follow the prompts to install NetApp Management Console.

Result

After installation, you can access NetApp Management Console from the following locations:

- On Windows systems, the default installation path is C:\Program Files\NetApp\Management Console.
  You can launch the console from the NetApp directory on the Start menu.
- On Linux systems, the default installation path is /usr/lib/ NetApp/management_console/.
  You can launch the console from /usr/bin.

Installing or upgrading OnCommand Unified Manager Windows PowerShell cmdlets

To use Windows PowerShell cmdlets with the OnCommand console, you must manually install them. You also must manually upgrade the cmdlets if you upgrade your version of the console.

Before you begin

You must have installed the appropriate version of OnCommand Core Package.

Steps

1. Navigate to the installation folder for OnCommand Core Package.
2. Navigate to the appropriate folder:

If you have installed the OnCommand Core Package on...	Then do this...
A Windows server	Navigate to the `DFM_Install_dir>\DFM\web\clients` folder.
A Linux server	Navigate to the folder.

   This folder contains the Windows PowerShell installation package.

3. Execute the installation file:

If you are installing the cmdlets on...	Then do this...
The same Windows server	Double-click the executable file and follow the installation wizard prompts.
A different Windows server	Copy the installation file to the server or workstation to which you want to install the cmdlets and then execute the installation.
A Linux server	Copy the installation file to a Windows server on which you want to install the cmdlets and then execute the installation: Windows PowerShell Cmdlets are not supported on Linux.

After you finish

You can next execute the Windows PowerShell cmdlets for OnCommand console.

Installing the OnCommand Host Package

The OnCommand Host Package provides management capabilities for your virtualized environment and, when the OnCommand Core Package is also installed, for your physical storage environment.

You can install the OnCommand Host Package using the installation wizard, or you can run an unattended installation by using a script at the Windows command prompt. Additionally, with the Core and Host Packages installed, policy-based local and remote backup and recovery are available from both the vCenter Server GUI and the OnCommand console.

Downloading the OnCommand Host Package

The OnCommand Host Package provides management capabilities for your virtual environment. Before installing the OnCommand Host Package, you must to download the software package from the NetApp Support Site.

Before you begin

- You must have an account on the NetApp Support Site.

About this task

You can choose from two executable files:

- Windows 64-bit
- Windows 32-bit

Steps

1. Using your browser, locate and select the OnCommand Host Package on the software download page of the NetApp Support Site.
2. From the drop-down list, select the operating system platform on which you are installing and click **Go!**
3. Click **View & Download** for the software version that you want to install.
4. On the **Description** page, click **Continue**.
5. Review and accept the license agreement.
6. On the **Download** page, click the link for the installation file:
   - For 32-bit systems, click **ochost-setup-1-2-x86.exe**.
   - For 64-bit systems, click **ochost-setup-1-2-x64.exe**.

7. Click **Save File** to download the software to the default installation directory.

   Note: Do not change the default location of the local TempFolder directory, or the installation fails. The installer automatically extracts the installation files to the %TEMP% location.

Related tasks

Downloading the OnCommand Core Package on page 37

Installing the OnCommand Host Package

After you have reviewed the guidelines, requirements, and restrictions for installing the OnCommand Host Package, you can execute the installation wizard to install the software.

Before you begin

- vSphere 5.0 must be installed on your vCenter server. If you install OnCommand Host Package and an earlier version of vSphere is installed on your vCenter server, you must manually reconfigure your datasets when you upgrade to vSphere 5.0.
- If you plan on using the Backup and Recovery capability, you must purchase a license for SnapManager for Virtual Infrastructure.
- The system that you use for your Host Package installation must belong to a domain rather than a workgroup.
- You must have administrator privileges for the Windows computer on which you are installing the Host Package.
- The DNS name of the Windows computer on which you are installing the Host Package must match the actual computer name and the computer name cannot be more than 15 characters.
- The Windows firewall must be set to allow exceptions.
- You must have the following items available:
  - A Windows system account user name and password
  - The path of the directory to which you want to install, if different from the default
  - The IP address, user name, and password of the DataFabric Manager server
  - The IP address, user name, and password of the vCenter Server

About this task

If you are installing the Host and Core Packages on the same system, a fully qualified domain name must be used for the Core Package instead of *localhost*.

The installer creates a locks directory, which is used to coordinate access to resources in the vSphere Client. The locks directory is located under the OnCommand Unified Manager directory. You must not change the name or the location of this directory.

The IP address and host name for the system on which you are installing OnCommand Host Package must have a DNS registration that resolves properly between the host service and the DataFabric Manager server.

You should use a dedicated Windows server for each vCenter Server instance. Having other applications installed on the same server can take up valuable system resources and might drastically reduce performance.

If the installer fails during the installation of OnCommand Host Package, in some rare cases, the installer does not rollback the changes made to the system. When this happens, you must manually remove OnCommand Host Package using the Control Panel application for your operating system and then delete the folder where the OnCommand Host Package was installed.

Steps

1. Double-click the executable file to launch the OnCommand Host Package installer:
   - For 32-bit systems, click `ochost-setup-1-2-x86.exe`.
   - For 64-bit systems, click `ochost-setup-1-2-x64.exe`.
2. Depending on your operating system, you must either enable Windows PowerShell or install it before you can continue with the installation of OnCommand Host Package:

   Note: An error message appears if PowerShell is not installed. PowerShell 1.0 is required but PowerShell 2.0 is recommended.

   - On Windows Server 2008 R2, PowerShell is installed by default and you do not need to enable it on the server.
   - On Windows Server 2008, PowerShell is not installed by default and you must enable it on the server after it is installed.

     To enable PowerShell, follow the instructions in the pop-up dialog box.
   - On Windows Server 2003 or 2003 R2, you must download and install PowerShell.
3. Select the installation location.
4. On the Service Credentials page, type the user name and password for the system on which you are installing OnCommand Host Package.

   You must type the user name in the following format:

   `domain name\user name`
5. On the Configure Communication Ports page, type the port numbers that you want to use or accept the default port numbers.

   Note: For custom firewalls, ensure that the Core and Host Packages are using the same port numbers.
6. On the Configure DataFabric Manager server page, type the IP address and the user name and password used to access the DataFabric Manager server. You can skip the validation of the DataFabric Manager server if you do not have the server credentials available.

7. On the vCenter Server Information page, type the host name or IP address of the system on which the vCenter Server is installed and the user name and password that allows the vSphere Client to communicate with the vCenter Server.
8. Click **Install** on the summary page, and then click **Finish**.

   When you next reboot the system, you might see some hidden MS-DOS command windows briefly appear in the background during the removal of installer support files that could not be deleted during the installation of OnCommand Host Package.

After you finish

- During the installation process, the installer creates some temporary folders that are automatically deleted when you next reboot the system.

  If you want to delete these folders, you can do so without adversely affecting the installation of the Host Package.
- The host service must be configured to perform backups.

Related concepts

Comparison of OnCommand Unified Manager Express edition and Standard editions (7-Mode only) on page 17

Related tasks

Downloading the OnCommand Host Package on page 49
Determining whether a storage system belongs to a workgroup or a domain on page 71
Configuring the OnCommand Unified Manager Express edition server (7-Mode only) on page 56

Related references

Operating system requirements on page 32
Software required prior to installing the OnCommand Host Package on page 33
Designated ports for the OnCommand Host Package on page 34

Shared lock directories with Virtual Storage Console

Use shared lock directories to coordinate mutually exclusive activities on shared resources.

OnCommand Host Package installs the following directories during installation:

- Locks
- VMware Plugin
- Host Services

If you plan to install OnCommand Host Package on the same system as Virtual Storage Console 2.1.1, a best practice is to setup a shared lock directory. A shared lock directory is used for products

that share resources through the vSphere client. This ensures that mutually exclusive functions do not happen in parallel. For example, cloning of a virtual machine through Virtual Storage Console at same time that OnCommand Host Package is attempting to restore the same virtual machine.

Setting up a shared lock directory

To enable the coordination of mutually exclusive activities on shared resources when OnCommand Host Package and Virtual Storage Console 2.1.1 are installed on the same system, you can create a shared lock directory.

About this task

Both OnCommand Host Package and Virtual Storage Console 2.1.1 install a locks directory that is not shared by default. You can disable the locks directory in OnCommand Host Package and setup the Virtual Storage Console 2.1.1 locks directory as a shared lock directory.

Steps

1. Stop the OnCommand Host Service VMware Plug-in
   a) Click **Start** > **Control Panel**.
   b) Double-click **Services.**

      A list opens of enabled and disabled services for the system.
   c) Locate the OnCommand Host Service VMware Plug-in.

      You can filter the list of services by clicking any of the column headers at the top of the list.
   d) Right-click the OnCommand Host Service VMware Plug-in to open the context sensitive menu and select **Stop**.

   The OnCommand Host Service VMware Plug-in is disabled.
2. Delete the locks sub-directory in the OnCommand Host Package installation directory: `<OC installation directory>\locks`
3. Locate and open the `smvi.override` file.

   This file is installed by default in: `<OC installation directory>\VMware Plugin\etc\smvi.override`.
4. Add the following line: `shared.subplugin.lock.directory=<VSC installation directory>\locks`
5. Save and close the `smvi.override` file.
6. Restart the OnCommand Host Service VMware Plug-in.

Result

OnCommand Host Package and Virtual Storage Console 2.1.1 will share the same locks sub-directory.

Installing the OnCommand Host Package using a script

You can quickly deploy the OnCommand Host Package by creating a script customized to the needs of your particular environment, and then performing an unattended installation. The installation script that you create contains your customized installation settings for OnCommand Host Package.

Before you begin

- You must have administrator privileges for the Windows computer on which you are installing OnCommand Host Package.
- Your script must contain the following required information:
  - Credentials for network access
  - IP address of the server on which you are installing
  - The path of the directory to which you want to install, if different from the default location

About this task

You can store your customized installation script in one of the following locations:

- Default installation script
- FTP
- HTTP/HTTPS
- NFS
- Local disk
- USB flash drive

Steps

1. Create a script using the supported commands.
2. Edit the installation script as needed to change the options that are unique for each installation.
3. Save the script in the location from which you want to run it.
4. Run the scripted installation or set a schedule for when the script is to run.

After you finish

If you are installing OnCommand Host Package in a 7-Mode environment, you must configure the host service to work with the DataFabric Manager server.

If you selected the OnCommand Unified Manager Express edition during the installation of the Core Package, you can use the configuration wizard to configure the host service.

Related references

Designated ports for the OnCommand Host Package on page 34

Scripted install options for the OnCommand Host Package

If you choose to install the OnCommand Host Package in a Windows environment by using an unattended script, you can use these options to create that script.

The following options can be used in the script:

Option	Description
`setup.exe /s/v /qn PLUGIN_TYPE=0`	• Performs the installation silently, without any interactive screens appearing.
`SVCUSERNAME`	• Specifies the host service user name.
`SVCUSERPASSWORD`	• Specifies the host service password.
`SVCCONFIRMUSERPASSWORD`	• Confirms the host service password.
`DFM_SERVER_INFO`	• Specifies the DataFabric Manager server IP address.
`DFM_SERVER_USERNAME`	• Specifies the DataFabric Manager server user name.
`DFM_SERVER_PASSWORD`	• Specifies the DataFabric Manager server password.
`VCENTER_IP`	• Specifies the vCenter Server IP address.
`VCENTER_USERNAME`	• Specifies the vCenter Server user name.
`VCENTER_PASSWORD`	• Specifies the vCenter Server password.
`PLUGIN_PORT`	• Specifies the default port.

Setting up your system

After you finish installing the OnCommand Unified Manager Host Package or Core Package, you can configure your system.

Configuring the OnCommand Unified Manager Express edition server (7-Mode only)

You can use the **Express Configuration** wizard to simplify the setup of your system in a 7-Mode environment. The wizard sets up the Express edition server to discover and monitor storage systems and host services, populates a default resource pool, associates available storage, and creates and attaches a default storage service.

Before you begin

- You must have installed the following:
  - OnCommand Core Package
  - OnCommand Host Package
  - VMware vCenter
  - Adobe Flash Player 8.0 or later
  - OnCommand Unified Manager Windows PowerShell cmdlets
- You might need some or all of the following information to complete this task:
  - IP address or FQDN for each host service
  - vCenter Server name and credentials
  - Name and credentials for each storage system
  - Port numbers, if different than the defaults
  - NDMP user name and password
  - SNMP credentials

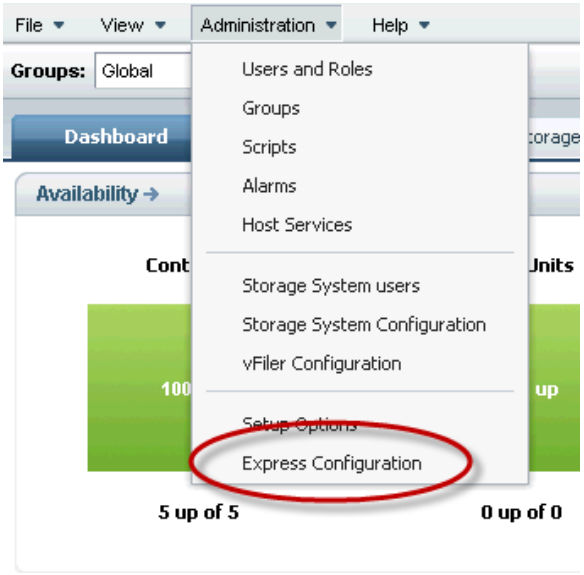
About this task

The **Express Configuration** wizard configures two default storage services, remote backup and mirror, with deduplication enabled for increased efficiency. You can validate your performance requirements to ensure that these policies align with your requirements.

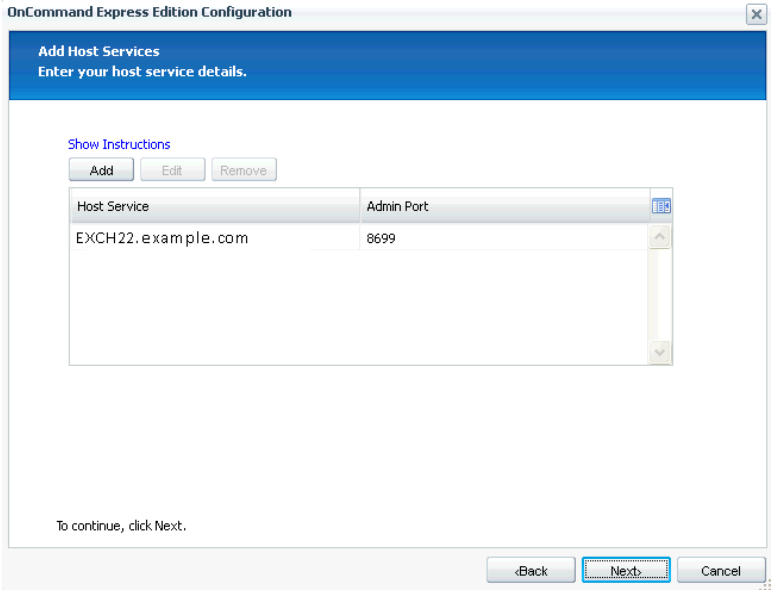
Steps

1. Click the **Administration** menu, then click the **Express Configuration** option.

The **Express Configuration** wizard might open automatically the first time you log in to the OnCommand console after you finish the Express edition installation.



2. On the **Add Host Service** page, click **Add** to register a host service with the DataFabric Manager server.



You must register each host service with the DataFabric Manager server, so that OnCommand Unified Manager is made aware of the host service and can manage it.

3. Enter values for **IP Address/Name** and **Admin Port** for the host service, then click **Add**.

   If using the name, it must be the fully qualified domain name (FQDN). If you are installing the Host Package and the DataFabric Manager server on the same system, you must specify the hostname or a fully qualified domain name, not localhost, for the DataFabric Manager server.

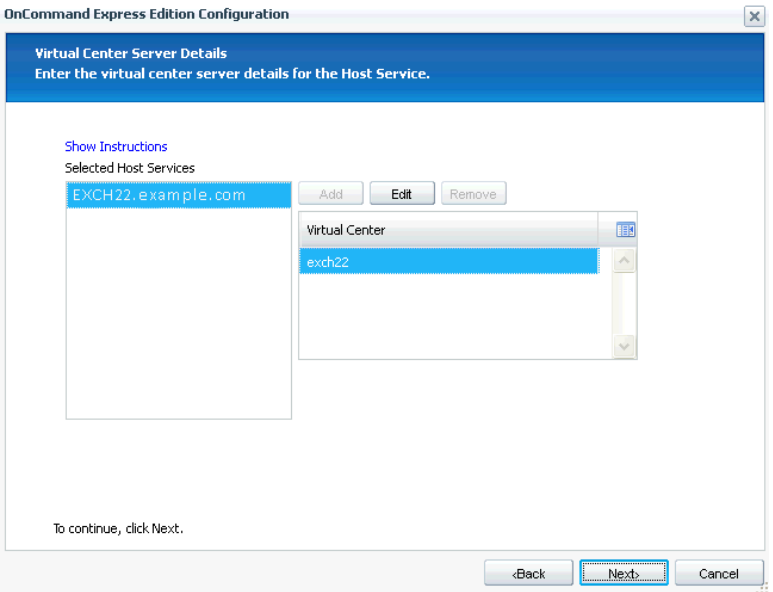
4. Optional: If you need to edit settings for a host service, click **Edit**, make the changes, and then click **OK**.

