

Symantec™ Dynamic Multi-Pathing 6.1 Installation Guide - Solaris

Symantec™ Dynamic Multi-Pathing Installation Guide

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- Product release level
- Hardware information

- Available memory, disk space, and NIC information
- Operating system
- Version and patch level
- Network topology
- Router, gateway, and IP address information
- Problem description:
 - Error messages and log files
 - Troubleshooting that was performed before contacting Symantec
 - Recent software configuration changes and network changes

Licensing and registration

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www.symantec.com/business/support/

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Customer Service is available to assist with non-technical questions, such as the following types of issues:

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- Product registration updates, such as address or name changes
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- Latest information about product updates and upgrades
- Information about upgrade assurance and support contracts
- Information about the Symantec Buying Programs
- Advice about Symantec's technical support options
- Nontechnical presales questions
- Issues that are related to CD-ROMs or manuals

Documentation

Product guides are available on the media in PDF format. Make sure that you are using the current version of the documentation. The document version appears on

page 2 of each guide. The latest product documentation is available on the Symantec website.

<https://sort.symantec.com/documents>

Your feedback on product documentation is important to us. Send suggestions for improvements and reports on errors or omissions. Include the title and document version (located on the second page), and chapter and section titles of the text on which you are reporting. Send feedback to:

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For information regarding the latest HOWTO articles, documentation updates, or to ask a question regarding product documentation, visit the Storage and Clustering Documentation forum on Symantec Connect.

<https://www-secure.symantec.com/connect/storage-management/forums/storage-and-clustering-documentation>

About Symantec Connect

Symantec Connect is the peer-to-peer technical community site for Symantec's enterprise customers. Participants can connect and share information with other product users, including creating forum posts, articles, videos, downloads, blogs and suggesting ideas, as well as interact with Symantec product teams and Technical Support. Content is rated by the community, and members receive reward points for their contributions.

<http://www.symantec.com/connect/storage-management>

Support agreement resources

If you want to contact Symantec regarding an existing support agreement, please contact the support agreement administration team for your region as follows:

Asia-Pacific and Japan	customercare_apac@symantec.com
Europe, Middle-East, and Africa	semea@symantec.com
North America and Latin America	supportsolutions@symantec.com

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Installation overview and planning

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- [Chapter 2. System requirements](#)
- [Chapter 3. Planning to install DMP](#)
- [Chapter 4. Licensing DMP](#)

Introducing Symantec Dynamic Multi-Pathing

This chapter includes the following topics:

- [About Symantec Dynamic Multi-Pathing \(DMP\)](#)
- [About Veritas Operations Manager](#)
- [About Symantec Operations Readiness Tools \(SORT\)](#)

About Symantec Dynamic Multi-Pathing (DMP)

Symantec Dynamic Multi-Pathing (DMP) provides multi-pathing functionality for the operating system native devices that are configured on the system. DMP creates DMP metadevices (also known as DMP nodes) to represent all the device paths to the same physical LUN.

DMP is also available as a standalone product, which extends DMP metadevices to support ZFS. You can create ZFS pools on DMP metadevices. Starting with Solaris 11 update 1, DMP supports both root and non-root ZFS pools. For earlier versions of Solaris, DMP supports only non-root ZFS file systems.

Symantec Dynamic Multi-Pathing can be licensed separately from Storage Foundation products. Veritas Volume Manager and Veritas File System functionality is not provided with a DMP license.

DMP functionality is available with a Storage Foundation (SF) Enterprise license, an SFHA Enterprise license, and a Storage Foundation Standard license.

Veritas Volume Manager (VxVM) volumes and disk groups can co-exist with ZFS pools, but each device can only support one of the types. If a disk has a VxVM label, then the disk is not available to ZFS. Similarly, if a disk is in use by ZFS, then the disk is not available to VxVM.

About Veritas Operations Manager

Veritas Operations Manager provides a centralized management console for Symantec Storage Foundation and High Availability products. You can use Veritas Operations Manager to monitor, visualize, and manage storage resources and generate reports.

Symantec recommends using Veritas Operations Manager (VOM) to manage Storage Foundation and Cluster Server environments.

You can download Veritas Operations Manager at no charge at <http://go.symantec.com/vom>.

Refer to the Veritas Operations Manager documentation for installation, upgrade, and configuration instructions.

The Veritas Enterprise Administrator (VEA) console is no longer packaged with Storage Foundation products. If you want to continue using VEA, a software version is available for download from

<http://www.symantec.com/operations-manager/support>. Symantec Storage Foundation Management Server is deprecated.

About Symantec Operations Readiness Tools (SORT)

[Symantec Operations Readiness Tools \(SORT\)](#) is a website that automates and simplifies some of the most time-consuming administrative tasks. It helps you identify risks in your datacenters and improve operational efficiency, enabling you to manage the complexity that is associated with datacenter architectures and scale

[Table 1-1](#) lists three major datacenter tasks and the SORT tools that can help you accomplish them.

Table 1-1 Datacenter tasks and the SORT tools

Task	SORT tools
Prepare for installations and upgrades	<ul style="list-style-type: none"> ■ Installation and Upgrade checklists Display system requirements including memory, disk space, and architecture. ■ Installation and Upgrade custom reports Create reports that determine if you're ready to install or upgrade a Symantec enterprise product. ■ Array-specific Module Finder List the latest Array Support Libraries (ASLs) and Array Policy Modules (APMs) for UNIX servers, and Device Driver Installers (DDIs) and Device Discovery Layers (DDLs) for Windows servers. ■ High Availability Agents table Find and download the agents for applications, databases, replication, and Symantec partners.
Identify risks and get server-specific recommendations	<ul style="list-style-type: none"> ■ Patch notifications Receive automatic email notifications about patch updates. (Sign in required.) ■ Risk Assessment check lists Display configuration recommendations based on your Symantec product and platform. ■ Risk Assessment custom reports Create reports that analyze your system and give you recommendations about system availability, storage use, performance, and best practices. ■ Error code descriptions and solutions Display detailed information on thousands of Symantec error codes.

Table 1-1 Datacenter tasks and the SORT tools (*continued*)

Task	SORT tools
Improve efficiency	<ul style="list-style-type: none"> ■ Patch Finder List and download patches for your Symantec enterprise products. ■ License/Deployment custom reports Create custom reports that list your installed Symantec products and license keys. Display licenses by product, platform, server tier, and system. ■ Symantec Performance Value Unit (SPVU) Calculator Use the calculator to assist you with the pricing meter transition. ■ Documentation List and download Symantec product documentation, including manual pages, product guides, and support articles. ■ Related links Display links to Symantec product support, forums, customer care, and vendor information on a single page.

SORT is available at no additional charge.

To access SORT, go to:

<https://sort.symantec.com>

System requirements

This chapter includes the following topics:

- [Release notes](#)
- [Important preinstallation information for DMP](#)
- [Supported operating systems](#)
- [Disk space requirements](#)
- [Checking installed product versions and downloading maintenance releases and hot fixes](#)
- [Obtaining installer hot fixes](#)
- [Disabling external network connection attempts](#)

Release notes

The *Release Notes* for each Symantec product contains last-minute news and important details for each product, including updates to system requirements and supported software. Review the *Release notes* for the latest information before you start installing the product.

The product documentation is available on the web at the following location:

<https://sort.symantec.com/documents>

Important preinstallation information for DMP

Before you install DMP, make sure that you have reviewed the following information:

- Preinstallation checklist for your configuration. Go to [the SORT installation checklist tool](#). From the drop-down lists, select the information for the Symantec product you want to install, and click **Generate Checklist**.
- Hardware compatibility list for information about supported hardware: <http://www.symantec.com/docs/TECH211575>
- For important updates regarding this release, review the Late-Breaking News Technote on the Symantec Technical Support website: <http://www.symantec.com/docs/TECH211540>

Supported operating systems

For information on supported operating systems, see the *Symantec Dynamic Multi-Pathing Release Notes*.

Disk space requirements

Before installing your products, confirm that your system has enough free disk space.

Use the **Perform a Preinstallation Check (P)** menu for the web-based installer to determine whether there is sufficient space.

Or, go to the installation directory and run the installer with the `-precheck` option.

```
# ./installer -precheck
```

See [“About the script-based installer”](#) on page 40.

Checking installed product versions and downloading maintenance releases and hot fixes

Symantec provides a means to check the Symantec packages you have installed, and download any needed maintenance releases and hot fixes.

Use the `installer` command with the `-version` option to determine what is installed on your system, and download any needed maintenance releases or hot fixes. After you have installed the current version of the product, you can use the `showversion` script in the `/opt/VRTS/install` directory to find product information.

The `version` option or the `showversion` script checks the specified systems and discovers the following:

- Storage Foundation and High Availability product versions that are installed on the system
- All the required packages and the optional Symantec packages installed on the system
- Any required or optional packages (if applicable) that are not present
- Installed hot fixes
- Available base releases (major or minor)
- Available maintenance releases
- Available hot fix releases

To check your systems and download maintenance releases and hot fixes

- 1 Mount the media, or navigate to the installation directory.
- 2 Start the installer with the `-version` option.

```
# ./installer -version sys1 sys2
```

For each system, the installer lists all of the installed base releases, maintenance releases, and hot fixes, followed by the lists of available downloads.

- 3 If you have Internet access, follow the prompts to download the available maintenance releases and hot fixes to the local system.
- 4 If you do not have Internet access, you can download any needed maintenance releases and hot fixes from the Symantec Operations Readiness Tools (SORT) Patch Finder page at:

<https://sort.symantec.com/patch/finder>

You can obtain installer hot fixes automatically or manually.

See “[Obtaining installer hot fixes](#)” on page 21.

Downloading maintenance releases and hot fixes requires the installer to make outbound networking calls. You can also disable external network connection attempts.

See “[Disabling external network connection attempts](#)” on page 23.

Obtaining installer hot fixes

Symantec occasionally finds issues with the Symantec Dynamic Multi-Pathing installer, and posts public installer hot fixes on the Symantec Operations Readiness Tools (SORT) website's Patch Finder page at:

<https://sort.symantec.com/patch/finder>

You can access installer hot fixes automatically or manually.

To download installer hot fixes automatically

- ◆ Starting with Symantec Dynamic Multi-Pathing version 6.1, installer hot fixes are downloaded automatically. No action is needed on your part.

If you are running Symantec Dynamic Multi-Pathing version 6.1 or later, and your system has Internet access, the installer automatically imports any needed installer hot fix, and begins using it.

Automatically downloading installer hot fixes requires the installer to make outbound networking calls. You can also disable external network connection attempts.

See “[Disabling external network connection attempts](#)” on page 23.

If your system does not have Internet access, you can download installer hot fixes manually.

To download installer hot fixes manually

- 1 Go to the Symantec Operations Readiness Tools (SORT) website's Patch Finder page, and save the most current Symantec patch on your local system.
- 2 Navigate to the directory where you want to unzip the file you downloaded in step 1.
- 3 Unzip the patch tar file. For example, run the following command:

```
# gunzip cpi-6.1P2-patches.tar.gz
```

- 4 Untar the file. For example, enter the following:

```
# tar -xvf cpi-6.1P2-patches.tar
patches/
patches/CPI61P2.pl
README
```

- 5 Navigate to the installation media or to the installation directory.
- 6 To start using the patch, run the `installer` command with the `-require` option. For example, enter the following:

```
# ./installer -require /target_directory/patches/CPI61P2.pl
```

Disabling external network connection attempts

When you execute the `installer` command, the installer attempts to make an outbound networking call to get information about release updates and installer hot fixes. If you know your systems are behind a firewall, or do not want the installer to make outbound networking calls, you can disable external network connection attempts by the installer.

To disable external network connection attempts

- ◆ Disable inter-process communication (IPC).

To do this, run the installer with the `-noipc` option.

For example, to disable IPC for system1 (sys1) and system2 (sys2) enter the following:

```
# ./installer -noipc sys1 sys2
```

Planning to install DMP

This chapter includes the following topics:

- [About planning for DMP installation](#)
- [About installation and configuration methods](#)

About planning for DMP installation

Before you continue, make sure that you have the current version of this guide. The latest documentation is available on the Symantec Operations Readiness Tools (SORT) website.

<https://sort.symantec.com/documents>

Document version: 6.1 Rev 3.

This installation guide is designed for system administrators who already have basic knowledge of UNIX system and network administration. Basic knowledge includes commands such as `tar`, `mkdir`, and simple shell scripting. What is also required is familiarity with the specific platform and operating system where DMP is to be installed.

Follow the preinstallation instructions if you want to install Symantec Dynamic Multi-Pathing.

See the chapter, "Preparing to install Symantec Dynamic Multi-Pathing" for more information.

About installation and configuration methods

You can install and configure DMP using Symantec installation programs or using native operating system methods.

[Table 3-1](#) shows the installation and configuration methods that DMP supports.

Table 3-1 Installation and configuration methods

Method	Description
The script-based installer	<p>Using the script-based installer, you can install Symantec products (version 6.1 and later) from a driver system running a supported platform to target computers running any supported platform.</p> <p>To install your Symantec product using the installer, choose one of the following:</p> <ul style="list-style-type: none"> ■ The general product installer: <code>installer</code> The general product installer script provides a menu that simplifies the selection of installation and configuration options. Use the general product installer if you want to install multiple products from a disc. ■ Product-specific installation scripts: <code>installdmp</code> The product-specific installation scripts provide command-line interface options. Installing and configuring with the <code>installdmp</code> script is identical to running the general product installer and specifying DMP from the list of products to install. Use the product-specific installation scripts to install or configure individual products you download electronically. <p>See "About the script-based installer" on page 40.</p>
The web-based installer	<p>Using the web-based installer, you can install Symantec products (version 6.1 and later) from a driver system running a supported platform to target computers running any supported platform</p> <p>The web-based installer provides an interface to manage the installation and configuration from a remote site using a standard web browser.</p> <p><code>webinstaller</code></p> <p>See "About the web-based installer" on page 46.</p>
Deployment Server	<p>Using the Deployment Server, you can store multiple release images in one central location and deploy them to systems of any supported platform.</p> <p>See "About the Deployment Server" on page 78.</p>

Table 3-1 Installation and configuration methods (*continued*)

Method	Description
Silent installation using response files	<p>Response files automate installation and configuration by using the information that is stored in a specified file instead of prompting you for information.</p> <p>You can use any of the above options to generate a response file. You can then customize the response file for another system. Run the product installation script with the response file option to install silently on one or more systems.</p> <p>See “About response files” on page 52.</p>
Install Bundles	<p>Beginning with version 6.1, you can easily install or upgrade your systems directly to a base, maintenance, or hot fix level in one step using Install Bundles.</p> <p>The installer installs both releases as if they were combined in the same release image. The various scripts, packages, and patch components are merged, and multiple releases are installed together as if they are one combined release.</p> <p>See “Using Install Bundles to simultaneously install or upgrade base releases, maintenance patches, and hot fixes” on page 110.</p>
JumpStart (For Solaris 10 systems)	<p>You can use the product installer of the product-specific installation script to generate a JumpStart script file. Use the generated script to install Symantec packages from your JumpStart server.</p> <p>See “Installing DMP on Solaris 10 using JumpStart” on page 64.</p>
Flash Archive (For Solaris 10 systems)	<p>You can use the product installer to clone the system and install the Symantec products on the master system.</p> <p>See “Using a Flash archive to install DMP and the operating system” on page 68.</p>
Manual installation and configuration	<p>Manual installation uses the Solaris commands to install DMP. To retrieve a list of all packages and patches required for all products in the correct installation order, enter:</p> <pre># installer -allpkgs</pre> <p>Use the Solaris commands to install DMP. Then manually or interactively configure DMP.</p> <p>See “Manually installing DMP using the system command” on page 70.</p>

Table 3-1 Installation and configuration methods (*continued*)

Method	Description
Automated Installer (For Solaris 11 systems)	You can use the Oracle Solaris Automated Installer (AI) to install the Solaris 11 operating system and Symantec packages on multiple client systems in a network. AI performs a hands-free installation (automated installation without manual interactions) of SPARC systems. See “Installing DMP on Solaris 11 using Automated Installer” on page 59.

Licensing DMP

This chapter includes the following topics:

- [About Symantec product licensing](#)
- [Setting or changing the product level for keyless licensing](#)
- [Installing Symantec product license keys](#)

About Symantec product licensing

You have the option to install Symantec products without a license key. Installation without a license does not eliminate the need to obtain a license. A software license is a legal instrument governing the usage or redistribution of copyright protected software. The administrator and company representatives must ensure that a server or cluster is entitled to the license level for the products installed. Symantec reserves the right to ensure entitlement and compliance through auditing.

If you encounter problems while licensing this product, visit the Symantec licensing Support website.

http://www.symantec.com/products-solutions/licensing/activating-software/detail.jsp?detail_id=licensing_portal

The product installer prompts you to select one of the following licensing methods:

- Install a license key for the product and features that you want to install.
When you purchase a Symantec product, you receive a License Key certificate. The certificate specifies the product keys and the number of product licenses purchased.
- Continue to install without a license key.
The installer prompts for the product modes and options that you want to install, and then sets the required product level.

Setting or changing the product level for keyless licensing

Within 60 days of choosing this option, you must install a valid license key corresponding to the license level entitled. If you do not comply with the above terms, continuing to use the Symantec product is a violation of your End User License Agreement, and results in warning messages

For more information about keyless licensing, see the following URL:

<http://go.symantec.com/sfhakeyless>

If you upgrade to this release from a previous release of the Symantec software, the installer asks whether you want to upgrade the key to the new version. The existing license keys may not activate new features in this release.

If you upgrade with the product installer, or if you install or upgrade with a method other than the product installer, you must do one of the following to license the products:

- Run the `vxkeyless` command to set the product level for the products you have purchased. This option also requires that you manage the server or cluster with a management server.
See “[Setting or changing the product level for keyless licensing](#)” on page 29.
See the `vxkeyless(1m)` manual page.
- Use the `vxlicinst` command to install a valid product license key for the products you have purchased.
See “[Installing Symantec product license keys](#)” on page 31.
See the `vxlicinst(1m)` manual page.

You can also use the above options to change the product levels to another level that you are authorized to use. For example, you can add the replication option to the installed product. You must ensure that you have the appropriate license for the product level and options in use.

Note: To change from one product group to another, you may need to perform additional steps.

Setting or changing the product level for keyless licensing

The keyless licensing method uses product levels to determine the Symantec products and functionality that are licensed.

For more information to use keyless licensing and to download the management server, see the following URL:

<http://go.symantec.com/vom>

Setting or changing the product level for keyless licensing

When you set the product license level for the first time, you enable keyless licensing for that system. If you install with the product installer and select the keyless option, you are prompted to select the product and feature level that you want to license.

When you upgrade from a previous release, the product installer prompts you to update the `vxkeyless` license product level to the current release level. If you update the `vxkeyless` license product level during the upgrade process, no further action is required. If you do not update the `vxkeyless` license product level, the output you see when you run the `vxkeyless display` command includes the previous release's `vxkeyless` license product level. Each `vxkeyless` license product level name includes the suffix `_previous_release_version`. For example, `DMP_6.0`, or `SFENT_VR_5.1SP1`, or `VCS_GCO_5.1`. If there is no suffix, it is the current release version.

You would see the suffix `_previous_release_version` if you did not update the `vxkeyless` product level when prompted by the product installer. Symantec highly recommends that you always use the current release version of the product levels. To do so, use the `vxkeyless set` command with the desired product levels. If you see `SFENT_60`, `VCS_60`, use the `vxkeyless set SFENT,VCS` command to update the product levels to the current release.

After you install or upgrade, you can change product license levels at any time to reflect the products and functionality that you want to license. When you set a product level, you agree that you have the license for that functionality.

To set or change the product level

- 1 Change your current working directory:

```
# export PATH=$PATH:/opt/VRTSvlic/bin
```

- 2 View the current setting for the product level.

```
# vxkeyless -v display
```

- 3 View the possible settings for the product level.

```
# vxkeyless displayall
```

- 4 Set the desired product level.

```
# vxkeyless set prod_levels
```

where `prod_levels` is a comma-separated list of keywords. The keywords are the product levels as shown by the output of step 3.

If you want to remove keyless licensing and enter a key, you must clear the keyless licenses. Use the NONE keyword to clear all keys from the system.

Warning: Clearing the keys disables the Symantec products until you install a new key or set a new product level.

See [“Installing Symantec product license keys”](#) on page 31.

To clear the product license level

- 1 View the current setting for the product license level.

```
# vxkeyless [-v] display
```

- 2 If there are keyless licenses installed, remove all keyless licenses:

```
# vxkeyless [-q] set NONE
```

For more details on using the `vxkeyless` utility, see the `vxkeyless(1m)` manual page.

Installing Symantec product license keys

The `VRTSvlic` package enables product licensing. After the `VRTSvlic` is installed, the following commands and their manual pages are available on the system:

<code>vxlicinst</code>	Installs a license key for a Symantec product
<code>vxlicrep</code>	Displays the currently installed licenses
<code>vxlictest</code>	Retrieves the features and their descriptions that are encoded in a license key

Even though other products are included on the enclosed software discs, you can only use the Symantec software products for which you have purchased a license.

To install or change a license

- 1 Run the following commands. In a cluster environment, run the commands on each node in the cluster:

```
# cd /opt/VRTS/bin  
  
# ./vxlicinst -k license key
```

- 2 Run the following Veritas Volume Manager (VxVM) command to recognize the new license:

```
# vxdctl license init
```

See the `vxdctl(1M)` manual page.

If you have `vxkeyless` licensing, you can view or update the keyless product licensing levels.

See [“Setting or changing the product level for keyless licensing”](#) on page 29.

Installation of DMP

- [Chapter 5. Preparing to install DMP](#)
- [Chapter 6. Installing DMP using the script-based installer](#)
- [Chapter 7. Installing DMP using the web-based installer](#)
- [Chapter 8. Automated installation using response files](#)
- [Chapter 9. Installing DMP using operating system-specific methods](#)

Preparing to install DMP

This chapter includes the following topics:

- [Installation preparation overview](#)
- [Creating a root user](#)
- [Setting environment variables](#)
- [About using ssh or rsh with the installer](#)
- [Creating the /opt directory](#)
- [Mounting the product disc](#)
- [Assessing the system for installation readiness](#)

Installation preparation overview

[Table 5-1](#) provides an overview of an installation using the product installer.

Table 5-1 Installation overview

Installation task	Section
Obtain product licenses.	See “About Symantec product licensing” on page 28.
Download the software, or insert the product DVD.	See “Mounting the product disc” on page 37.
Set environment variables.	See “Setting environment variables” on page 36.
Create the /opt directory, if it does not exist.	See “Creating the /opt directory” on page 37.

Table 5-1 Installation overview (*continued*)

Installation task	Section
Configure the Secure Shell (ssh) or Remote Shell (rsh) on all nodes.	See “About using ssh or rsh with the installer” on page 36.
Verify that hardware, software, and operating system requirements are met.	See “Release notes” on page 19.
Check that sufficient disk space is available.	See “Disk space requirements” on page 20.
Use the installer to install the products.	See “About the script-based installer” on page 40.

Creating a root user

On Oracle Solaris 11, you need to change the root role into a user as you cannot directly log in as root user.

To change root role into a user

- 1 Log in as local user and assume the root role.

```
% su - root
```

- 2 Remove the root role from local users who have been assigned the role.

```
# roles admin  
  
root  
  
# usermod -R " " admin
```

- 3 Change the root role into a user.

```
# rolemod -K type=normal root
```

- 4 Verify the change.

```
■ # getent user_attr root  
  
root:::auths=solaris.*;profiles=All;audit_flags=lo\  
:no;lock_after_retries=no;min_label=admin_low;clearance=admin_high
```

If the `type` keyword is not present in the output or is equal to `normal`, the account is not a role.

```
■ # userattr type root
```

If the output is empty or lists normal, the account is not a role.

Note: For more information, see the Oracle documentation on Oracle Solaris 11 operating system.

Note: After installation, you may want to change root user into root role to allow local users to assume the root role.

See [“Changing root user into root role”](#) on page 100.

Setting environment variables

Most of the commands which are used in the installation are present in the `/sbin` or `/usr/sbin` directory. Add these directories to your `PATH` environment variable as necessary.

After installation, DMP commands are in `/opt/VRTS/bin`. DMP manual pages are stored in `/opt/VRTS/man`.

Add the following directories to your `PATH` and `MANPATH` environment variable:

- If you want to use Bourne or Korn shell (`sh` or `ksh`), enter the following:

```
$ PATH=$PATH:/usr/sbin:/opt/VRTS/bin
$ MANPATH=/usr/share/man:/opt/VRTS/man:$MANPATH
$ export PATH MANPATH
```

- If you want to use a C shell (`csh` or `tcsh`), enter the following:

```
% set path = ( $path /usr/sbin /opt/VRTS/bin )
% setenv MANPATH /usr/share/man:/opt/VRTS/man:$MANPATH
```

About using ssh or rsh with the installer

The installer uses passwordless Secure Shell (ssh) or Remote Shell (rsh) communications among systems. The installer uses the ssh daemon or rsh daemon that comes bundled with the operating system. During an installation, you choose the communication method that you want to use. Or, you can run the `installer -comsetup` command to set up ssh or rsh explicitly. You then provide the installer with the superuser passwords for the systems where you plan to install. The ssh communication or rsh communication among the systems is removed when the

installation process completes, unless the installation abruptly terminates. If installation terminated abruptly, use the installation script's `-comcleanup` option to remove the ssh configuration or rsh configuration from the systems.

In most installation, configuration, upgrade (where necessary), and uninstallation scenarios, the installer can configure ssh or rsh on the target systems. In the following scenarios, you need to set up ssh or rsh manually, or use the `installer -comsetup` option to set up an ssh or rsh configuration from the systems.

- When you perform installer sessions using a response file.

See [“About configuring secure shell or remote shell communication modes before installing products”](#) on page 184.

Creating the /opt directory

The directory `/opt` must exist, be writable, and must not be a symbolic link.

If you want to upgrade, you cannot have a symbolic link from `/opt` to an unconverted volume. If you have a symbolic link to an unconverted volume, the symbolic link does not function during the upgrade and items in `/opt` are not installed.

Mounting the product disc

You must have superuser (root) privileges to load the DMP software.

To mount the product disc

- 1 Log in as superuser on a system where you want to install DMP.
The systems must be in the same subnet.
- 2 Insert the product disc into a DVD drive that is connected to your system.
- 3 If Solaris volume management software is running on your system, the software disc automatically mounts as `/cdrom/cdrom0`.
- 4 If Solaris volume management software is not available to mount the DVD, you must mount it manually. After you insert the software disc, enter:

```
# mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom
```

Where `c0t6d0s2` is the default address for the disc drive.

Assessing the system for installation readiness

Symantec provides the following tools for assessing your system, to ensure that the system meets the requirements for installing Symantec Dynamic Multi-Pathing 6.1.

Symantec Operations Readiness Tools	<p>Symantec Operations Readiness Tools (SORT) is a web-based application that is designed to support Symantec enterprise products.</p> <p>See “About Symantec Operations Readiness Tools (SORT)” on page 16.</p>
Prechecking your systems using the installer	<p>Performs a preinstallation check on the specified systems. The product installer reports whether the specified systems meet the minimum requirements for installing Symantec Dynamic Multi-Pathing 6.1.</p> <p>See “Prechecking your systems using the installer” on page 38.</p>

Prechecking your systems using the installer

The script-based and web-based installer's precheck option checks for the following:

- Recommended swap space for installation
- Recommended memory sizes on target systems for Symantec programs for best performance
- Required operating system versions

To use the precheck option

- 1 Start the script-based or web-based installer.

See [“Installing DMP using the script-based installer”](#) on page 42.

See [“Installing DMP with the web-based installer”](#) on page 49.
- 2 Select the precheck option:
 - From the web-based installer, select the **Perform a Pre-Installation Check** from the Task pull-down menu.
 - In the script-based installer, from root on the system where you want to perform the check, start the installer.

```
# ./installer
```

In the Task Menu, press the p key to start the precheck.

- 3** Enter the system name or the IP address of the system that you want to check.
- 4** Review the output and make the changes that the installer recommends.

Installing DMP using the script-based installer

This chapter includes the following topics:

- [About the script-based installer](#)
- [Installing DMP using the script-based installer](#)
- [Installing language packages](#)
- [Performing a postcheck on a node](#)

About the script-based installer

You can use the script-based installer to install Symantec products (version 6.1 and later) from a driver system that runs any supported platform to a target system that runs different supported platforms.

To install your Symantec product, use one of the following methods:

- The general product installer (`installer`). The general product installer script provides a menu that simplifies the selection of installation and configuration options. Use the general product installer if you want to install multiple products from a disc.
See [“Installing DMP using the script-based installer”](#) on page 42.
- Product-specific installation scripts (`installdmp`). The product-specific installation scripts provide command-line interface options. Installing and configuring with the `installdmp` script is identical to running the general product installer and specifying DMP from the list of products to install. Use the product-specific installation scripts to install or configure individual products you download electronically. You can find these scripts at the root of the product media. These scripts are also installed with the product.

Table 6-1 lists all the SFHA Solutions product installation scripts. The list of product-specific installation scripts that you find on your system depends on the product that you install on your system.

Table 6-1 Product installation scripts

Symantec product name	Script name in the media	Script name after an installation
For all SFHA Solutions products	installer	N/A
Symantec ApplicationHA	installapplicationha	installapplicationha<version>
Symantec Cluster Server (VCS)	installvcs	installvcs<version>
Symantec Storage Foundation (SF)	installsf	installsf<version>
Symantec Storage Foundation and High Availability (SFHA)	installsfha	installsfha<version>
Symantec Storage Foundation Cluster File System High Availability (SFCFSHA)	installsfcfsha	installsfcfsha<version>
Symantec Storage Foundation for Oracle RAC (SF Oracle RAC)	installsfrac	installsfrac<version>
Symantec Dynamic Multi-pathing (DMP)	installdmp	installdmp<version>

When you install from the installation media, the script name does not include a product version.

When you configure the product after an installation, the installation scripts include the product version in the script name.

For example, for the 6.1 version:

```
# /opt/VRTS/install/installdmp61 -configure
```

Note: The general product installer (`installer`) script does not include the product version.

At most points during the installation you can type the following characters for different actions:

- Use `b` (back) to return to a previous section of the installation procedure. The back feature of the installation scripts is context-sensitive, so it returns to the beginning of a grouped section of questions.
- Use `Control+c` to stop and exit the program if an installation procedure hangs. After a short delay, the script exits.
- Use `q` to quit the installer.
- Use `?` to display help information.
- Use the Enter button to accept a default response.

See [“Command options for the installation script”](#) on page 164.

See [“Command options for uninstall script”](#) on page 171.

Installing DMP using the script-based installer

Use the installer program to install Symantec Dynamic Multi-pathing (DMP) on your system.

The following sample procedure installs DMP on a single system.

To install DMP

- 1 To install on multiple systems, set up the systems so that commands between systems execute without prompting for passwords or confirmations.

See [“About configuring secure shell or remote shell communication modes before installing products”](#) on page 184.

- 2 Load and mount the software disc.

See [“Mounting the product disc”](#) on page 37.

- 3 Move to the top-level directory on the disc.

```
# cd /cdrom/cdrom0
```

- 4 From this directory, type the following command to install on the local system. Also use this command to install on remote systems provided that the Secure Shell (SSH) or Remote Shellrsh) utilities are configured:

```
# ./installer
```

- 5 Enter `1` to install and press the Return key.
- 6 When the list of available products is displayed, to select **Symantec Dynamic Multi-Pathing**, enter the corresponding number, and press the Return key.
- 7 At the prompt, specify whether you accept the terms of the End User License Agreement (EULA). Press the return key to proceed.
- 8 Select one of the following installation options:
 - A minimal installation installs packages for minimal functionality for the selected product.
 - A recommended installation installs the recommended DMP packages that provide complete functionality of the product.
Note that this option is the default.
 - The display selection displays all packages and provides information about them. Note that the recommended installation installs the minimum and the recommended packages.
- 9 When the installer prompts you, indicate the systems where you want to install DMP. Enter one or more system names, using spaces to separate them.
- 10 The installer program verifies the system for installation. If the installer does not verify a system, fix the issue and return to the installer.

After the system checks complete, the installer displays a list of the packages to be installed. Press Return to continue with the installation.
- 11 The installer can configure Remote Shell or Secure Shell communications for you among systems, however each system needs to have rsh or SSH servers installed. You also need to provide the superuser passwords for the systems. Note that for security reasons, the installation program neither stores nor caches these passwords.

- 12** The installer installs the product packages.

The installer program prompts you to choose a licensing method.

If you have a valid license key, select 1 and enter the license key at the prompt.

To install through keyless licensing, select 2.

Note: With the keyless license option, you must manage the systems with a management server.

For more information, go to the following website:

<http://go.symantec.com/sfhakeyless>

- 13** The installer starts DMP processes. When you are prompted next, specify whether you want to send your installation information to Symantec. Note that the information that is sent to Symantec is only to help improve the installer software.

```
Installation procedures and diagnostic information were saved
in the log files under directory /var/tmp/installer-<platform>-<uuid>.
Analyzing this information helps Symantec discover and fix failed
operations performed by the installer. Would you like to send the
information about this installation to Symantec to help improve
installation in the future? [y,n,q,?] (y) y
```

- 14** The installer program completes the installation. If the Solaris operating system version is 11.1 or later, DMP is enabled for the ZFS root device.

For more information about ZFS root support, see *Symantec Dynamic Multi-Pathing Administrator's Guide*.

If required, check the log files to confirm the installation.

Installation log files, summary file, and response file are saved at:

```
/opt/VRTS/install/logs/installer-****
```

Installer also generates a summary file of the whole procedure, you can view your summary file by answering **y**:

```
Would you like to view the summary file? [y,n,q] (n)
```

- 15** Restart the systems if the installer prompts for a restart, to enable DMP native support.

Installing language packages

To install DMP in a language other than English, install the required language packages after installing the English packages.

To install the language packages on the server

- 1 Insert the "Language" disc into the DVD-ROM or CD-ROM drive. With Solaris volume management software, the disc is automatically mounted as `/cdrom/cdrom0`.
- 2 Install the language packages using the `install_lp` command.

```
# cd /cdrom/cdrom0
# ./install_lp
```

Performing a postcheck on a node

The installer's `postcheck` command can help you to determine installation-related problems.

To run the postcheck command on a node

- 1 Run the installer with the `-postcheck` option.

```
# ./installer -postcheck system_name
```

Or you can run the following command on your local machine once DMP is installed.

```
# /opt/VRTS/install/installdmp61 -postcheck
```

- 2 The installer reports some errors or warnings if any processes or drivers do not start.

Installing DMP using the web-based installer

This chapter includes the following topics:

- [About the web-based installer](#)
- [Before using the web-based installer](#)
- [Starting the web-based installer](#)
- [Obtaining a security exception on Mozilla Firefox](#)
- [Performing a preinstallation check with the web-based installer](#)
- [Installing DMP with the web-based installer](#)

About the web-based installer

Use the web-based installer interface to install Symantec products. The web-based installer can perform most of the tasks that the script-based installer performs.

You use the `webinstaller` script to start and stop the Veritas XPortal Server `xprtlwid` process. The `webinstaller` script can also be used to check the status of the XPortal Server.

When the `webinstaller` script starts the `xprtlwid` process, the script displays a URL. Use this URL to access the web-based installer from a web browser such as Internet Explorer or FireFox.

The web installer creates log files whenever the web installer operates. While the installation processes operate, the log files are located in a session-based directory under the `/var/tmp` directory. After the install process completes, the log files are

located in the `/opt/VRTS/install/logs` directory. Symantec recommends that you keep these files for auditing, debugging, and future use.

The location of the Veritas XPortal Server configuration file is `/var/opt/webinstaller/xprtlwid.conf`.

See [“Before using the web-based installer”](#) on page 47.

See [“Starting the web-based installer”](#) on page 47.

Before using the web-based installer

The web-based installer requires the following configuration.

Table 7-1 Web-based installer requirements

System	Function	Requirements
Target system	The systems where you plan to install the Symantec products.	Must be a supported platform for Symantec Dynamic Multi-Pathing 6.1.
Installation server	The server where you start the installation. The installation media is accessible from the installation server.	Must be at one of the supported operating system update levels.
Administrative system	The system where you run the web browser to perform the installation.	Must have a web browser. Supported browsers: <ul style="list-style-type: none">■ Internet Explorer 6, 7, and 8■ Firefox 3.x and later

Starting the web-based installer

This section describes starting the web-based installer.

To start the web-based installer

- 1 Start the Veritas XPortal Server process `xprt1wid`, on the installation server:

```
# ./webinstaller start
```

The `webinstaller` script displays a URL. Note this URL.

Note: If you do not see the URL, please check your firewall and `iptables` settings. If you have configured a firewall, ensure that the firewall settings allow access to the port 14172. You can alternatively use the `-port` option to use a free port instead.

You can use the following command to display the details about ports used by `webinstaller` and its status:

```
# ./webinstaller status
```

- 2 On the administrative server, start the web browser.
- 3 Navigate to the URL that the script displayed.
- 4 Certain browsers may display the following message:

```
Secure Connection Failed
```

Obtain a security exception for your browser.

When you are prompted, enter `root` and `root`'s password of the installation server.

- 5 Log in as superuser.

Obtaining a security exception on Mozilla Firefox

You may need to get a security exception on Mozilla Firefox.

The following instructions are general. They may change because of the rapid release cycle of Mozilla browsers.

To obtain a security exception

- 1 Click **Or you can add an exception** link.
- 2 Click **I Understand the Risks**, or **You can add an exception**.
- 3 Click **Get Certificate** button.
- 4 Uncheck **Permanently Store this exception checkbox (recommended)**.

- 5 Click **Confirm Security Exception** button.
- 6 Enter root in *User Name* field and root password of the web server in the *Password* field.

Performing a preinstallation check with the web-based installer

This section describes performing a preinstallation check with the web-based installer.

To perform a preinstallation check

- 1 Start the web-based installer.
See [“Starting the web-based installer”](#) on page 47.
- 2 On the Select a task and a product page, select **Perform a Pre-installation Check** from the **Task** drop-down list.
- 3 Select **Symantec Dynamic Multi-Pathing** from the **Product** drop-down list, and click **Next**.
- 4 Indicate the systems on which to perform the precheck. Enter one or more system names, separated by spaces. Click **Next**.
- 5 The installer performs the precheck and displays the results.
- 6 If the validation completes successfully, click **Next**. The installer prompts you to begin the installation. Click **Yes** to install on the selected system. Click **No** to install later.
- 7 Click **Finish**. The installer prompts you for another task.

Installing DMP with the web-based installer

This section describes installing DMP with the Symantec web-based installer.

To install DMP using the web-based installer

- 1 Perform preliminary steps.
See [“Performing a preinstallation check with the web-based installer”](#) on page 49.
- 2 Start the web-based installer.
See [“Starting the web-based installer”](#) on page 47.
- 3 Select **Install a Product** from the **Task** drop-down list.

- 4 Select **Symantec Dynamic Multi-Pathing** from the Product drop-down list, and click **Next**.
- 5 On the License agreement page, read the End User License Agreement (EULA). To continue, select **Yes, I agree** and click **Next**.
- 6 Choose minimal or recommended packages. Click **Next**.
- 7 Indicate the systems where you want to install. Separate multiple system names with spaces. Click **Next**.
- 8 If you have not yet configured a communication mode among systems, you have the option to let the installer configure ssh or rsh. If you choose to allow this configuration, select the communication mode and provide the superuser passwords for the systems.
- 9 After the validation completes successfully, click **Next** to install DMP on the selected system.
- 10 After the installation completes, you must choose your licensing method.
On the license page, select one of the following radio buttons:
 - Enable keyless licensing and complete system licensing later

Note: The keyless license option enables you to install without entering a key. However, to ensure compliance, you must manage the systems with a management server.

For more information, go to the following website:

<http://go.symantec.com/sfhakeyless>

Click **Next**

- Enter a valid license key
If you have a valid license key, input the license key and click **Next**.
- 11 After the product is registered, the processes are started.
For information about migrating your data volumes to DMP devices, refer to the *Symantec Dynamic Multi-Pathing Administrator's Guide*.

- 12 If you are prompted, enter the option to specify whether you want to send your installation information to Symantec.

```
Installation procedures and diagnostic information were saved in  
the log files under directory  
/var/tmp/installer-<platform>-<uuid>. Analyzing this information  
helps Symantec discover and fix failed operations performed by  
the installer. Would you like to send the information about this  
installation to Symantec to help improve installation in the  
future? [y,n,q,?]
```

Click **Finish**. The installer asks if you want to read the summary file. Select **Yes** to read the summary file. If you select **No**, the installer prompts you for another task.

- 13 If the Solaris operating system version is 11.1 or later, DMP is enabled for the ZFS root device. The installer prompts you to restart the systems.

For more information about ZFS root support, see the *Symantec Dynamic Multi-Pathing Administrator's Guide*.

Automated installation using response files

This chapter includes the following topics:

- [About response files](#)
- [Installing DMP using response files](#)
- [Upgrading DMP using response files](#)
- [Uninstalling DMP using response files](#)
- [Syntax in the response file](#)
- [Response file variable definitions](#)

About response files

The installer script or product installation script generates a response file during any installation, configuration, upgrade, or uninstall procedure. The response file contains the configuration information that you entered during the procedure. When the procedure completes, the installation script displays the location of the response files.

You can use the response file for future installation procedures by invoking an installation script with the `-responsefile` option. The response file passes arguments to the script to automate the installation of that product. You can edit the file to automate installation and configuration of additional systems.

You can generate a response file using the `-makeresponsefile` option.

Installing DMP using response files

Typically, you can use the response file that the installer generates after you perform DMP installation on a system to install DMP on other systems. You can also create a response file using the `-makeresponsefile` option of the installer.

To install DMP using response files

- 1 Make sure the systems where you want to install DMP meet the installation requirements.
- 2 Make sure that the preinstallation tasks are completed.
- 3 Copy the response file to the system where you want to install DMP.
- 4 Edit the values of the response file variables as necessary.
- 5 Mount the product disc and navigate to the directory that contains the installation program.
- 6 Start the installation from the system to which you copied the response file. For example:

```
# ./installer -responsefile /tmp/response_file  
  
# ./installdmp -responsefile /tmp/response_file
```

Where `/tmp/response_file` is the response file's full path name.

See [“About the script-based installer”](#) on page 40.

If the Solaris operating system version is 11.1 or later, DMP is enabled for the ZFS root device.

For more information about ZFS root support, see *Symantec Dynamic Multi-Pathing Administrator's Guide*.

- 7 Complete the DMP post-installation tasks.
For instructions, see the chapter *Performing post-installation and configuration tasks* in this document.

Upgrading DMP using response files

Typically, you can use the response file that the installer generates after you perform DMP upgrade on one system to upgrade DMP on other systems. You can also create a response file using the `makeresponsefile` option of the installer.

To perform automated DMP upgrade

- 1 Make sure the systems where you want to upgrade DMP meet the upgrade requirements.
- 2 Make sure the pre-upgrade tasks are completed.
- 3 Copy the response file to one of the systems where you want to upgrade DMP.
- 4 Edit the values of the response file variables as necessary.
- 5 Mount the product disc and navigate to the folder that contains the installation program.
- 6 Start the upgrade from the system to which you copied the response file. For example:

```
# ./installer -responsefile /tmp/response_file  
# ./installdmp -responsefile /tmp/response_file
```

Where `/tmp/response_file` is the response file's full path name.

Uninstalling DMP using response files

Typically, you can use the response file that the installer generates after you perform DMP uninstallation on one system to uninstall DMP on other systems.

To perform an automated uninstallation

- 1 Make sure that you meet the prerequisites to uninstall DMP.
- 2 Copy the response file to one of the cluster systems where you want to uninstall DMP.
- 3 Edit the values of the response file variables as necessary.
- 4 Start the uninstallation from the system to which you copied the response file. For example:

```
# /opt/VRTS/install/uninstalldmp<version>  
-responsefile /tmp/response_file
```

Where `<version>` is the specific release version, and `/tmp/response_file` is the response file's full path name.

See [“About the script-based installer”](#) on page 40.

Syntax in the response file

The syntax of the Perl statements that is included in the response file variables varies. It can depend on whether the variables require scalar or list values.

For example, in the case of a string value:

```
$CFG{Scalar_variable}="value";
```

or, in the case of an integer value:

```
$CFG{Scalar_variable}=123;
```

or, in the case of a list:

```
$CFG{List_variable}=["value 1 ", "value 2 ", "value 3 "];
```

Response file variable definitions

[Table 8-1](#) lists the variables that are used in the response file and their definitions.

Table 8-1 Response file variables

Variable	Description
CFG{opt}{install}	Installs DMP packages. Configuration can be performed at a later time using the <code>-configure</code> option. List or scalar: scalar Optional or required: optional
CFG{accepteula}	Specifies whether you agree with the EULA.pdf file on the media. List or scalar: scalar Optional or required: required
CFG{opt}{vxkeyless}	Installs the product with keyless license. List or scalar: scalar Optional or required: optional
CFG{systems}	List of systems on which the product is to be installed, uninstalled, or configured. List or scalar: list Optional or required: required

Table 8-1 Response file variables (*continued*)

Variable	Description
CFG{prod}	Defines the product to be installed, uninstalled, or configured. List or scalar: scalar Optional or required: required
CFG{opt}{keyfile}	Defines the location of an ssh keyfile that is used to communicate with all remote systems. List or scalar: scalar Optional or required: optional
CFG{opt}{patchpath}	Defines a location, typically an NFS mount, from which all remote systems can install product patches. The location must be accessible from all target systems. List or scalar: scalar Optional or required: optional
CFG{opt}{pkgpath}	Defines a location, typically an NFS mount, from which all remote systems can install product packages. The location must be accessible from all target systems. List or scalar: scalar Optional or required: optional
CFG{opt}{tmppath}	Defines the location where a working directory is created to store temporary files and the packages that are needed during the install. The default location is <code>/var/tmp</code> . List or scalar: scalar Optional or required: optional
CFG{opt}{rsh}	Defines that <code>rsh</code> must be used instead of <code>ssh</code> as the communication method between systems. List or scalar: scalar Optional or required: optional

Table 8-1 Response file variables (*continued*)

Variable	Description
CFG{vm_restore_cfg}{sys1}	Indicates whether a previous VM configuration should be restored. 0: indicates do not restore 1: indicates do restore. List or scalar: Scalar Optional or required: optional
CFG{opt}{logpath}	Mentions the location where the log files are to be copied. The default location is /opt/VRTS/install/logs. List or scalar: scalar Optional or required: optional
CFG{opt}{configure}	Performs the configuration after the packages are installed using the <code>-install</code> option. List or scalar: scalar Optional or required: optional
CFG{opt}{upgrade}	Upgrades all packages installed, without configuration. List or scalar: list Optional or required: optional
CFG{opt}{uninstall}	Uninstalls DMP packages. List or scalar: scalar Optional or required: optional
CFG{opt}{disable_dmp_native_support}	If it is set to 1, Dynamic Multi-pathing support for the native LVM volume groups and ZFS pools is disabled after upgrade. List or scalar: scalar Optional or required: optional

Installing DMP using operating system-specific methods

This chapter includes the following topics:

- [About installing DMP using operating system-specific methods](#)
- [Installing DMP on Solaris 11 using Automated Installer](#)
- [Installing DMP on Solaris 10 using JumpStart](#)
- [Manually installing DMP using the system command](#)

About installing DMP using operating system-specific methods

On Solaris, you can install DMP using the following methods:

- You can use the Oracle Solaris Automated Installer (AI) to install the Solaris 11 operating system and Storage Foundation product on multiple client systems in a network.
See [“Installing DMP on Solaris 11 using Automated Installer”](#) on page 59.
- The procedure to manually install DMP differs depending on the Solaris version.
See [“Manually installing DMP using the system command”](#) on page 70.
- You can install DMP on Solaris 10 systems using Solaris JumpStart.
See [“Installing DMP on Solaris 10 using JumpStart”](#) on page 64.
- You can install DMP using Flash archive on the Solaris 10 operating system.

See [“Using a Flash archive to install DMP and the operating system”](#) on page 68.

Installing DMP on Solaris 11 using Automated Installer

You can use the Oracle Solaris Automated Installer (AI) to install the Solaris 11 operating system and Storage Foundation product on multiple client systems in a network. AI performs a hands-free installation (automated installation without manual interactions) of SPARC systems. You can also use AI media to install the Oracle Solaris OS on a single SPARC platform. Oracle provides the AI bootable image and it can be downloaded from the Oracle website. All cases require access to a package repository on the network to complete the installation.

About Automated Installation

AI automates the installation of the Oracle Solaris 11 OS on one or more SPARC clients in a network. Automated Installation applies to Solaris 11 only. You can install the Oracle Solaris OS on many different types of clients. The clients can differ in:

- Architecture
- Memory characteristics
- MAC address
- IP address
- CPU

The installations can differ depending on specifications including network configuration and packages installed.

An automated installation of a client in a local network consists of the following high-level steps:

- 1 A client system boots and gets IP information from the DHCP server
- 2 Characteristics of the client determine which AI service and which installation instructions are used to install the client.
- 3 The installer uses the AI service instructions to pull the correct packages from the package repositories and install the Oracle Solaris OS on the client.

Using Automated Installer

To use Automated Installer to install systems over the network, set up DHCP and set up an AI service on an AI server. The DHCP server and AI server can be the same system or two different systems.

Make sure that the systems can access an Oracle Solaris Image Packaging System (IPS) package repository. The IPS package repository can reside on the AI server, on another server on the local network, or on the Internet.

An AI service is associated with a SPARC AI install image and one or more sets of installation instructions. The installation instructions specify one or more IPS package repositories from where the system retrieves the packages that are needed to complete the installation. The installation instructions also include the names of additional packages to install and information such as target device and partition information. You can also specify instructions for post-installation configuration of the system.

Consider the operating systems and packages you want to install on the systems. Depending on your configuration and needs, you may want to do one of the following:

- If two systems have different architectures or need to be installed with different versions of the Oracle Solaris OS, create two AI services. Then, associate each AI service with a different AI image
- If two systems need to be installed with the same version of the Oracle Solaris OS but need to be installed differently in other ways, create two sets of installation instructions for the AI service. The different installation instructions can specify different packages to install or a different slice as the install target.

The installation begins when you boot the system. DHCP directs the system to the AI install server, and the system accesses the install service and the installation instructions within that service.

For more information, see the *Oracle® Solaris 11 Express Automated Installer Guide*.

Using AI to install the Solaris 11 operating system and SFHA products

Use the following procedure to install the Solaris 11 operating system and SFHA products using AI.

To use AI to install the Solaris 11 operating system and SFHA products

- 1 Follow the Oracle documentation to set up a Solaris AI server and DHCP server.

You can find the documentation at <http://docs.oracle.com>.

- 2 Set up the Symantec package repository.