   Editing is enabled only for host services that you add manually to the list.

5. Add or edit other host services as needed, then click **Next**.

   When you click **Next**, all of the hosts in the list are registered, authorized, and discovered.

6. In the **Virtual Center Server Details** page, select a host service from the list.



7. If a virtual center server is not listed for the host service, click **Add** and enter the virtual center server name and credentials, then click **OK**.

8. On the **Add Storage System** page, click **Add** to register a storage system with the DataFabric Manager server.

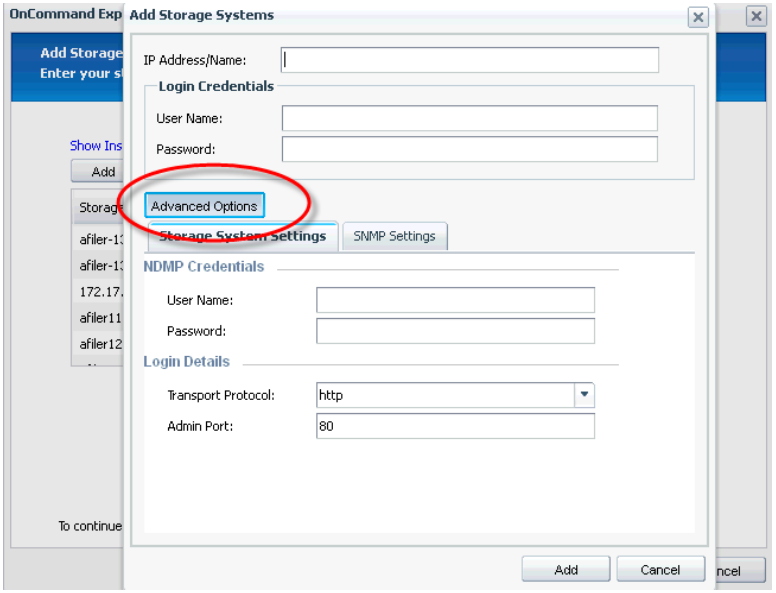
   You must register each storage system with the DataFabric Manager server, so that OnCommand Unified Manager is made aware of the storage system and can monitor it and use it for backup.

9. Enter values for **IP Address/Name**, **User Name**, and **Password** for the storage system.

   The login credentials are validated and set in the DataFabric Manager server. Login credentials are required for backups to succeed.

10. Modify the NDMP and SNMP settings in the **Advanced Options** section.

If the NDMP credentials are not set explicitly, then the login credentials are used for NDMP. NDMP credentials are required for backups to succeed.



11. Click **Add**.

    The credentials are validated and the storage system you added appears in the list of storage systems.

12. Optional: If you need to edit the settings for a storage system, click **Edit**, make the changes, then click **OK**.

13. Optional: Add or edit other storage systems as needed, then click **Next**.

    The storage systems for which you set the credentials are pushed to the host service and the systems are added to a default resource pool.

14. When the status screen appears, showing the configuration progress details, click **Finish**.

Result

The configuration wizard implements the following:

- The storage systems are configured in the DataFabric Manager server.
- The storage systems are associated with the selected host service.
- The storage systems are added to a default resource pool.
- A default remote protection storage service is created.

After you finish

You can monitor details about discovered virtual machines from the Host Services window in the OnCommand console.

Verify that the SQL service is running. This service must be running for DataFabric Manager server database backup and restore operations to succeed.

Configuring the OnCommand Standard edition server with host services (7-Mode only)

You must configure the host services to communicate with DataFabric Manager server, vCenter Servers, and storage systems that are required for backup and recovery of your data.

Before you begin

You must have installed the following:

- OnCommand Core Package
- OnCommand Host Package
- Adobe Flash Player 8.0 or later
- OnCommand Unified Manager Windows PowerShell cmdlets

About this task

The tasks identified in this configuration process can also be completed after initial installation and configuration. See the OnCommand console Help for information.

During the configuration process, job status and details about jobs can be viewed from the Jobs tab.

After you finish

After completing the configuration process, you can create backups of virtual objects from the Server tab.

Steps

1. *Verifying that a host service is registered with the DataFabric Manager server (7-Mode only)* on page 61

2. *Authorizing a host service to access storage system credentials (7-Mode only)* on page 62
   Before you can create backup jobs, you must authorize the host service to access the storage system credentials if it is not already authorized.
3. *Associating a host service with vCenter Server (7-Mode only)* on page 63

In a VMware environment, you must authorize each host service and associate it with a vCenter Server instance. This provides part of the communication needed for discovery, monitoring, backup, and recovery of virtual server objects such as virtual machines and datastores.

4. *Verifying communication between the host service and the OnCommand plug-in* on page 66
   You can verify that the host service is communicating with the OnCommand Unified Manager VMware Plug-in by ensuring that virtual machines are associated with the host service. If the host service is not communicating with the plug-in, the software cannot perform backup jobs.
5. *Associating storage systems with a host service (7-Mode only)* on page 67
   For each host service instance, you must associate one or more storage systems that host virtual machines for the host service. This enables communication between the service and storage to ensure that storage objects, such as virtual disks, are discovered and that host service features work properly.
6. *Editing storage system login and NDMP credentials from the Host Services tab (7-Mode only)* on page 69
   You must provide valid login and NDMP credentials for storage systems so that the DataFabric Manager server can access them. If the server cannot access the storage, your backups might fail.

Verifying that a host service is registered with the DataFabric Manager server (7-Mode only)

You must properly register a host service with a DataFabric Manager server before the server can discover objects and before you can perform a backup in a virtual environment.

About this task

A host service can be registered either with the DataFabric Manager server during installation, or later from the OnCommand console. However, you might want to verify that the registration is still valid when troubleshooting problems or prior to performing an action involving a host service, such as adding a storage system to a host service.

Steps

1. From the **Administration** menu, select **Host Services**.

   The Host Services tab opens.
2. In the host services list, verify that the name of the host service is listed.

   When a host service is registered with the DataFabric Manager server, it displays in the host services list.
3. For the selected host service, verify that Discovery Status is OK and that Status is Up.

After you finish

If the host service is not displayed in the list, you must add and configure the new host service.

If Status is other than Up, or Discovery Status is other than OK, edit the host service to provide the correct properties.

Related tasks

Associating a host service with vCenter Server (7-Mode only) on page 63
In a VMware environment, you must authorize each host service and associate it with a vCenter Server instance. This provides part of the communication needed for discovery, monitoring, backup, and recovery of virtual server objects such as virtual machines and datastores.

Authorizing a host service to access storage system credentials (7-Mode only)

Before you can create backup jobs, you must authorize the host service to access the storage system credentials if it is not already authorized.

Before you begin

The host service must be registered with the DataFabric Manager server.

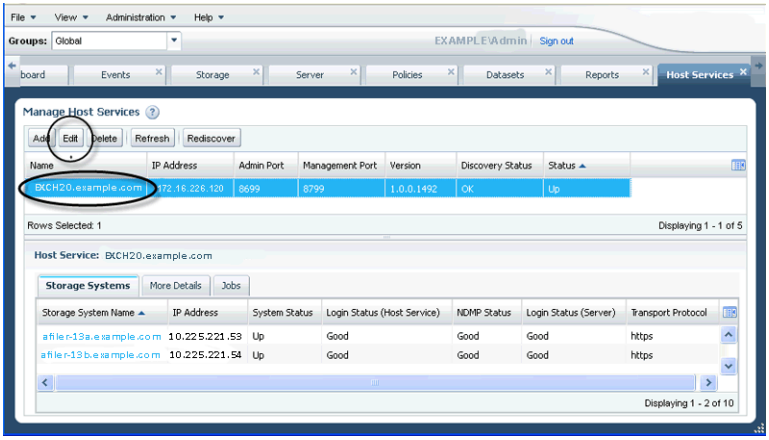
About this task

The DataFabric Manager server does not support a host service created as a generic service from Microsoft Windows Server Failover Cluster Manager.

Steps

1. From the **Administration** menu, select the **Host Services** option.
2. In the host service list, select the host service that you want to authorize and click **Edit**.

   If a host service is not displayed in the list, you must add the host service and verify that it is registered with the DataFabric Manager server.



3. In the **Edit Host Service** dialog box, click **Authorize**, review the certificate, and then click **OK**.

   If the Authorize area is unavailable, the host service is already authorized.

   When authorization is complete, the Authorize area becomes disabled.

4. Click **OK**.

After you finish

If you do not have storage systems associated with the host service, you must associate at least one storage system to be able to perform backups.

After you finish editing the host service properties, you can view job progress from the Jobs subtab on the Manage Host Services window and you can view details about each job from the Jobs tab.

Associating a host service with vCenter Server (7-Mode only)

In a VMware environment, you must authorize each host service and associate it with a vCenter Server instance. This provides part of the communication needed for discovery, monitoring, backup, and recovery of virtual server objects such as virtual machines and datastores.

Before you begin

The host service must be registered with the DataFabric Manager server; otherwise, it does not appear in the list of available host services.

The following information must be available:

- Name or IP address of the vCenter Server instance
- User name and password for access to the vCenter Server instance

About this task

The DataFabric Manager server does not support a host service created as a generic service from Microsoft Windows Server Failover Cluster Manager.

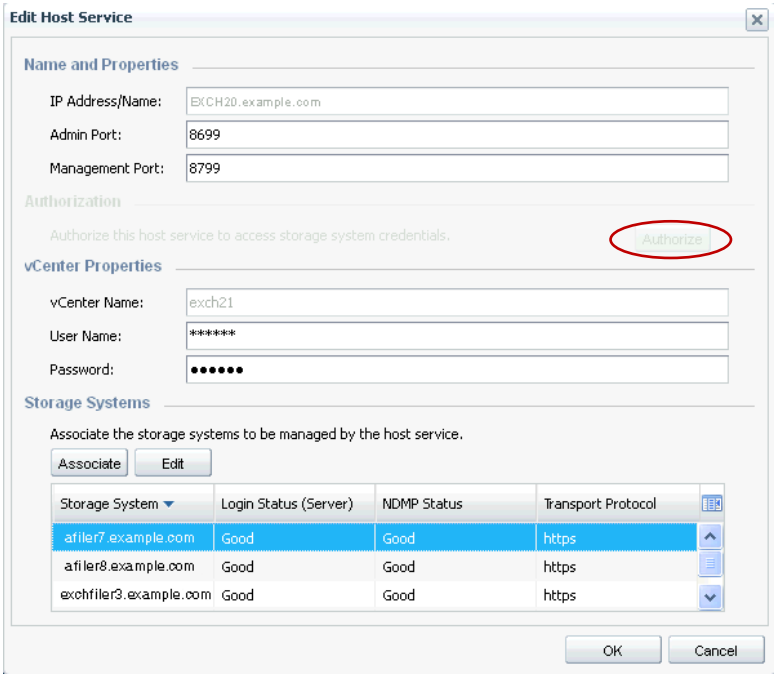
Steps

1. From the **Administration** menu, select the **Host Services** option.
2. In the host services list, select the host service that you want to associate and then click **Edit**.

   If the host service is not displayed in the list, you must add the host service and verify that it is registered with the DataFabric Manager server.

3. In the **Edit Host Service** dialog box, click **Authorize**, review the certificate, and then click **OK**.

   If the Authorize area is disabled, the host service is already authorized.



4. Enter the vCenter Server properties.

   You must specify the host name or the fully qualified domain name for host service registration. Do not use "localhost."

   If the properties fields are populated, then a server is already associated with the host service that you selected.

   If the vCenter Properties section is not displayed, you might have selected a host service that is installed in an environment other than VMware.

5. Click **OK**.

After you finish

If you do not have storage systems associated with the host service, you must associate at least one storage system to be able to perform backups.

After you finish editing the host service properties, you can view job progress from the Jobs subtab on the Manage Host Services window and you can view details about each job from the Jobs tab.

Related tasks

Verifying that a host service is registered with the DataFabric Manager server (7-Mode only) on page 61

You must properly register a host service with a DataFabric Manager server before the server can discover objects and before you can perform a backup in a virtual environment.

Adding and registering a host service (7-Mode only)

Before you can use a VMware host, you must add the host service and register it with the DataFabric Manager server.

Before you begin

The host service firewall must be disabled for the administration and management ports.

You must be authorized to perform all the steps of this task; your RBAC administrator can confirm your authorization in advance.

Attention: Host services can be registered with only one DataFabric Manager server at a time. Before you register a host service with a new DataFabric Manager server, you must first manually unregister the host service from the previous DataFabric Manager server. See the *NetApp Host Agent Installation and Administration Guide* for instructions on how to unregister a host service from the DataFabric Manager server.

About this task

The DataFabric Manager server does not support a host service created as a generic service from Microsoft Windows Server Failover Cluster Manager.

If you unregister a cluster-level host service, the DataFabric Manager server does not automatically register the host service when you re-register the node. You must re-register or add the host service using the cluster IP address.

Attention: If you change the name of the machine after installing the OnCommand Host Package, you must uninstall the OnCommand Host Package and perform a fresh installation.

Steps

1. Click the **Administration** menu, then click the **Host Services** option.
2. In the **Host Services** tab, click **Add**.
3. In the **Add Host Service** dialog box, type the IP address or the DNS name of the host on which the host service is installed.
4. If the administrative port has been changed in the host service from the default, type the changed port number.

   This is the port that is used by plug-ins to discover information about the host service.
5. Click **Add**.

Result

The host service is added and registered with the DataFabric Manager server.

Tip: If you see an error stating that the requested operation did not complete in 60 seconds, wait several minutes and then click **Refresh** to see if the host service was actually added.

After you finish

To make the host service fully operational, you might need to authorize the host service. In a VMware environment, you must edit the host service to add the vCenter Server credentials.

Related information

NetApp Host Agent Installation and Administration Guide - support.netapp.com/documentation/productlibrary/index.html?productID=30109

Verifying communication between the host service and the OnCommand plug-in

You can verify that the host service is communicating with the OnCommand Unified Manager VMware Plug-in by ensuring that virtual machines are associated with the host service. If the host service is not communicating with the plug-in, the software cannot perform backup jobs.

About this task

If a host service is communicating with the VMware plug-in, the virtual machines associated with the host service display in the VMs list on the Server tab.

Steps

1. Select the **Administration** menu and then select the **Host Services** option.

   The Manage Host Services window opens.

2. In the Host Services list, identify the name of the host service that you want to validate.
3. Select the **View** menu and then select the **Server** option.
4. Scroll through the list of virtual machines to see if the VMs related to the host service are listed.

   If the virtual machines are listed, the host service is communicating properly with the plug-in.

After you finish

If the virtual machines related to the host service do not display, consult the event logs on the host service system. You can also use the `List-HSResources` PowerShell cmdlet to verify that the host service is properly retrieving the virtual machine list from VMware.

Associating storage systems with a host service (7-Mode only)

For each host service instance, you must associate one or more storage systems that host virtual machines for the host service. This enables communication between the service and storage to ensure that storage objects, such as virtual disks, are discovered and that host service features work properly.

Before you begin

You must have the following information available for each storage system you want to associate:

- IP address or name
- Login and NDMP credentials
- Access protocol (HTTP or HTTPS)

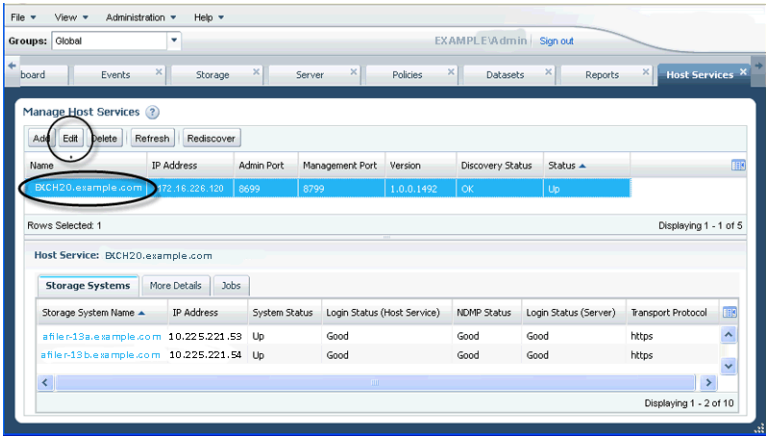
About this task

In a VMware environment, if the storage system that you add uses HTTP but has SSL enabled, then the host service uses HTTPS to communicate with the storage system. If the storage system that you add uses HTTP and does not have SSL enabled, then the host service uses HTTP to communicate with the storage system.