Run the following commands to startup necessary SMF services and create directories:

```
# svcadm enable svc:/network/dns/multicast:default
# mkdir /ai
# zfs create -o compression=on -o mountpoint=/ai rpool/ai
```

- 3 Run the following commands to set up IPS repository for Symantec SPARC packages:

```
# mkdir -p /ai/repo_symc_sparc
# pkgrepo create /ai/repo_symc_sparc
# pkgrepo add-publisher -s /ai/repo_symc_sparc Symantec
# pkgrecv -s <media_sparc>/pkgs/VRTSpkgs.p5p -d
/ai/repo_symc_sparc '*'
# svccfg -s pkg/server list
# svcs -a | grep pkg/server
# svccfg -s pkg/server add symcsparc
# svccfg -s pkg/server:symcsparc addpg pkg application
# svccfg -s pkg/server:symcsparc setprop pkg/port=10003
# svccfg -s pkg/server:symcsparc setprop pkg/inst_root=
/ai/repo_symc_sparc
# svccfg -s pkg/server:symcsparc addpg general framework
# svccfg -s pkg/server:symcsparc addpropvalue general/complete
astring: symcsparc
# svccfg -s pkg/server:symcsparc addpropvalue general/enable
boolean: true
# svcs -a | grep pkg/server
# svcadm refresh application/pkg/server:symcsparc
# svcadm enable application/pkg/server:symcsparc
```

Or run the following commands to set up the private depot server for testing purposes:

```
# /usr/lib/pkg.depotd -d /ai/repo_symc_sparc -p 10003 > /dev/null &
```

Check the following URL on IE or Firefox browser:

<http://<host>:10003>

4 Set up the install service on the AI server.

Run the following command:

```
# mkdir /ai/iso
```

Download the AI image from the Oracle website and place the `iso` in the `/ai/iso` directory.

Create an install service.

For example:

To set up the AI install service for SPARC platform::

```
# # installadm create-service -n sol11sparc -s\  
/ai/iso/sol-11-1111-ai-sparc.iso -d /ai/aiboot/
```

5 Run the installer to generate manifest XML files for all the SFHA products that you plan to install.

```
# mkdir /ai/manifests  
# <media>/installer -ai /ai/manifests
```

6 For each system, generate the system configuration and include the host name, user accounts, and IP addresses. For example, enter one of the following:

```
# mkdir /ai/profiles  
# sysconfig create-profile -o /ai/profiles/profile_client.xml
```

or

```
# cp /ai/aiboot/auto-install/sc_profiles/sc_sample.xml  
/ai/profiles/profile_client.xml
```

- 7 Add a system and match it to the specified product manifest and system configuration.

Run the following command to add a SPARC system, for example:

```
# installadm create-client -e "<client_MAC>" -n soll1sparc
# installadm add-manifest -n soll1sparc -f \
/ai/manifests/vrts_manifest_sfha.xml
# installadm create-profile -n soll1sparc -f \
/ai/profiles/profile_client.xml -p profile_sc
# installadm set-criteria -n soll1sparc -m \
vrts_sfha -p profile_sc -c mac="<client_MAC>"
# installadm list -m -c -p -n soll1sparc
```

- 8 For SPARC system, run the following command to restart the system and install the operating system and Storage Foundation products:

```
# boot net:dhcp - install
```

If the Solaris operating system version is 11.1 or later, DMP is enabled for the ZFS root device.

For more information about ZFS root support, see *Symantec Dynamic Multi-Pathing Administrator's Guide*.

Installing DMP on Solaris 10 using JumpStart

This installation method applies only to Solaris 10. These JumpStart instructions assume a working knowledge of JumpStart. See the JumpStart documentation that came with your operating system for details on using JumpStart.

Upgrading is not supported. The following procedure assumes a standalone configuration.

For the language pack, you can use JumpStart to install packages. You add the language packages in the script, and put those files in the JumpStart server directory.

You can use a Flash archive to install DMP and the operating system with JumpStart.

See [“Using a Flash archive to install DMP and the operating system”](#) on page 68.

Overview of JumpStart installation tasks

Review the summary of tasks before you perform the JumpStart installation.

Summary of tasks

- 1 Add a client (register to the JumpStart server). See the JumpStart documentation that came with your operating system for details.
- 2 Read the JumpStart installation instructions.
- 3 Generate the finish scripts.
See [“Generating the finish scripts”](#) on page 65.
- 4 Prepare shared storage installation resources.
See [“Preparing installation resources”](#) on page 66.
- 5 Modify the rules file for JumpStart.
See the JumpStart documentation that came with your operating system for details.
- 6 Install the operating system using the JumpStart server.
- 7 When the system is up and running, run the installer command from the installation media to configure the Symantec software.

```
# /opt/VRTS/install/installer -configure
```

See [“About the script-based installer”](#) on page 40.

Generating the finish scripts

Perform these steps to generate the finish scripts to install DMP.

To generate the script

- 1 Run the product installer program to generate the scripts for all products.

```
./installer -jumpstart directory_to_generate_scripts
```

Or

```
./install<productname> -jumpstart directory_to_generate_script
```

where **<productname>** is the product's installation command, and *directory_to_generate_scripts* is where you want to put the product's script.

For example:

```
# ./installdmp -jumpstart /js_scripts
```

- 2 JumpStart finish scripts and encapsulation scripts are generated in the directory you specified in step 1. Output resembles:

```
The finish scripts for DMP is generated at /js_scripts/  
jumpstart_dmp.fin
```

Preparing installation resources

Prepare resources for the JumpStart installation.

To prepare the resources

- 1 Copy the `pkgs` directory of the installation media to the shared storage.

```
# cd /path_to_installation_media  
# cp -r pkgs BUILDSRC
```

- 2 Generate the response file with the list of packages.

```
# cd BUILDSRC/pkgs/  
# pkgask -r package_name.response -d /  
BUILDSRC/pkgs/packages_name.pkg
```

- 3 Create the `adminfile` file under `BUILDSRC/pkgs/` directory.

```
mail=  
instance=overwrite  
partial=nocheck  
runlevel=quit  
idepend=quit  
rdepend=nocheck  
space=quit  
setuid=nocheck  
conflict=nocheck  
action=nocheck  
basedir=default
```

Adding language pack information to the finish file

To add the language pack information to the finish file, perform the following procedure.

To add the language pack information to the finish file

- 1 For the language pack, copy the language packages from the language pack installation disc to the shared storage.

```
# cd /cdrom/cdrom0/pkg  
# cp -r * BUILDSRC/pkg
```

If you downloaded the language pack:

```
# cd /path_to_language_pack_installation_media/pkg  
# cp -r * BUILDSRC/pkg
```

- 2 In the finish script, copy the product package information and replace the product packages with language packages.
- 3 The finish script resembles:

```
. . .  
for PKG in product_packages  
do  
...  
done. . .  
for PKG in language_packages  
do  
...  
done. . .
```

Using a Flash archive to install DMP and the operating system

You can only use Flash archive on the Solaris 10 operating system. In the following outline, refer to Solaris documentation for Solaris-specific tasks.

Note: Symantec does not support Flash Archive installation if the root disk of the master system is encapsulated.

The following is an overview of the creation and installation of a Flash archive with Symantec software.

- If you plan to start flar (flash archive) creation from bare metal, perform step 1 through step 10.
- If you plan to start flar creation from a system where you have installed, but not configured the product, perform step 1 through step 4. Skip step 5 and finish step 6 through step 10.

- If you plan to start flar creation from a system where you have installed and configured the product, perform step 5 through step 10.

Flash archive creation overview

- 1 Ensure that you have installed Solaris 10 on the master system.
- 2 Use JumpStart to create a clone of a system.
- 3 Restart the cloned system.
- 4 Install the Symantec products on the master system.
Perform one of the installation procedures from this guide.
- 5 If you have configured the product on the master system, create the `vrts_deployment.sh` file and the `vrts_deployment.cf` file and copy them to the master system.

See [“Creating the Symantec post-deployment scripts”](#) on page 69.
- 6 Use the `flarcreate` command to create the Flash archive on the master system.
- 7 Copy the archive back to the JumpStart server.
- 8 Use JumpStart to install the Flash archive to the selected systems.
- 9 Configure the Symantec product on all nodes in the cluster.

The scripts that are installed on the system include the product version in the script name. For example, to install the SF script from the install media, run the `installsf` command. However, to run the script from the installed binaries, run the `installsf<version>` command. For example, for the 6.1 version:

```
# /opt/VRTS/install/installdmp61 -configure
```

See [“About the script-based installer”](#) on page 40.

- 10 Perform post-installation and configuration tasks.

See the product installation guide for the post-installation and configuration tasks.

Creating the Symantec post-deployment scripts

The generated files `vrts_deployment.sh` and `vrts_post-deployment.cf` are customized Flash archive post-deployment scripts. These files clean up Symantec product settings on a cloned system before you reboot it for the first time. Include these files in your Flash archives.

To create the post-deployment scripts

- 1 Mount the product disc.
- 2 From the prompt, run the `-flash_archive` option for the installer. Specify a directory where you want to create the files.

```
# ./installer -flash_archive /tmp
```

- 3 Copy the `vrts_postdeployment.sh` file and the `vrts_postdeployment.cf` file to the golden system.
- 4 On the golden system perform the following:
 - Put the `vrts_postdeployment.sh` file in the `/etc/flash/postdeployment` directory.
 - Put the `vrts_postdeployment.cf` file in the `/etc/vx` directory.
- 5 Make sure that the two files have the following ownership and permissions:

```
# chown root:root /etc/flash/postdeployment/vrts_postdeployment.sh
# chmod 755 /etc/flash/postdeployment/vrts_postdeployment.sh
# chown root:root /etc/vx/vrts_postdeployment.cf
# chmod 644 /etc/vx/vrts_postdeployment.cf
```

Note that you only need these files in a Flash archive where you have installed Symantec products.

Manually installing DMP using the system command

The procedure to manually install DMP differs depending on the Solaris version.

See [“Installing DMP on Solaris 10 using the pkgadd command”](#) on page 70.

See [“Installing DMP on Solaris 11 using the pkg install command”](#) on page 72.

Installing DMP on Solaris 10 using the pkgadd command

On Solaris 10, the packages must be installed while in the global zone.

To install DMP on Solaris 10 using the pkgadd command

- 1 Mount the software disc.
See [“Mounting the product disc”](#) on page 37.
- 2 Copy the supplied VRTS* files from the installation media to a temporary location. Modify them if needed.

```
# cp /cdrom/cdrom0/pkgsvrts* \
    /tmp/pkgsvrts
```

- 3 Create the admin file in the current directory. Specify the `-a adminfile` option when you use the `pkgadd` command:

```
mail=
instance=overwrite
partial=nocheck
    runlevel=quit
idepend=quit
rdepend=nocheck
space=quit
setuid=nocheck
conflict=nocheck
action=nocheck
basedir=default
```

- 4 Use the product-specific install command with one of the following options to get a list of packages in the order to be installed:

- minpkgs
- recpkgs
- allpkgs

See [“About the script-based installer”](#) on page 40.

- 5 Install the packages listed in step 4.

```
# pkgadd -a adminfile -d /tmp/pkgsvrts pkgname.pkg
```

On Solaris 10, these packages must be installed while in the global zone. If a package's `pkginfo` file contains the variable `SUNW_PKG_ALLZONES` set not equal to `true`, the `-G` option should additionally be specified to the `pkgadd` command.

- 6 Verify that the packages are installed:

```
# pkginfo -l  
    packagename
```

- 7 Start the processes.

Installing DMP on Solaris 11 using the pkg install command

To install DMP on Solaris 11 using the pkg install command

- 1 Copy the VRTSpkgs.p5p package from the pkgs directory from the installation media to the system at /tmp/install directory.

- 2 Disable the publishers that are not reachable as package install may fail if any of the already added repositories are unreachable.

```
# pkg set-publisher --disable <publisher name>
```

- 3 Add a file-based repository in the system.

```
# pkg set-publisher -p /tmp/install/VRTSpkgs.p5p Symantec
```

- 4 Install the required packages.

```
# pkg install --accept VRTSvlic VRTSperl VRTSspt  
VRTSaslapm VRTSsfmh VRTSvxvm VRTSsfcp1601
```

- 5 Remove the publisher from the system.

```
# pkg unset-publisher Symantec
```

- 6 Clear the state of the SMF service if non-global zones are present in the system. In presence of non-global zones, setting the file-based repository causes SMF service `svc:/application/pkg/system-repository:default` to go into maintenance state.

```
# svcadm clear svc:/application/pkg/system-repository:default
```

- 7 Enable the publishers that were disabled earlier.

```
# pkg set-publisher --enable <publisher name>
```

Manually installing packages on Oracle Solaris 11 systems

To install packages on Solaris 11 system

1 Copy the `VRTSpkgs.p5p` package from the `pkgs` directory from the installation media to the the system at `/tmp/install` directory..

2 Disable the publishers that are not reachable, as package install may fail if any of the already added repositories are unreachable.

```
# pkg set-publisher --disable <publisher name>
```

3 Add a file-based repository in the non-global zone.

```
# pkg set-publisher -p/tmp/install/VRTSpkgs.p5p Symantec
```

4 Install the required packages.

```
# pkg install --accept VRTSperl VRTSvlic VRTSvxvm  
VRTSaslapm VRTSsfcp161 VRTSsfmh VRTSspt
```

5 To configure an OracleVMServer logical domain for disaster recovery, install the following required packages inside the logical domain:

```
# pkg install --accept VRTSvcsnr
```

6 Remove the publisher on the non-global zone.

```
# pkg unset-publisher Symantec
```

7 Clear the state of the SMF service if non-global zones are present in the system. In presence of non-global zones, setting the file-based repository causes SMF service `svc:/application/pkg/system-repository:default` to go into maintenance state. .

```
# svcadm clear svc:/application/pkg/system-repository:default
```

8 Enable the publishers that were disabled earlier.

```
# pkg set-publisher --enable <publisher>
```

If the Solaris operating system version is 11.1 or later, DMP is enabled for the ZFS root device.

For more information about ZFS root support, see *Symantec Dynamic Multi-Pathing Administrator's Guide*.

Manually installing packages on Solaris brand non-global zones

With Oracle Solaris 11, you must manually install DMP packages inside non-global zones. The native non-global zones are called Solaris brand zones.

To install packages manually on Solaris brand non-global zones

- 1 Ensure that the SMF service

```
svc:/application/pkg/system-repository:default and  
svc:/application/pkg/zones-proxyd:default is online on the global zone.
```

```
# svcs svc:/application/pkg/system-repository:default  
# svcs svc:/application/pkg/zones-proxyd:default
```

- 2 Log on to the non-global zone as a superuser.

- 3 Ensure that the SMF service

```
svc:/application/pkg/zones-proxy-client:default is online inside  
non-global zone
```

```
# svcs svc:/application/pkg/zones-proxy-client:default
```

- 4 Copy the `VRTSpkgs.p5p` package from the `pkgs` directory from the installation media to the non-global zone (for example at `/tmp/install` directory).

- 5 Disable the publishers that are not reachable, as package install may fail if any of the already added repositories are unreachable.

```
# pkg set-publisher --disable <publisher name>
```

- 6 Add a file-based repository in the non-global zone.

```
# pkg set-publisher -g/tmp/install/VRTSpkgs.p5p Symantec
```

- 7 Install the required packages.

```
# pkg install --accept VRTSperl VRTSvlic VRTSvxfs VRTSvcs  
VRTSvcsag VRTSvcssea
```

- 8 Remove the publisher on the non-global zone.

```
# pkg unset-publisher Symantec
```

- 9 Clear the state of the SMF service, as setting the file-based repository causes SMF service `svc:/application/pkg/system-repository:default` to go into maintenance state.

```
# svcadm clear svc:/application/pkg/system-repository:default
```

- 10 Enable the publishers that were disabled earlier.

```
# pkg set-publisher --enable <publisher>
```

Note: Note: Perform steps 2 through 10 on each non-global zone.

Managing your Symantec deployments

- [Chapter 10. Performing centralized installations using the Deployment Server](#)

Performing centralized installations using the Deployment Server

This chapter includes the following topics:

- [About the Deployment Server](#)
- [How to install the Deployment Script](#)
- [Deployment management overview](#)
- [Setting up a Deployment Server](#)
- [Setting deployment preferences](#)
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- [Updating release information on systems without Internet access](#)

About the Deployment Server

The Deployment Server is a script that makes it easier to install or upgrade SFHA releases. The Deployment Server lets you store multiple release images in one central location and deploy them to systems of any supported UNIX or Linux operating system (6.1 or later). Prior to 6.1, releases still require the same platform, architecture, distribution, and version of the operating system. You can use the Deployment Server if you want to install or upgrade multiple releases and or multiple platforms.

The Deployment Server lets you do the following as described in [Table 10-1](#).

Table 10-1 Deployment Server functionality

Feature	Description
Manage release images	<ul style="list-style-type: none"> ■ View available SFHA releases. ■ Download maintenance and hot fix release images from the Symantec Operations Readiness Tools (SORT) website into a repository. ■ Load the downloaded release image files from FileConnect and SORT into the repository. ■ View and remove release image files stored in the repository.
Check versions	<ul style="list-style-type: none"> ■ Discover packages and patches installed on designated systems and informs you of the product and version installed, including installed hot fixes. ■ Identify base, maintenance, and hot fix level upgrades to your system and download maintenance and hot fix releases. ■ Query SORT for the most recent updates.
Install or upgrade systems	<ul style="list-style-type: none"> ■ Install or upgrade a release stored in the repository on selected systems. ■ In release 6.1 and later: <ul style="list-style-type: none"> ■ Install hot fix level releases. ■ Install SFHA from any supported UNIX or Linux operating system to any other supported UNIX or Linux operating system. ■ Automatically load the script-based installer hot fixes that apply to that release.
Update metadata and preferences	<ul style="list-style-type: none"> ■ Download, load the release matrix updates, and script-based installer updates for systems behind a firewall. ■ Define or reset program settings.

Note: The Deployment Server is available only for the script-based installer, not the web-based installer.

How to install the Deployment Script

The Deployment Script is the utility for managing your Deployment Server.

You can obtain the Deployment Script by either:

- Installing the Deployment Script manually.
- Running the Deployment Script after installing at least one Symantec 6.1 product.

Note: The `VRTSperl` and the `VRTSsfcpic<version>` packages are included in all Storage Foundation (SF) products, so installing any Symantec 6.1 product lets you access the Deployment Script.

To install the Deployment Script manually

1 Log in as superuser.

2 Mount the installation media.

See [“Mounting the product disc”](#) on page 37.

3 For Solaris 10, move to the top-level directory on the disc.

```
# cd /cdrom/cdrom0
```

4 For Solaris 10, navigate to the following directory:

```
# cd pkgs
```

5 For Solaris 10, run the following commands to install the `VRTSperl` and the `VRTSsfcpic<version>` packages:

```
# pkgadd -d ./VRTSperl.pkg VRTSperl
# pkgadd -d ./VRTSsfcpic<version>.pkg VRTSsfcpic<version>
```

6 For Solaris 11, move to the top-level directory on the disc.

```
# cd /cdrom/cdrom0
```

- 7 For Solaris 11, navigate to the following directory:

```
# cd pkgs
```

- 8 For Solaris 11, run the following commands to install the `VRTSper1` and the `VRTSsfcp1<version>` packages:

```
# pkg install --accept -g ./VRTSpkgs.p5p VRTSper1 VRTSsfcp1<version>
```

To run the Deployment Script

- 1 Log in as superuser.
- 2 Navigate to the following directory:

```
# cd /opt/VRTS/install
```

- 3 Run the Deployment Script.

```
# ./deploy_sfha
```

Deployment management overview

After obtaining and installing the Deployment Server and defining a central repository, you can begin managing your deployments from that repository. You can load and store product images for Symantec products up to version 5.1 in your Deployment Server. The Deployment Server is a central installation server for storing and managing your product updates.

See [“How to install the Deployment Script”](#) on page 79.

Setting up and managing your repository involves the following tasks:

- Setting up a Deployment Server.
See [“Setting up a Deployment Server”](#) on page 81.
- Finding out which products you have installed, and which upgrades or updates you may need.
See [“Viewing or downloading available release images”](#) on page 86.
- Adding release images to your Deployment Server.
See [“Viewing or downloading available release images”](#) on page 86.
- Removing release images from your Deployment Server.
See [“Viewing or removing repository images stored in your repository”](#) on page 90.

Later, when your repository is set up, you can use it to deploy Symantec products to other systems in your environment.

See [“Deploying Symantec product updates to your environment”](#) on page 93.

Setting up a Deployment Server

For large deployments, Symantec recommends that you create a dedicated Deployment Server to manage your product updates.

A Deployment Server is useful for doing the following tasks:

- Downloading and storing release images for the latest upgrades and updates from Symantec in a central repository directory.
- Installing and updating systems directly by accessing the release images that are stored within a central repository (direct installation).
- Performing heterogeneous push installations (installing Symantec products from the Deployment Server to systems running any supported platform).

Note: The script-based installer for version 6.1 and higher supports installations from one operating system node onto a different operating system. Therefore, heterogeneous push installations are supported for 6.1 and higher releases only. To perform push installations for product versions 5.1, 6.0, or 6.0.1 releases, you must have a separate Deployment Server for each operating system.

- Creating a file share on the repository directory provides a convenient, central location from which systems running any supported platform can install the latest Symantec products and updates.

Create a central repository on the Deployment Server to store and manage the following types of Symantec releases:

- Base releases. These major releases and minor releases are available for all Symantec products. They contain new features, and you can download them from FileConnect.
- Maintenance releases. These releases are available for all Symantec products. They contain bug fixes and a limited number of new features, and you can download them from the Symantec Operations Readiness Tools (SORT) website.
- Hot fixes. These releases contain fixes for specific products, and you can download them from the SORT website.

Note: All DMP base releases and maintenance releases can be deployed using the install scripts that are included in the release. Hot fixes are typically installed manually, however, from the 6.1 release and onwards, install scripts are included with hot fix releases.

You can set up a Deployment Server with or without Internet access.

- If you set up a Deployment Server that has Internet access, you can download DMP maintenance releases and hot fixes from Symantec directly. Then, you can deploy them to your systems.

[Setting up a Deployment Server that has Internet access](#)

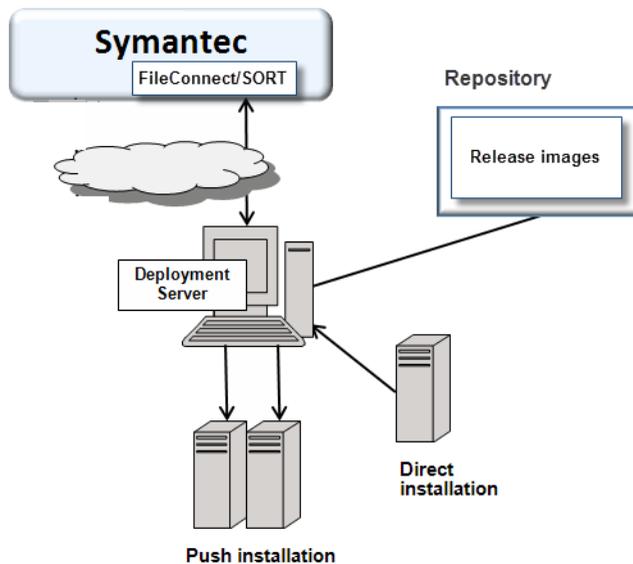
- If you set up a Deployment Server that does not have Internet access, you can download DMP maintenance releases and hot fixes from Symantec on another system that has Internet access. Then, you can load the images onto the Deployment Server separately.

[Setting up a Deployment Server that does not have Internet access](#)

Setting up a Deployment Server that has Internet access

Figure 10-1 shows a Deployment Server that can download product images directly from Symantec using the Deployment Server.

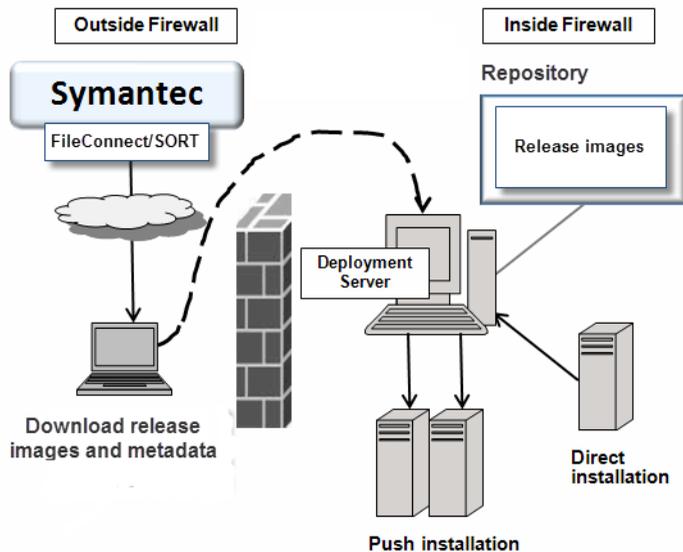
Figure 10-1 Example Deployment Server that has Internet access



Setting up a Deployment Server that does not have Internet access

Figure 10-2 shows a Deployment Server that does not have Internet access. In this scenario, release images and metadata updates are downloaded from another system. Then, they are copied to a file location available to the Deployment Server, and loaded.

Figure 10-2 Example Deployment Server that does not have Internet access



Setting deployment preferences

You can set preferences for managing the deployment of products dating back to version 5.1.

Note: You can select option **T (Terminology and Usage)** to obtain more information about Deployment Server terminology and usage.

To set deployment preferences

- 1 Launch the Deployment Server.

```
# /opt/VRTS/install/deploy_sfha
```

You see the following output:

Task Menu:

R) Manage Repository Images	M) Update Metadata
V) Version Check Systems	S) Set Preferences
U) Upgrade/Install Systems	T) Terminology and Usage
?) Help	Q) Quit

Enter a Task: [R,M,V,S,U,T,?,Q]

- 2 Select option **S, Set Preferences**.
- 3 In the current preferences page, select option **S, Set Preferences**.
- 4 Do one of the following:

- To set the default repository, enter **1**. Then enter the name of the repository in which you want to store your downloads. For example, enter the following:

```
# /opt/VRTS/install/ProductDownloads
```

If the specified repository replaces a previous repository, the installer asks if you want to move all your files into the new repository. To move your files to the new repository, enter **y**.

- To set the option for saving or removing tar files, enter **2**. At the prompt, if you want to save the tar files after untarring them, enter **y**. Or, if you want to remove tar files after untarring them, enter **n**.

By default, the installer does not remove tar files after the releases have been untarred.

Using the Deployment Server command line option to specify a non-default repository location

You can specify a repository location other than the default that has been set within the system preferences by using the command line option. The command line option is mainly used to install a release image from a different repository location. When you use the command line option, the designated repository folder is used instead

of the default for the execution time of the script. Using the command line option does not override the repository preference set by the **Set Preference** menu item.

To use the command line option to specify a non-default repository location

- ◆ At the command line, to specify a non-default repository location, enter the following:

```
# ./deploy_sfha -repository repository_path
```

where *repository_path* is the preferred location of the repository.

Using the Deployment Server command line options to load and download the most recent release information

You can use the Deployment Server command line options to perform the following operations:

- Load the most recent SF release information and installer hot fixes on systems without Internet access using the `deploy_sfha` command.
- Download a `.tar` file containing the most recent SF release information and installer hot fixes from the SORT site. This `.tar` file is used to update release information on systems without Internet access using the `deploy_sfha -load_metadata` command.

To use the Deployment Server command line option to load the most recent SF release information and installer hot fixes without Internet access

- ◆ At the command line, enter the following:

```
# ./deploy_sfha -load_metadata metadata_tar_file
```

where *metadata_tar_file* is the name of the metadata tar file where you want to load the most recent SF release information and installer hot fixes.

You can download the `.tar` file from the SORT site at:

https://sort.symantec.com/support/related_links/offline-release-updates

Or, you can create it by running the `deploy_sfha -download_metadata` command from a system that does have Internet access and can connect to the SORT site.

To use the Deployment Server command line option to download the most recent SF release information and installer hot fixes from the SORT site

- ◆ At the command line, enter the following:

```
# ./deploy_sfha -download_metadata
```

Viewing or downloading available release images

You can use the Deployment Server to conveniently view or download available DMP release images to be deployed on other systems in your environment.

Note: If you have Internet access, communication with the Symantec Operations Readiness Tools (SORT) provides the latest release information. If you do not have Internet access, static release matrix files are referenced, and the most recent updates may not be included.

See [“Updating release information on systems without Internet access”](#) on page 97.

To view or download available release images

1 Launch the Deployment Server.

```
# /opt/VRTS/install/deploy_sfha
```

You see the following output:

Task Menu:

```
R) Manage Repository Images      M) Update Metadata
V) Version Check Systems         S) Set Preferences
U) Upgrade/Install Systems       T) Terminology and Usage
?) Help                          Q) Quit
```

Enter a Task: [R,M,V,S,U,T,?,Q]

2 Select option R, **Manage Repository Images**.

You see the following output:

```
1) View/Download Available Releases
2) View/Remove Repository Images
3) Load a Release Image
b) Back to previous menu
```

Select the option you would like to perform [1-3,b,q,?]

3 Select option 1, **View/Download Available Releases**, to view or download what is currently installed on your system.

You see a list of platforms and release levels.

To view or download available releases, the platform type and release level type must be selected.

```
1) AIX 5.3                      2) AIX 6.1
3) AIX 7.1                      4) HP-UX 11.31
5) RHEL5 x86_64                 6) RHEL6 x86_64
7) SLES10 x86_64               8) SLES11 x86_64
9) Solaris 9 Sparc             10) Solaris 10 Sparc
11) Solaris 10 x64             12) Solaris 11 Sparc
13) Solaris 11 x64            b) Back to previous menu
```

Select the platform of the release to view/download [1-13,b,q]

- 4** Select the release level for which you want to get release image information. Enter the platform you want.

You see options for the Symantec release levels.

- 1) Base
- 2) Maintenance
- 3) Hot Fix
- b) Back to previous menu

Select the level of the <platform> releases to view/download
 [1-3,b,q,?]

- 5** Select the number corresponding to the type of release you want to view (Base, Maintenance, or Hot Fix).

You see a list of releases available for download.

Available Maintenance releases for sol10_sparc:

release_version	SORT_release_name	DL	OBS	AI	rel_date	size_KB
5.1SP1PR2RP2	sfha-sol10_sparc-5.1SP1PR2RP2	-	Y	Y	2011-09-28	145611
5.1SP1PR2RP3	sfha-sol10_sparc-5.1SP1PR2RP3	-	Y	Y	2012-10-02	153924
5.1SP1PR2RP4	sfha-sol10_sparc-5.1SP1PR2RP4	-	-	-	2013-08-21	186859
5.1SP1PR3RP2	sfha-sol10_sparc-5.1SP1PR3RP2	-	Y	Y	2011-09-28	145611
5.1SP1PR3RP3	sfha-sol10_sparc-5.1SP1PR3RP3	-	Y	Y	2012-10-02	153924
5.1SP1PR3RP4	sfha-sol10_sparc-5.1SP1PR3RP4	-	-	-	2013-08-21	186859
6.0RP1	sfha-sol10_sparc-6.0RP1	Y	-	-	2012-03-22	245917
6.0.3	sfha-sol10_sparc-6.0.3	Y	-	-	2013-02-01	212507

Enter the release_version to view details about a release or press 'Enter' to continue [b,q,?]

The following are the descriptions for the column headers:

- release_version: The version of the release.
- SORT_release_name: The name of the release, used when accessing SORT (<https://sort.symantec.com>).
- DL: An indicator that the release is present in your repository.
- OBS: An indicator that the release has been obsoleted by another higher release.
- AI: An indicator that the release has scripted install capabilities. All base and maintenance releases have auto-install capabilities. Hot Fix releases

with auto-install capabilities are available beginning with version 6.1. Otherwise the hot fix will require a manual installation.

- `rel_date`: The date the release is available.
- `size_KB`: The file size of the release in kilobytes.

6 If you are interested in viewing more details about any release, type the release version. For example, enter the following:

6.0.3

You see the following output:

```
release_version: 6.0.3
release_name: sfha-sol10_sparc-6.0.3
release_type: MR
release_date: 2013-02-01
downloaded: Y
install_path: sol10_sparc/installmr
upload_location: ftp://ftp.veritas.com/pub/support/patchcentral
/Solaris/6.0.3/sfha/sfha-sol10_sparc-6.0.3-patches.tar.gz
obsoletes: 6.0.1.200-fs,6.0.1.200-vm,6.0.1.300-fs
obsoleted_by: None
Would you like to download this patch? [y,n,q] (y) n
```

Enter the `release_version` to view the details about a release or press 'Enter' to continue [b,q,?]

- 7 If you do not need to check detail information, you can press **Enter**.

You see the following question:

```
Would you like to download a sol10_sparc Maintenance Release Image?  
[y,n,q] (n) y
```

If you select a **y**, you see a menu of all releases that are not currently in the repository.

- ```
1) 5.1SP1PR1RP2
2) 5.1SP1PR1RP4
3) 6.0RP1
4) All non-obsolete releases
5) All releases
b) Back to previous menu
```

```
Select the patch release to download, 'All non-obsolete releases' to
download all non-obsolete releases, or 'All releases' to download
all releases [1-5,b,q] 3
```

- 8 Select the number corresponding to the release that you want to download. It is possible to download a single release, all non-obsolete releases, or all releases.

The selected release images are downloaded to the Deployment Server.

```
Downloading sfha-sol10_sparc-6.0RP1 from SORT - https://sort.symantec.com
Downloading 215118373 bytes (Total 215118373 bytes [205.15 MB]): 100%
Untarring sfha-sol10_sparc-6.0RP1 Done

sfha-sol10_sparc-6.0RP1 has been downloaded successfully.
```

- 9 From the menu, select option **2, View/Remove Repository Images**, and follow the prompts to check that the release images are loaded.

See [“Viewing or downloading available release images”](#) on page 86.

## Viewing or removing repository images stored in your repository

You can use the Deployment Server to conveniently view or remove the release images that are stored in your repository.

## To view or remove release images stored in your repository

### 1 Launch the Deployment Server.

```
/opt/VRTS/install/deploy_sfha
```

You see the following output:

Task Menu:

```
R) Manage Repository Images M) Update Metadata
V) Version Check Systems S) Set Preferences
U) Upgrade/Install Systems T) Terminology and Usage
?) Help Q) Quit
```

Enter a Task: [R,M,V,S,U,T,?,Q]

### 2 Select option R, **Manage Repository Images**.

You see the following output:

```
1) View/Download Available Releases
2) View/Remove Repository Images
3) Load a Release Image
b) Back to previous menu
```

Select the option you would like to perform [1-3,b,q,?]

### 3 Select option **2, View/Remove Repository Images**, to view or remove the release images currently installed on your system.

You see a list of platforms and release levels if you have downloaded the corresponding Base, Maintenance, or Hot Fix release on that platform.

To view or remove repository images, the platform type and release level type must be selected.

```
1) AIX 5.3 2) AIX 6.1
3) AIX 7.1 4) HP-UX 11.31
5) RHEL5 x86_64 6) RHEL6 x86_64
7) SLES10 x86_64 8) SLES11 x86_64
9) Solaris 9 Sparc 10) Solaris 10 Sparc
11) Solaris 10 x64 12) Solaris 11 Sparc
13) Solaris 11 x64 b) Back to previous menu
```

Select the platform of the release to view/remove [1-13,b,q]

- 4** Select the release level for which you want to get release image information. Enter the platform you want.

You see options for the Symantec release levels if you have downloaded the corresponding Base, Maintenance, or Hot Fix release.

- 1) Base
- 2) Maintenance
- 3) Hot Fix
- b) Back to previous menu

Select the level of the <platform> releases to view/remove  
[1-3,b,q]

- 5** Select the number corresponding to the type of release you want to view or remove (Base, Maintenance, or Hot Fix).

You see a list of releases that are stored in your repository.

Stored Repository Releases:

| release_version | SORT_release_name       | OBS | AI |
|-----------------|-------------------------|-----|----|
| 6.0RP1          | sfha-sol10_sparc-6.0RP1 | -   | Y  |
| 6.0.3           | sfha-sol10_sparc-6.0.3  | -   | Y  |

- 6** If you are interested in viewing more details about a release image stored in your repository, type the release version. For example, enter the following:

6.0.3

- 7 If you do not need to check detail information, you can press **Enter**.

You see the following question:

```
Would you like to remove a sol10_sparc Maintenance Release Image?
[y,n,q] (n) y
```

If you select a **y**, you see a menu of all releases stored in your repository that match the selected platform and release level.

```
1) 6.0RP1
2) 6.0.3
b) Back to previous menu
```

```
Select the patch release to remove [1-2,b,q] 1
```

- 8 Type the number corresponding to the release version you want to remove.

The release images are removed from the Deployment Server.

```
Removing sfha-sol10_sparc-6.0RP1-patches Done
sfha-sol10_sparc-6.0RP1-patches has been removed successfully.
```

- 9 From the menu, select option **2, View/Remove Repository Images**, and follow the prompts to check that the release images are removed.

See [“Viewing or downloading available release images”](#) on page 86.

## Deploying Symantec product updates to your environment

After you install at least one Symantec 6.1 product on a server, you can use the Deployment Server to deploy release images to the systems in your environment as follows:

- If you are not sure what to deploy, perform a version check. A version check tells you if there are any Symantec products installed on your systems. It suggests patches and maintenance releases, and gives you the option to install updates.

See [“Finding out which releases you have, and which upgrades or updates you may need”](#) on page 94.

- If you know which update you want to deploy on your systems, use the Upgrade/Install Systems script to deploy a specific Symantec release. See “[Deploying a specific Symantec release](#)” on page 96.

## Finding out which releases you have, and which upgrades or updates you may need

Use the Version Check script to determine which Symantec product you need to deploy. The Version Check script is useful if you are not sure which releases you already have installed, or want to know about available releases.

The Version Check script gives the following information:

- Installed products and their versions (base, maintenance releases, and hot fixes)
- Installed packages (required and optional)
- Available releases (base, maintenance releases, and hot fixes) relative to the version which is installed on the system

### To determine which Symantec product updates to deploy

- 1 Launch the Deployment Server. For example, enter the following:

```
/opt/VRTS/install/deploy_sfha
```

You see the following output:

Task Menu:

|                             |                          |
|-----------------------------|--------------------------|
| R) Manage Repository Images | M) Update Metadata       |
| V) Version Check Systems    | S) Set Preferences       |
| U) Upgrade/Install Systems  | T) Terminology and Usage |
| ?) Help                     | Q) Quit                  |

Enter a Task: [R,M,V,S,U,T,?,Q]

- 2 Select option **V, Version Check Systems**.

- At the prompt, enter the system names for the systems you want to check. For example, enter the following:

```
sys1
```

You see output for the installed packages (required, optional, or missing).

You see a list of releases available for download.

```
Available Base Releases for Veritas Storage Foundation HA 6.0.1:
None
```

```
Available Maintenance Releases for Veritas Storage Foundation HA 6.0.1:
```

| release_version | SORT_release_name      | DL | OBS | AI | rel_date   | size_KB |
|-----------------|------------------------|----|-----|----|------------|---------|
| 6.0.3           | sfha-sol10_sparc-6.0.3 | Y  | -   | -  | 2013-02-01 | 212507  |

```
Available Public Hot Fixes for Veritas Storage Foundation HA 6.0.1:
```

| release_version | SORT_release_name        | DL | OBS | AI | rel_date   | size_KB |
|-----------------|--------------------------|----|-----|----|------------|---------|
| 6.0.1.200-fs    | fs-sol10_sparc-6.0.1.200 | -  | Y   | -  | 2012-09-20 | 14346   |
| 6.0.1.200-vm    | vm-sol10_sparc-6.0.1.200 | -  | Y   | -  | 2012-10-10 | 47880   |

```
Would you like to download the available Maintenance or Public Hot
Fix releases which cannot be found in the repository? [y,n,q] (n) y
```

- If you want to download any of the available maintenance releases or hot fixes, enter **y**.
- If you have not set a default repository for releases you download, the installer prompts you for a directory. (You can also set the default repository in **Set Preferences**).

See [“Setting deployment preferences”](#) on page 83.

You can also specify a non-default repository location using the command line.

See [“Using the Deployment Server command line option to specify a non-default repository location”](#) on page 84.

- Select an option for downloading products.

The installer downloads the releases you specified and stores them in the repository.

# Deploying a specific Symantec release

After you install at least one Symantec 6.1 product on a server, you can use the Deployment Server to deploy your licensed Symantec products dating back to version 5.1. If you know which product version you want to install, follow the steps in this section to install it.

## To deploy a specific Symantec release

- 1 From the directory in which you installed your Symantec product (version 6.1 or later), launch the Deployment Server with the upgrade and install systems option. For example, enter the following:

```
/opt/VRTS/install/deploy_sfha
```

You see the following output:

Task Menu:

```
R) Manage Repository Images M) Update Metadata
V) Version Check Systems S) Set Preferences
U) Upgrade/Install Systems T) Terminology and Usage
?) Help Q) Quit
```

Enter a Task: [R,M,V,S,U,T,?,Q]

- 2 Select option **U, Upgrade/Install Systems**.

You see the following output:

```
1) AIX 5.3
2) AIX 6.1
3) AIX 7.1
4) RHEL5 x86_64
b) Back to previous menu
```

Select the platform of the available release(s) to be upgraded/installed [1-4,b,q,?]

- 3 Select the number corresponding to the platform for the release you want to deploy. For example, select the number for the **RHEL5 x86\_64** release or the **AIX 6.1** release.
- 4 Select a Symantec product release.  
The installation script is executed and the release is deployed on the specified server.

## Updating release information on systems without Internet access

When you install the Deployment Server, the installation includes product metadata that includes information about Symantec, all prior base, maintenance, and hot fix releases across all the products and the platforms. If your system has Internet access, release matrix information is automatically updated from the Symantec Operations Readiness Tools (SORT) site with each use. If your system is behind a firewall, these updates are not possible and the release matrices eventually get out of date.

To update release information on systems without Internet access, you can download a `.tar` file (`deploy_sfha.tar`) containing all the latest release matrices. Then, load it on to your Deployment Server. The `deploy_sfha.tar` file available from the SORT site is updated on a daily basis, and there are typically several release updates every week captured in the updates.

[Downloading a .tar file from the SORT site](#)

[Loading releases and hot fixes onto your Deployment Server](#)

### Downloading a .tar file from the SORT site

To obtain a `.tar` file with release updates, the easiest method is to download a copy from the SORT website.

#### To download a .tar file from the SORT site

- 1 Navigate to the following link:  
[https://sort.symantec.com/support/related\\_links/offline-release-updates](https://sort.symantec.com/support/related_links/offline-release-updates)
- 2 Click on **deploy\_sfha.tar [Download]**.
- 3 Save the file to your desktop.

## Loading releases and hot fixes onto your Deployment Server

In this procedure, the Internet-enabled system is the system to which you downloaded the `deploy_sfha.tar` file.

### To load releases and hot fixes onto your Deployment Server

- 1 On the Internet-enabled system, copy the `deploy_sfha.tar` file you downloaded to a location accessible by the Deployment Server.
- 2 On the Deployment Server, change to the installation directory. For example, enter the following:

```
cd /opt/VRTS/install/
```

- 3 Run the Deployment Script. Enter the following:

```
./deploy_sfha
```

- 4 Select option **M, Update Metadata**, and enter the location of the `deploy_sfha.tar` file (the installer calls it a "meta-data tar file").

```
Enter the location of the meta-data tar file: [b]
(/opt/VRTS/install/deploy_sfha.tar)
```

For example, enter the location of the meta-data tar file:

```
/tmp/deploy_sfha.tar
```

# Post-installation tasks

- [Chapter 11. Performing post-installation tasks](#)
- [Chapter 12. Verifying the DMP installation](#)

# Performing post-installation tasks

This chapter includes the following topics:

- [Changing root user into root role](#)

## Changing root user into root role

On Oracle Solaris 11, you need to create root user to perform installation. This means that a local user cannot assume the root role. After installation, you may want to turn root user into root role for a local user, who can log in as root.

1. Log in as root user.
2. Change the root account into role.

```
rolemod -K type=role root

getent user_attr root

root:::type=role;auths=solaris.*;profiles=All;audit_flags=lo\
:no;lock_after_retries=no;min_label=admin_low;clearance=admin_high
```

3. Assign the root role to a local user who was unassigned the role.

```
usermod -R root admin
```

For more information, see the Oracle documentation on Oracle Solaris 11 operating system.

# Verifying the DMP installation

This chapter includes the following topics:

- [Verifying that the products were installed](#)
- [Installation log files](#)
- [Starting and stopping processes for the Symantec products](#)

## Verifying that the products were installed

Verify that the DMP products are installed.

Use `pkginfo` (Solaris 10) or `pkg info` (Solaris 11) command to check which packages have been installed.

Solaris 10:

```
pkginfo -l VRTSvlic package_name package_name ...
```

Solaris 11:

```
pkg info -l VRTSvlic package_name package_name
```

See [“Symantec Dynamic Multi-Pathing installation packages”](#) on page 192.

You can verify the version of the installed product. Use the following command:

```
/opt/VRTS/install/installdmp<version>
```

Where `<version>` is the specific release version.

See [“About the script-based installer”](#) on page 40.

Use the following sections to further verify the product installation.

## Installation log files

The Symantec product installer or product installation script `installdmp` creates log files for auditing and debugging. After every product installation, configuration, or uninstall, the installer displays the name and location of the files. The files are located in the `/opt/VRTS/install/logs` directory. Symantec recommends that you keep the files for auditing, debugging, and future use.

The log files include the following types of text files:

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Installation log file | The installation log file contains all the commands that are executed during the procedure, their output, and the errors that are generated. This file is for debugging installation problems and can be used for analysis by Symantec Support.                                                                                                                                                                                                                                                                    |
| Response file         | The response file contains the configuration information that you entered during the procedure. You can use the response file for future installation procedures by invoking an installation script with the <code>responsefile</code> option. The response file passes arguments to the script to automate the installation of that product. You can edit the file to automate installation and configuration of additional systems.<br><br>See <a href="#">“Installing DMP using response files”</a> on page 53. |
| Summary file          | The summary file contains the results of the installation by the common product installer or product installation scripts. The summary includes the list of the packages, and the status (success or failure) of each package. The summary also indicates which processes were stopped or restarted during the installation. After installation, refer to the summary file to determine whether any processes need to be started.                                                                                  |

## Starting and stopping processes for the Symantec products

After the installation and configuration is complete, the Symantec product installer starts the processes that the installed products use. You can use the product installer to stop or start the processes, if required.

**To stop the processes**

- ◆ Use the `-stop` option to stop the product installation script.

For example, to stop the product's processes, enter the following command:

```
./installer -stop
```

or

```
/opt/VRTS/install/installdmp<version> -stop
```

Where `<version>` is the specific release version.

See [“About the script-based installer”](#) on page 40.

**To start the processes**

- ◆ Use the `-start` option to start the product installation script.

For example, to start the product's processes, enter the following command:

```
./installer -start
```

or

```
/opt/VRTS/install/installdmp<version> -start
```

Where `<version>` is the specific release version.

See [“About the script-based installer”](#) on page 40.

# Upgrade of DMP

- [Chapter 13. Planning to upgrade DMP](#)
- [Chapter 14. Upgrading DMP](#)
- [Chapter 15. Upgrading DMP using Live Upgrade and Boot Environment upgrade](#)
- [Chapter 16. Performing post-upgrade tasks](#)

# Planning to upgrade DMP

This chapter includes the following topics:

- [Upgrade methods for DMP](#)
- [Supported upgrade paths for DMP](#)
- [Preparing to upgrade DMP](#)
- [Using Install Bundles to simultaneously install or upgrade base releases, maintenance patches, and hot fixes](#)

## Upgrade methods for DMP

Symantec offers you several different ways to upgrade. You need to decide which upgrade method best suits your environment, your expertise, and the downtime required.

**Table 13-1** Review this table to determine how you want to perform the upgrade

| Upgrade types and considerations                                                                                      | Methods available for upgrade                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Typical upgrades—use a Symantec provided tool or you can perform the upgrade manually. Requires some server downtime. | Script-based—you can use this method to upgrade for the supported upgrade paths<br>Web-based—you can use this method to upgrade for the supported upgrade paths<br>Manual—you can use this method to upgrade from the previous release<br>Response file—you can use this method to upgrade from the supported upgrade paths |

**Table 13-1** Review this table to determine how you want to perform the upgrade (*continued*)

| Upgrade types and considerations                                                                                                                            | Methods available for upgrade                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Native operating system upgrade—use the upgrade software that comes with the operating system. Note that not all operating systems support native upgrades. | Operating system-specific methods<br>Operating system upgrades                                                                                                     |
| Upgrade from any supported UNIX or Linux platform to any other supported UNIX or Linux platform.                                                            | Deployment Server<br>See <a href="#">“About the Deployment Server”</a> on page 78.                                                                                 |
| Simultaneously upgrade base releases, maintenance patches, and hot fixes.                                                                                   | Install Bundles<br>See <a href="#">“Using Install Bundles to simultaneously install or upgrade base releases, maintenance patches, and hot fixes”</a> on page 110. |

## Supported upgrade paths for DMP

The following tables describe upgrading to 6.1.

**Table 13-2** Solaris SPARC upgrades using the script- or web-based installer

| Symantec software versions | Solaris 9                                                                        | Solaris 10                           | Solaris 11                                                                                             |
|----------------------------|----------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------|
| 5.1 SP1 and later          | Upgrade the OS to at least Solaris 10, then use the installer to upgrade to 6.1. | Use the installer to upgrade to 6.1. | N/A.                                                                                                   |
| 6.0 and 6.0 RP1            | N/A.                                                                             | Use the installer to upgrade to 6.1. | N/A.                                                                                                   |
| 6.0 PR1                    | N/A                                                                              | N/A.                                 | Upgrade operating system to latest SRU 11.1.x.y.z, and then upgrade to 6.1 using the installer script. |

**Table 13-2** Solaris SPARC upgrades using the script- or web-based installer  
(continued)

| Symantec software versions | Solaris 9 | Solaris 10                                                  | Solaris 11                                                                                             |
|----------------------------|-----------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 6.0.1<br>6.0.3             | N/A       | Upgrade directly to 6.1 using the installer script.         | Upgrade operating system to latest SRU 11.1.x.y.z, and then upgrade to 6.1 using the installer script. |
| No Symantec product        | N/A       | Perform a full 6.1 installation using the installer script. | Perform a full 6.1 installation using the installer script.                                            |

**Note:** Supported Repository Update (SRU) digits in the table represent Release.Update.SRU.Build.Respin.

**Note:** Starting with Solaris version 11.1, DMP provides support for ZFS root devices. On Solaris 11.1 or later, upgrading DMP enables ZFS root support automatically. However, if you upgrade from a previous Solaris release to Solaris 11.1, DMP support for ZFS root devices is not automatically enabled. You must enable support explicitly.

## Preparing to upgrade DMP

Before you upgrade, you need to prepare the systems and storage. Review the following procedures and perform the appropriate tasks.

### Getting ready for the upgrade

Complete the following tasks before you perform the upgrade:

- Review the Symantec Technical Support website for additional information:  
<http://www.symantec.com/techsupp/>
- If zones are present, make sure that all non-global zones are booted and are in the running state before you use the Symantec product installer to upgrade the Storage Foundation products in the global zone so that any packages present inside non-global zones also gets updated automatically.

For Oracle Solaris 10, if the non-global zones are not mounted and running at the time of the upgrade, you have to attach the zone with `-U` option to upgrade the SFHA packages inside non-global zone.

For Live Upgrade, if the alternative root environment also has a zone, you cannot install `VRTSodm`. You must remove the `VRTSodm` package first then install the Storage Foundation product. After you restart the alternative root, you can install `VRTSodm`.