Steps

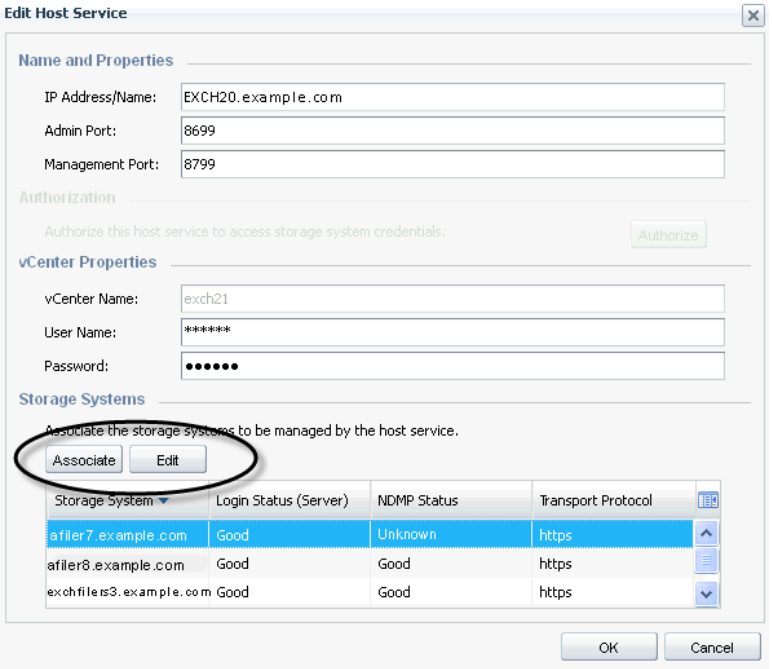
1. From the **Administration** menu, select **Host Services**.
2. In the host services list, select the host service with which you want to associate storage.

   In the Storage Systems subtab is a list of storage systems currently associated with the host service you selected.
3. Click **Edit** to associate a new storage system.



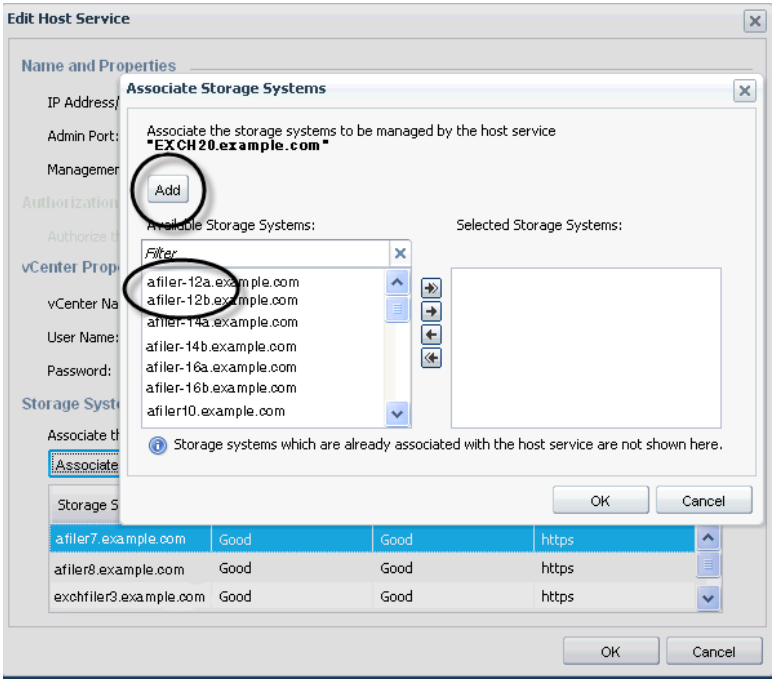
The Edit Host Service dialog box opens.

4. In the Storage Systems area, click **Associate**.



5. Choose one of the following ways to associate the storage systems with the host service:

   - To associate storage systems shown in the Available Storage Systems list, select the system names and click **OK**.
   - To associate a storage system not listed in Available Storage Systems, click **Add**, enter the required information, and click **OK**.



The newly associated storage system displays in the Storage Systems area.

6. In the list of storage systems, verify that the status is Good for the login and NDMP credentials for each storage system.

After you finish

If the login or NDMP status is other than Good for any storage system, you must edit the storage system properties to provide the correct credentials before you can use that storage system.

After you finish editing the host service properties, you can view job progress from the Jobs subtab on the Manage Host Services window and you can view details about each job from the Jobs tab.

Editing storage system login and NDMP credentials from the Host Services tab (7-Mode only)

You must provide valid login and NDMP credentials for storage systems so that the DataFabric Manager server can access them. If the server cannot access the storage, your backups might fail.

Before you begin

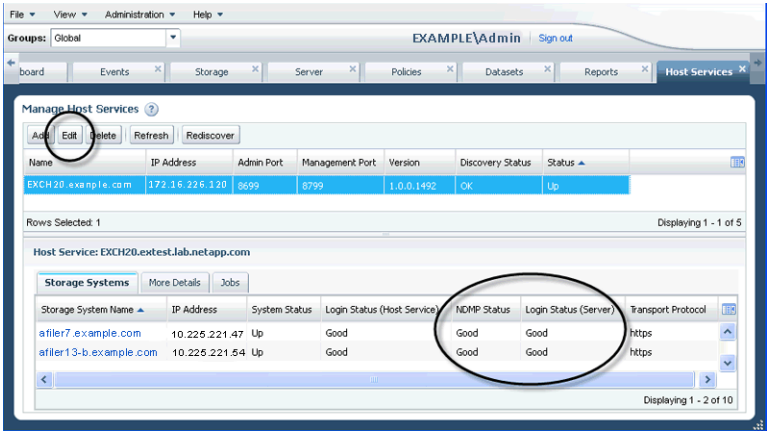
Have the following storage system information available:

- IP address or name
- Login and NDMP credentials
- Access protocol (HTTP or HTTPS)

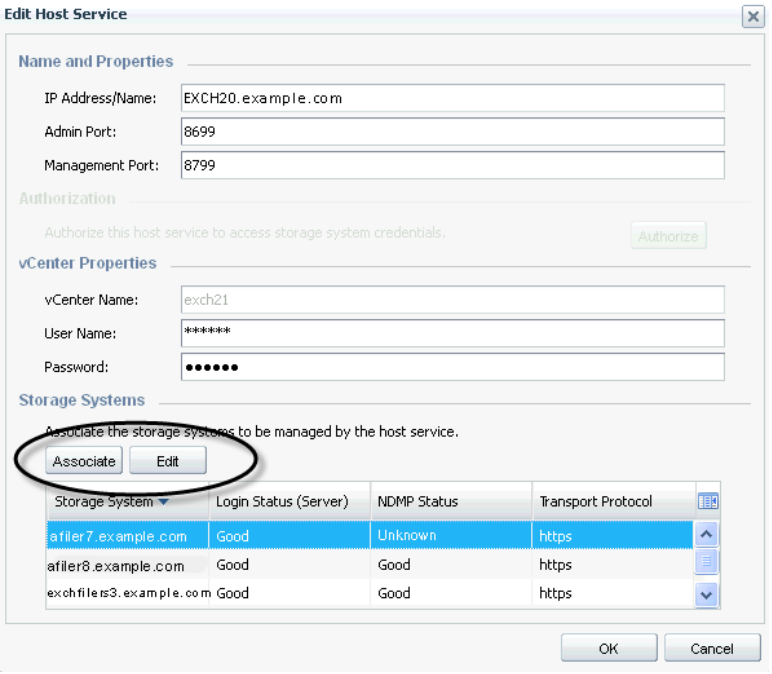
Steps

1. From the Administration menu, select **Host Services**.
2. In the host services list, select a host service.

   The storage systems associated with the selected host service display in the Host Services tab.
3. In the **Host Services** tab, select a storage system with a login or an NDMP status of Bad or Unknown.



4. Click **Edit**.
5. In the **Edit Host Service** dialog box, click **Edit**.



6. Enter the appropriate login and NDMP credentials and click **OK**.
7. In the **Host Services** tab, verify that the Login Status and NDMP Status are Good.
8. Click **OK**.

   The storage system status columns in the Host Services tab display the new status.

After you finish

After you finish editing the storage system properties, you can view job progress from the Jobs subtab on the Manage Host Services window and you can view details about each job from the Jobs tab.

Determining whether a storage system belongs to a workgroup or a domain

The storage system that you use for the OnCommand Unified Manager Core or Host Package installation must belong to a domain rather than a workgroup. Prior to installing the Core or Host Packages, you must determine if the system belongs to a workgroup or a domain.

Step

1. Right-click **My Computer** and click **Properties** and the **Computer Name** tab.

For details, see the documentation for your Windows operating system.

The Computer Name tab displays either a Workgroup label or a Domain label.

Certificate-based authentication

Connecting DataFabric Manager server to a virtual or cloud infrastructure network using certificate-based authentication means that authentication occurs using an SSL certificate. Using the certificate makes the requirement for user names or passwords unnecessary.

Certificate-based authentication occurs when a client, such as the host service or cloud orchestration tool, connects to the DataFabric Manager server with a Web service or ZAPI request. The client presents a self-signed certificate to DataFabric Manager server. In turn, DataFabric Manager server accepts the certificate, validates the certificate, and processes the request if it authenticates the client.

Certificate information

An SSL certificate is a digital document whose legitimacy is signed off by its creator. The certificate is used to verify that a key belongs to an individual or organization.

When you install DataFabric Manager server or the host service, the truststore contains no certificates to trust. You must add client certificates to the truststore before DataFabric Manager server will trust those client connections.

By default, the DataFabric Manager server installs the DataFabric Manager server key and certificate pair, and any trusted certificates in a repository called the DataFabric Manager server truststore

When DataFabric Manager server is installed, it is configured to not trust any public certificate authorities (CAs). If you want DataFabric Manager server to trust clients with certificates signed by a public CA, you must add the root CA certificate to the truststore.

Certificates are identified in the Windows Trusted Root Certification Authorities store with the following titles in the Issued To and Issued By columns:

- DataFabric Manager - VIM
- DFM Host Services for VIM
- DFM Plugin for VIM

Managing certificates for cloud service clients

You can manage certificates on your DataFabric Manager server for clients in a cloud infrastructure network, including generating a key and a self-signed certificate, adding certificates to a truststore, listing all certificates in a truststore, displaying details of certificates in a truststore, removing a certificate from a truststore, and disabling certificate-based authentication.

Generating a key and self-signed certificate

You can generate a key and certificate pair by using the `dfm ssl service setup` command.

Steps

1. On DataFabric Manager server, open a console session.
2. Enter the following command:

   `dfm ssl service setup -f`

   The `-f` option causes the command to overwrite existing key and certificate pairs.
3. To force DataFabric Manager server to immediately use the newly generated key, enter the following command:

   `dfm ssl service reload`

Adding a certificate in the truststore

You can add a certificate in the DataFabric Manager server truststore for clients in a cloud infrastructure network by using the `dfm ssl service truststore add` command.

Before you begin

The certificate must be in privacy-enhanced mail (PEM) format.

Step

1. On the DataFabric Manager server console, enter the following command:

   `dfm ssl service truststore add -f` ***`cacert.pem`***

   The `-f` option adds the certificate without prompting you for permission.

Removing a certificate from the truststore

You can remove a cloud service client certificate from the DataFabric Manager server truststore by using the `dfm ssl service truststore remove` command.

Step

1. On the DataFabric Manager server console, enter the following command:

   `dfm ssl service truststore remove` ***`certificate_number`***

Displaying the list of certificates in a truststore

You can use the DataFabric Manager server command-line interface to display a list of all the certificates in a truststore. You might want to do this to determine how long a certificate is valid, to

find information about the certificate's issuer, or to find the certificate number assigned to a specific certificate.

Step

1. On the DataFabric Manager server console, enter the following command:

   dfm ssl service truststore list

Displaying details about certificates in a truststore

You can display the details about one or more certificates in a truststore, including details about the certificate serial number, signature algorithm, issuer, valid from and valid to dates, and public key algorithm.

Steps

1. On the DataFabric Manager server, open a console session.
2. Enter the following command:

   dfm ssl service truststore detail *certificate number*

   certificate number displays details about a specific certificate in the truststore.

   You can use the `dfm ssl service truststore list` command to find the certificate numbers.

Displaying the contents of the DataFabric Manager server key and certificate file

You can display the contents of a key and certificate file, including the expiry date of the certificate, and verify whether the certificate is generated correctly, by using the DataFabric Manager server command-line interface. The key and certificate file contents are displayed in hexadecimal format.

Step

1. On the DataFabric Manager serverconsole, enter the following command:

   dfm ssl service show -c -k -f -o *output*

   `-c` selects the certificate for printing.

   `-k` selects the key for printing.

   `-o` saves the information to a file.

   `-f` overwrites the file without prompting.

Displaying DataFabric Manager server certificate details

You can display the DataFabric Manager server certificate details, including the certificate serial number, valid to and valid from dates, and signature algorithm.

Before you begin

The system date and time must be correct on the system where DataFabric Manager server is installed; otherwise, the Not Before and Not After dates might be displayed incorrectly in the command output.

Steps

1. On the DataFabric Manager server, open a console session.
2. Enter the following command:

   `dfm ssl service detail -f -o` ***`outputfile`***

   `-f` overwrites the file without prompting.

   `-o` saves the information to a file.

Disabling certificate-based authentication

The DataFabric Manager server uses certificate-based authentication by default to authenticate clients in a cloud infrastructure network. You can disable this feature so that clients cannot use a root certificate to connect to the DataFabric Manager server. You might want to disable certificate-based authentication when a certificate is expiring or you are replacing a certificate.

Steps

1. On the DataFabric Manager server console, open a the command-line interface.
2. Enter the following command:

   `dfm option set serverCertAuthEnabled=No`

Managing certificates for host services clients

You can manage certificates for host services clients on your DataFabric Manager server, including registering certificates, authorizing certificates, unregistering certificates, and displaying certificate information for a specific host service.

Authorizing a host service certificate

When you register a new host service with DataFabric Manager server, you must manually authorize the authentication certificate so that requests from the host service to DataFabric Manager server are successful.

Steps

1. Enter the following command from a DataFabric Manager server console session:

   `dfm hs list`

   The host requesting authorization is listed with the status "Authorization Pending".

2. Record the ID number of the host requiring authorization.

   The host ID is located in the first column of the list output.

3. Using the ID number you recorded in Step 2, enter the following command:

   `dfm hs authorize` ***`ID number`***

   You are asked whether you authorize the host service to use this DataFabric Manager server.

4. Enter `y` to authorize the host service certificate.

Migrating certificates, keys, and truststores manually

During DataFabric Manager server database backups, the directories containing certificates, keys, and truststores for both cloud service clients and host service clients are not backed up. If you want to restore database backups to a different DataFabric Manager server, you must manually migrate the certificates, keys, and truststore directories or the restore fails.

About this task

This procedure is not required when you back up and restore the database to the same DataFabric Manager server.

Steps

1. On the DataFabric Manager server you want to migrate, back up the database.
2. On the DataFabric Manager server you just backed up, copy the following three folders from the `\`*`DataFabric Manager install directory`*`\conf\keys\` directory:

   - `certs`
   - `private_keys`
   - `truststore`

3. Restore the database to the new DataFabric Manager server.

4. Copy the three folders from the original DataFabric Manager server to the same directory on the destination DataFabric Manager server.
5. Perform one of the following actions, depending on which type of clients you are migrating:
   - If you migrate clients in a cloud infrastructure, after the migration, generate a new DataFabric Manager server certificate on the destination DataFabric Manager server by entering `dfm ssl service setup`, and then load the new certificate by entering `dfm ssl service reload`

     Note: If you do not generate a new certificate, the new DataFabric Manager server will load the certificate that was migrated from the original DataFabric Manager server causing DataFabric Manager server hostname validation to fail on cloud service clients.
   - If you are migrating host service clients, after the migration, unregister the host service and then register the new host service from the Host Services tab in the OnCommand console.

Related tasks

Verifying that a host service is registered with the DataFabric Manager server (7-Mode only) on page 61

You must properly register a host service with a DataFabric Manager server before the server can discover objects and before you can perform a backup in a virtual environment.

Upgrading to the OnCommand Unified Manager Core and Host Packages

You can upgrade the OnCommand Unified Manager Core or Host Packages to use the monitoring tools and dashboards of the OnCommand console instead of reinstalling previous versions of DataFabric Manager server.

Upgrading the OnCommand Core Package on Windows

You can upgrade to the Express edition in Data ONTAP operating in 7-Mode environments, or to the Standard edition by installing the OnCommand Core Package.

Before you begin

- You must have administrator privileges for the Windows computer on which you are installing the Core Package.
- You must have downloaded the setup file, based on whether your Windows server is 32-bit or 64-bit.
- You must have the following items:
  - Credentials for network access
  - If you are upgrading from the Express edition of OnCommand Core Package to a Cluster-Mode environment, you must have first upgraded to OnCommand Core Package 5.0 and installed the Standard edition.

    The Express edition is not supported in Cluster-Mode environments.
  - The IP address of the server on which you are installing the software
  - Directory path where you want to install, if different from the default location

    If you are upgrading to the OnCommand Core Package while also migrating to a new system, you should use the original DataFabric Manager server installation path to avoid errors caused by changes to the path setting option for DataFabric Manager server databases.

    For example, if the original installation path is `C:\Program Files (x86)\NetApp \DataFabric Manager`, you should use that path and not the new default path `C:\Program Files\NetApp\DataFabric Manager`.

About this task

The installation software automatically detects and stops any DataFabric Manager server services that are running on the system.

If a DataFabric Manager server manages both 7-Mode and Cluster-Mode objects, an upgrade to a Cluster-Mode environment deletes all the 7-Mode objects. Similarly, an upgrade to a 7-Mode environment deletes all the Cluster-Mode objects.

Steps

1. Start the Core Package installation wizard by running the appropriate setup file.
2. Review and accept the license and AutoSupport agreements.