- Make sure that the administrator who performs the upgrade has root access and a good knowledge of the operating system's administration.
- Make sure that all users are logged off and that all major user applications are properly shut down.
- Make sure that you have created a valid backup.  
See [“Creating backups”](#) on page 109.
- Ensure that you have enough file system space to upgrade. Identify where you want to copy the packages, for example `/packages/Veritas` when the root file system has enough space or `/var/tmp/packages` if the `/var` file system has enough space.  
Do not put the files under `/tmp`, which is erased during a system restart.  
Do not put the files on a file system that is inaccessible before running the upgrade script.  
You can use a Symantec-supplied disc for the upgrade as long as modifications to the upgrade script are not required.  
If `/usr/local` was originally created as a slice, modifications are required.
- For any startup scripts in `/usr/sbin/svccadm disable`, comment out any application commands or processes that are known to hang if their file systems are not present.
- Make sure that the current operating system supports version 6.1 of the product. If the operating system does not support it, plan for a staged upgrade.
- Schedule sufficient outage time and downtime for the upgrade and any applications that use the Symantec products. Depending on the configuration, the outage can take several hours.
- Any swap partitions not in `rootdg` must be commented out of `/etc/vfstab`. If possible, swap partitions other than those on the root disk should be commented out of `/etc/vfstab` and not mounted during the upgrade. The active swap partitions that are not in `rootdg` cause `upgrade_start` to fail.
- Make sure that the file systems are clean before upgrading.
- Symantec recommends that you upgrade VxFS disk layouts to a supported version before installing VxFS 6.1. Unsupported disk layout versions 4, 5, and

6 can be mounted for the purpose of online upgrading in VxFS 6.1. You can upgrade unsupported layout versions online before installing VxFS 6.1.

- Upgrade arrays (if required).  
See [“Upgrading the array support”](#) on page 109.
- To reliably save information on a mirrored disk, shut down the system and physically remove the mirrored disk. Removing the disk in this manner offers a failback point.
- If CP server-based coordination points are used in your current fencing configuration, then check that your CP servers are upgraded to 6.1 before starting the upgrade process.
- Make sure that DMP support for native stack is disabled (`dmp_native_support=off`). If DMP support for native stack is enabled (`dmp_native_support=on`), the installer may detect it and ask you to restart the system.

## Creating backups

Save relevant system information before the upgrade.

### To create backups

- 1 Log in as superuser.
- 2 Before the upgrade, ensure that you have made backups of all data that you want to preserve.

Back up the `/etc/system` file.

- 3 Installer verifies that recent backups of configuration files in VxVM private region have been saved in `/etc/vx/cbr/bk`.

If not, a warning message is displayed.

---

**Warning:** Backup `/etc/vx/cbr/bk` directory.

---

- 4 Run the `vxlicrep`, `vxdisk list`, and `vxprint -ht` commands and record the output. Use this information to reconfigure your system after the upgrade.

## Upgrading the array support

The Storage Foundation 6.1 release includes all array support in a single package, `VRTSaslapm`. The array support package includes the array support previously included in the `VRTSvxvm` package. The array support package also includes support

**Using Install Bundles to simultaneously install or upgrade base releases, maintenance patches, and hot fixes**

previously packaged as external Array Support Libraries (ASLs) and array policy modules (APMs).

See the 6.1 Hardware Compatibility List for information about supported arrays.

When you upgrade Storage Foundation products with the product installer, the installer automatically upgrades the array support. If you upgrade Storage Foundation products with manual steps, you should remove any external ASLs or APMs that were installed previously on your system. Installing the `VRTSvxvm` package exits with an error if external ASLs or APMs are detected.

After you have installed Storage Foundation 6.1, Symantec provides support for new disk arrays through updates to the `VRTSaslapm` package.

For more information about array support, see the *Symantec Storage Foundation Administrator's Guide*.

## Using Install Bundles to simultaneously install or upgrade base releases, maintenance patches, and hot fixes

Beginning with version 6.1, Symantec offers you a method to easily install or upgrade your systems directly to a base, maintenance, or hot fix level in one step using Install Bundles. With Install Bundles, the installers have the ability to merge so that customers can install or upgrade directly to maintenance or hot fix levels in one execution. The various scripts, packages, and patch components are merged, and multiple releases are installed together as if they are one combined release. You do not have to perform two or more install actions to install or upgrade systems to maintenance levels or hot fix levels.

Releases are divided into the following categories:

**Table 13-3** Release Levels

| Level       | Content             | Form factor       | Applies to   | Release types                                          | Download location                          |
|-------------|---------------------|-------------------|--------------|--------------------------------------------------------|--------------------------------------------|
| Base        | Features            | packages          | All products | Major, minor, Service Pack (SP), Platform Release (PR) | FileConnect                                |
| Maintenance | Fixes, new features | packages, patches | All products | Maintenance Release (MR)                               | Symantec Operations Readiness Tools (SORT) |

**Table 13-3** Release Levels (*continued*)

| Level   | Content | Form factor | Applies to     | Release types                            | Download location  |
|---------|---------|-------------|----------------|------------------------------------------|--------------------|
| Hot fix | Fixes   | packages    | Single product | P-Patch, Public hot fix, Private hot fix | SORT, Support site |

When you install or upgrade using Install Bundles:

- SFHA products are discovered and assigned as a single version to the maintenance level. Each system can also have one or more hot fixes applied.
- Base releases are accessible from FileConnect that requires customer serial numbers. Maintenance and hot fix releases can be automatically downloaded from SORT. You can download them from the SORT website manually or use the `deploy_sfha` script.
- Public hot fix releases can be installed using automated installers from the 6.1 version or later.
- Private hot fixes can now be detected to prevent upgrade conflict. Private hot fix releases are not offered as a combined release. They are only available from Symantec Technical Support on a need basis.

You can use the `-base_path` and `-hotfix_path` options to import installation code from multiple releases. You can find packages and patches from different media paths, and merge package and patch definitions for multiple releases. You can use these options to use new task and phase functionality to correctly perform required operations for each release component. You can install the packages and patches in defined phases using these options, which helps you when you want to perform a single start or stop process and perform pre and post operations for all level in a single operation.

Four possible methods of integration exist. All commands must be executed from the highest base or maintenance level install script.

For example:

1. Base + maintenance:

This integration method can be used when you install or upgrade from a lower version to 6.1.1.

Enter the following command:

```
installmr -base_path <path_to_base>
```

2. Base + hot fix:

**Using Install Bundles to simultaneously install or upgrade base releases, maintenance patches, and hot fixes**

This integration method can be used when you install or upgrade from a lower version to 6.1.0.100.

Enter the following command:

```
installer -hotfix_path <path_to_hotfix>
```

3. Maintenance + hot fix:

This integration method can be used when you upgrade from version 6.1 to 6.1.1.100.

Enter the following command:

```
installmr -hotfix_path <path_to_hotfix>
```

4. Base + maintenance + hot fix:

This integration method can be used when you install or upgrade from a lower version to 6.1.1.100.

Enter the following command:

```
installmr -base_path <path_to_base>
-hotfix_path <path_to_hotfix>
```

---

**Note:** For the 6.1 release, you can add a maximum of five hot fixes using  
`-hotfix_path <path_to_hotfix> -hotfix2_path <path_to_hotfix> ... -hotfix5_path <path_to_hotfix>`

---

# Upgrading DMP

This chapter includes the following topics:

- [Upgrading Symantec Dynamic Multi-Pathing with the product installer when OS upgrade is not required](#)
- [Upgrading Symantec Dynamic Multi-Pathing to 6.1 using the product installer or manual steps](#)
- [Upgrading DMP using the web-based installer](#)
- [Upgrading the Solaris operating system](#)
- [Upgrading language packages](#)

## Upgrading Symantec Dynamic Multi-Pathing with the product installer when OS upgrade is not required

This section describes upgrading to the current Symantec Dynamic Multi-Pathing if the root disk is unencapsulated, and you do not intend to upgrade your Solaris version. Only use this procedure if you are already running a version of Solaris that is supported with 6.1.

### To upgrade Symantec Dynamic Multi-Pathing

- 1 Log in as superuser.
- 2 If the root disk is encapsulated under VxVM, unmirror and unencapsulate the root disk as described in the following steps, to be performed in the order listed:
  - Use the `vxplex` command to remove all the plexes of the volumes `rootvol`, `swapvol`, `usr`, `var`, `opt`, and `home` that are on disks other than the root disk.

For example, the following command removes the plexes `mirrootvol-01`, and `mirswapvol-01` that are configured on a disk other than the root disk:

```
vxplex -o rm dis mirrootvol-01 mirswapvol-01
```

---

**Warning:** Do not remove the plexes on the root disk that corresponds to the original disk partitions.

---

- Enter the following command to convert all the encapsulated volumes in the root disk back to being accessible directly through disk partitions instead of through volume devices.

```
/etc/vx/bin/vxunroot
```

Following the removal of encapsulation, the system is restarted from the unencapsulated root disk.

If your system is running VxVM 4.1 MP2, the following remnants of encapsulation are still present:

- Partition table entries for the private regions and public regions
  - GRUB or LILO configuration entries for VxVM
- 3 If your system has separate `/opt` and `/var` file systems, make sure that they are mounted before proceeding with installation.
  - 4 Load and mount the disc. If you downloaded the software, navigate to the top level of the download directory.
  - 5 From the disc, run the `installer` command. If you downloaded the software, run the `./installer` command.

```
cd /cdrom/cdrom0
./installer
```

- 6 Enter `g` to upgrade and select the **Full Upgrade**.
- 7 You are prompted to enter the system names (in the following example, "sys1") on which the software is to be installed. Enter the system name or names and then press Return.

```
Enter the system names separated by spaces on which to
install DMP: sys1 sys2
```

Depending on your existing configuration, various messages and prompts may appear. Answer the prompts appropriately.

**Upgrading Symantec Dynamic Multi-Pathing to 6.1 using the product installer or manual steps**

- 8 The installer asks if you agree with the terms of the End User License Agreement. Press **y** to agree and continue.
- 9 The installer lists the packages to install or to update. You are prompted to confirm that you are ready to upgrade.
- 10 Stop the product's processes.

```
Do you want to stop DMP processes now? [y,n,q] (y) y
```

If you select **y**, the installer stops the product processes and makes some configuration updates before it upgrades.

- 11 The installer stops, uninstalls, reinstalls, and starts specified packages.
- 12 If the upgrade was done from 5.0 or if the Symantec Dynamic Multi-Pathing was done without `vxkeyless` keys, the installer shows the following warning:

```
CPI WARNING V-9-40-5323 DMP license version 5.0 is not
updated to 6.1 on sys1. It's recommended to upgrade to a 6.1 key.
CPI WARNING V-9-40-5323 DMP license version 5.0 is not updated
to 6.1 on sys2. It's recommended to upgrade to a 6.1 key.
DMP is licensed on the systems.
```

```
Do you wish to enter additional licenses? [y,n,q,b] (n) n
```

- 13 The Symantec Dynamic Multi-Pathing software is verified and configured.
- 14 The installer prompts you to provide feedback, and provides the log location for the upgrade.  
  
If your system is already on Solaris 11.1 or later, the installer enables ZFS root support when you upgrade DMP. You must restart the system after the upgrade.
- 15 Restart the systems if the installer prompts restart to enable DMP native support.

## Upgrading Symantec Dynamic Multi-Pathing to 6.1 using the product installer or manual steps

This section describes upgrading DMP from a previous release to 6.1. Symantec recommends that you perform this upgrade from single-user mode.

### Upgrading Symantec Dynamic Multi-Pathing with the product installer

This section describes upgrading to the current Symantec Dynamic Multi-Pathing, and you do not intend to upgrade your Solaris version. Only use this procedure if you are already running a version of Solaris that is supported with 6.1.

**To upgrade Symantec Dynamic Multi-Pathing**

- 1 Log in as superuser.
- 2 Load and mount the disc.  
See [“Mounting the product disc”](#) on page 37.
- 3 To invoke the common installer, run the `installer` command on the disc as shown in this example:

```
cd /cdrom/cdrom0
./installer
```

- 4 Enter `c` to upgrade and press Return.
- 5 You are prompted to enter the system names (in the following example, "host1"). Enter the system name or names and then press Return.

```
Enter the system names separated by spaces on which to
install DMP: host1
```

Depending on your existing configuration, various messages and prompts may appear. Answer the prompts appropriately.

- 6 Installer asks if you agree with the terms of the End User License Agreement. Press `y` to agree and continue.
- 7 You can perform this step if you want to upgrade from DMP 5.1 SP1 for Solaris. The installer discovers if any of the systems that you want to upgrade have mirrored and encapsulated boot disks. For each system that has a mirrored boot disk, you have the option to create a backup of the system's boot disk group before the upgrade proceeds. If you want to split the boot disk group to create a backup, answer `y`.

---

**Note:** Splitting the mirrors for the root disk group backup requires a restart upon completion of the upgrade.

---

- 8 The installer then prompts you to name the backup boot disk group. Enter the name for it or press **Enter** to accept the default.

---

**Note:** The split operation can take some time to complete.

---

- 9 You are prompted to start the split operation. Press `y` to continue.

**Upgrading Symantec Dynamic Multi-Pathing to 6.1 using the product installer or manual steps**

- 10** Stop the product's processes.

```
Do you want to stop DMP processes now? ? [y,n,q] (y) y
```

- 11** The installer lists the packages to install or upgrade, and performs the installation or upgrade.
- 12** If the upgrade was done from 5.0 or if the Symantec Dynamic Multi-Pathing was done without `vxkeyless` keys, the installer shows the following warning:

```
CPI WARNING V-9-40-5323 DMP license version 5.0 is not
updated to 6.1 on sys1. It's recommended to upgrade to a 6.1 key.
CPI WARNING V-9-40-5323 DMP license version 5.0 is not updated
to 6.1 on sys2. It's recommended to upgrade to a 6.1 key.
DMP is licensed on the systems
Do you wish to enter additional licenses? [y,n,q,b] (n) n
```

- 13** The installer verifies, configures, and starts the Symantec Storage Foundation software.
- 14** Only perform this step if you have split the boot disk group into a backup disk group. After a successful restart, verify the upgrade and re-join the backup disk group. If the upgrade fails, revert to the backup disk group.

## Upgrading Symantec Storage Foundation to 6.1 using upgrade scripts (OS upgrade)

This section describes upgrading to the current Symantec Storage Foundation and the need to upgrade the Solaris version. If the operating system is not at a supported Solaris version, you must follow this procedure.

This upgrade procedure lets you retain existing VxVM and VxFS configurations. After upgrading, you can resume using your file systems and volumes as before (without having to run `vxinstall` again).

These steps have to be followed in the specified order.

### To begin the upgrade

- 1** If VCS agents for VVR are configured, you must perform the pre-upgrade steps before proceeding.
- 2** Load and mount the disc.

See [“Mounting the product disc”](#) on page 37.

**Upgrading Symantec Dynamic Multi-Pathing to 6.1 using the product installer or manual steps**

- 3 Verify that an upgrade is possible on the system. Enter the following command:

```
/dvd_mount/scripts/upgrade_start -check
```

- 4 Run the `upgrade_start` script to preserve the previous configuration of Volume Manager.

```
/dvd_mount/scripts/upgrade_start
```

- 5 If the `upgrade_start` script fails for any reason, run the `upgrade_finish` script to undo any changes already made. Compare `/etc/system`, `/etc/vfstab`, and the output of the `format` command and verify that the system is restored. Then determine and correct the cause of the `upgrade_start` failure. If you cannot correct the problem in a timely manner, restore the `vfstab` file to the version saved, restore any other applications, and perform an `init 6` to completely restore the system.

- 6 Verify that all the Primary RLINKs are up-to-date on all the hosts.

```
vxrlink -g diskgroup status rlink_name
```

---

**Caution:** Do not continue until the Primary RLINKs are up-to-date.

---

- 7 If VVR is configured, run the `vvr_upgrade_start` script on all hosts to save the original VVR configuration:

```
/dvd_mount/scripts/vvr_upgrade_start
```

- 8 If you have VxFS file systems specified in the `/etc/vfstab` file, comment them out.

- 9 Remove the existing Storage Foundation packages in one of the following ways:

- Using the `uninstalldmp` script
- Using the `pkgrm` command

For details, refer to the *Storage Foundation Installation Guide* for the existing Storage Foundation version.

After you run the `uninstalldmp` script, verify that all VRTS\* packages are removed; otherwise, remove them manually using `pkgrm`.

- 10 If you want to upgrade the operating system, do so now.  
Refer to the Solaris installation documentation.
- 11 Install the Storage Foundation packages in one of the following ways:
  - Using the common installer  
See [“To upgrade the Symantec Storage Foundation packages with the product installer”](#) on page 119.
  - Using manual steps  
See [“To upgrade the Symantec Storage Foundation packages with manual steps”](#) on page 120.

### To upgrade the Symantec Storage Foundation packages with the product installer

- 1 Load and mount the disc.  
See [“Mounting the product disc”](#) on page 37.
- 2 To invoke the common installer, run the `installer` command on the disc as shown in this example:

```
cd /dvd_mount
./installer
```
- 3 Select **I** to upgrade the product. The installer asks you if you want to use the previous configuration.
- 4 Depending on your existing configuration, various messages and prompts may appear. Answer the prompts appropriately.
- 5 If you commented out VxFS File System entries in the `/etc/vfstab` file, uncomment them.
- 6 Complete the upgrade by restoring the configuration.

**To upgrade the Symantec Storage Foundation packages with manual steps**

- 1 If you want to upgrade from Symantec Storage Foundation for DB2 or Symantec Storage Foundation for Oracle, resynchronize all existing snapshots before upgrading.

For Symantec Storage Foundation for DB2:

```
/opt/VRTS/bin/db2ed_vmsnap -D DB2DATABASE -f SNAPPLAN \
-o resync
```

For Symantec Storage Foundation for Oracle:

```
/opt/VRTS/bin/dbed_vmsnap -S $ORACLE_SID -f SNAPPLAN \
-o resync
```

- 2 Load and mount the software disc.
- 3 Change to the directory containing the packages.
- 4 Run the following command to obtain a list of recommended packages to install:

```
./installdmp -recpkgs
```

Run the following command to obtain a list of all packages to install:

```
./installdmp -allpkgs
```

- 5 Add packages with the `pkgadd` command.
- 6 If you commented out VxFS File System entries in the `/etc/vfstab` file, uncomment them.
- 7 Complete the upgrade by restoring the configuration.

**Restoring the configuration and completing the upgrade**

- 1 Complete the upgrade using the `upgrade_finish` script.

```
devlinks
/dvd_mount/scripts/upgrade_finish
```

- 2 Configure the product using the following command:

```
/dvd_mount/installer -configure
```

If some Veritas modules fail to unload, perform the following steps:

- Restart the systems.
- 3 Importing a pre-6.1 Veritas Volume Manager disk group does not automatically upgrade the disk group version to the VxVM 6.1 level. You may need to manually upgrade each of your disk groups following a VxVM upgrade.

## Upgrading DMP using the web-based installer

This section describes upgrading DMP with the web-based installer. The installer detects and upgrades the product that is currently installed on the specified system or systems.

### To upgrade DMP

- 1 Perform the required steps to save any data that you want to preserve. For example, make configuration file backups.
- 2 Start the web-based installer.  
See [“Starting the web-based installer”](#) on page 47.
- 3 On the Select a task and a product page, select **Upgrade a Product** from the Task drop-down menu.  
The product is discovered once you specify the system. Click **Next**.
- 4 Indicate the systems on which to upgrade. Enter one or more system names, separated by spaces. Click **Next**.
- 5 Installer detects the product that is installed on the specified system. It shows the cluster information and lets you confirm if you want to perform upgrade on the cluster. Select **Yes** and click **Next**.
- 6 Click **Next** to complete the upgrade.  
After the upgrade completes, the installer displays the location of the log and summary files. If required, view the files to confirm the installation status.
- 7 If you are prompted to restart the systems, enter the following restart command:

```
/usr/sbin/shutdown -y -i6 -g0
```

## Upgrading the Solaris operating system

If you are running Symantec Dynamic Multi-Pathing 6.1 with an earlier release of the Solaris operating system, you can upgrade the Solaris operating system using the following procedure.

---

**Warning:** You should only use this procedure to upgrade the Solaris operating system if you are running Symantec Dynamic Multi-Pathing 6.1.

---

The directory `/opt` must exist, be writable, and must not be a symbolic link as the volumes that the `upgrade_start` command does not temporarily convert are unavailable during the upgrade process. If you have a symbolic link from `/opt` to one of the unconverted volumes, the symbolic link does not function during the upgrade and items in `/opt` are not installed.

### To upgrade the Solaris operating system only

- 1 Bring the system down to single-user mode using the following command:

```
init s
```

You must mount `/opt` manually if `/opt` is on its own partition.

- 2 Load and mount the software disc from the currently installed version of Symantec Dynamic Multi-Pathing.

See “[Mounting the product disc](#)” on page 37.

- 3 Change directory:

```
cd /mount_point/scripts
```

- 4 Run the `upgrade_start` with the `-check` argument to detect any problems that exist which can prevent a successful upgrade. Use the `upgrade_start` script that was supplied with the currently installed SF release. If this command reports success, you can proceed with running the `upgrade_start` script, but if it reports errors, correct the problem(s) and rerun `upgrade_start -check`.

```
./upgrade_start -check
```

- 5 Run the `upgrade_start` script so that the system can come up with partitions. The `upgrade_start` script searches for volumes containing file systems, and if any are found, converts them to partitions:

```
./upgrade_start
```

- 6 Bring the system down to run level 0.

```
init 0
```

- 7 Upgrade the operating system to a supported version of Solaris.  
You should boot up the system from run level 0 depending on the Solaris upgrade procedure that you want to follow. Refer to the Solaris installation documentation for instructions on how to upgrade the Solaris operating system.
- 8 After installing the Solaris operating system, install any Solaris patches required by Symantec Dynamic Multi-Pathing 6.1.  
See the *Symantec Dynamic Multi-Pathing Release Notes*.

- 9 After the system is up with the upgraded Solaris operating system, bring the system down to single-user mode by entering:

```
init s
```

- 10 Ensure that `/opt` is mounted.
- 11 Load and mount the software disc from the currently installed version of Symantec Dynamic Multi-Pathing.
- 12 If you upgraded to Solaris 10, you must reinstall certain Symantec Dynamic Multi-Pathing packages to support Solaris 10 functionality.

To reinstall the required packages, follow the steps below:

- Remove the existing packages in the reverse order of their installation. For example, if you chose the installation of all packages then uninstall those in the following order.
- Run the following commands.  
To obtain a list of recommended packages to install:

```
./installdmp -recpkgs
```

Or

To obtain a list of all packages to install:

```
./installdmp -allpkgs
```

- Change to the directory containing the appropriate packages.  

```
cd /mount_point/pkg
```
- Use the `pkgadd` command to install the packages from the list you generated.

- Restart the system.
- 13** Complete the upgrade from the software disc from the currently installed version of Storage Foundation by entering:

```
devlinks
./upgrade_finish
```

## Upgrading language packages

If you want to upgrade Symantec products in a language other than English, you must install the required language packages after installing the English packages. Verify that the English installation is correct before you proceed.

Install the language packages as for an initial installation.

See [“Installing language packages”](#) on page 45.

# Upgrading DMP using Live Upgrade and Boot Environment upgrade

This chapter includes the following topics:

- [About Live Upgrade](#)
- [About ZFS Boot Environment \(BE\) upgrade](#)
- [Supported upgrade paths for Live Upgrade and Boot Environment upgrade](#)
- [Performing Live Upgrade on Solaris 10 systems](#)
- [Performing Boot Environment upgrade on Solaris 11 systems](#)
- [About Live Upgrade in a Volume Replicator \(VVR\) environment](#)

## About Live Upgrade

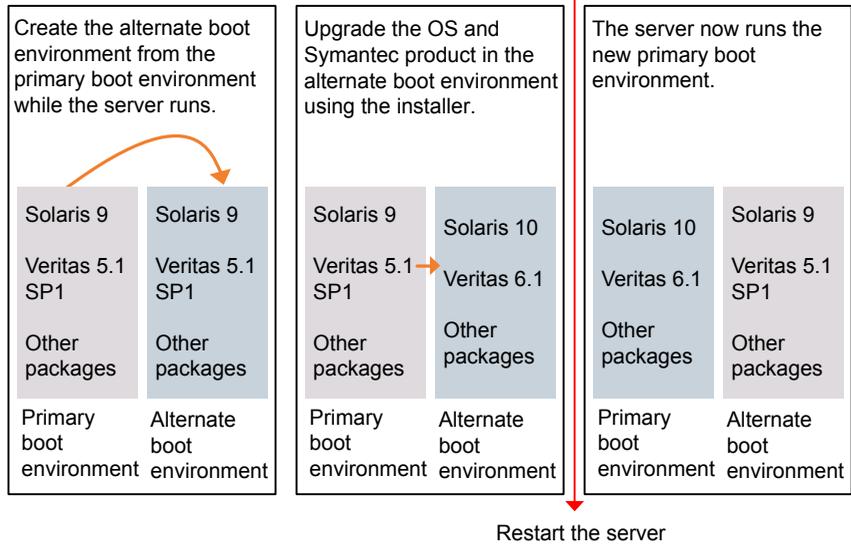
Solaris Live Upgrade provides a method of upgrading a system while the system continues to operate. This is done by creating an alternate boot environment (ABE) from the current boot environment and then upgrading the ABE. Once the ABE is upgraded, you can activate the ABE and then reboot the system.

On Solaris 10 or previous releases, you can use Live Upgrade technology to reduce downtime associated with the OS upgrade and DMP product upgrade by creating a boot environment on an alternate boot disk.

- See [“Performing Live Upgrade on Solaris 10 systems”](#) on page 128.

Figure 15-1 illustrates an example of an upgrade of Symantec products from 5.1 SP1 to 6.1, and the operating system from Solaris 9 to Solaris 10 using Live Upgrade.