   You cannot install the Core Package unless you accept the license agreement.
3. Select the Data ONTAP environment: 7-Mode or Cluster-Mode.

   Note: If you are upgrading the Express edition, this prompt is not displayed.
4. When prompted, confirm if you want the database backed up.

   Backing up the database can take several minutes to many hours, depending on the size of your database.

   Attention: If you do not back up the database, your data is not archived.
5. Review the summary screen and consider whether you want to make changes before completing the installation process, and then click **Install**.
6. When the **Installation Complete** screen is displayed, click **Next** to continue.
7. Click **Finish** to close the wizard.

After you finish

- When you finish installing the Core Package, you can install the Host Package and use the configuration wizard to configure a host service.
- You should clear the browser cache before you first start the OnCommand console and when you upgrade to a new version of the software.

Related tasks

Downloading the OnCommand Core Package on page 37
Installing the OnCommand Core Package on Windows on page 38
Determining whether a storage system belongs to a workgroup or a domain on page 71

Upgrading the OnCommand Core Package on Linux

You can upgrade to the Express edition in Data ONTAP operating in 7-Mode environments, or to the Standard edition by installing the OnCommand Core Package.

Before you begin

- If you have a large database, you must have backed up the database before starting the setup wizard.

- You must have root user privileges for the Linux system on which you are installing the Core Package.
- If you are upgrading from the Express edition of OnCommand Unified Manager to a Cluster-Mode environment, you must have upgraded to OnCommand Core Package 5.0 and installed the Standard edition.

  The Express edition is not supported in Cluster-Mode environments.
- You must have downloaded the setup file, based on whether your Linux server is 32-bit or 64-bit.
- You must have the following items:
  - Credentials for network access
  - The IP address of the server on which you are installing the software
  - Directory path where you want to install, if different from the default location

About this task

The installation software automatically detects and stops any DataFabric Manager server services that are running on the system.

If a DataFabric Manager server manages both 7-Mode and Cluster-Mode objects, an upgrade to a Cluster-Mode environment deletes all the 7-Mode objects. Similarly, an upgrade to a 7-Mode environment deletes all the Cluster-Mode objects.

Steps

1. Start the Core Package installation wizard by running the appropriate setup file.

   The upgrade is started.
2. Follow the prompts and select the Data ONTAP environment: 7-Mode or Cluster-Mode.

   Note: If you are upgrading the Express edition, this prompt is not displayed.
3. Continue following the prompt.

   When the URL for opening the OnCommand console is displayed, the installation is complete.
4. Copy and paste the URL to a browser to open the OnCommand console.

Related tasks

Downloading the OnCommand Core Package on page 37
Installing the OnCommand Core Package on Linux on page 41

Upgrading OnCommand Core Package to manage both 7-Mode and Cluster-Mode environments

You can install two separate instances of OnCommand Core Package and migrate data from earlier versions of DataFabric Manager server to enable management of both 7-Mode and Cluster-Mode

environments. OnCommand Unified Manager does not support management of both 7-Mode and Cluster-Mode environments from the same server.

Before you begin

You must have two DataFabric Manager server license keys, one for each server instance.

Steps

1. Back up the database on the current installation of DataFabric Manager server before upgrading to the new version of OnCommand Unified Manager.
2. Download and install the OnCommand Core Package.
3. When you are prompted, choose 7-Mode as your environment, and complete the installation.
4. On a second server, perform a fresh installation of the OnCommand Core Package, choosing Cluster-Mode as your environment.
5. On the second server, restore the database that you backed up before the upgrade.

   You are warned that all 7-Mode data will be purged.
6. Disable the license key on the second server by entering the following line at the CLI:

   ```
   dfm license disable all
   ```

   After the restore, the two DataFabric Manager server installations share the same license key; therefore, one must be disabled to avoid conflicts.
7. Add a new license key to the second server by entering the following command:

   ```
   dfm license install NewLicenseKey
   ```
8. Verify that the new license key is installed by entering:

   ```
   dfm license list
   ```

   The second server installation is complete.

Related tasks

Downloading the OnCommand Core Package on page 0
Installing the OnCommand Core Package on Windows on page 38
Installing the OnCommand Core Package on Linux on page 41

Upgrading to the OnCommand Host Package

You can upgrade to the OnCommand Host Package from a previous version of SnapManager for Virtual Infrastructure to enable the DataFabric Manager server to use a host service to discover and

monitor virtual objects such as virtual machines or datastores for the Backup and Recovery capability.

Before you begin

- The system that you use for your Host Package installation must belong to a domain rather than a workgroup.
- You must have administrator privileges for the Windows computer on which you are installing the Host Package.
- The DNS name of the Windows computer on which you are installing the Host Package must match the actual computer name and the computer name cannot be more than 15 characters.
- The `smvi.override` file from the previous installation directory must be backed up if you are upgrading from VSC 2.0 to OnCommand Unified Manager.
- The Windows firewall must be set to allow exceptions.
- The Server Manager administrative tool on Windows 2008/Windows 2008 R2 systems must be stopped.
- You must at least PowerShell 1.0 installed. PowerShell 2.0 is recommended.
    - On Windows Server 2008 R2, PowerShell is installed by default and you do not need to enable it on the server.
    - On Windows Server 2008, PowerShell is not installed by default and you must enable it on the server after it is installed.

      To enable PowerShell, follow the instructions in the pop-up dialog box.
    - On Windows Server 2003 or 2003 R2, you must download and install PowerShell.
- Any service or process that is using the same Java Runtime Environment (JRE) that is installed with the Host Package must be stopped.
- You must have the following items available:
    - A Windows system account user name and password
    - A Host Package install location, if not the default
    - The IP address, user name, and password of the DataFabric Manager server
    - The IP address, user name, and password of the vCenter Server

About this task

If you are installing the Host and Core Packages on the same system, a fully qualified domain name must be used for the Core Package, instead of *localhost*.

The installer creates a locks directory, which is used to coordinate access to resources in the vSphere Client. The locks directory is located within the OnCommand Unified Manager directory. You must not change the name or the location of this directory.

The IP address and host name for the system on which you are installing the Host Package must have a DNS registration that resolves properly between the host service and the DataFabric Manager server.

You should use a dedicated Windows server for each vCenter Server instance. Having other applications installed on the same server can take up valuable system resources and might drastically reduce performance.

If the installer fails during the installation of the Host Package, it might not revert the system to its original state. You must manually remove the Host Package using the Control Panel application for your operating system and then delete the folder where the Host Package was installed.

Steps

1. Double-click the executable file to launch the OnCommand Host Package installer:
   - For 32-bit systems, click `ochost-setup-1-2-x86.exe`.
   - For 64-bit systems, click `ochost-setup-1-2-x64.exe`.
2. Click **Next** to accept the default installation location, or click **Change** to enter a different location.
3. On the **Service Credentials** page, type the user name and password for the system on which you are installing the Host Package.

   You must type the user name in the following format:

   `domain name\user name`
4. On the **Configure Communication Ports** page, type the port numbers that you want to use or accept the default port numbers.

   If you use custom firewalls, ensure that the Core and Host Packages use the same port numbers.
5. On the **Configure DataFabric Manager server** page, type the IP address and the user name and password used to access DataFabric Manager server.

   If you want to monitor your virtual environment or use the Backup and Recovery capability, you must type the credentials for the DataFabric Manager server. You can skip the validation of the DataFabric Manager server if you do not have the server credentials available.
6. On the **Plug-in Service and vCenter Server Information** page, provide the following information:
   a) Type the admin IP address of the system on which you are installing the Host Package.
   b) Type the host name or IP address of the system on which the vCenter Server is installed and the user name and password that enables the vSphere Client to communicate with the vCenter Server.
7. Click **Install** on the summary page, and then click **Finish**.

After you finish

- During the installation process, the installer creates some temporary folders that are automatically deleted when you next reboot the system.

If you want to delete these folders, you can do so without adversely affecting the installation of the Host Package.

- The host service must be configured to perform backups.

Related tasks

Downloading the OnCommand Host Package on page 49
Installing the OnCommand Host Package on page 50
Determining whether a storage system belongs to a workgroup or a domain on page 71

Related references

Designated ports for the OnCommand Host Package on page 34

Upgrade issues with DataFabric Manager 3.8 or earlier

You can upgrade to OnCommand management software from previous versions of the DataFabric Manager server. However, due to changes in system behavior between releases, you might have to resolve issues before upgrading.

The following issues are associated with upgrading to OnCommand Core Package 5.1 from DataFabric Manager 3.8 and earlier. Issues associated with upgrading from DataFabric Manager server 4.0 or later to OnCommand Core Package are covered in the requirements and installation instructions throughout this guide and in the *Core Package Release Notes*.

Supported methods to upgrade from Windows 2000 to Windows Server 2003

DataFabric Manager 3.7 or later does not support Windows 2000. Therefore, you must upgrade your server operating system to Windows Server 2003 before you upgrade to DataFabric Manager 3.7 or later. If you currently run DataFabric Manager server software on Windows 2000, upgrade to DataFabric Manager 3.0.1 or later and then upgrade the operating system to Windows Server 2003.

If you have Windows Server 2003 already installed on another system, install DataFabric Manager 3.7 or later on it, and then migrate the database from the Windows 2000 system.

For information about database backup, see the section on setting up the DataFabric Manager server database backup in the *Operations Manager Administration Guide*. For information about migrating the database, see the manual (man) page for the `dfm datastore setup <dfm-data-dir>` command.

Supported methods to upgrade from Solaris to Windows or Linux

DataFabric Manager 3.8 and later does not support Solaris. Therefore, you must migrate the DataFabric Manager server database on Solaris to a server running Windows or Linux before you upgrade to DataFabric Manager 3.8 or later.

You can migrate the database by creating an archive copy of the backup by using the `dfm backup create <backup_filename>` command, then restore the database by using the `dfm backup restore <backup_filename>` command.

Upgrading from DataFabric Manager 3.7.1

If you have created custom reports with GUILink and SecureGUILink as fields in DataFabric Manager 3.7.1 or earlier, upgrading to DataFabric Manager 3.8 or later causes the `dfm report view` command to fail. You must open the custom report in Operations Manager console and save the report to view it.

Upgrading from DataFabric Manager 3.7 on Linux

If you are upgrading from DataFabric Manager 3.7 to DataFabric Manager 3.8 or later on Linux, the upgrade might fail with the following notification:

```
rpm: /opt/NTAPdfm/lib/libgcc_s.so.1: version `GCC_4.2.0' not found
(required by /usr/lib/libstdc++.so.6)
```

You can resolve this issue by deleting the entry `/opt/NTAPdfm/lib` from the environment variable LD_LIBRARY_PATH.

Upgrading from DataFabric Manager 3.7 or earlier

If you are upgrading from DataFabric Manager 3.7 or earlier to DataFabric Manager 3.8 or later, you must delete the existing Data Source Name (DSN) entry for the Adaptive Server Anywhere 9.0 driver and create a new DSN entry for SQL Anywhere 10.

Upgrading from DataFabric Manager 3.5 or earlier

If you are upgrading from DataFabric Manager 3.5 or earlier to DataFabric Manager 3.6 or later, it takes a long time to upgrade the performance data files (data of 20 GB or more). The length of time depends on the platform used. The space used by the performance data files increases by about 65% during the upgrade.

Upgrading from DataFabric Manager 3.2 or earlier

Because of database schema changes, you might experience a delay of several minutes to a few hours when upgrading from DataFabric Manager 3.2 or earlier.

The time required to perform the upgrade depends on the size of the database, the amount of history in the database, the CPU speed, and the I/O throughput of the system. The following processes might require a lot of time:

- Merging rotating history tables
- Populating history tables
- Populating volume history tables
- Populating aggregate history tables
- Reloading the database into the latest file format (at the end of upgrade)

Upgrading from DataFabric Manager 3.1

After an upgrade from DataFabric Manager 3.1, Last Backup Status of All Primary Directories in Storage Systems under the Backup Manager tab is shown as unknown.

This issue is resolved after DataFabric Manager server runs a backup job for the relationship.

Upgrading from DataFabric Manager 2.1 or earlier, on Windows

Because of a database upgrade that is no longer supported on a Windows platform, you must first upgrade to DataFabric Manager 2.2 or later (up to DataFabric Manager 3.2) before you upgrade to DataFabric Manager 4.0.

Windows installation path when upgrading to DataFabric Manager 3.6 or later

Following are the default installation paths for various software versions:

- DataFabric Manager 3.8 through 4.0.1 on Windows
  32-bit platform: C:\Program Files\NetApp\DataFabric Manager
  64-bit platform: C:\Program Files (x86)\NetApp\DataFabric Manager
- DataFabric Manager 3.6 or later (up to 3.7.1):
  C:\Program Files\NetApp\DataFabric
- Versions earlier than DataFabric Manager 3.6:
  C:\Program Files\Network Appliance\DataFabric

Windows Server 2003 default browser security setting recommendations

After Windows Server 2003 is installed, the default security setting for the browser is “high.” This setting can cause the browser to block certain actions that can interfere with your OnCommand Core Package upgrade.

To ensure the best browsing experience when using OnCommand Unified Manager, you might need to adjust your browser security setting to “medium.”

Installing OnCommand Core Package in a custom Linux directory

If you used the `-d <new directory>` command to install DataFabric Manager 3.2 or earlier in a custom directory, the software was installed in an NTAPdfm directory that was automatically created within the new directory you specified.

If you use the `-d <new directory>` command to install DataFabric Manager 3.3 or later in a custom directory, the software is installed in the new directory you specify; no additional NTAPdfm directory is created.

Viewing dynamic data

To use Disaster Recovery, the browser that you use to view Operations Manager console must support Java applets.

Conversion of group names from DataFabric Manager 3.1 or earlier

The naming convention for hierarchical groups uses the forward slash character (/) as a separator between levels in the hierarchy. If you upgrade from DataFabric Manager 3.1 or earlier, any group that uses the forward slash character in its name is renamed so that the group is not mistaken for a subgroup in a hierarchy.

Each forward slash character is replaced by a hyphen character (-). If the new name is already in use by another group, OnCommand Unified Manager adds an increasing numeric suffix to the name until an unused name is derived. For example, OnCommand Unified Manager would try to rename group apple/orange to appleorange, then to apple-orange1, then to apple-orange2, and so on, until an unused group name is found.

Upgrade considerations for configuration groups

After upgrading from DataFabric Manager 3.1 or earlier, some administrators of configuration resource groups might gain additional privileges through inheritance. Before upgrading, review the privileges for group hierarchies that include configuration resource groups and make adjustments as necessary.

Uninstalling the OnCommand Unified Manager Core and Host Packages

If you are no longer using the package or need additional space, it might be necessary to uninstall and remove packages. When you uninstall the OnCommand Unified Manager Core or Host Package from your system, the installer automatically removes all components.

Uninstalling the OnCommand Core Package from Windows

You can uninstall the OnCommand Core Package, for instance, when a Core Package installation is unsuccessful, or when you want to reconfigure your system with a fresh installation. You uninstall the Core Package using the Control Panel application for your operating system.

Before you begin

You must have ensured that there are no other dependencies on the Core Package, because the wizard uninstalls all associated components.

Steps

1. On the Windows server where you installed the Core Package, navigate to the Windows Control Panel and select **Control Panel > Add/Remove Programs** (Windows Server 2003) or **Control Panel > Programs and Features** (Windows Server 2008).

   For details, see the documentation for your Windows operating system.

2. Scroll through the list of installed programs to find the program that you want to remove.
3. Click the program that you want to uninstall, and then click **Uninstall/Change** or **Change/Remove**, depending on your operating system.

   The NetApp install wizard opens.

4. Select **Remove**, and then click **Next**.
5. Click **Uninstall**.
6. If requested, reboot the system.

   A system reboot is required when, during the uninstall process, the `\DataFabric Manager \DFM` program directory is not moved to a new directory. The new directory is created with a name that indicates the date and time that you performed the uninstall process: for example, `\DataFabricManager\DFM-20110622140520\`, which specifies that the OnCommand Core Package was uninstalled on June 22, 2011, at 2:05:20 PM. When this uninstall directory is not

created, you must reboot to complete the uninstall process and newly install the OnCommand Core Package.

Related tasks

Installing the OnCommand Core Package on Windows on page 38

Uninstalling the OnCommand Core Package from Linux

You can use the command `rpm -e` to uninstall the OnCommand Core Package from Linux, for instance, when a Core Package installation is unsuccessful, or when you want to reconfigure your system with a fresh installation.

Before you begin

You must have ensured that there are no other dependencies on the Core Package, because the wizard uninstalls all associated components.

Step

1. At the command prompt, type the command to uninstall the OnCommand Core Package: for example, `rpm -e NTAPdfm`.

   The software automatically uninstalls.

Related tasks

Installing the OnCommand Core Package on Linux on page 41

Uninstalling the OnCommand Host Package

You can uninstall the OnCommand Host Package from your system using the Control Panel application for your operating system. When you uninstall the Host Package, the host service does not unregister from the DataFabric Manager server.

Before you begin

- You must save any files that contain data such as local backups, scheduled jobs, or datasets. You can find these files in the installation folder. The uninstall process removes all Host Package files.
- You must stop any service or process that is using the same Java Runtime Environment (JRE) that is installed with the Host Package.

Steps

1. On the Windows server where you installed the Host Package, navigate to the Windows Control Panel and select **Control Panel > Add/Remove Programs** (Windows Server 2003) or **Control Panel > Programs and Features** (Windows Server 2008).

   For details, see the documentation for your Windows operating system.

2. Scroll through the list of installed programs to find the program that you want to remove.
3. Click once on the program you want to uninstall and then click **Uninstall/Change** or **Change/Remove**, depending on your operating system.

   You can also double-click the program name and Windows will uninstall OnCommand Host Package by default.

   This will open a prompt asking you to confirm you want to uninstall OnCommand Host Package.

4. Click **Yes** to continue uninstalling OnCommand Host Package.

Result

OnCommand Host Package will uninstall without any additional prompts.

After you finish

- When you finish uninstalling the Host Package, you might need to manually close the port used for OnCommand Unified Manager Host Service Management.
- You must disable all the ports opened by the installer for all profiles as appropriate for your operating system.

Related tasks

Installing the OnCommand Host Package on page 50
Upgrading to the OnCommand Host Package on page 82

Related references

Designated ports for the OnCommand Host Package on page 34

Troubleshooting OnCommand Unified Manager installation and setup

If you encounter unexpected behavior during the installation or when using OnCommand Unified Manager, you can use specific troubleshooting procedures to identify and resolve the cause of such issues.

Address already in use

Description	This message occurs when the Windows computer has run out of outbound ports. A Transmission Control Protocol (TCP) connection has closed, causing the socket pair associated with the connection to go into a TIME-WAIT state. This prevents other connections from using the TCP protocol, source Internet Protocol (IP) address, destination IP address, source port, and destination port for an unknown period of time.
Corrective action	Reduce the length of the TCP TIME-WAIT delay. See the *Microsoft MSDN library* for more information.

There is a problem with this Windows Installer package

Description	This message occurs when you uninstall an application by using the Add or Remove Programs tool in Windows server. The Windows Installer service manages the installation and removal of programs. If there is a problem with the registration of the Microsoft installation engine, you might not be able to remove programs that you have installed by using the Windows installer.
Corrective action	Unregister and reregister the Windows Installer service. See KB891985 on the *Microsoft support site* for more information.

Cursor displays in multiple locations in the same dashboard panel

Cause	This problem occurs when you use the Firefox browser to open the OnCommand console.

Corrective action

Disable a browser setting in Firefox, as follows:

1. Open the Firefox browser and click the **Tools** menu, then click **Options**.
2. Click the **Advanced** tab.
3. Clear the Always use the cursor keys to navigate within pages option.
4. Restart the Firefox browser.

Plug-in container for Firefox has stopped working

Cause

While installing DataFabric Manager server Express edition, the configuration wizard might crash.

Corrective action

Update the Adobe Flash Player plug-in.

See the Mozilla Firefox Help for more information.

Related information

Firefox Help

No related objects are displayed for a virtual object

Issue

No physical servers corresponding to a virtual object are displayed in the Related Objects list in the Server tab of the OnCommand console.

Cause

This problem occurs when you add or register a new host service but the mapping between the physical servers and virtual objects does not occur.

Corrective action

1. Refresh the monitor by opening a console session and type the following command:

   ```
   dfm host discover -m share <storage system>
   ```

2. To view the results, type the following command:

   ```
   dfm details <storage system>
   ```

3. Search for the `shareTimestamp` value to ensure that discovery for the storage system is complete.
4. Click **Rediscover** in the Host Services tab of the OnCommand console to rediscover the host service.

5. Verify that the physical servers are displayed in the Related Objects list in the Server tab.

Could not find any storage mapping for virtual object

Description This message occurs in the following circumstances:

- When you create a new dataset in the OnCommand console that contains a datastore or a virtual machine from an NFS-based qtree

Corrective action

1. Refresh the monitor by opening a console session and type the following command:

   `dfm host discover -m share <storage system>`

2. To view the results, type the following command:

   `dfm details <storage system>`

   If you created a dataset from an NFS-based qtree, then you must set the export permission for the qtree in the storage system.

3. Search for the `shareTimestamp` value to ensure that discovery for the storage system is complete.
4. Click **Rediscover** in the Host Services tab of the OnCommand console to rediscover the host service.
5. Verify that the physical servers are displayed in the Related Objects list in the Server tab.

Storage mapping fails for virtual machine and datastore created on VMFS datastore using FC LUN

Issue Host service does not display any storage mapping in the OnCommand console for virtual machine and datastore created on VMFS datastore using FC LUN.

Cause This problem occurs when you do not correctly unmap an FC LUN from the ESX host and there are non-accessible LUNs in the datastore that you created, the SCSI target might not get updated in the vCenter Server inventory.

Corrective action Remove the non-accessible LUN and rescan the storage adapter.

Operation timed out

Description	This message occurs when an ESX or vCenter Server is busy creating snapshots or running local backups. In this instance, a copy operation for a restore might timeout from the vCenter server and the restore operation fails.
Corrective action	You can retry the restore operation when the ESX or vCenter Server is not as busy or you can use a different ESX or vCenter Server that is also connected to the same datastores.

Primary key for table is not unique

Description	This message occurs if you move the virtual machine when adding the entire virtual machine folder to the vCenter Server inventory. This causes the new virtual machine to have the same universal unique identifier (UUID) as the virtual machine from which the virtual machine folder was copied, and a UUID conflict occurs causing the host service discovery to fail.
Corrective action	Delete the folder that was moved and then copy the virtual machine folder to the vCenter Server inventory.

Access is denied

Description	This message occurs when you successfully install the Host Package, then attempt to modify the installation by setting new user credentials using the Add or Remove Programs tool in Windows server. This message might appear if the User Account Control (UAC) feature is enabled in Windows Server 2008 or Windows Server 2008 R2.
Corrective action	Set the UAC security level to low or you can change the Host Package settings by restarting the Host Package installer.

Error 1067 while starting webui service

Description	This message occurs during the installation of the Core Package on a system that if there is any other Java installation (older, newer, or same version) which sets Java specific environment variables. It might result in this problem in which the DFM WebUi service fails to start when the installation is complete.

Corrective action

You can uninstall the tool or application that set the Java specific environment variables or you can delete these variables when the DFM WebUi service fails to start after you install the Core Package. You can start the service manually by typing the command `dfm service start webui/http`.

Verifying host service to DataFabric Manager server communication

Issue

You can use the `dfm hs diag` command to verify that communication is enabled between the host service and the DataFabric Manager server, and to verify that the host service can communicate with the VMware plug-in. You can use this command to troubleshoot connectivity issues or to verify that communication is enabled before starting a host service backup.

Corrective action

1. On the DataFabric Manager server console, type the following command:

   `dfm hs diag <host service>`

Administrators usergroup does not exist on <vFiler name>

Description

This message occurs when you have a vFiler and you did not run the RBAC monitor for that vFiler, causing the vFiler configuration job for adding the vFiler credentials to the host service to fail.

Corrective action

1. Run the RBAC monitor for the vFiler using the command `dfm host discover -m rbac <Vfiler Name>`.
2. Run the configuration job for the vFiler.

Host service fails to connect to DataFabric Manager server after a restart

Cause

If there not enough space on the disk, the Windows Event Log automatically stops the plug-in services.

Corrective action

You must ensure there is enough space on the system drive and then restart the services that were stopped. The plug-in service has to be restarted before starting the host service.

Host service is unresponsive after successful installation of OnCommand Host Package

Issue

After you successfully install the Host Package, the host service does not display in the Host Services tab of the OnCommand console. You cannot configure a host service and no virtual objects are discovered.

Cause

This problem occurs because of a limitation in XML, when the host name contains two hyphens in a row, causing the host service to become unresponsive. Additionally, another unusual sequence of characters might also cause this problem.

Corrective action

1. Stop the oncommandhostsvc service.
2. You must modify the `hs_plugins.xml` file, which is located in the installation directory.
   The location of this file is at `C:\Program Files\NetApp\OnCommand Host Package\Host Service` if you installed the Host Package in the default directory at `C:\Program Files\NetApp\OnCommand Host Package`.
3. You must remove the following from within the comments section in a VMware environment:

```
 <PlugInEndpointInfo>
          <PlugInName>NetApp OnCommand Host Service VMware
Plug-in</PlugInName>
          <PlugInId>0122AC9E-ACE9-4958-AF1D-F6C0057F8597</
PlugInId>
          <PlugInVersion>1.0.0.0</PlugInVersion>
          <NetAppName>NetApp, Inc.</NetAppName>
          <EndpointURI>https://FCP-Q-VM5--W2K8:8044/smvi/
services/Hsplugin</EndpointURI>
          <EndpointHost>FCP-Q-VM5--W2K8</EndpointHost>
        </PlugInEndpointInfo>
```

4. Restart the oncommandhostsvc service.

Installing and configuring the OnCommand Core Package in an MSCS environment

Microsoft Cluster Server (MSCS) provides high-availability protection for your Windows environment.

As part of the OnCommand Core Package installation process, the DataFabric Manager server and its associated services are installed on your system. The cluster resources, including the services for the DataFabric Manager server, the network name, the network address, and the shared data disks, are always online and available on one of the nodes. You must configure the network name and address, and the shared data disks, during the OnCommand Core Package installation process.

When any failure occurs, whether a node failure or a failure of one of the resources, all the resources are automatically moved, or failed over, to the partner node by MSCS.

This failover process is assisted by using a quorum resource on the cluster. The quorum resource is a physical storage device that can be accessed by both nodes in the cluster, although only one node has access to the quorum resource at any given time. The node that has access to the quorum resource is the node that has control of the cluster resource.

Preparing to install the OnCommand Core Package in an MSCS environment

To ensure high availability of the DataFabric Manager server, you must configure the services to be accessible through a network name and a network address. The DataFabric Manager server can also use this network name or network address; therefore, you do not have to add new network resources for the services.

An MSCS cluster that is configured with the DataFabric Manager server consists of two nodes, each node running the same version of the DataFabric Manager server.

All of the DataFabric Manager server data (database files, Performance Advisor files, and so on) is configured to be accessed from a shared data disk.

Prerequisites for installing the OnCommand Core Package in MSCS

Before installing the Core Package in MSCS, you must set up two Windows servers running on identical hardware platforms. You must ensure that all the requirements and guidelines for configuring cluster servers are met, according to the MSCS documentation.

During the MSCS setup, you must ensure that you have completed the following actions:

- Creating a shared data disk to be used as a quorum resource.
- Creating a network name resource and a network address resource.

- Adding cluster resources to a resource group.

Related information

Introducing Microsoft Cluster Service (MSCS)

Configuration requirements for the OnCommand Core Package in MSCS

You must meet specific configuration requirements when you set up your MSCS environment to use OnCommand Core Package.

To ensure OnCommand Core Package installs and functions properly in an MSCS environment, the following MSCS configuration conditions must exist:

- Microsoft Windows servers running Windows Server 2003 Enterprise Edition, Windows 2008 Enterprise Edition, or Data Center Edition have the same patch versions on identical hardware.

  Note: MSCS is not supported on Windows Server 2008 and Windows Server 2008 R2. However, you can configure DataFabric Manager 3.8 or later for high availability on these platforms by using Failover Clustering. For more details, see the technical report on *High-Availability Support for DataFabric Manager server*.

- The DataFabric Manager server is connected to the storage system using either iSCSI or Fibre Channel (FC), and it is in a SAN environment.
- FC switched fabric or iSCSI-based storage is used for shared data disks with a NetApp storage system as the storage back end.
- Members of the cluster are member servers, and not domain controllers.
- The same version of OnCommand Core Package is installed using the same path on both of the cluster nodes: for example, `C:\Program Files\NetApp\DataFabric Manager\DFM`.
- All DataFabric Manager server administrators are domain users, rather than local system users, so that the user login is successful even when the DataFabric Manager server services fail over to the partner node.
- 64-bit Perl in Windows 64-bit 2008 server is installed, to run DataFabric Manager server configuration scripts.

Related information

Technical report on High-Availability Support for DataFabric Manager server: media.netapp.com/documents/tr-3767.pdf

Configuration limitations for the OnCommand Core Package in MSCS

OnCommand Core Package in MSCS is not supported on certain environmental conditions of the MSCS environment.

The following are configuration limitations of installing OnCommand Core Package in an MSCS environment:

- IPv6 virtual IP address on failover clustering is supported on Windows 2008 only.

- Only the Single Quorum Device Cluster setup is supported on Windows 2003.
- Quorum type “node and disk majority” in Failover Cluster is supported on Windows 2008 server only.
- OnCommand Core Package in MSCS is not supported on Windows running in a virtual machine.
- DataFabric Manager server does not support a host service created as a generic service from failover cluster manager in Microsoft Windows.

Installing the OnCommand Core Package in an MSCS environment

Before installing the OnCommand Core Package, you must configure MSCS with a shared disk for a quorum resource, assign a network name and a network address, place the cluster resources in a cluster resource group. After the installation is complete, you have to add DataFabric Manager server services to MSCS. You can install OnCommand Core Package in MSCS to ensure high availability in a Windows environment. You must install OnCommand Core Package on the first node, and repeat on the second node.

Configuring MSCS for the OnCommand Core Package installation

Before you install OnCommand Core Package in MSCS, you must configure your MSCS environment.

About this task

You must complete this task by using Cluster Administrator in the MSCS interface. See the MSCS documentation for more details.

You must configure MSCS to create the following:

- A shared quorum disk, which is used for storing the cluster configuration information
- A network name and a network address, which are used for managing the cluster server and the DataFabric Manager server
- A resource group to store the resources so that all these resources are available to both the cluster nodes

Steps

1. Select a domain user and add the domain user to the **Administrators Group** on both the cluster nodes.

   Example

   Enter the following command in **Administrators Group**:

   ```
   domain\dfmuser
   ```

2. Create a shared data disk:

   a) Make the disk accessible to both the cluster nodes.

b) Map the disk to a drive letter (such as drive `S:`).

Note: The data disk should be mapped to the same drive letter on both the cluster nodes.

c) Add the shared data disk, as a physical disk resource, to the cluster server.

This disk is a resource for storing data specific to OnCommand Core Package.

3. Verify that the new resource group can successfully fail over to the partner node.

Result

Cluster Administrator displays the resources, nodes, and groups. In addition to the content displayed after the initial setup, Cluster Administrator displays a physical disk resource named Disk `S:`.

Related information

Introducing Microsoft Cluster Service (MSCS): http://msdn.microsoft.com

Installing the OnCommand Core Package in MSCS

You can install the OnCommand Core Package in MSCS to ensure high availability in a Windows environment. You must install the OnCommand Core Package on the first node, and repeat the installation procedure on the second node.

Before you begin

The following conditions must be met:

- Microsoft Cluster Server is installed and configured on both the nodes of the cluster.
- The preinstallation tasks are completed.
- You must have the Core license key.
- The workstation meets the hardware requirements.
- You have Local Administrator login permission for the DataFabric Manager server.
- If you are upgrading from a previous version of the DataFabric Manager server, you should back up your database before the installation or during the installation process.
- The OnCommand Core Package installer from the NetApp Support Site is downloaded.

About this task

The two DataFabric Manager server nodes are configured to use the same database and to monitor the same set of nodes. Therefore, you can install the same license on both the nodes.

If you are upgrading from an earlier licensed version of DataFabric Manager server, you do not require a license key. Both the installation and upgrade processes automatically install the AutoSupport feature with AutoSupport enabled and display a message about how to disable the feature.

Steps

1. Log in to the first node of the cluster pair as a domain user, with administrator privileges on the local system.
2. Open the **Cluster Administrator** interface and select **Owner** of the Resources folder, to ensure that the node owns the cluster resources.
3. Run the executable file.
4. Follow the setup prompts to complete the installation and note the installation directory path for later reference.
5. Stop the DataFabric Manager server services after the installation is complete by entering the following command:

   ```
   dfm service stop
   ```

   Attention: You should perform all cluster operations by using either Cluster Administrator or `cluster.exe`. Except where specifically indicated in installation and configuration procedures, you must not use the `dfm service start` and `dfm service stop` commands. These commands interfere with cluster operations.
6. Move the cluster resources to the second node by using the **Move Group** option in MSCS.
7. Log in to the second node of the cluster pair as a domain user, with administrator privileges on the local system.

   Note: You must log in with the same user name you used on the first node.
8. Install the Core Package on the second node at the same directory path that you used on the first node.
9. Stop the DataFabric Manager server services on the second node by entering the following command:

   ```
   dfm service stop
   ```
10. Disable the automatic start-up of the DataFabric Manager server by entering the following command on both the nodes:

    ```
    dfm service enable -m
    ```

After you finish

You can start configuring both the cluster nodes by using the configuration scripts that are provided with the installation, or you can perform the configuration manually.