**Figure 15-1** Live Upgrade process



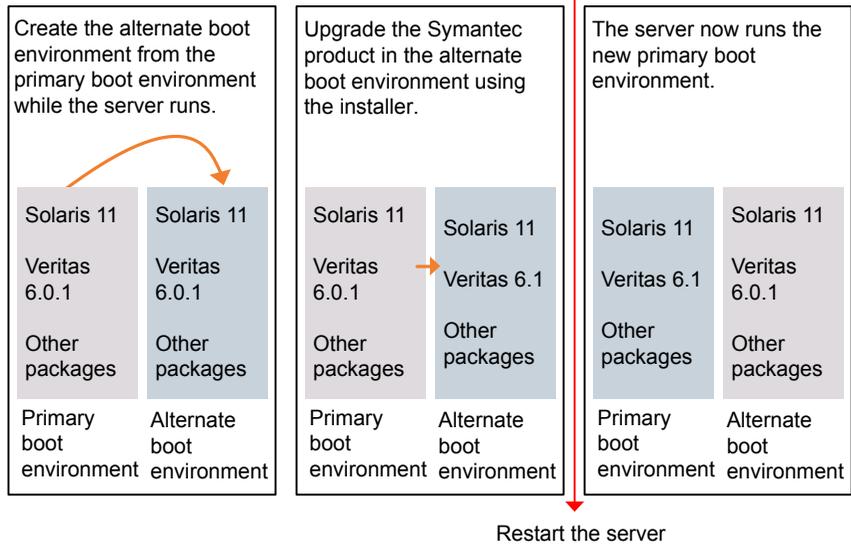
Some service groups (failover and parallel) may be online in this cluster and the Live Upgrade process does not affect them. Downtime is experienced only when the server is restarted to boot into the alternate boot environment.

## About ZFS Boot Environment (BE) upgrade

A Boot Environment (BE) is a bootable instance of the Oracle Solaris operating system image along with any other application software packages installed into that image. System administrators can maintain multiple BEs on their systems, and each BE can have different software versions installed. Upon the initial installation of the Oracle Solaris 11 release onto a system, a BE is created.

On Solaris 11, you can use the `beadm` utility to create and administer additional BEs on your system.

**Figure 15-2** Boot Environment upgrade process



## Supported upgrade paths for Live Upgrade and Boot Environment upgrade

The systems where you plan to use Live Upgrade must run Solaris 9 or Solaris 10. Boot environment upgrade can be used on Solaris 11 system only. You can upgrade from those systems that run Solaris 9, but DMP 6.1 is not supported on Solaris 9.

For Live Upgrade method, existing DMP version must be at least 5.1 SP1. For Boot Environment upgrade method, the DMP version you are upgrading to must be at least 6.1.0.

You can use Live Upgrade or Boot environment upgrade in the following virtualized environments:

**Table 15-1** Live Upgrade or Boot environment upgrade support in virtualized environments

| Environment                    | Procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Solaris native zones           | <p>Perform Live Upgrade or Boot Environment upgrade to upgrade both global and non-global zones.</p> <p>See <a href="#">“Performing Live Upgrade on Solaris 10 systems”</a> on page 128.</p> <p>See <a href="#">“Performing Boot Environment upgrade on Solaris 11 systems”</a> on page 138.</p>                                                                                                                                                                                             |
| Solaris branded zones (BrandZ) | <p>Perform Live Upgrade or Boot Environment upgrade to upgrade the global zone.</p> <p>See <a href="#">“Performing Live Upgrade on Solaris 10 systems”</a> on page 128.</p> <p>See <a href="#">“Performing Boot Environment upgrade on Solaris 11 systems”</a> on page 138.</p> <p>Manually upgrade the branded zone separately.</p> <p>Note that while you can perform a Live Upgrade or Boot Environment upgrade in the presence of branded zones, the branded zones are not upgraded.</p> |
| Oracle VM Server for SPARC     | <p>Use Live upgrade or Boot Environment upgrade procedure for Control domain as well as guest domains.</p> <p>See <a href="#">“Performing Live Upgrade on Solaris 10 systems”</a> on page 128.</p> <p>See <a href="#">“Performing Boot Environment upgrade on Solaris 11 systems”</a> on page 138.</p>                                                                                                                                                                                       |

## Performing Live Upgrade on Solaris 10 systems

Perform the Live Upgrade using the installer.

**Table 15-2** Upgrading DMP using Solaris 10 Live Upgrade

| Step   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 1 | Prepare to upgrade using Solaris Live Upgrade.<br>See <a href="#">“Before you upgrade DMP using Solaris Live Upgrade”</a> on page 129.                                                                                                                                                                                                                                                                                                                                              |
| Step 2 | Create a new boot environment on the alternate boot disk.<br>See <a href="#">“Creating a new Solaris 10 boot environment on the alternate boot disk”</a> on page 130.                                                                                                                                                                                                                                                                                                               |
| Step 3 | Upgrade DMP using the installer.<br>See <a href="#">“Upgrading DMP using the installer for Solaris 10 Live Upgrade”</a> on page 133.<br><br>To upgrade only Solaris<br>See the Oracle documentation on Solaris 10 operating system<br><b>Note:</b> If you choose to upgrade the operating system, the Solaris operating system on the alternate boot environment is upgraded. A new boot environment is created on the alternate boot disk by cloning the primary boot environment. |
| Step 4 | Switch the alternate boot environment to be the new primary.<br>See <a href="#">“Completing the Solaris 10 Live Upgrade”</a> on page 135.                                                                                                                                                                                                                                                                                                                                           |
| Step 5 | Verify Live Upgrade of DMP.<br>See <a href="#">“Verifying the Solaris 10 Live Upgrade of DMP”</a> on page 135.                                                                                                                                                                                                                                                                                                                                                                      |

## Before you upgrade DMP using Solaris Live Upgrade

Before you upgrade, perform the following procedure.

### To prepare for the Live Upgrade

- 1 Make sure that the DMP installation media and the operating system installation images are available and on hand.
- 2 On the nodes to be upgraded, select an alternate boot disk that is at least the same size as the root partition of the primary boot disk
- 3 On the primary boot disk, patch the operating system for Live Upgrade.

For upgrade from Solaris 9 to 10:

- SPARC system: Patch 137447-01 or later is required.

Verify that the patches are installed.

- 4 The version of the Live Upgrade packages must match the version of the operating system to which you want to upgrade on the alternate boot disk. If you upgrade the Solaris operating system, do the following steps:
  - Remove the installed Live Upgrade packages for the current operating system version:  
All Solaris versions: `SUNWluu`, `SUNWlur` packages.  
Solaris 10 update 7 or later also requires: `SUNWlucfg` package.
  - From the new Solaris installation image, install the new versions of the following Live Upgrade packages:  
All Solaris versions: `SUNWluu`, `SUNWlur`, and `SUNWlucfg` packages.

Solaris installation media comes with a script for this purpose named `liveupgrade20`. Find the script at `/cdrom/solaris_release/Tools/Installers/liveupgrade20`. If scripting, you can use:

```
/cdrom/solaris_release/Tools/Installers/liveupgrade20 \
-nodisplay -noconsole
```

If the specified image has some missing patches that are installed on the primary boot disk, note the patch numbers. To ensure that the alternate boot disk is the same as the primary boot disk, you have to install any missing patches on the alternate boot disk.

- 5 If the specified image has some missing patches that are installed on the primary boot disk, note the patch numbers. To ensure that the alternate boot disk is the same as the primary boot disk, you need to install any missing patches on the alternate boot disk.

## Creating a new Solaris 10 boot environment on the alternate boot disk

Symantec provides the `vxlustart` script that runs a series of commands to create the alternate boot environment for the upgrade.

To preview the commands, specify the `vxlustart` script with the `-v` option.

Symantec recommends that you preview the commands with `-v` option to ensure there are no problems before beginning the Live Upgrade process. The `vxlustart` script is located in the `scripts` directory on the distribution media.

---

**Note:** This step can take several hours to complete. Do not interrupt the session as it may leave the boot environment unstable.

---

```
cd /cdrom/scripts
./vxlustart -V -u targetos_version -s osimage_path -d diskname
```

**Table 15-3**

| vxlustart option | Usage                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -V               | <p>Lists the commands to be executed during the upgrade process without executing them and pre-checks the validity of the command.</p> <p>If the operating system is upgraded, the user is prompted to compare the patches that are installed on the image with the patches installed on the primary boot disk. This determines if any critical patches are not present from the new operating system image.</p> |
| -v               | <p>Indicates verbose, print commands before executing them.</p>                                                                                                                                                                                                                                                                                                                                                  |
| -f               | <p>Forces the vtoc creation on the disk.</p>                                                                                                                                                                                                                                                                                                                                                                     |
| -Y               | <p>Indicates a default yes with no questions asked.</p>                                                                                                                                                                                                                                                                                                                                                          |
| -m               | <p>Uses the already existing vtoc on the disk.</p>                                                                                                                                                                                                                                                                                                                                                               |
| -D               | <p>Prints with debug option on, and is for debugging.</p>                                                                                                                                                                                                                                                                                                                                                        |
| -U               | <p>Specifies that only the Storage Foundation products are upgraded. The operating system is cloned from the primary boot disk.</p>                                                                                                                                                                                                                                                                              |
| -g               | <p>Specifies the DG to which the rootdisk belongs. Optional.</p>                                                                                                                                                                                                                                                                                                                                                 |
| -d               | <p>Indicates the name of the alternate boot disk <code>c#t#d#s2</code> on which you intend to upgrade. The default disk is <code>mirrordisk</code>.</p>                                                                                                                                                                                                                                                          |
| -u               | <p>Specifies the operating system version for the upgrade on the alternate boot disk. For example, use <code>5.9</code> for Solaris 9 and <code>5.10</code> for Solaris 10.</p> <p>If you want to upgrade only SF products, specify the current OS version.</p>                                                                                                                                                  |

**Table 15-3** (continued)

| vxlustart option | Usage                                                                                                                                                                                                                                    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -F               | Specifies the root disk's file system, where the default is <i>ufs</i> .                                                                                                                                                                 |
| -S               | Specifies the path to the Solaris image. It can be a network/directory path. If the installation uses the CD, this option must not be specified. See <i>Solaris Live Upgrade installation guide</i> for more information about the path. |
| -r               | Specifies that if the computer crashes or restarts before the <code>vxlufinish</code> command is run, the alternate disk is remounted using this option.                                                                                 |
| -k               | Specifies the location of file containing auto-registration information. This file is required by <code>luupgrade (1M)</code> for OS upgrade to Solaris 10 9/10 or a later release.                                                      |
| -x               | Excludes file from newly created BE.<br>( <code>lucreate -x</code> option)                                                                                                                                                               |
| -X               | Excludes file list from newly created BE.<br>( <code>lucreate -f</code> option)                                                                                                                                                          |
| -i               | Includes file from newly created BE.<br>( <code>lucreate -y</code> option)                                                                                                                                                               |
| -I               | Includes file list from newly created BE.<br>( <code>lucreate -Y</code> option)                                                                                                                                                          |
| -z               | Filters file list from newly created BE.<br>( <code>lucreate -z</code> option)                                                                                                                                                           |
| -w               | Specifies additional mount points. ( <code>lucreate -m</code> option)                                                                                                                                                                    |
| -W               | Specifies additional mount points in a file<br>( <code>lucreate -M</code> option)                                                                                                                                                        |

If the `-U` option is specified, you can omit the `-s` option. The operating system is cloned from the primary boot disk.

For example, to preview the commands to upgrade only the Symantec product:

```
./vxlustart -V -u 5.10 -U -d disk_name
```

For example, to preview the commands for an upgrade to Solaris 10 update 6:

```
./vxlustart -V -u 5.10 -s /mnt/Solaris_10u6 -d c0t1d0s2
```

In the procedure examples, the primary or current boot environment resides on Disk0 (c0t0d0s2) and the alternate or inactive boot environment resides on Disk1 (c0t1d0s2).

At the end of the process:

- A new boot environment is created on the alternate boot disk by cloning the primary boot environment.
- The Solaris operating system on the alternate boot disk is upgraded, if you have chosen to upgrade the operating system.

#### To create a new boot environment on the alternate boot disk

- 1 Review the output and note the new mount points. If the system is restarted before completion of the upgrade or if the mounts become unmounted, you may need to remount the disks.

If you need to remount, run the command:

```
vxlustart -r -u targetos_version -d disk_name
```

- 2 After the alternate boot disk is created and mounted on */altroot.5.10*, install any operating system patches or packages on the alternate boot disk that are required for the Symantec product installation.

```
pkgadd -R /altroot.5.10 -d pkg_dir
```

## Upgrading DMP using the installer for Solaris 10 Live Upgrade

You can use the Symantec product installer to upgrade DMP as part of the Live Upgrade.

At the end of the process, Symantec Dynamic Multi-Pathing 6.1 is installed on the alternate boot disk.

#### To perform Live Upgrade of DMP using the installer

- 1 Insert the product disc with Symantec Dynamic Multi-Pathing 6.1 or access your copy of the software on the network.
- 2 Run the installer script specifying the root path as the alternate boot disk, enter the following:

```
./installer -upgrade -rootpath /altroot.5.10
```

- 3 Enter the names of the nodes that you want to upgrade to Symantec Dynamic Multi-Pathing 6.1.

The installer displays the list of packages to be installed or upgraded on the nodes.

- 4 Press **Return** to continue with the installation.
- 5 Verify that the version of the Veritas packages on the alternate boot disk is 6.1.

```
pkginfo -R /altroot.5.10 -l VRTSpkgname
```

For example:

Review the installation logs at `/altroot.5.10/opt/VRTS/install/logs`.

## Upgrading DMP manually for Solaris 10 Live Upgrade

At the end of the process, Symantec Dynamic Multi-Pathing 6.1 is installed on the alternate boot disk.

### To perform Live Upgrade of DMP manually

- 1 Remove the DMP packages on the alternate boot disk in the reverse order in which they were installed:

- For Dynamic Multi-pathing (DMP):

```
pkgrm -R /altroot.5.10 \
VRTSsfmh VRTSaslapm VRTSvxvm VRTSspt VRTSvlic VRTSperl
```

The `-R` option removes the packages from the root path `/altroot.5.10` on the alternate boot disk.

- 2 Install the DMP packages from the `/pkgs` directory. You must install the packages in the following order one at a time to the alternate boot disk using the `pkgadd` command:

- For DMP:

```
VRTSvlic.pkg VRTSperl.pkg VRTSspt.pkg VRTSvxvm.pkg VRTSaslapm.pkg
VRTSsfmh.pkg
```

For example:

```
pkgadd -R /altroot.5.10 -d package_name.pkg
```

Where you replace *package\_name.pkg* with a package's name, for example *VRTSperl.pkg*.

```
pkgadd -R /altroot.5.10 -d VRTSperl.pkg
```

- 3 Verify that the version of the Veritas packages on the alternate boot disk is 6.1.

```
pkginfo -R /altrootpath -l VRTSpkgname
```

For example:

```
pkginfo -R /altroot.5.10 -l VRTSvxvm
```

## Completing the Solaris 10 Live Upgrade

At the end of the process:

- The alternate boot environment is activated.
- The system is booted from the alternate boot disk.

### To complete the Live Upgrade

- ◆ **Note:** Do not use the `reboot`, `halt`, or `uadmin` commands to restart the system. Use either the `init` or the `shutdown` commands to enable the system to boot using the alternate boot environment.

You can ignore the following error if it appears: Error: boot environment `<dest.13445>` already mounted on `</altroot.5.10>`.

```
shutdown -g0 -y -i6
```

## Verifying the Solaris 10 Live Upgrade of DMP

To ensure that Live Upgrade has completed successfully, verify that the system have booted from the alternate boot environment.

**To verify that Live Upgrade completed successfully**

- 1 Verify that the alternate boot environment is active.

```
lustatus
```

If the alternate boot environment fails to be active, you can revert to the primary boot environment.

See [“Reverting to the primary boot environment on a Solaris 10 system”](#) on page 136.

- 2 Perform other verification as required to ensure that the new boot environment is configured correctly.

## Administering boot environments in Solaris 10 Live Upgrade

Use the following procedures to perform relevant administrative tasks for boot environments.

### Reverting to the primary boot environment on a Solaris 10 system

If the alternate boot environment fails to start, you can revert to the primary boot environment.

Start the system from the primary boot environment in the PROM monitor mode.

### Switching the boot environment for Solaris SPARC

You do not have to perform the following procedures to switch the boot environment when you use the `vxlufinish` scripts to process Live Upgrade. You must perform the following procedures when you perform a manual Live Upgrade.

Two different procedures exist to switch the boot environment, choose one of the following procedures based on the encapsulation of the root disk:

- See [“To switch the boot environment if the root disk is not encapsulated”](#) on page 137.
- See [“To switch the boot environment if the root disk is encapsulated”](#) on page 138.

The switching procedures for Solaris SPARC vary, depending on whether VxVM encapsulates the root disk.

**To switch the boot environment if the root disk is not encapsulated**

- 1 Display the status of Live Upgrade boot environments.

```
lustatus
```

| Boot Environment Name | Is Complete | Active Now | Active On Reboot | Can Delete | Copy Status |
|-----------------------|-------------|------------|------------------|------------|-------------|
| source.2657           | yes         | yes        | yes              | no         | -           |
| dest.2657             | yes         | no         | no               | yes        | -           |

In this example, the primary boot environment is currently (source.2657). You want to activate the alternate boot environment (dest.2657).

- 2 Unmount any file systems that are mounted on the alternate boot environment (dest.2657).

```
lufslist dest.2657
```

```
boot environment name: dest.2657
```

| Filesystem        | fstype | device      | size | Mounted on | Mount Options |
|-------------------|--------|-------------|------|------------|---------------|
| /dev/dsk/c0t0d0s1 | swap   | 4298342400  | -    | -          | -             |
| /dev/dsk/c0t0d0s0 | ufs    | 15729328128 | /    | -          | -             |
| /dev/dsk/c0t0d0s5 | ufs    | 8591474688  | /var | -          | -             |
| /dev/dsk/c0t0d0s3 | ufs    | 5371625472  | /vxf | -          | -             |

```
luumount dest.2657
```

- 3 Activate the Live Upgrade boot environment.

```
luactivate dest.2657
```

- 4 Restart the system.

```
shutdown -g0 -i6 -y
```

The system automatically selects the boot environment entry that was activated.

**To switch the boot environment if the root disk is encapsulated**

- 1 Display the current boot disk device and device aliases

```
eeprom
boot-device=vx-rootdg vx-int_disk
use-nvramrc?=true
nvramrc=devalias vx-int_disk /pci@1c,600000/scsi@2/disk@0,0:a
devalias vx-rootdg01 /pci@1c,600000/scsi@2/disk@1,0:a
```

- 2 Set the device from which to boot using the `eeprom` command. This example shows booting from the primary root disk.

```
eeprom boot-device=vx-rootdg01
```

- 3 Restart the system.

```
shutdown -g0 -i6 -y
```

# Performing Boot Environment upgrade on Solaris 11 systems

Perform the Symantec Dynamic Multi-Pathing 6.1 BE upgrade manually or use the installer.

**Table 15-4** Upgrading DMP using BE upgrade

| Step   | Description                                                                                                                             |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Step 1 | Create a new BE on the primary boot disk.<br>See <a href="#">“Creating a new Solaris 11 BE on the primary boot disk”</a> on page 139.   |
| Step 2 | Upgrade DMP using the installer.<br>See <a href="#">“Upgrading DMP using the installer for upgrading BE on Solaris 11”</a> on page 139. |
|        | To upgrade only Solaris<br>See the Oracle documentation on Oracle Solaris 11 operating system.                                          |

**Table 15-4** Upgrading DMP using BE upgrade *(continued)*

| Step   | Description                                                                                                                             |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Step 3 | Switch the alternate BE to be the new primary.<br><br>See <a href="#">"Completing the DMP upgrade on BE on Solaris 11"</a> on page 141. |
| Step 4 | Verify BE upgrade of DMP.<br><br>See <a href="#">"Verifying Solaris 11 BE upgrade"</a> on page 141.                                     |

## Creating a new Solaris 11 BE on the primary boot disk

At the end of the process, a new BE is created on the primary boot disk by cloning the primary BE.

### To create a new BE on the primary boot disk

- 1 View the list of BE in the primary disk.

```
beadm list
```

- 2 Create a new BE in the primary boot disk.

```
beadm create beName
```

```
beadm mount beName mountpoint
```

If VVR is configured, it is recommended that *<beName>* should have the value *altroot.5.11* and *<mountpoint>* should have the value */altroot.5.11*.

## Upgrading DMP using the installer for upgrading BE on Solaris 11

You can use the Symantec product installer to upgrade DMP on a BE.

At the end of the process, the Symantec Dynamic Multi-Pathing 6.1 is installed on the alternate BE.

### To perform BE upgrade of DMP using the installer

- 1 Insert the product disc with Symantec Dynamic Multi-Pathing 6.1 or access your copy of the software on the network.
- 2 Run the installer script specifying the root path as the alternate BE:

```
./installer -upgrade -rootpath /altroot.5.11
```

- 3 Enter the names of the nodes that you want to upgrade to Symantec Dynamic Multi-Pathing 6.1.

The installer displays the list of packages to be installed or upgraded on the nodes.

- 4 Press **Return** to continue with the installation.
- 5 Verify that the version of the Veritas packages on the alternate BE is 6.1.

```
pkg -R /altroot.5.11 list VRTS*
```

Review the installation logs at `/altroot.5.11/opt/VRTS/install/logs`.

## Upgrading DMP manually for Solaris 11 Live Upgrade

You can perform a manual upgrade of DMP using Live Upgrade.

At the end of the process, the Symantec Dynamic Multi-Pathing 6.1 is installed on the alternate boot environment.

### To perform Live Upgrade of DMP manually

- 1 Remove the DMP packages on the alternate boot environment in the reverse order in which they were installed:

- For Dynamic Multi-pathing (DMP):

```
pkg -R /altroot.5.11 uninstall \
VRTSsfmh VRTSaslapm VRTSvxvm VRTSspt VRTSvlic VRTSperl
```

Note that this package list is an example. Full package lists vary from release to release and by product option.

The `-R` option removes the packages from the root path `/altroot.5.11` on the alternate boot environment.

- 2 Set the package repository from the `/pkgs/VRTSpkgs.p5p` directory.

```
pkg set-publisher -p VRTSpkgs.p5p Symantec
```

- 3 Install the DMP packages from the repository. You must install the packages one at a time to the alternate boot environment using the `pkg install` command in the following order:

```
pkg install --accept --no-backup-be
VRTSperl VRTSvlic VRTSspt VRTSvxvm VRTSaslapm VRTSvxfs VRTSfsadv
VRTSfssdk VRTS1lt VRTSgab VRTSvxfen VRTSamf VRTSvcs VRTScps VRTSvcsag
VRTSvcssea VRTSdbed VRTSodm VRTSsfcp161 VRTSsfmh VRTSvbs VRTSvcs wiz
```

- 4 Verify that the version of the Veritas packages on the alternate boot environment is 6.1.

```
pkg -R /altrootpath info VRTSpkgname
```

For example:

```
pkg -R /altroot.5.11 info VRTSvxvm
```

- 5 Unset the repository.

```
pkg unset-publisher Symantec
```

## Completing the DMP upgrade on BE on Solaris 11

At the end of the process:

- The alternate BE is activated.
- The system is booted from the alternate BE.

### To complete the BE upgrade

- 1 Activate the alternate BE.

```
beadm activate altroot.5.11
```

- 2 Restart the system. The BE on the alternate disk is activated when you restart it.

---

**Note:** Do not use the `reboot`, `halt`, or `uadmin` commands to restart the system. Use either the `init` or the `shutdown` commands to enable the system to boot using the alternate BE.

---

```
shutdown -g0 -y -i6
```

## Verifying Solaris 11 BE upgrade

To ensure that BE upgrade has completed successfully, verify that the system have booted from the alternate BE.

**To verify that BE upgrade completed successfully**

- 1 Verify that the alternate BE is active.

```
beadm list
```

If the alternate BE fails to be active, you can revert to the primary BE.

See [“Reverting to the primary BE on a Solaris 11 system”](#) on page 143.

- 2 Perform other verification as required to ensure that the new BE is configured correctly.

If you have solaris10 brand zone on your system, you must manually upgrade the packages inside the solaris10 brand zone with packages from Solaris 10 install media.

If you have installed `VRTSvxfs` or `VRTSodm` packages inside the zones, you need to manually upgrade these packages inside the zone.

## Administering BEs in Solaris 11 BE upgrade

Use the following procedures to perform relevant administrative tasks for BEs.

### Switching the BE for Solaris SPARC

- 1 Display the status of BEs.

```
beadm list
```

```
Boot Environment Active Mountpoint Space Policy Created
--
solaris NR / 13.08G static 2012-11-14 10:22
altroot.5.11 - - 3.68G static 2013-01-06 18:41
```

In this example, the primary boot disk is currently *solaris*. You want to activate the alternate boot disk *altroot.5.11*.

- 2 Activate the BE.

```
beadm activate altroot.5.11
```

- 3 Restart the system to complete the BE activation.

```
shutdown -g0 -i6 -y
```

The system automatically selects the BE entry that was activated.

- 4 You can destroy an existing BE.

```
beadm destroy altroot.5.11
```

## Reverting to the primary BE on a Solaris 11 system

Boot the system to `ok` prompt.

View the available BEs.

To view the BEs, enter the following:

```
ok> boot -L
```

Select the option of the original BE to which you need to boot.

To boot to the BE

```
boot -Z <path to boot env>
```

For example:

```
{0} ok boot -L
Boot device: /virtual-devices@100/channel-devices@200/disk@0:a
File and args: -L
1 Oracle Solaris 11 11/11 SPARC
2 solaris-backup-1
Select environment to boot: [1 - 2]: 1
```

To boot the selected entry, enter the following:

```
boot [<root-device>] -Z rpool/ROOT/solaris
```

```
Program terminated
```

```
{0} ok boot -Z rpool/ROOT/solaris
```

## About Live Upgrade in a Volume Replicator (VVR) environment

This section provides an overview of the VVR upgrade process.

In an DMP environment that uses Volume Replicator, the following scripts provide the means to upgrade the VVR configuration:

- `vvr_upgrade_lu_start`
- `vvr_upgrade_lu_finish`

The scripts are available in the `scripts` directory in the install media.