Related concepts

OnCommand Core Package hardware and software requirements on page 24

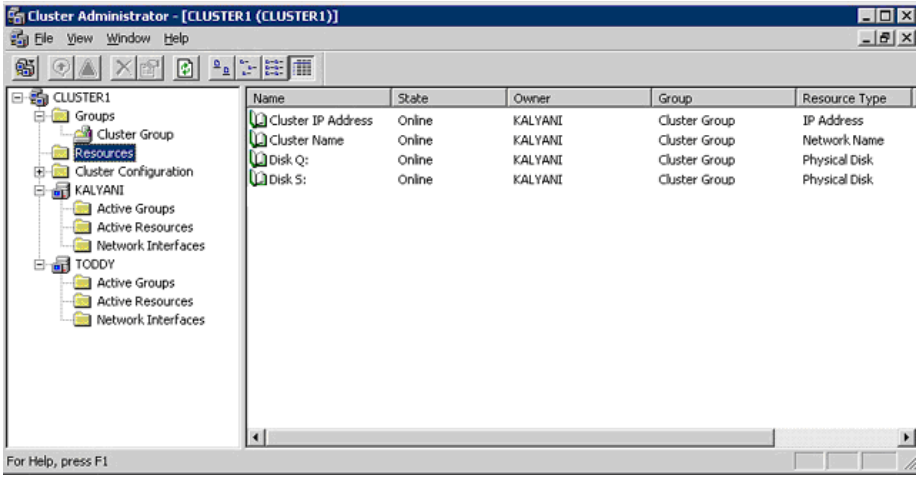
Related tasks

Preparing to install the OnCommand Core Package in an MSCS environment on page 98

Example of the MSCS initial setup

You should understand how the cluster, the nodes, the physical disk, the network name, and the network IP address are displayed in the Cluster Administrator interface.

The following image is an example of the Cluster Administrator interface after the initial setup of MSCS:



The configuration displayed in this example is as follows:

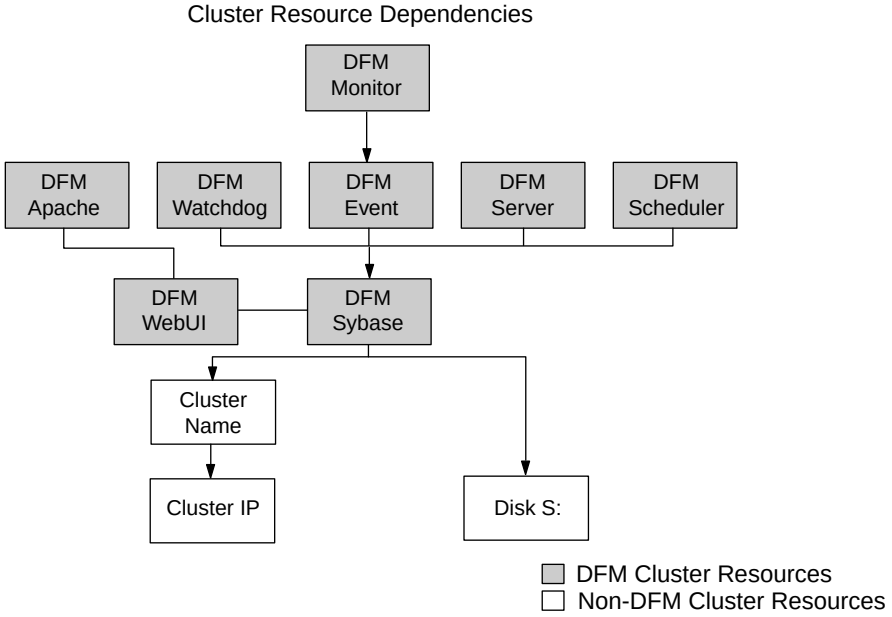
- The cluster name is Cluster 1.
- The first node name is Kalyani.
- The second node name is Toddy.
- The physical disk, the shared disk quorum resource, is created with the name Disk Q: and is mapped to drive letter Q:.
- The network name resource is called Cluster Name.
- The network IP Address resource is called Cluster IP Address.

DataFabric Manager server service resources added to MSCS

You must add the DataFabric Manager server cluster service resources to MSCS. The services include DFM Monitor, DFM Apache, DFM Watchdog, DFM Event, DFM Server, DFM Scheduler, DFM WebUI, and DFM Sybase.

These services are used for various purposes, such as monitoring storage systems, scheduling jobs, serving HTTP requests and executing servlets, processing events and database queries, and monitoring all the other services.

The following illustration shows the services and the dependencies among the various resources:



Configuring the OnCommand Core Package in an MSCS environment

When you install the OnCommand Core Package, the DataFabric Manager server services are installed with it. To achieve high availability, you must add the DataFabric Manager server cluster services to MSCS. You can configure the services either by using scripts or by adding the services manually.

The following service resources are added to MSCS:

- DFM Monitor
- DFM Apache
- DFM Watchdog
- DFM Event
- DFM Server
- DFM Scheduler
- DFM WebUI
- DFM Sybase

Adding the cluster services using a script

You can configure DataFabric Manager server in your cluster environment by running a configuration script. You can use the script to add the DataFabric Manager server cluster services to the cluster environment.

Steps

1. Log in to the node that owns cluster resources.
2. Move the DataFabric Manager server data to the shared data disk by entering the following command:

   dfm datastore setup *new_clusterdisk_directory*
3. Stop DataFabric Manager server services by entering the following command:

   dfm service stop

   This ensures that DataFabric Manager server does not try to access the data disk to be moved to the secondary node.
4. Ensure that the DataFabric Manager server services do not start automatically by entering the following command:

   dfm service enable -m

   The option `-m` ensures that the DataFabric Manager server services do not start automatically.
5. Manually move the cluster group to the second node.
6. Verify that the secondary node owns the cluster resources.
7. Enter the following commands on the secondary node:

   dfm service enable -m

   dfm datastore setup -n *drive_name*

   Note: You must ensure that you use the same drive letter for the secondary node as the first node. The `-n` option ensures that the data is not copied again to the shared data disk.
8. Access the directory at `C:\Program Files\NetApp\DataFabric Manager\DFM\examples` or `/opt/NTAPdfm/examples` , and `C:\Program Files(x64)\NetApp\DataFabric Manager\DFM\examples for x64-bit platform`.
9. Configure the DataFabric Manager server services in your cluster environment by running the following script:

   dfmcluster_add_resources.pl -t *cluster_type* -g *cluster_group* -i *cluster_ip_resource* -n *cluster_nameresource*

Script options for configuring services in MSCS

You can use a configuration script to add the DataFabric Manager server generic service resources to MSCS.

The command to add services to the DataFabric Manager server is as follows:

`perl dfmcluster_add_resources.pl` ***`option name ...`***

The `perl dfmcluster_add_resources.pl` command includes the following options:

`-t` ***`cluster_type`***	Cluster solution used for high availability. The values are `mscs` (default) and `vcs`.
`-g` ***`cluster_group`***	Name of the cluster group to which the resources are added. This group already includes the other resources.
`-i` ***`cluster_ip_resource`***	Name of the cluster IP resource that is displayed under the Name column in the Cluster Administrator.
`-n` ***`cluster_nameresource`***	Name of the cluster name resource.
`-k` ***`data_disk_resource`***	Name of the data disk resource.

Example

```
perl dfmcluster_add_resources.pl -g ClusterGroup1 -i 172.24.1.20 -n
Cluster1 -k Disk S:
```

Bringing DataFabric Manager server cluster services online in MSCS

After you add the DataFabric Manager server services to MSCS, you must bring the services online.

Steps

1. In the MSCS interface, select **Cluster Group** under the Groups folder.
2. Click **File**, and then click **Bring Online**.

Configuring DataFabric Manager server to use the cluster name in MSCS

When DataFabric Manager server sends e-mail alert messages to administrators, the DataFabric Manager server uses the local system name in the URL, by default. These local system names are not accessible to users in the cluster. Therefore, you must configure DataFabric Manager server to use the cluster name instead.

Step

1. Configure the DataFabric Manager server to use the cluster name by entering the following command:

```
dfm option set localHostName=fqdn-of-cluster
```

FQDN is the fully qualified domain name of the cluster.

Configuring DataFabric Manager server in MSCS manually

You can manually configure DataFabric Manager server in MSCS, which allows you to customize the setup of the cluster. For example, you can move different DataFabric Manager server data files to different shared data disks. However, you cannot move the data files using the configuration scripts.

Configuring DataFabric Manager server services on the first node in MSCS

You must configure the DataFabric Manager server by manually adding the DataFabric Manager server services.

Before you begin

You must be logged in as a domain user, with administrative privileges on the local system, to access the shared data drive. By default, the DataFabric Manager server services run using the local system account, and therefore do not provide access to the shared drive where the database files and other files reside.

Steps

1. In the **Cluster Administrator** interface, select the **Owner** field of the **Resources** folder.
2. Verify that the first node owns the resource group named Cluster Group.
3. Stop the DataFabric Manager server services by entering the following command:

   ```
   dfm service stop
   ```

   Attention: You should perform all cluster operations by using either Cluster Administrator or `cluster.exe`. Except where specifically indicated in installation and configuration procedures, you must not use the `dfm service start` and `dfm service stop` commands. These commands interfere with cluster operations.

4. Specify a user account in the **Logon As** field:
   a) Open the **Services** page from Windows **Control Panel**.
   b) Double-click **DFM Sybase ASA**.
   c) In the **General** tab, change the **Startup type** option to **Manual**.
   d) Click **Apply**.
5. Click the **Log On** tab.
6. Enter the name of the domain user account that you want to use to access the DataFabric Manager server service from the shared drive.
7. Click **OK**.
8. Repeat Steps 4 through 7 to add the cluster services.

You must configure all the services for the cluster to start working. You have to enter the following cluster service names in the **Services** tab that is displayed in the **Administrative Tools**:

- DFM Monitor
- DFM Apache
- DFM Watchdog
- DFM Event
- DFM Server
- DFM Scheduler
- DFM WebUI

After you finish

You must move the DataFabric Manager server data files to a shared disk.

Moving DataFabric Manager server data files to a shared disk

You must configure the DataFabric Manager server to allow access to data files in a shared disk.

Steps

1. For the first node, move the database files to a nonroot folder in the shared data drive.

   The default location for database files is *`installation_directory`*`\data`.

   Example
   `S:\dfm\data`

2. Ensure that the DataFabric Manager server points to the relocated database by entering the following command:

   `dfm database set dbDir=S:\dfm\data`

3. Verify that all the services are stopped by entering the following command:

   `dfm service list`

4. Move the following data files to appropriate folders in the shared disk:

   - Performance Advisor data files
     The default location is *`installation_directory`*`\perfdata` (for example, `S:\dfm\perfdata`).
   - Script plug-in files
     The default location is *`installation_directory`*`\script-plugins` (for example, `S:\dfm\script-plugins`).
   - Configuration Management plug-in files
     The default location is *`installation_directory`*`\plugins` (for example, `S:\dfm\plugins`).
   - Archived reports

The default location is *installation_directory*\reports (for example, S:\dfm\reports).

5. Start the SQL service by entering the following command:

   dfm service start sql

6. Set the options to point to the new location of the relocated files by entering the following commands:
   a) **dfm option set *perfArchiveDir*=S:\dfm\perfdata**
   b) **dfm option set *pluginsDir*=S:\dfm\plugins**
   c) **dfm option set *scriptDir*=S:\dfm\script-plugins**
   d) **dfm option set *reportsArchiveDir*=S:\dfm\reports**

   Note: The dfm option set command prompts you to start the services after setting each option. However, you must start the services only after you complete setting all the options.

7. Stop the SQL service by entering the following command:

   dfm service stop sql

Configuring DataFabric Manager server services on the second node in MSCS

After the first node is configured to allow access to all data files from a shared disk, you must configure the second node to allow the same access.

Before you begin

You must be logged in as a domain user, with administrative privileges on the local system, to access the shared data drive. By default, the DataFabric Manager server services run using the local system account, and therefore do not provide access to the shared drive where the database files and other files reside.

Steps

1. In the **Cluster Administrator** interface, select the **Owner** field of the **Resources** folder.
2. Verify that the first node owns the resource group named Cluster Group.
3. Stop the DataFabric Manager server services by entering the following command:

   dfm service stop

   Attention: You should perform all cluster operations by using either Cluster Administrator or cluster.exe. Except where specifically indicated in installation and configuration procedures, you must not use the dfm service start and dfm service stop commands. These commands interfere with cluster operations.

4. Specify a user account in the **Logon As** field:
   a) Open the **Services** page from Windows **Control Panel**.

b) Double-click **DFM Sybase ASA**.
c) In the **General** tab, change the **Startup type** option to **Manual**.
d) Click **Apply**.

5. Click the **Log On** tab.
6. Enter the name of the domain user account that you want to use to access the DataFabric Manager server service from the shared drive.
7. Click **OK**.
8. Repeat Steps 3 through 6 to add the cluster services.

   You must configure all the services for the cluster to start working. You must enter the following cluster service names in the **Services** tab in **Administrative Tools**:

   - DFM Monitor
   - DFM Apache
   - DFM Watchdog
   - DFM Event
   - DFM Server
   - DFM Scheduler
   - DFM WebUI

9. Verify that all the services are stopped by entering the following command:

   ```
   dfm service list
   ```

Configuring DataFabric Manager server services as cluster resources in MSCS

After you install the DataFabric Manager server services, you have to configure them as cluster resources and make them available to both nodes.

Before you begin

- The dependencies that exist between the various cluster resources must be determined.
  A dependency requires that one service must be running before its associated service can be brought online. For example, most services cannot function unless Sybase ASA is already running.
- You must be logged in to the node as a domain use, with administrator privileges on the local system.

About this task

You can use the following table to add the resource name, dependencies, and service name when configuring each new cluster service:

Resource name field	Dependencies field	Service name field
DFM Sybase ASA	Cluster IP, Cluster Name, Shared Data Disk, Data Disk	DFMSybase
DFM Apache	DFM Sybase ASA, DFM WebUI	DFMApache
DFM Scheduler	DFM Sybase ASA	DFMScheduler
DFM Watchdog	DFM Sybase ASA	DFMWatchdog
DFM Server	DFM Sybase ASA	DFMServer
DFM Event	DFM Sybase ASA	DFMEvent
DFM Monitor	DFM Event	DFMMonitor
DFM WebUI	DFM Sybase ASA	DFMWebUI

Steps

1. In the **Cluster Administrator** interface, select the **Owner** field of the Resources folder and verify that the node owns all the cluster resources.
2. In the console tree, double-click the **Groups** folder.
3. In the **Details** pane, click the group named **Cluster Group**.
4. Select **File** menu, and then select **New > Resource**.
5. On the **New Resource** page, complete the following steps:
   a) Enter the resource name in the **Name** field.
   b) Select **Generic Service** as the **Service Type**.
   c) Select **Cluster Group** as the group.
   d) Click **Next**.
6. On the **Possible Owners** page, complete the following steps:
   a) Add both nodes as the possible owners of the resource.
   b) Click **Next**.
7. On the **Dependencies** page, complete the following steps:
   a) Add dependencies related to the new service in the **Dependencies** field.

      Example
      Set **DFM Sybase ASA Dependencies** as the cluster IP address, cluster name, disk S:, and data disk.
   b) Click **Next**.
8. On the **Generic Service Parameters** page, complete the following steps:
   a) Enter the name of the service in **Service Name**.

Example

Set the name to DFM Sybase.

b) Clear the **Use Network name for computer name** option.

9. On the **Registry Replication** page, click **Finish**.

Note: You do not have to perform registry replication.

10. Repeat Steps 5 through 9 for every DataFabric Manager server service.

Related references

DataFabric Manager server service resources added to MSCS on page 103

Bringing DataFabric Manager server cluster services online in MSCS

After you add the DataFabric Manager server services to MSCS, you must bring the services online.

Steps

1. In the MSCS interface, select **Cluster Group** under the Groups folder.
2. Click **File**, and then click **Bring Online**.

Configuring a host service in MSCS

When you add a new host service in a cluster environment, you must ensure that both nodes in a cluster pair have access to the keys folder. This ensures that when one node fails, the second node of the cluster pair starts functioning.

Steps

1. Copy the keys folder from one node to the other in the cluster pair at `installation_directory\conf`.
2. In the **Cluster Administrator** interface, select the cluster group and click **Move group**, or manually move the cluster group to the second node and verify that the second node owns the resources.
3. Enter the following command on the second node to start using the new setting:

   ```
   dfm ssl service reload
   ```

4. Launch the OnCommand console and verify that the host service status is Up in the **Host Services** tab.

Managing DataFabric Manager server in an MSCS environment

You can create and restore backups, set HTTPS options, and configure DataFabric Manager server to share data on the DataFabric Manager server cluster nodes.

Best practices to start and stop DataFabric Manager server services in MSCS

After you set up DataFabric Manager server in MSCS, do not use the `dfm service start` and `dfm service stop` commands, except where specifically indicated in installation and configuration procedures. These commands interfere with the working of MSCS.

You must start or stop all operations by using either the Cluster Administrator in MSCS or the `cluster.exe` command.

Note: Do not change the Service startup type to `Automatic` in the Service Control Manager on any of the nodes. You must ensure that this option is set to `Manual`.

Restoring the DataFabric Manager server database in MSCS

Restoring a database enables the DataFabric Manager server to use the current settings. You can restore the database by using Cluster Administrator.

Steps

1. Log in to the node that currently owns the cluster resources.
2. In **Cluster Administrator**, take the services offline by completing the following steps:
   a) Right-click the **DFM Sybase** service.
   b) Select **Take offline**.

   The other services are also taken offline.
3. Restore the database by entering the following command in the OnCommand console:

   ```
   dfm backup restore
   ```
4. Stop all the services by entering the following command in the OnCommand console:

   ```
   dfm service stop
   ```
5. In **Cluster Administrator**, bring the DataFabric Manager server services online:
   a) Select **Cluster Group** under the Groups folder.
   b) Click **File**, and click **Bring Online**.

Configuring DataFabric Manager server to use HTTPS in MSCS

You can configure DataFabric Manager server to use HTTPS on both the cluster nodes for secure data transfers.

About this task

HTTPS is first set up with an SSL certificate, and then the HTTPS option is enabled on both the nodes.

Steps

1. Log in to the first node in the cluster.
2. In **Cluster Administrator**, take the DataFabric Manager server services offline:
   a) Right-click the **DFM Sybase** service.
   b) Select **Take offline**.

      The other services are also taken offline.
3. Start the SQL service by entering the following command in the OnCommand console:

   `dfm service start sql`
4. Create an SSL certificate for HTTPS by entering the following command:

   `dfm ssl server setup`

   This creates two files, `server.crt` and `server.key`, in the *`installation_directory`*`\conf` folder.
5. Set the DataFabric Manager server option to enable HTTPS by entering the following command:

   `dfm option set httpsEnabled=yes`
6. Start the HTTP service by entering the following command:

   `dfm service start http`

   Starting the service using `dfm service start` re-creates the `httpd.conf` file with the changed options.

   Attention: You should perform all cluster operations by using either Cluster Administrator or `cluster.exe`. Except where specifically indicated in installation and configuration procedures, you must not use the `dfm service start` and `dfm service stop` commands. These commands interfere with cluster operations.
7. Ensure that the DataFabric Manager server services are offline.

   If the services are not offline, the HTTP service is not enabled on the other node, because the configuration is not complete.
8. Stop all the services by entering the following command:

```
dfm service stop
```

9. In **Cluster Administrator**, move the cluster group to the second node by using the **Move Group** option.
10. Log in to the second node in the cluster.
11. Copy the `server.crt` and `server.key` files created on the first node to the *`installation_directory`*`\conf` folder in the second node.
12. Start the services and verify that they are operating as required by entering the following command:

    ```
    dfm service start
    ```

    Starting the service by using `dfm service start` re-creates the `httpd.conf` file with the changed options.
13. Stop the services by entering the following command:

    ```
    dfm service stop
    ```
14. In **Cluster Administrator**, bring the DataFabric Manager server services online:
    a) Select **Cluster Group** under the Groups folder.
    b) Click **File**, and click **Bring Online**.

Changing HTTP options in an MSCS environment

You can change the HTTP options to enable HTTPS, or change the default HTTP and HTTPS ports.

Steps

1. Log in to the first node in the cluster.
2. In **Cluster Administrator**, take the DataFabric Manager server services offline:
    a) Right-click the DFM Sybase service.
    b) Select **Take offline**.

    The other services are also taken offline.
3. Start the SQL service by entering the following command:

    ```
    dfm service start sql
    ```

    Attention: You should perform all cluster operations by using either Cluster Administrator or `cluster.exe`. Except where specifically indicated in installation and configuration procedures, do not use `dfm service start` and `dfm service stop`. These commands interfere with cluster operations.
4. Set the required HTTP option by entering the following command:

    ```
    dfm option set option-name=option-value
    ```

Example

```
dfm option set httpsPort=443
```

5. Start the HTTP service by entering the following command:

   ```
   dfm service start http
   ```

   Starting the service by using `dfm service start` re-creates the `httpd.conf` file with the changed options.

6. Stop all the services by entering the following command:

   ```
   dfm service stop
   ```

   Note: You must ensure that DataFabric Manager server services are offline before proceeding. Otherwise, HTTP is not enabled on the other node because the configuration is not complete.

7. In **Cluster Administrator**, move the cluster group to the second node by using the **Move Group** option.
8. Log in to the second node in the cluster.
9. Start the services by entering the following command:

   ```
   dfm service start
   ```

10. Stop the services by entering the following command:

    ```
    dfm service stop
    ```

11. In **Cluster Administrator**, bring the DataFabric Manager server services online:
    a) Select **Cluster Group** under the Groups folder.
    b) Click **File**, and click **Bring Online**.

DataFabric Manager server monitoring in MSCS

Microsoft provides the Server Clusters Management Pack as part of Microsoft Operations Manager. You can monitor the cluster server, and report node status, resource status, and alerts by using Cluster Administrator in MSCS. DataFabric Manager server does not provide any additional cluster monitoring or alerting functionality.

Data shared by MSCS cluster nodes

You must configure the DataFabric Manager server Microsoft Cluster Server (MSCS) nodes to access files from a shared disk. Using a shared disk ensures that any updates to these files are reflected in the files of the other nodes in the cluster after a failover.

The MSCS cluster nodes share the following files:

***installation_directory*\data**	Sybase database files
***installation_directory*\perfdata**	Performance Advisor data files
***installation_directory*\scriptplugins**	Installed script plug-ins and related files

***installation_directory*\plugins**	Storage system configuration plug-ins
***installation_directory*\reports**	Archived reports
***installation_directory*\dataExport**	DataFabric Manager server and Performance Advisor data
***installation_directory*\jetty**	Libraries and Web application files
***installation_directory*\conf\keys**	Encryption keys

Data that is not shared by MSCS cluster nodes

Files such as executables, configuration files, and licenses are not shared by the MSCS cluster nodes. This ensures that the same version is maintained in the cluster nodes.

The following files are not shared:

***installation_directory*\bin**	Executable files
***installation_directory*\conf**	Configuration files
***installation_directory*\docs**	Third-party licenses
***installation_directory*\examples**	Cluster configuration scripts, and so on
***installation_directory*\log**	Log files
***installation_directory*\misc**	Configuration files
***installation_directory*\sbin**	Third-party executables
***installation_directory*\scripts**	Sybase_install.sql
***installation_directory*\src**	Storage system configuration plug-ins
***installation_directory*\web\clients**	Performance Advisor clients
***installation_directory*\web\com**	JAR files for applets
***installation_directory*\web\help**	Help files
***installation_directory*\web\man**	Manual pages
***installation_directory*\web\media**	Images used on Web interfaces
***installation_directory*\web\scripts**	Java script files
***installation_directory*\web\styles**	CSS style sheets
***installation_directory*\perfExport**	Exported performance counter data for specified objects

Uninstalling the OnCommand Core Package in an MSCS environment

You can uninstall the OnCommand Core Package from a cluster by deleting the cluster services from each cluster node.

Steps

1. In **Cluster Administrator**, delete all the DataFabric Manager server services:
   a) Right-click the **DFM Sybase** resource.
   b) Select **Delete**.

   The other DataFabric Manager server services are also deleted.
2. Log in to any one of the cluster nodes.
3. From the Windows Add or Remove Programs utility, uninstall the OnCommand Core Package.
4. Repeat Steps 2 through 3 for the other nodes.

Upgrading the OnCommand Core Package in an MSCS environment

You must ensure that all the nodes in the cluster are upgraded to the correct OnCommand Core Package.

Before you begin

- A backup of your existing DataFabric Manager server database must be created.
- The OnCommand Core Package installer must be downloaded from the NetApp Support Site.
- The DFM WebUI services must be added to the DataFabric Manager server.

Steps

1. From **Cluster Administrator**, take the DataFabric Manager server services offline:
   a) Right-click the DFM Sybase service.
   b) Select **Take offline**.

   The other services are also taken offline.
2. Select the **Owner** field of the **Resources** folder to ensure that the first node owns the resource group named Cluster Group.
3. Upgrade to the OnCommand Core Package installation on the first node:

a) Run the executable file.
b) Follow the OnCommand Core Package setup prompts to complete the installation.

4. Stop all the DataFabric Manager server services by entering the following command:

   `dfm service stop`

   Attention: You should perform all cluster operations by using either Cluster Administrator or `cluster.exe`. Except where specifically indicated in installation and configuration procedures, you must not use the `dfm service start` and `dfm service stop` commands. These commands interfere with cluster operations.

5. Disable the automatic service start-up during reboot by entering the following command:

   `dfm service enable -m`

6. In **Cluster Administrator**, move the cluster group to the second cluster node by selecting the group name in **Services and Applications**, and then click **Move this service or application to other node**.

7. Select the **Owner** field of the **Resources** folder to upgrade the second node.

   You must ensure that the second node owns all the cluster resources.

8. Upgrade to the OnCommand Core Package installation on the second node:
   a) Run the executable file.
   b) Follow the OnCommand Core Package setup prompts to complete the installation.

9. Stop all the DataFabric Manager server services by entering the following command:

   `dfm service stop`

10. Disable the automatic service start-up during reboot by entering the following command:

    `dfm service enable -m`

11. In **Cluster Administrator**, click the console tree, and double-click the **Groups** folder.

12. In the **Details** pane, click the group named **Cluster Group**.

13. Select the **File** menu, and then select **New > Resource**.

14. On the **New Resource** page, complete the following steps:
    a) In the Name field, enter the following name:

       `DFM WebUI`
    b) Select **Generic Service** as the **Service Type**.
    c) Select **Cluster Group** as the group.
    d) Click **Next**.

15. On the **Possible Owners** page, add both the nodes as the possible resource owners, and click **Next**.

16. On the **Dependencies** page, add DFM Sybase ASA as a dependency on DFM WebUI, and click **Next**.

    In the DFM Apache Properties page, set DFM WebUI to be dependent on DFM Apache.

17. On the **Generic Service Parameters** page, complete the following steps:
    a) In the **Service Name** field, enter the following name:

       ```
       DFM WebUI
       ```

    b) Clear the **Use Network name for computer name** option.

18. Bring the DataFabric Manager server services online:
    a) Select **Cluster Group** under the **Groups** folder.
    b) Click **File**, and click **Bring Online**.

Related tasks

Adding the cluster services using a script on page 105

Installing and configuring the OnCommand Core Package in a VCS environment

Veritas Cluster Server (VCS) provides high-availability protection for cluster configurations.

As part of the OnCommand Core Package installation process, the DataFabric Manager server and its associated services are installed on your system. The cluster resources, including the services for the DataFabric Manager server, the network name, the network address, and the shared data disks, are always online and available on one of the nodes. You must configure the network name and address, and the shared data disks, during the OnCommand Core Package installation process.

When a resource node failure is detected, all the resources are automatically moved, or failed over, to the partner node by VCS.

Preparing to install the OnCommand Core Package in a VCS environment

To ensure high availability of the DataFabric Manager server, you must configure the services to be accessible through a network name and a network address. TheDataFabric Manager server can also use this network name or network address; therefore, you do not have to add new network resources for the services.

A VCS cluster configured with the DataFabric Manager server consists of two nodes, each node running the same version of the DataFabric Manager server. All of the DataFabric Manager server data (database files, Performance Advisor files, and so on) is configured to be accessed from a shared data disk.

Prerequisites for installing OnCommand Core Package in VCS

Before installing OnCommand Core Package in Veritas Cluster Server (VCS), you must ensure that the VCS configuration requirements are met.

VCS must be installed according to the instructions provided in the *Veritas Cluster Server 5.0 Installation Guide*

Related information

Veritas Cluster Server - http://www.symantec.com/business/cluster-server

Symantec Support - http://www.symantec.com/business/support

Configuration requirements for OnCommand Core Package in VCS

Before installing OnCommand Core Package in Veritas Cluster Server (VCS), you must ensure that the cluster nodes are properly configured to support the OnCommand Unified Manager software.

You must ensure that the VCS configuration meets the following requirements:

- Both of the cluster nodes must be running a supported operating system version.
  The minimum supported operating systems are Red Hat Enterprise Linux 5.6 and SUSE Linux Enterprise Server 10 with SP3.
- The same version of the OnCommand Core Package must be installed using the same path on both of the cluster nodes.
- Veritas File System and Volume Manager on Native ext3 File System and Logical Volume Manager (LVM) must be used.
- The DataFabric Manager server should be connected to the storage system using Fibre Channel (FC).
  Also ensure that the FC link is active and that the LUNs created on the storage systems are accessible to both of the cluster nodes.
- The shared data disk must have enough space to accommodate the DataFabric Manager server database, performance data, and script plug-in folders.
- A minimum of two network interfaces must be set up on each system: one for node-to-node communication and the other for node-to-client communication.
  The name of the network interface used for node-to-client communication should be the same on both the systems.
- A separate heartbeat link must be established between the cluster nodes; otherwise, the network interface is used to communicate between the cluster nodes.

Configuration limitations for the OnCommand Core Package in VCS

You must be aware of the configuration limitations before you install the OnCommand Core Package in a VCS environment.

The following are configuration limitations in VCS:

- Only two-node clusters are supported.
- The OnCommand Core Package in VCS is not supported on VMware.
- For shared disks, the storage back-end must be an FC-based storage only.
- iSCSI storage is not supported for the OnCommand Core Package in VCS.

Installing the OnCommand Core Package in a VCS environment

You must install Veritas Storage Foundation first and then install the core package in VCS. After you install these on both the nodes, you must configure VCS on the first node to use data from a shared disk, configure the DataFabric Manager server, and configure VCS on the second node.

Configuring VCS to install the OnCommand Core Package

Before you install the OnCommand Core Package in VCS, you must install SnapDrive, a Fibre Channel adapter, and Veritas Storage Foundation. You must then configure VCS and use SnapDrive for UNIX to create file systems.

Before you begin

- All requirements and guidelines for configuring cluster servers must be met, according to the VCS documentation.
- SnapDrive for UNIX must be installed.

Steps

1. Install Veritas Storage Foundation and High Availability Solutions 5.0 with Maintenance Pack 1 (MP 1).

   When you install Veritas Storage Foundation and High Availability Solutions 5.0, VCS is also installed.

2. Configure VCS by entering the following command:

   ```
   installvcs -configure
   ```

3. Enter the network address (virtual IP address).
4. Use SnapDrive for UNIX to create file systems and logical volumes.

Related information

Veritas Cluster Server: www.symantec.com/business/cluster-server
Veritas Storage Foundation: www.symantec.com/en/in/business/storage-foundation
SnapDrive for UNIX: support.netapp.com/NOW/knowledge/docs/docs.cgi

Installing the OnCommand Core Package in VCS

You can install the OnCommand Core Package in VCS to ensure high availability.

Before you begin

The following conditions must be met:

- VCS is installed and configured on both the nodes of the cluster.
- The same version of the OnCommand Core Package is installed on both the nodes.
- The installation directory is the same on both the nodes: for example, `/opt/NTAPdfm` .
- The first node owns the cluster resources.
- You have root privileges to log in to the DataFabric Manager server.
- The OnCommand Core Package installer from the NetApp Support Site is downloaded.

About this task

The two DataFabric Manager server nodes are configured to use the same database and to monitor the same set of nodes. Therefore, you can use the same license to install, on both the nodes.

If you are upgrading from a previous version of the DataFabric Manager server, you can back up your database before or during the installation process.

During a new installation, you must specify the OnCommand Unified Manager Core license key. If you are upgrading from an earlier licensed version of DataFabric Manager server, you do not require a license key. The installation and upgrade process automatically installs the AutoSupport feature with AutoSupport enabled and displays a message about how to disable the feature.

Steps

1. Log in to the first node of the cluster pair.
2. Run the executable file.
3. Follow the setup prompts to complete the installation.
4. When the installation is complete, enter the following command to stop the DataFabric Manager server services:

   `dfm service stop`

5. Disable the automatic start-up of the DataFabric Manager server by entering the following command:

   `dfm service enable -m`

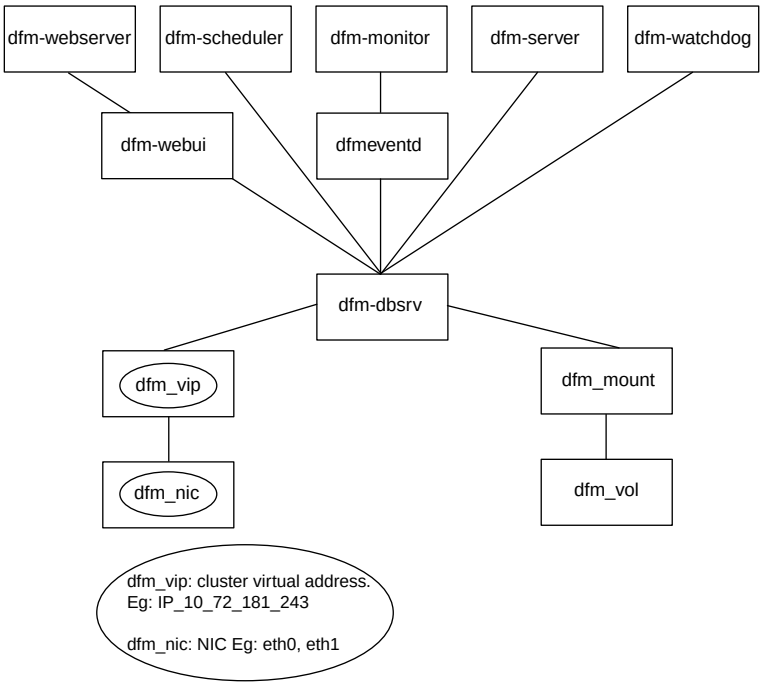
   Attention: You must perform all cluster operations using Cluster Manager. Other than in installation and configuration procedures, you must not use the `dfm service start` and `dfm service stop` commands. These commands interfere with cluster operations.