- Immediately before restarting the system to switch over to the alternate boot environment, run the `vvr_upgrade_lu_start` script.

---

**Note:** Use the `vvr_upgrade_lu_start` script only when the applications are stopped and the next step is to switch over to the alternate boot environment.

---

- After the `vvr_upgrade_lu_start` script completes successfully, restart the system. This restart results in the system booting from the alternate boot environment.
- After the objects are recovered, and the disk group version is upgraded (if desired), run the `vvr_upgrade_lu_finish` script.

# Performing post-upgrade tasks

This chapter includes the following topics:

- [Updating variables](#)
- [Upgrading the Array Support Library](#)
- [Verifying the Symantec Dynamic Multi-Pathing upgrade](#)

## Updating variables

In `/etc/profile`, update the `PATH` and `MANPATH` variables as needed.

`MANPATH` can include `/opt/VRTS/man` and `PATH` can include `/opt/VRTS/bin`.

## Upgrading the Array Support Library

VxVM provides support for new disk arrays in the form of Array Support Library (ASL) software package.

## Adding JBOD support for storage arrays for which there is not an ASL available

If an array is of type `A/A-A`, `A/P` or `ALUA` and a suitable ASL is not available, the array must be claimed as a JBOD of type `A/P`. This is to prevent path delays and I/O failures arising. As JBODs are assumed to be type `A/A` by default, you must create appropriate JBOD entries for such arrays.

**To configure an A/A-A, A/P or ALUA array as a JBOD**

- 1 Stop all applications, such as databases, from accessing the VxVM volumes that are configured on the array, and unmount all VxFS file systems and Storage Checkpoints that are configured on the array.

- 2 Add the array as a JBOD of type A/P:

```
vxddladm addjbod vid=SUN pid=T300 policy=ap
```

- 3 If you have not already done so, upgrade the Storage Foundation or VxVM software to 6.1. Device discovery is performed during the upgrade, and the array is claimed as a JBOD of appropriate type.

If you have already upgraded your system to 6.1, run the following command to perform device discovery:

```
vxdctl enable
```

- 4 Verify that the array has been added with the policy set to APdisk:

```
vxddladm listjbod
VID PID Opcode Page Code Page Offset SNO length Policy
=====
SUN T300 18 -1 36 12 APdisk
```

- 5 Check that the correct devices are listed for the array:

```
vxdisk list
DEVICE TYPE DISK GROUP STATUS
APdisk_0 auto:cdsdisk - - online invalid
APdisk_1 auto:cdsdisk - - online invalid
APdisk_2 auto:cdsdisk - - online invalid
...
```

## Unsuppressing DMP for EMC PowerPath disks

This section is only applicable if you want to upgrade a system that includes EMC PowerPath disks.

In releases of VxVM before 4.1, a combination of DMP subpaths and the controllers of DMP subpaths were usually suppressed to prevent interference between DMP and the EMC PowerPath multi-pathing driver. Suppression has the effect of hiding these subpaths and their controllers from DMP, and as a result VxVM cannot see the disks on these subpaths and controllers.

VxVM 4.1 and later releases have the ability to discover EMCpower disks, and configure them as autodiscovered disks that DMP recognizes are under the control of a separate multi-pathing driver. This has the benefit of allowing such disks to be reconfigured in cluster-shareable disk groups. Before upgrading to VxVM 6.1, you must remove the suppression of the subpaths and controllers so that DMP can determine the association between EMCpower metadevices and `c#t#d#` disk devices.

In the following scenarios, you may need to unsuppress DMP subpaths and controllers:

- Converting a foreign disk  
See [“Converting a foreign disk to auto:simple”](#) on page 147.
- Converting a defined disk  
See [“Converting a defined disk to auto:simple”](#) on page 150.
- Converting a `powervxvm` disk  
See [“Converting a `powervxvm` disk to auto:simple”](#) on page 153.

Because EMCpower disks are auto-discovered, the `powervxvm` script should be disabled and removed from the startup script. To remove the `powervxvm` script, use the command:

```
powervxvm remove
```

## Converting a foreign disk to auto:simple

Release 4.0 of VxVM provides the `vxddladm addforeign` command to configure foreign disks with default disk offsets for the private regions and public regions, and to define them as simple disks. A foreign disk must be manually converted to `auto:simple` format before you upgrade to VxVM 6.1.

If the foreign disk is defined on a slice other than `s2`, you must copy the partition entry for that slice to that for `s0` and change the tag. If the tag of the original slice is changed, the status of the disk is seen as `online:aliased` after the upgrade.

The following example is used to illustrate the procedure. The `vxdisk list` command can be used to display the EMCpower disks that are known to VxVM:

```
vxdisk list
DEVICE TYPE DISK GROUP STATUS
c6t0d12s2 auto:sliced - - online
emcpower10c simple fdisk fdg online
...
```

The `vxprint` command is used to display information about the disk group, `fdg`:

```
vxprint
Disk group: fdg
TY NAME ASSOC KSTATE LENGTH PLOFFS STATE TUTILO PUTILO
dg fdg fdg - - - - - -
dm fdisk emcpower10c - 17673456 - - - -
...
```

### To convert a foreign disk to `auto:simple` format

- 1 Stop all the volumes in the disk group, and then deport it:

```
vxvol -g fdg stopall
vxdg deport fdg
```

- 2 Use the `vxddladm` command to remove definitions for the foreign devices:

```
vxddladm rmforeign blockpath=/dev/dsk/emcpower10c \
 charpath=/dev/rdisk/emcpower10c
```

If you now run the `vxdisk list` command, the EMCpower disk is no longer displayed:

```
vxdisk list
DEVICE TYPE DISK GROUP STATUS
c6t0d12s2 auto:sliced - - online
...
```

- 3 Run the `vxprtvtoc` command to retrieve the partition table entry for the device:

```
/etc/vx/bin/vxprtvtoc -f /tmp/vtoc /dev/rdisk/emcpower10c
```

**4** Use the `vxedvtoc` command to modify the partition tag and update the VTOC:

```
/etc/vx/bin/vxedvtoc -f /tmp/vtoc /dev/rdisk/emcpower10c

THE ORIGINAL PARTITIONING IS AS FOLLOWS:
SLICE TAG FLAGS START SIZE
0 0x0 0x201 0 0
1 0x0 0x200 0 0
2 0x5 0x201 0 17675520

THE NEW PARTITIONING WILL BE AS FOLLOWS:
SLICE TAG FLAGS START SIZE
0 0xf 0x201 0 17675520
1 0x0 0x200 0 0
2 0x5 0x201 0 17675520

DO YOU WANT TO WRITE THIS TO THE DISK ? [Y/N] :Y
WRITING THE NEW VTOC TO THE DISK #
```

**5** Upgrade to VxVM 6.1 using the appropriate upgrade procedure.

- 6 After upgrading VxVM, use the `vxdisk list` command to validate the conversion to `auto:simple` format:

```
vxdisk list
DEVICE TYPE DISK GROUP STATUS
c6t0d12s2 auto:sliced - - online
emcpower10s2 auto:simple - - online
...
```

To display the physical device that is associated with the metadvice, `emcpower10s2`, enter the following command:

```
vxddmmpadm getsubpaths dmpnodename=emcpower10s2
```

- 7 Import the disk group and start the volumes:

```
vxdg import fdg
vxvol -g fdg startall
```

You can use the `vxdisk list` command to confirm that the disk status is displayed as `online:simple`:

```
vxdisk list
DEVICE TYPE DISK GROUP STATUS
c6t0d12s2 auto:sliced - - online
emcpower10s2 auto:simple fdisk fdg online
```

## Converting a defined disk to auto:simple

In VxVM 4.0, and particularly in prior releases, EMCpower disks could be defined by a persistent disk access record (`darec`), and identified as simple disks. If an EMCpower disk is defined with a persistent `darec`, it must be manually converted to `auto:simple` format before upgrading to VxVM 6.1.

If the defined disk is defined on a slice other than `s2`, you must copy the partition entry for that slice to that for `s0` and change the tag. If the tag of the original slice is changed, the status of the disk is seen as `online:aliased` after the upgrade.

The following example is used to illustrate the procedure. The `ls` command shows the mapping of the EMC disks to persistent disk access records:

```
ls -l /dev/vx/dmp/emcdisk1
lrwxrwxrwx 1 root other 36 Sep 24 17:59 /dev/vx/dmp/emcdisk1->
/dev/dsk/c6t0d11s5
ls -l /dev/vx/rdmp/emcdisk1
```

```
lrwxrwxrwx 1 root other 40Sep 24 17:59 /dev/vx/rdmp/emcdisk1->
/dev/dsk/c6t0d11s5
```

Here the fifth partition of `c6t0d11s5` is defined as the persistent disk access record `emcdisk1`.

The `vxdisk list` command can be used to display the EMCpower disks that are known to VxVM:

```
vxdisk list
DEVICE TYPE DISK GROUP STATUS
c6t0d12s2 auto:sliced - - online
emcdisk1 simple fdisk fdg online
...
```

The `vxprint` command is used to display information about the disk group, `fdg`:

```
vxprint
Disk group: fdg
TY NAME ASSOC KSTATE LENGTH PLOFFS STATE TUTILO PUTILO
dg fdg fdg - - - - - -
dm fdisk emcdisk1 - 17673456 - - - -
...
```

## To convert a disk with a persistent disk access record to auto:simple format

- 1 Stop all the volumes in the disk group, and then deport it:

```
vxvol -g fdg stopall
vxdg deport fdg
```

- 2 Use the `vxdisk rm` command to remove the persistent record definitions:

```
vxdisk rm emcdisk1
```

If you now run the `vxdisk list` command, the EMCpower disk is no longer displayed:

```
vxdisk list
DEVICE TYPE DISK GROUP STATUS
c6t0d12s2 auto:sliced - - online
...
```

- 3 Use the `vxprtvtoc` command to retrieve the partition table entry for the device:

```
/etc/vx/bin/vxprtvtoc -f /tmp/hdisk /dev/rdisk/c6t0d11s2
```

**4** Use the `vxedvtoc` command to modify the partition tag and update the VTOC:

```
/etc/vx/bin/vxedvtoc -f /tmp/hdisk /dev/rdisk/c6t0d11s2

THE ORIGINAL PARTITIONING IS AS FOLLOWS:
SLICE TAG FLAGS START SIZE
4 0x0 0x200 0 0
5 0x0 0x200 3591000 2100375
6 0x0 0x200 0 0

THE NEW PARTITIONING WILL BE AS FOLLOWS:
SLICE TAG FLAGS START SIZE
4 0x0 0x200 0 0
5 0xf 0x200 3591000 2100375
6 0x0 0x200 0 0

DO YOU WANT TO WRITE THIS TO THE DISK ? [Y/N] :Y
WRITING THE NEW VTOC TO THE DISK #
```

**5** Upgrade to VxVM 6.1 using the appropriate upgrade procedure.

- 6 After upgrading VxVM, use the `vxdisk list` command to validate the conversion to `auto:simple` format:

```
vxdisk list
DEVICE TYPE DISK GROUP STATUS
c6t0d12s2 auto:sliced - - online
emcpower10s2 auto:simple - - online:aliased
...
```

To display the physical device that is associated with the metadvice, `emcpower10s2`, enter the following command:

```
vxddmmpadm getsubpaths dmpnodename=emcpower10s2
```

- 7 Import the disk group and start the volumes:

```
vxdg import fdg
vxvol -g fdg startall
```

You can use the `vxdisk list` command to confirm that the disk status is displayed as `online:simple`:

```
vxdisk list
DEVICE TYPE DISK GROUP STATUS
c6t0d12s2 auto:sliced - - online
emcpower10s2 auto:simple fdisk fdg online:aliased
```

To allow DMP to receive correct enquiry data, the common Serial Number (C-bit) Symmetrix Director parameter must be set to enabled.

## Converting a powervxvm disk to auto:simple

In VxVM 4.0, and particularly in previous releases, EMCpower disks can be defined by a persistent disk access record (darec) using `powervxvm` script, and identified as simple disks. If an EMCpower disk is used using `powervxvm`, it must be manually converted to `auto:simple` format before you upgrade to VxVM 6.1.

If there are any controllers or devices that are suppressed from VxVM as `powervxvm` requirement, then such controllers or disks must be unsuppressed. This is required for Veritas DMP to determine the association between PowerPath metanodes and their subpaths. After the conversion to `auto:simple` is complete, the `powervxvm` script is no longer useful, and should be disabled from startup script.

The following example is used to illustrate the procedure. The `ls` command shows the mapping of the EMC disks to persistent disk access records:

```
ls -l /dev/vx/rdmp/
crw----- 1 root root 260, 76 Feb 7 02:36 emcpower0c
```

```
vxdisk list
```

| DEVICE     | TYPE        | DISK     | GROUP | STATUS |
|------------|-------------|----------|-------|--------|
| c6t0d12s2  | auto:sliced | -        | -     | online |
| emcpower0c | simple      | ppdisk01 | ppdg  | online |

```
vxprint
```

```
Disk group: fdg
```

| TY | NAME     | ASSOC      | KSTATE | LENGTH  | PLOFFS | STATE | TUTILO | PUTILO |
|----|----------|------------|--------|---------|--------|-------|--------|--------|
| dg | ppdg     | ppdg       | -      | -       | -      | -     | -      | -      |
| dm | ppdisk01 | emcpower0c | -      | 2094960 | -      | -     | -      | -      |

**To convert an EMCpower disk (defined using `powervxvm`) to `auto:simple` format**

**1** Stop all the volumes in the disk group, and then deport it:

```
vxvol -g ppdg stopall
vxdg deport ppdg
```

**2** Use the `vxdisk rm` command to remove all emcpower disks from VxVM:

```
vxdisk rm emcpower0c
```

If you now run the `vxdisk list` command, the EMCpower disk is no longer displayed:

```
vxdisk list
```

| DEVICE    | TYPE        | DISK | GROUP | STATUS |
|-----------|-------------|------|-------|--------|
| c6t0d12s2 | auto:sliced | -    | -     | online |

**3** Use the `vxprtvtoc` command to retrieve the partition table entry for this device:

```
/etc/vx/bin/vxprtvtoc -f /tmp/vtoc /dev/vx/rdmp/emcpower0c
```

**4 Use the `vxedvtoc` command to modify the partition tag and update the VTOC:**

```
/etc/vx/bin/vxedvtoc -f /tmp/vtoc /dev/vx/rdmp/emcpower0c
THE ORIGINAL PARTITIONING IS AS FOLLOWS:
SLICE TAG FLAGS START SIZE
0 0x0 0x201 0 0
1 0x0 0x200 0 0
2 0x5 0x201 0 17675520

THE NEW PARTITIONING WILL BE AS FOLLOWS:
SLICE TAG FLAGS START SIZE
0 0xf 0x201 0 17675520
1 0x0 0x200 0 0
2 0x5 0x201 0 17675520

DO YOU WANT TO WRITE THIS TO THE DISK ? [Y/N] :Y
WRITING THE NEW VTOC TO THE DISK #
```

**5 Upgrade to VxVM 6.1 using the appropriate upgrade procedure.**

**6 After upgrading VxVM, use the `vxdisk list` command to validate the conversion to auto:simple format:**

```
vxdisk list
```

| DEVICE      | TYPE        | DISK | GROUP | STATUS |
|-------------|-------------|------|-------|--------|
| c6t0d12s2   | auto:sliced | -    | -     | online |
| emcpower0s2 | auto:simple | -    | -     | online |

**7 Import the disk group and start the volumes.**

```
vxdg import ppdg
vxvol -g ppdg startall
vxdisk list
```

| DEVICE      | TYPE        | DISK     | GROUP | STATUS |
|-------------|-------------|----------|-------|--------|
| c6t0d12s2   | auto:sliced | -        | -     | online |
| emcpower0s2 | auto:simple | ppdisk01 | ppdg  | online |

# Verifying the Symantec Dynamic Multi-Pathing upgrade

Refer to the section about verifying the installation to verify the upgrade.

See [“Verifying that the products were installed”](#) on page 101.

# Uninstallation of DMP

- [Chapter 17. Uninstalling DMP](#)

# Uninstalling DMP

This chapter includes the following topics:

- [About removing Symantec Dynamic Multi-Pathing](#)
- [Preparing to uninstall](#)
- [Uninstalling DMP](#)
- [Uninstalling DMP with the web-based installer](#)
- [Uninstalling Symantec Dynamic Multi-Pathing using the pkgrm or pkg uninstall command](#)

## About removing Symantec Dynamic Multi-Pathing

This section covers uninstallation requirements and steps to uninstall the Veritas software.

Only users with superuser privileges can uninstall Symantec Dynamic Multi-Pathing.

---

**Warning:** Failure to follow the instructions in the following sections may result in unexpected behavior.

---

## Preparing to uninstall

Review the following before removing the Veritas software.

## Remote uninstallation

You must configure remote communication to uninstall DMP on remote systems. In a High Availability environment, you must meet the prerequisites to uninstall on all nodes in the cluster at one time.

The following prerequisites are required for remote uninstallation:

- Communication protocols must exist between systems. By default, the uninstall scripts use ssh.
- You must be able to execute ssh or rsh commands as superuser on all systems.
- The ssh or rsh must be configured to operate without requests for passwords or pass phrases

See [“About configuring secure shell or remote shell communication modes before installing products”](#) on page 184.

## Uninstalling DMP

Use the following procedure to remove Symantec Dynamic Multi-Pathing (DMP).

### To uninstall DMP

- 1 To uninstall from multiple systems, set up the systems so that commands between systems execute without prompting for passwords or confirmations.

See [“About configuring secure shell or remote shell communication modes before installing products”](#) on page 184.

- 2 On the system where you plan to remove DMP, move to the `/opt/VRTS/install` directory.

- 3 Run the `uninstalldmp` command.

```
./uninstalldmp<version>
```

Where `<version>` is the specific release version.

See [“About the script-based installer”](#) on page 40.

- 4 When the installer prompts you, enter the names of each system where you want to uninstall DMP. Separate system names with spaces.
- 5 The installer program checks the systems. It then asks you if you want to stop DMP processes.

```
Do you want to stop DMP processes now? [y,n,q,?] (y)
```

If you respond yes, the processes are stopped and the packages are uninstalled.

- 6 After the uninstall completes, the installer displays the location of the summary, response, and log files. If required, view the files to confirm the status of the removal.
- 7 Restart all the nodes.

## Uninstalling DMP with the web-based installer

This section describes how to uninstall using the web-based installer.

---

**Note:** After you uninstall the product, you cannot access any file systems you created using the default disk layout version in DMP 6.1 with a previous version of DMP.

---

### To uninstall DMP

- 1 Perform the required steps to save any data that you want to preserve. For example, take backups of configuration files.
- 2 Start the web-based installer.  
See [“Starting the web-based installer”](#) on page 47.
- 3 On the Select a task and a product page, select **Uninstall a Product** from the Task drop-down list.
- 4 Select **Symantec Dynamic Multi-Pathing** from the Product drop-down list, and click **Next**.
- 5 Indicate the systems on which to uninstall. Enter one or more system names, separated by spaces. Click **Next**.
- 6 After the validation completes successfully, click **Next** to uninstall DMP on the selected system.
- 7 If there are any processes running on the target system, the installer stops the processes. Click **Next**.
- 8 After the installer stops the processes, the installer removes the products from the specified system.  
Click **Next**.

**Uninstalling Symantec Dynamic Multi-Pathing using the `pkgrm` or `pkg uninstall` command**

- 9 After the uninstall completes, the installer displays the location of the summary, response, and log files. If required, view the files to confirm the status of the removal.

- 10 Click **Finish**.

Most packages have kernel components. To ensure their complete removal, a system restart is recommended after all the packages have been removed.

## Uninstalling Symantec Dynamic Multi-Pathing using the `pkgrm` or `pkg uninstall` command

Use the following procedure to uninstall Symantec Dynamic Multi-Pathing using the `pkgrm` command.

If you want to uninstall Symantec Dynamic Multi-Pathing using the `pkgrm` command, the packages must be removed in a specific order, or else the uninstallation fails. Removing the packages out of order results in some errors, including possible core dumps, although the packages are still removed.

### To uninstall Symantec Dynamic Multi-Pathing

- 1 Unmount all mount points for file systems and Storage Checkpoints.

```
umount /mount_point
```

---

**Note:** Comment out or remove any Veritas File System (VxFS) entries from the file system table `/etc/vfstab`. Failing to remove these entries can result in system boot problems later.

---

- 2 Stop all applications from accessing VxVM volumes, and close all volumes.
- 3 For Solaris 11.1 or later, if DMP native support is enabled, DMP controls the ZFS root pool. Turn off native support before removing Symantec Dynamic Multi-Pathing.

```
vxddmpadm settune dmp_native_support=off
```

---

**Note:** If you do not disable native support, the system cannot be restarted after you remove DMP.

---

- 4 Stop any Veritas daemons that are running.
- 5 Remove the packages in the following order:

**Uninstalling Symantec Dynamic Multi-Pathing using the `pkgm` or `pkg uninstall` command**

- For Symantec Dynamic Multi-Pathing (Solaris 10):

```
pkgm VRTSsfcp161 VRTSsfmh VRTSaslapm VRTSvxvm
VRTSspt VRTSperl VRTSvlic
```

- For Symantec Dynamic Multi-Pathing (Solaris 11):

```
pkg uninstall VRTSsfcp161 VRTSsfmh VRTSaslapm VRTSvxvm
VRTSspt VRTSperl VRTSvlic
```

## Uninstalling the language packages using the `pkgm` command

If you want to remove only the language packages, you can do so with the `pkgm` command.

If you use the product installer menu or the uninstallation script, you can remove the language packages along with the English packages.

### To remove the language packages

- ◆ Use the `pkgm` command to remove the appropriate packages.

```
pkgm package_name package_name ...
```

Because the packages do not contain any dependencies, you can remove them in any order.

## Installation reference

- [Appendix A. Installation scripts](#)
- [Appendix B. Tunable files for installation](#)
- [Appendix C. Configuring the secure shell or the remote shell for communications](#)
- [Appendix D. DMP components](#)
- [Appendix E. Troubleshooting installation issues](#)
- [Appendix F. Compatibility issues when installing DMP with other products](#)

# Installation scripts

This appendix includes the following topics:

- [Command options for the installation script](#)
- [Command options for uninstall script](#)

## Command options for the installation script

The `installdmp` command usage takes the following form:

```
installdmp [sys1 sys2...]
 [-configure | -license | -upgrade | -precheck | -requirements
 | -start | -stop | -postcheck]
 [-require installer_hot_fix_file]
 [-responsefile response_file]
 [-logpath log_path]
 [-tmppath tmp_path]
 [-tunablesfile tunables_file]
 [-timeout timeout_value]
 [-hostfile hostfile_path]

 [-keyfile ssh_key_file]

 [-pkgpath pkg_path]

 [-prod product_name]

 [-hotfix_path hotfix_path]
 [-hotfix2_path hotfix2_path]
 [-hotfix3_path hotfix3_path]
 [-hotfix4_path hotfix4_path]
 [-hotfix5_path hotfix5_path]
```

[ -rootpath *root\_path* ]

Only on Solaris 10:

[ -jumpstart *jumpstart\_path* ]

[ -flash\_archive *flash\_archive\_path* ]

Only on Solaris 11:

[ -ai *ai\_path* ]

[ -serial | -rsh | -redirect | -installminpkgs | -installrecpkgs  
 | -installallpkgs | -minpkgs | -recpkgs | -allpkgs  
 | -pkgset | -pkgtable | -pkginfo | -makeresponsefile | -serial  
 | -comcleanup | -comsetup -version | -nolic | -settunables  
 | -tunables | -noipc | -disable\_dmp\_native\_support ]

[Table A-1](#) lists the `installdmp` command options.