DataFabric Manager server service resources added to VCS

You must add the DataFabric Manager server cluster service resources to VCS. There are dependencies among the various resources.

These services are used for various purposes, such as monitoring storage systems, scheduling jobs, processing events, and monitoring all the other services.

The following illustration shows the services and the dependencies among the various resources:



Configuring the OnCommand Core Package in a VCS environment

After installing the OnCommand Core Package, you have to configure the DataFabric Manager server in VCS. You must configure the DataFabric Manager server on the nodes sequentially and then bring the cluster services online.

1. Configure the DataFabric Manager server on the first node.
2. Configure the DataFabric Manager server on the second node.
3. Configure the DataFabric Manager server services for clustering, either manually or by running a script.

4. Bring the cluster services online.

Configuring DataFabric Manager server on the first node in VCS

You can configure the DataFabric Manager server on the first node by using the `dfm datastore setup` command.

Steps

1. Ensure that the first node owns all the cluster resources, such as Mount, NIC, and Volume.
2. Move all the shared data, such as database files and performance data files, to the shared storage system by entering the following command:

   `dfm datastore setup`

Configuring DataFabric Manager server on the second node in VCS

You must configure the DataFabric Manager server on the second node in preparation for a failover. You can do this by disabling the services and then by running the `dfm datastore setup -n` command.

Steps

1. Perform a manual failover so that the second node owns all of the resources, such as the disks and virtual IP addresses:
   a) Open **Cluster Manager** by entering the following command at the command prompt:

      `hagui`

   b) Right-click **service group**, click **Switch To**, and then select the second cluster node for failover.
2. In **Cluster Administrator**, take the services offline on the second node:
   a) Right-click the **DFM Sybase** service.
   b) Select **Take offline**.

      The other services are also taken offline.
3. Configure the node to use the shared data by entering the following command:

   `dfm datastore setup -n`

   You must use the `-n` option when you configure the second node to ensure that the DataFabric Manager server uses the data that was copied during the configuration of the first node.

Adding the cluster services using a script

You can configure DataFabric Manager server in your cluster environment by running a configuration script. You can use the script to add the DataFabric Manager server cluster services to the cluster environment.

Steps

1. Log in to the node that owns cluster resources.
2. Move the DataFabric Manager server data to the shared data disk by entering the following command:

   dfm datastore setup *new_clusterdisk_directory*
3. Stop DataFabric Manager server services by entering the following command:

   dfm service stop

   This ensures that DataFabric Manager server does not try to access the data disk to be moved to the secondary node.
4. Ensure that the DataFabric Manager server services do not start automatically by entering the following command:

   dfm service enable -m

   The option `-m` ensures that the DataFabric Manager server services do not start automatically.
5. Manually move the cluster group to the second node.
6. Verify that the secondary node owns the cluster resources.
7. Enter the following commands on the secondary node:

   dfm service enable -m

   dfm datastore setup -n *drive_name*

   Note: You must ensure that you use the same drive letter for the secondary node as the first node. The `-n` option ensures that the data is not copied again to the shared data disk.
8. Access the directory at `C:\Program Files\NetApp\DataFabric Manager\DFM\examples` or `/opt/NTAPdfm/examples` , and `C:\Program Files(x64)\NetApp\DataFabric Manager\DFM\examples for x64-bit platform`.
9. Configure the DataFabric Manager server services in your cluster environment by running the following script:

   dfmcluster_add_resources.pl -t *cluster_type* -g *cluster_group* -i *cluster_ip_resource* -n *cluster_nameresource*

Script options for configuring services in VCS

You have to configure the DataFabric Manager server to add its service resources to VCS. You can add the services manually, or by using the Perl configuration script.

The command to add services to the DataFabric Manager server is as follows:

`perl dfmcluster_add_resources.pl -t cluster_type option ...`

The `perl dfmcluster_add_resources.pl` incluides the following options:

`-t cluster_type`	Cluster solution used for high availability. The possible values are `vcs` (default value on UNIX) and `mscs`.
`-h cluster_node1 cluster_node2`	Nodes used for cluster setup, separated by a space.
`-g cluster_group_name`	Name of the cluster service group to which the resources are added.
`-e nic_resource_name`	Name of the network interface card. This must be the same on both cluster nodes.
`-i cluster_ip_resource_name`	Name of the cluster IP resource.
`-n cluster_name_resource_name`	Host name of the cluster, which is mapped to the cluster virtual IP address.
`-f mount_point_resource_name`	Name of the mount resource.
`-v volume_resource_name`	Name of the volume resource that contains the filesystem, represented by the mountpoint resource.
`-d disk_group_resource_name`	Name of the disk group that contains the volume, represented by the volume resource.
`-m netmask`	Netmask associated with the cluster IP address.
`-l installation_directory`	OnCommand Core Package installation directory. The default location is `/opt/NTAPdfm`.

Bringing DataFabric Manager server cluster services online in VCS

After you finish configuring the DataFabric Manager server on both nodes and adding the cluster services to the DataFabric Manager server, you must bring the services online.

Steps

1. Open **Cluster Manager** by entering the following command at the command prompt:

   `hagui`

2. Right-click the **service group**.

3. Click **Online**.
4. Select the first cluster node.
5. Make sure the LUNs are visible to the host by entering the following command:

   ```
   snapdrive config prepare luns -count n
   ```

   You must ensure that the LUNs are visible to the host each time the server is rebooted.

Configuring DataFabric Manager server in VCS manually

You can manually configure the DataFabric Manager server by using the VCS Application Configuration wizard. Configuring the DataFabric Manager server in VCS manually enables you to customize the cluster.

Before you begin

If DataFabric Manager server is not installed at `/opt/NTAPdfm` , the path entries should have been modified accordingly.

Steps

1. Run the **VCS Application Configuration** wizard by entering the following command on the node where VCS is set up:

   ```
   hawizard
   ```

2. Select **Create Application Service Group** and click **Next**.
3. Enter a name in **Service Group Name** and select the cluster from the **Available Cluster** list.
4. Click **Next**.
5. Enter the application details:
   a) Specify `/usr/bin/dfm` as the path in **Start Program**.
   b) Select **root** as user.
6. Click **Next**.
7. Select the processes that must be monitored by the DataFabric Manager server by entering the appropriate process monitor string.

   The following table lists the processes and their process monitor string.

Process	Process monitor string
+ dfmmonitor	/opt/NTAPdfm/sbin/dfmmonitor
+ dfmserver	/opt/NTAPdfm/sbin/dfmserver
+ dfmscheduler	/opt/NTAPdfm/sbin/dfmscheduler
+ dfmeventd	/opt/NTAPdfm/sbin/dfmeventd start

Process	Process monitor string
+ database server	/opt/NTAPdfm/sbin/dbsrv10 @/opt/NTAPdfm/conf/sybase.conf
+ Apache server	/opt/NTAPdfm/sbin/httpd -f /opt/NTAPdfm/conf/httpd.comf
+Webui	/opt/NTAPdfm/java/bin/java /opt/NTAPdfm/jetty/start.jar /opt/NTAPdfm/conf/jetty.conf

8. Optional: Verify the process monitor string for each process by using the `ps -u root -o args` command.
9. Click **Next**.
10. Configure the mount resources and click **Next**.
11. Configure the IP and NIC resources and click **Next**.
12. Repeat Steps 5 through 11 for each DataFabric Manager server process.
13. Open **Cluster Manager** to configure the remaining cluster resources.
14. Select the service group **dfm_sg** in the left pane.
15. In the **Resource** tab, right-click **Resource View**.
16. Enter the details for each **Resource Type**.

    On Linux, you should select only **LVMLogicalVolume** and **Mount** as the resource types. The FSType attribute should be set to `ext3` for **Mount**.
17. Select **NIC** from the **Resource Type** list.
18. Right-click the added resources and select **Link**.
19. Create a dependency tree and bring all the services online.
20. Ensure the DataFabric Manager server uses the cluster name (instead of the local system name) by entering the following command:

    `dfm option set` *`localHostName=fqdn-of-cluster`*

    The DataFabric Manager server uses the name of the local system to send email alerts to administrators.

Configuring a host services in VCS

When you add a new host service in VCS, you must ensure that both nodes in a cluster pair have access to the keys folder. This ensures that when one node fails, the second node of the cluster starts functioning.

Steps

1. Copy the keys folder from one node to the other in the cluster pair at `installation_directory\conf`.
2. Open the **Cluster Manager** by entering the following command at the command prompt:

   `hagui`
3. In the **Cluster Manager**, right-click the **service group**, click **Switch To**, and select the second cluster node for failover
4. Enter the following command on the second node to start using the new setting:

   `dfm ssl service reload`
5. Launch the OnCommand console, verify that the host service status is Up in the **Host Services** tab.

Managing the DataFabric Manager server in a VCS environment

You can create and restore backups, set HTTPS options, and configure DataFabric Manager server to share data on the DataFabric Manager server cluster nodes.

Best practices to start and stop DataFabric Manager server services in VCS

After you set up DataFabric Manager server in VCS, do not use the `dfm service start` and `dfm service stop` commands, except where specifically indicated in installation and configuration procedures. You must perform all operations by using the Cluster Manager.

- You should disable the DataFabric Manager server init scripts after installation on both the cluster nodes.
- You should not change the service start-up type to Automatic in Service Control Manager on any of the nodes.

  The DataFabric Manager server reactivates these scripts during an upgrade and then disables them again when the upgrade is complete.

Restoring the DataFabric Manager server database in VCS

Restoring a database enables the DataFabric Manager server to use the current settings. You can restore the DataFabric Manager server database by disabling it through Cluster Manager and using the `dfm backup restore` command.

Steps

1. In **Cluster Manager**, disable the DataFabric Manager server services by right-clicking the name of the service group and then clicking **Offline**.
2. Select the first cluster node in which the services are online. NetApp Management Console
3. Ensure that one of the nodes owns the cluster resources (such as the mount point) by completing the following steps:
   a) Select the service group **dfm_sg**.
   b) In the **Resources** tab, right-click **Resource View**.
   c) Right-click the resource **Mount**, and then click **Online**
4. Restore the database by entering the command in the node that owns the Mount resource:

   ```
   dfm backup restore
   ```

5. In **Cluster Manager**, right-click the service group, click **Online**, and then select the first cluster node that is used for restore.

Configuring the DataFabric Manager server to use HTTPS in VCS

You can configure the DataFabric Manager server to use HTTPS on both the cluster nodes for a secured data transfer.

About this task

You must not take the dfm-dbsrv service offline.

Steps

1. In **Cluster Manager**, take the DataFabric Manager server services offline:
   a) Right-click the service group **dfm-sg**, and click **Offline**.
   b) Select the first cluster node where the services are online.
   c) In the **Resources** tab, right-click **Resource View**.
   d) Right-click the resource **dfm-dbsrv** and click **Online**.
2. Create an SSL certificate by entering the following command:

   ```
   dfm ssl server setup
   ```

3. Copy the files `server.crt` and `server.key` to the second node before starting the services on that node.

The files are located in the `installation_directory/conf` folder.

4. Enable HTTPS by setting the following DataFabric Manager server option to yes:

   `dfm option set httpsEnabled=yes`

5. Start the HTTP service by entering the following command:

   `dfm service start http`

   This re-creates the `httpd.conf` file with the changed options.

6. Stop all the services by entering the following command:

   `dfm service stop`

   Note: You must ensure that DataFabric Manager server services are offline. Otherwise, the HTTP service fails to be enabled on the other node, because the configuration is not complete.

7. In **Cluster Manager**, move the cluster group to the second node by using the option **Switch To**.
8. Log in to the second node in the cluster.
9. Copy the files `server.crt` and `server.key` created on the first node to the folder *`install-dir`*`/conf`.
10. Start the services and verify that they are operating by entering the following command:

    `dfm service start`

    This creates the `httpd.conf` file with the changed options.

11. Stop the services by entering the following command:

    `dfm service stop`

12. In **Cluster Manager**, reenable the DataFabric Manager server services.

Changing the HTTP options in a VCS environment

You can change the HTTP options to enable HTTPS, or change the default HTTP and HTTPS port.

About this task

You must not take the dfm-dbsrv service offline.

Steps

1. In **Cluster Manager**, take the DataFabric Manager server services offline:
   a) Right-click the service group, and click **Offline**.
   b) Select the first cluster node where the services are online.
   c) In the **Resources** tab, right-click **Resource View**.
   d) Right-click the resource **dfm-dbsrv** and click **Online**.
2. Set the required HTTP option by entering the following command:

dfm option set option-name=*option-value*

Example

dfm option set httpsPort=443

3. Restart the HTTP service by entering the following command:

   dfm service start http

   Attention: You must perform all cluster operations using Cluster Manager. Apart from installation and configuration procedures, you should not use the commands `dfm service start` and `dfm service stop`. These commands interfere with cluster operations.

4. Stop all the services by entering the following command:

   dfm service stop

   This re-creates the file `httpd.conf` with the changed options.

   Note: You must ensure that DataFabric Manager server services are offline. Otherwise, the HTTP service fails to come up on the other node because the configuration is not complete.

5. In **Cluster Manager**, move the cluster group to the second node by using the option **Switch To**.
6. Log in to the second node in the cluster.
7. Start the services by entering the following command:

   dfm service start

8. Stop the services by entering the following command:

   dfm service stop

9. In **Cluster Manager**, bring the DataFabric Manager server services online.

Data shared by VCS cluster nodes

You must configure DataFabric Manager server nodes to access files from a shared disk. If each node uses its own local copy of files, any updates to files might not be accessible to the other nodes, after a failover.

The VCS cluster nodes share the following files:

***installation_directory*/data**	Sybase database files
***installation_directory*/perfdata**	Performance Advisor data files
***installation_directory*/scriptplugins**	Installed script plug-ins and related files
***installation_directory*/plugins**	Storage system configuration plug-ins
***installation_directory*/reports**	Archived reports
***installation_directory*/dataExport**	DataFabric Manager server and Performance Advisor data

***installation_directory*/jetty**	Libraries and Web application files

Data that is not shared by VCS cluster nodes

To ensure that the same version is maintained in both the cluster nodes, executable and configuration files, license information, and so on are not shared by the DataFabric Manager server cluster nodes.

The VCS cluster nodes do not share the following files:

***installation_directory*/bin**	Executable files
***installation_directory*/conf**	Configuration files
***installation_directory*/docs**	Third-party licenses
***installation_directory*/examples**	Cluster configuration scripts, and other script files
***installation_directory*/log**	Log files
***installation_directory*/misc**	Configuration files
***installation_directory*/sbin**	Third-party executables
***installation_directory*/scripts**	Location of the `Sybase_install.sql` file
***installation_directory*/src**	Storage system configuration plug-ins
***installation_directory*/web/clients**	Performance Advisor clients
***installation_directory*/web/com**	JAR files for applets
***installation_directory*/web/help**	Help files
***installation_directory*/web/man**	Manual (man) pages
***installation_directory*/web/media**	Images used on Web interfaces
***installation_directory*/web/scripts**	Java script files
***installation_directory*/web/styles**	CSS style sheets

Uninstalling the OnCommand Core Package in a VCS environment

You can uninstall the OnCommand Core Package from a cluster by deleting all the DataFabric Manager server services from the cluster nodes.

Steps

1. In **Cluster Manager**, delete all the DataFabric Manager server services:
   a) Right-click the service group **dfm-sg**.

b) Select **Delete**.

2. Log in to one of the cluster nodes.
3. Uninstall by entering the one of the following commands:
   - `rpm -e NTAPdfm`
   - `rpm --erase NTAPdfm`
4. Repeat Steps 2 through 3 for the other cluster nodes.

Upgrading the OnCommand Core Package in a VCS environment

When you upgrade to the OnCommand Core Package cluster nodes, you must ensure that all the nodes in the cluster are upgraded.

Before you begin

- The DataFabric Manager server installer from must be downloaded.

Steps

1. In **Cluster Manager**, take all DataFabric Manager server services offline by completing the following steps:
   a) Right-click the service group, and then click **Offline**.
   b) Select the first cluster node where the services are online.
2. Upgrade to the OnCommand Core Package on this node.
3. Stop all the DataFabric Manager server services by entering the following command:

   `dfm service stop`

   Attention: You must perform all cluster operations using Cluster Manager. Other than in installation and configuration procedures, do not use the commands `dfm service start` and `dfm service stop` unless advised to. These commands interfere with cluster operations.
4. Disable the automatic service start-up during reboot by entering the following command:

   `dfm service enable -m`
5. Switch the mount resource and its dependents to the second node by selecting the option **Switch To**.
6. Ensure that the second node owns all the cluster resources.
7. Upgrade to the OnCommand Core Package installation on this node.
8. Stop all the DataFabric Manager server services by entering the following command:

```
dfm service stop
```

9. Disable the automatic service start-up during reboot by entering the following command:

   ```
   dfm service enable -m
   ```

10. In **Cluster Manager**, make all DataFabric Manager server services online.
11. Select the **cluster service** group, and right-click **dfm-sg** group to remove the DataFabric Manager server services.
12. To re-create the cluster service group and to add the DFM Web UI service run the following command:

    ```
    dfmcluster_add_resources.pl -t cluster_type -g cluster_group -i
    cluster_ip_resource -n cluster_nameresource
    ```

Related tasks

Adding the cluster services using a script on page 105

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