**Table A-1**      `installdmp` options

| Option and Syntax | Description                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -ai               | The <code>-ai</code> option is supported on Solaris 11 only, and is used to generate Automated Installation manifest. This can be used by Solaris Automated Installation Server to install the Symantec product, along with the Solaris 11 operation system. An available location to store the installation manifests must be specified as a complete path. |
| -allpkgs          | View a list of all DMP packages and patches. The <code>installdmp</code> lists the packages and patches in the correct installation order.<br><br>You can use the output to create scripts for command-line installation, or for installations over a network.<br><br>See the <code>-minpkgs</code> and the <code>-recpkgs</code> options.                   |
| -comcleanup       | The <code>-comcleanup</code> option removes the ssh or rsh configuration added by installer on the systems. The option is only required when installation routines that performed auto-configuration of ssh or rsh are abruptly terminated.                                                                                                                  |
| -configure        | Configure DMP after using <code>-install</code> option to install DMP.                                                                                                                                                                                                                                                                                       |

**Table A-1**      `installdmp` options (*continued*)

| Option and Syntax                                  | Description                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-disable_dmp_native_support</code>           | Disables Dynamic Multi-pathing support for the native LVM volume groups and ZFS pools during upgrade. Retaining Dynamic Multi-pathing support for the native LVM volume groups and ZFS pools during upgrade increases package upgrade time depending on the number of LUNs and native LVM volume groups and ZFS pools configured on the system. |
| <code>-hotfix_path</code>                          | Defines the path of a hot fix level release to be integrated with a base or a maintenance level release in order for multiple releases to be simultaneously installed .                                                                                                                                                                         |
| <code>-hotfix2_path</code>                         | Defines the path of a second hot fix level release to be integrated with a base or a maintenance level release in order for multiple releases to be simultaneously installed.                                                                                                                                                                   |
| <code>-hotfix3_path</code>                         | Defines the path of a third hot fix level release to be integrated with a base or a maintenance level release in order for multiple releases to be simultaneously installed.                                                                                                                                                                    |
| <code>-hotfix4_path</code>                         | Defines the path of a fourth hot fix level release to be integrated with a base or a maintenance level release in order for multiple releases to be simultaneously installed.                                                                                                                                                                   |
| <code>-hotfix5_path</code>                         | Defines the path of a fifth hot fix level release to be integrated with a base or a maintenance level release in order for multiple releases to be simultaneously installed.                                                                                                                                                                    |
| <code>-hostfile</code><br><i>full_path_to_file</i> | Specifies the location of a file that contains the system names for the installer.                                                                                                                                                                                                                                                              |
| <code>-installallpkgs</code>                       | Selects all the packages for installation.<br>See the <code>-allpkgs</code> option.                                                                                                                                                                                                                                                             |
| <code>-installminpkgs</code>                       | Selects the minimum packages for installation.<br>See the <code>-minpkgs</code> option.                                                                                                                                                                                                                                                         |
| <code>-installrecpkgs</code>                       | Selects the recommended packages for installation.<br>See the <code>-recpkgs</code> option.                                                                                                                                                                                                                                                     |
| <code>-jumpstart dir_path</code>                   | Use this option to generate the finish scripts that the Solaris JumpStart Server can use for Veritas products. The <i>dir_path</i> indicates the path to an existing directory where the installer must store the finish scripts.                                                                                                               |

**Table A-1**      `installdmp` options (*continued*)

| Option and Syntax                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-keyfile ssh_key_file</code> | Specifies a key file for SSH. The option passes <code>-i ssh_key_file</code> with each SSH invocation.                                                                                                                                                                                                                                                                                                                        |
| <code>-license</code>              | Register or update product licenses on the specified systems. This option is useful to replace a demo license.                                                                                                                                                                                                                                                                                                                |
| <code>-logpath log_path</code>     | Specifies that <code>log_path</code> , not <code>/opt/VRTS/install/logs</code> , is the location where install log files, summary files, and response files are saved.                                                                                                                                                                                                                                                        |
| <code>-makeresponsefile</code>     | Create a response file. This option only generates a response file and does not install DMP.                                                                                                                                                                                                                                                                                                                                  |
| <code>-minpkgs</code>              | View a list of the minimal packages and the patches that are required for DMP. The <code>installdmp</code> lists the packages and patches in the correct installation order. The list does not include the optional packages.<br><br>You can use the output to create scripts for command-line installation, or for installations over a network.<br><br>See the <code>-allpkgs</code> and the <code>-recpkgs</code> options. |
| <code>-noipc</code>                | Disables <code>installdmp</code> from making outbound networking calls to SORT in order to automatically obtain hot fix and release information updates.                                                                                                                                                                                                                                                                      |
| <code>-nolic</code>                | Allows installation of product packages without entering a license key. Licensed features cannot be configured, started, or used when this option is specified.                                                                                                                                                                                                                                                               |
| <code>-osversion</code>            | View the list of packages and patches that apply to the specified Solaris version. Valid values are <code>sol8</code> , <code>sol9</code> , or <code>sol10</code> .<br><br>Use this option with one of the following options: <ul style="list-style-type: none"> <li>■ <code>-allpkgs</code></li> <li>■ <code>-minpkgs</code></li> <li>■ <code>-recpkgs</code></li> <li>■ <code>-jumpstart</code></li> </ul>                  |

**Table A-1**      `installdmp` options (*continued*)

| Option and Syntax                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-pkginfo</code>                 | <p>Displays a list of packages in the order of installation in a user-friendly format.</p> <p>Use this option with one of the following options:</p> <ul style="list-style-type: none"> <li>■ <code>-allpkgs</code><br/>If you do not specify an option, <code>-allpkgs</code> is used by default.</li> <li>■ <code>-minpkgs</code></li> <li>■ <code>-recpkgs</code></li> </ul>                                                          |
| <code>-pkgpath <i>pkg_path</i></code> | Specifies that <i>pkg_path</i> contains all packages that the <code>installdmp</code> is about to install on all systems. The <i>pkg_path</i> is the complete path of a directory, usually NFS mounted.                                                                                                                                                                                                                                  |
| <code>-pkgset</code>                  | Discovers and lists the 6.1 packages installed on the systems that you specify.                                                                                                                                                                                                                                                                                                                                                          |
| <code>-pkgtable</code>                | Displays the DMP 6.1 packages in the correct installation order.                                                                                                                                                                                                                                                                                                                                                                         |
| <code>-postcheck</code>               | Checks that the processes are running and other post-installation checks.                                                                                                                                                                                                                                                                                                                                                                |
| <code>-precheck</code>                | <p>Verify that systems meet the installation requirements before proceeding with DMP installation.</p> <p>Symantec recommends doing a precheck before you install DMP.</p>                                                                                                                                                                                                                                                               |
| <code>-prod</code>                    | Specifies the product for the operations.                                                                                                                                                                                                                                                                                                                                                                                                |
| <code>-recpkgs</code>                 | <p>View a list of the recommended packages and the patches that are required for DMP. The <code>installdmp</code> lists the packages and patches in the correct installation order. The list does not include the optional packages.</p> <p>You can use the output to create scripts for command-line installation, or for installations over a network.</p> <p>See the <code>-allpkgs</code> and the <code>-minpkgs</code> options.</p> |
| <code>-redirect</code>                | Specifies that the installer need not display the progress bar details during the installation.                                                                                                                                                                                                                                                                                                                                          |
| <code>-require</code>                 | Specifies an installer hot fix file.                                                                                                                                                                                                                                                                                                                                                                                                     |

**Table A-1**      `installdmp` options (*continued*)

| Option and Syntax                                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-requirements</code>                               | View a list of required operating system version, required patches, file system space, and other system requirements to install DMP.                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>-responsefile</code><br><code>response_file</code> | <p>Perform automated DMP installation using the system and the configuration information that is stored in a specified file instead of prompting for information.</p> <p>The <i>response_file</i> must be a full path name. You must edit the response file to use it for subsequent installations. Variable field definitions are defined within the file.</p> <p>See <a href="#">"Installing DMP using response files"</a> on page 53.</p> <p>See <a href="#">"Upgrading DMP using response files"</a> on page 53.</p> |
| <code>-rootpath root_path</code>                         | <p>Specifies that <i>root_path</i> is the root location for the installation of all packages.</p> <p>On Solaris, <code>-rootpath</code> passes <code>-R root_path</code> to <code>pkgadd</code> command.</p>                                                                                                                                                                                                                                                                                                             |
| <code>-rsh</code>                                        | Specifies that <i>rsh</i> and <code>rcp</code> are to be used for communication between systems instead of <code>ssh</code> and <code>scp</code> . This option requires that systems be preconfigured such that <i>rsh</i> commands between systems execute without prompting for passwords or confirmations                                                                                                                                                                                                             |
| <code>-serial</code>                                     | Performs the installation, uninstallation, start, and stop operations on the systems in a serial fashion. By default, the installer performs these operations simultaneously on all the systems.                                                                                                                                                                                                                                                                                                                         |
| <code>-setttunables</code>                               | Specify this option when you want to set tunable parameters after you install and configure a product. You may need to restart processes of the product for the tunable parameter values to take effect. You must use this option together with the <code>-tunablesfile</code> option.                                                                                                                                                                                                                                   |

**Table A-1**      `installdmp` options (*continued*)

| Option and Syntax              | Description                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-start</code>            | <p>Starts the daemons and processes for DMP.</p> <p>If the <code>installdmp</code> failed to start up all the DMP processes, you can use the <code>-stop</code> option to stop all the processes and then use the <code>-start</code> option to start the processes.</p> <p>See the <code>-stop</code> option.</p> <p>See <a href="#">“Starting and stopping processes for the Symantec products”</a> on page 102.</p>   |
| <code>-stop</code>             | <p>Stops the daemons and processes for DMP.</p> <p>If the <code>installdmp</code> failed to start up all the DMP processes, you can use the <code>-stop</code> option to stop all the processes and then use the <code>-start</code> option to start the processes.</p> <p>See the <code>-start</code> option.</p> <p>See <a href="#">“Starting and stopping processes for the Symantec products”</a> on page 102.</p>   |
| <code>-timeout</code>          | <p>The <code>-timeout</code> option is used to specify the number of seconds that the script must wait for each command to complete before timing out. Setting the <code>-timeout</code> option overrides the default value of 1200 seconds. Setting the <code>-timeout</code> option to 0 prevents the script from timing out. The <code>-timeout</code> option does not work with the <code>-serial</code> option.</p> |
| <code>-tmppath tmp_path</code> | <p>Specifies that <code>tmp_path</code> is the working directory for <code>installdmp</code>. This path is different from the <code>/var/tmp</code> path. This destination is where the <code>installdmp</code> performs the initial logging and where the <code>installdmp</code> copies the packages on remote systems before installation.</p>                                                                        |
| <code>-tunables</code>         | <p>Lists all supported tunables and create a tunables file template.</p>                                                                                                                                                                                                                                                                                                                                                 |
| <code>-tunablesfile</code>     | <p>Specify this option when you specify a tunables file. The tunables file should include tunable parameters.</p>                                                                                                                                                                                                                                                                                                        |
| <code>-upgrade</code>          | <p>Upgrades the installed packages on the systems that you specify.</p>                                                                                                                                                                                                                                                                                                                                                  |

**Table A-1**      `installdmp` options (*continued*)

| Option and Syntax     | Description                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-version</code> | Checks and reports the installed products and their versions. Identifies the installed and missing packages and patches where applicable for the product. Provides a summary that includes the count of the installed and any missing packages and patches where applicable. Lists the installed patches, hot fixes, and available updates for the installed product if an Internet connection is available. |

## Command options for uninstall script

The `uninstallldmp` command usage takes the following form:

```
uninstallldmp [<sys1> <sys2>...]
 [-require <installer_hot_fix_file>]
 [-responsefile <response_file>]
 [-logpath <log_path>]
 [-tmppath <tmp_path>]
 [-timeout <timeout_value>]
 [-hostfile <hostfile_path>]
 [-keyfile <ssh_key_file>]
 [-prod <product_name>]
 [-hotfix_path <hotfix_path>]
 [-hotfix2_path <hotfix2_path>]
 [-hotfix3_path <hotfix3_path>]
 [-hotfix4_path <hotfix4_path>]
 [-hotfix5_path <hotfix5_path>]

 [-rootpath <rootpath>]

 [-serial | -rsh | -redirect | -makeresponsefile | -comcleanup
 | -comsetup | -version | -noipc | -disable_dmp_native_support]
```

[Table A-2](#) lists the `uninstallldmp` command options.

**Table A-2**          `uninstalldmp` options

| Option and Syntax                                  | Description                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-comcleanup</code>                           | The <code>-comcleanup</code> option removes the ssh or rsh configuration added by installer on the systems. The option is only required when installation routines that performed auto-configuration of ssh or rsh are abruptly terminated.                                                                                                     |
| <code>-hostfile</code><br><i>full_path_to_file</i> | Specifies the location of a file that contains the system names for the installer.                                                                                                                                                                                                                                                              |
| <code>-disable_dmp_native_support</code>           | Disables Dynamic Multi-pathing support for the native LVM volume groups and ZFS pools during upgrade. Retaining Dynamic Multi-pathing support for the native LVM volume groups and ZFS pools during upgrade increases package upgrade time depending on the number of LUNs and native LVM volume groups and ZFS pools configured on the system. |
| <code>-hotfix_path</code>                          | Defines the path of a hot fix level release to be integrated with a base or a maintenance level release in order for multiple releases to be simultaneously installed .                                                                                                                                                                         |
| <code>-hotfix2_path</code>                         | Defines the path of a second hot fix level release to be integrated with a base or a maintenance level release in order for multiple releases to be simultaneously installed.                                                                                                                                                                   |
| <code>-hotfix3_path</code>                         | Defines the path of a third hot fix level release to be integrated with a base or a maintenance level release in order for multiple releases to be simultaneously installed.                                                                                                                                                                    |
| <code>-hotfix4_path</code>                         | Defines the path of a fourth hot fix level release to be integrated with a base or a maintenance level release in order for multiple releases to be simultaneously installed.                                                                                                                                                                   |
| <code>-hotfix5_path</code>                         | Defines the path of a fifth hot fix level release to be integrated with a base or a maintenance level release in order for multiple releases to be simultaneously installed.                                                                                                                                                                    |
| <code>-keyfile</code><br><i>ssh_key_file</i>       | Specifies a key file for SSH. The option passes <code>-i ssh_key_file</code> with each SSH invocation.                                                                                                                                                                                                                                          |
| <code>-logpath</code> <i>log_path</i>              | Specifies that <i>log_path</i> , not <code>/opt/VRTS/install/logs</code> , is the location where <code>uninstalldmp</code> log files, summary file, and response file are saved.                                                                                                                                                                |
| <code>-makeresponsefile</code>                     | Use this option to create a response file or to verify that your system configuration is ready for uninstalling DMP.                                                                                                                                                                                                                            |
| <code>-redirect</code>                             | Displays progress details without showing progress bar.                                                                                                                                                                                                                                                                                         |

**Table A-2**      `uninstalldmp` options (*continued*)

| Option and Syntax                                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-require</code>                                    | Specifies an installer hot fix file.                                                                                                                                                                                                                                                                                                                                                                                                             |
| <code>-responsefile</code><br><code>response_file</code> | <p>Perform automated DMP uninstallation using the system and the configuration information that is stored in a specified file instead of prompting for information.</p> <p>The <i>response_file</i> must be a full path name. You must edit the response file to use it for subsequent installations. Variable field definitions are defined within the file.</p> <p>See <a href="#">“Uninstalling DMP using response files”</a> on page 54.</p> |
| <code>-rootpath</code> <i>root_path</i>                  | <p>Specifies that <i>root_path</i> is the root location for uninstalling all packages.</p> <p>On Solaris, <code>-rootpath</code> passes <code>-R root_path</code> to <code>pkgmgr</code> command.</p>                                                                                                                                                                                                                                            |
| <code>-rsh</code>                                        | Specifies that <i>rsh</i> and <i>rcp</i> are to be used for communication between systems instead of <i>ssh</i> and <i>scp</i> . This option requires that systems be preconfigured such that <i>rsh</i> commands between systems execute without prompting for passwords or confirmations                                                                                                                                                       |
| <code>-serial</code>                                     | Performs the installation, uninstallation, start, and stop operations on the systems in a serial fashion. By default, the installer performs these operations simultaneously on all the systems.                                                                                                                                                                                                                                                 |
| <code>-tmppath</code> <i>tmp_path</i>                    | Specifies that <i>tmp_path</i> is the working directory for <code>uninstalldmp</code> . This path is different from the <code>/var/tmp</code> path. This destination is where the <code>uninstalldmp</code> performs the initial logging and where the <code>installdmp</code> copies the packages on remote systems before installation.                                                                                                        |
| <code>-timeout</code>                                    | The <code>-timeout</code> option is used to specify the number of seconds that the script should wait for each command to complete before timing out. Setting the <code>-timeout</code> option overrides the default value of 1200 seconds. Setting the <code>-timeout</code> option to 0 will prevent the script from timing out. The <code>-timeout</code> option does not work with the <code>-serial</code> option.                          |

**Table A-2**      `uninstalldmp` options (*continued*)

| Option and Syntax     | Description                                                                                                                                                                                                                                                                  |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-version</code> | Checks and reports the installed products and their versions. Identifies the installed and missing packages and patches where applicable for the product. Provides a summary that includes the count of the installed and any missing packages and patches where applicable. |

# Tunable files for installation

This appendix includes the following topics:

- [About setting tunable parameters using the installer or a response file](#)
- [Setting tunables for an installation, configuration, or upgrade](#)
- [Setting tunables with no other installer-related operations](#)
- [Setting tunables with an un-integrated response file](#)
- [Preparing the tunables file](#)
- [Setting parameters for the tunables file](#)
- [Tunables value parameter definitions](#)

## About setting tunable parameters using the installer or a response file

You can set non-default product and system tunable parameters using a tunables file. With the file, you can set tunables such as the I/O policy or toggle native multi-pathing. The tunables file passes arguments to the installer script to set tunables. With the file, you can set the tunables for the following operations:

- When you install, configure, or upgrade systems.

```
./installer -tunablesfile tunables_file_name
```

See [“Setting tunables for an installation, configuration, or upgrade”](#) on page 176.

- When you apply the tunables file with no other installer-related operations.

```
./installer -tunablesfile tunables_file_name -set tunables [
sys1 sys2 ...]
```

See [“Setting tunables with no other installer-related operations”](#) on page 177.

- When you apply the tunables file with an un-integrated response file.

```
./installer -responsefile response_file_name -tunablesfile
tunables_file_name
```

See [“Setting tunables with an un-integrated response file”](#) on page 178.

See [“About response files”](#) on page 52.

You must select the tunables that you want to use from this guide.

See [“Tunables value parameter definitions”](#) on page 180.

## Setting tunables for an installation, configuration, or upgrade

You can use a tunables file for installation procedures to set non-default tunables. You invoke the installation script with the `tunablesfile` option. The tunables file passes arguments to the script to set the selected tunables. You must select the tunables that you want to use from this guide.

See [“Tunables value parameter definitions”](#) on page 180.

---

**Note:** Certain tunables only take effect after a system reboot.

---

### To set the non-default tunables for an installation, configuration, or upgrade

- 1 Prepare the tunables file.  
See [“Preparing the tunables file”](#) on page 179.
- 2 Make sure the systems where you want to install DMP meet the installation requirements.
- 3 Complete any preinstallation tasks.
- 4 Copy the tunables file to one of the systems where you want to install, configure, or upgrade the product.
- 5 Mount the product disc and navigate to the directory that contains the installation program.

- 6 Start the installer for the installation, configuration, or upgrade. For example:

```
./installer -tunablesfile /tmp/tunables_file
-settunables [sys1 sys2 ...]
```

Where `/tmp/tunables_file` is the full path name for the tunables file.

- 7 Proceed with the operation. When prompted, accept the tunable parameters.  
Certain tunables are only activated after a reboot. Review the output carefully to determine if the system requires a reboot to set the tunable value.
- 8 The installer validates the tunables. If an error occurs, exit the installer and check the tunables file.

## Setting tunables with no other installer-related operations

You can use the installer to set tunable parameters without any other installer-related operations. You must use the parameters described in this guide. Note that many of the parameters are product-specific. You must select the tunables that you want to use from this guide.

See [“Tunables value parameter definitions”](#) on page 180.

---

**Note:** Certain tunables only take effect after a system reboot.

---

### To set tunables with no other installer-related operations

- 1 Prepare the tunables file.  
See [“Preparing the tunables file”](#) on page 179.
- 2 Make sure the systems where you want to install DMP meet the installation requirements.
- 3 Complete any preinstallation tasks.
- 4 Copy the tunables file to one of the systems that you want to tune.
- 5 Mount the product disc and navigate to the directory that contains the installation program.
- 6 Start the installer with the `-settunables` option.

```
./installer -tunablesfile tunables_file_name -settunables [
sys123 sys234 ...]
```

Where `/tmp/tunables_file` is the full path name for the tunables file.

- 7 Proceed with the operation. When prompted, accept the tunable parameters.  
Certain tunables are only activated after a reboot. Review the output carefully to determine if the system requires a reboot to set the tunable value.
- 8 The installer validates the tunables. If an error occurs, exit the installer and check the tunables file.

## Setting tunables with an un-integrated response file

You can use the installer to set tunable parameters with an un-integrated response file. You must use the parameters described in this guide. Note that many of the parameters are product-specific. You must select the tunables that you want to use from this guide.

See [“Tunables value parameter definitions”](#) on page 180.

---

**Note:** Certain tunables only take effect after a system reboot.

---

### To set tunables with an un-integrated response file

- 1 Make sure the systems where you want to install DMP meet the installation requirements.
- 2 Complete any preinstallation tasks.
- 3 Prepare the tunables file.  
See [“Preparing the tunables file”](#) on page 179.
- 4 Copy the tunables file to one of the systems that you want to tune.
- 5 Mount the product disc and navigate to the directory that contains the installation program.
- 6 Start the installer with the `-responsefile` and `-tunablesfile` options.

```
./installer -responsefile response_file_name -tunablesfile
tunables_file_name
```

Where *response\_file\_name* is the full path name for the response file and *tunables\_file\_name* is the full path name for the tunables file.

- 7 Certain tunables are only activated after a reboot. Review the output carefully to determine if the system requires a reboot to set the tunable value.
- 8 The installer validates the tunables. If an error occurs, exit the installer and check the tunables file.

## Preparing the tunables file

A tunables file is a Perl module and consists of an opening and closing statement, with the tunables defined between. Use the hash symbol at the beginning of the line to comment out the line. The tunables file opens with the line "our %TUN;" and ends with the return true "1;" line. The final return true line only needs to appear once at the end of the file. Define each tunable parameter on its own line.

You can use the installer to create a tunables file template, or manually format tunables files you create.

### To create a tunables file template

- ◆ Start the installer with the `-tunables` option. Enter the following:

```
./installer -tunables
```

You see a list of all supported tunables, and the location of the tunables file template.

### To manually format tunables files

- ◆ Format the tunable parameter as follows:

```
$TUN{"tunable_name"}{"system_name"|"*"}=value_of_tunable;
```

For the *system\_name*, use the name of the system, its IP address, or a wildcard symbol. The *value\_of\_tunable* depends on the type of tunable you are setting. End the line with a semicolon.

The following is an example of a tunables file.

```

Tunable Parameter Values:

our %TUN;

$TUN{"tunable1"}{"*"}=1024;
$TUN{"tunable3"}{"sys123"}="SHA256";

1;
```

## Setting parameters for the tunables file

Each tunables file defines different tunable parameters. The values that you can use are listed in the description of each parameter. Select the tunables that you want to add to the tunables file and then configure each parameter.

See [“Tunables value parameter definitions”](#) on page 180.

Each line for the parameter value starts with \$TUN. The name of the tunable is in curly brackets and double-quotes. The system name is enclosed in curly brackets and double-quotes. Finally define the value and end the line with a semicolon, for example:

```
$TUN{"dmp_daemon_count"}{"node123"}=16;
```

In this example, you are changing the dmp\_daemon\_count value from its default of 10 to 16. You can use the wildcard symbol "\*" for all systems. For example:

```
$TUN{"dmp_daemon_count"}{"*"}=16;
```

## Tunables value parameter definitions

When you create a tunables file for the installer you can only use the parameters in the following list.

Prior to making any updates to the tunables, refer to the *Symantec Storage Foundation Cluster File System High Availability Administrator's Guide* for detailed information on product tunable ranges and recommendations.

[Table B-1](#) describes the supported tunable parameters that can be specified in a tunables file.

**Table B-1** Supported tunable parameters

| Tunable             | Description                                                                                                                |
|---------------------|----------------------------------------------------------------------------------------------------------------------------|
| autoreminor         | (Veritas Volume Manager) Enable reminoring in case of conflicts during disk group import.                                  |
| autostartvolumes    | (Veritas Volume Manager) Enable the automatic recovery of volumes.                                                         |
| dmp_cache_open      | (Symantec Dynamic Multi-Pathing) Whether the first open on a device performed by an array support library (ASL) is cached. |
| dmp_daemon_count    | (Symantec Dynamic Multi-Pathing) The number of kernel threads for DMP administrative tasks.                                |
| dmp_delayq_interval | (Symantec Dynamic Multi-Pathing) The time interval for which DMP delays the error processing if the device is busy.        |

**Table B-1** Supported tunable parameters (*continued*)

| Tunable                 | Description                                                                                                                                                                                                                        |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dmp_fast_recovery       | (Symantec Dynamic Multi-Pathing) Whether DMP should attempt to obtain SCSI error information directly from the HBA interface. This tunable must be set after Symantec Dynamic Multi-Pathing is started.                            |
| dmp_health_time         | (Symantec Dynamic Multi-Pathing) The time in seconds for which a path must stay healthy.                                                                                                                                           |
| dmp_log_level           | (Symantec Dynamic Multi-Pathing) The level of detail to which DMP console messages are displayed.                                                                                                                                  |
| dmp_low_impact_probe    | (Symantec Dynamic Multi-Pathing) Whether the low impact path probing feature is enabled.                                                                                                                                           |
| dmp_lun_retry_timeout   | (Symantec Dynamic Multi-Pathing) The retry period for handling transient errors.                                                                                                                                                   |
| dmp_monitor_fabric      | (Symantec Dynamic Multi-Pathing) Whether the Event Source daemon ( <code>vxesd</code> ) uses the Storage Networking Industry Association (SNIA) HBA API. This tunable must be set after Symantec Dynamic Multi-Pathing is started. |
| dmp_monitor_osevent     | (Symantec Dynamic Multi-Pathing) Whether the Event Source daemon ( <code>vxesd</code> ) monitors operating system events.                                                                                                          |
| dmp_monitor_ownership   | (Symantec Dynamic Multi-Pathing) Whether the dynamic change in LUN ownership is monitored.                                                                                                                                         |
| dmp_native_multipathing | (Symantec Dynamic Multi-Pathing) Whether DMP will intercept the I/Os directly on the raw OS paths or not.                                                                                                                          |
| dmp_native_support      | (Symantec Dynamic Multi-Pathing) Whether DMP does multi-pathing for native devices.                                                                                                                                                |
| dmp_path_age            | (Symantec Dynamic Multi-Pathing) The time for which an intermittently failing path needs to be monitored before DMP marks it as healthy.                                                                                           |

**Table B-1** Supported tunable parameters (*continued*)

| Tunable                   | Description                                                                                                                                                 |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dmp_pathswitch_blks_shift | (Symantec Dynamic Multi-Pathing) The default number of contiguous I/O blocks sent along a DMP path to an array before switching to the next available path. |
| dmp_probe_idle_lun        | (Symantec Dynamic Multi-Pathing) Whether the path restoration kernel thread probes idle LUNs.                                                               |
| dmp_probe_threshold       | (Symantec Dynamic Multi-Pathing) The number of paths will be probed by the restore daemon.                                                                  |
| dmp_restore_cycles        | (Symantec Dynamic Multi-Pathing) The number of cycles between running the check_all policy when the restore policy is check_periodic.                       |
| dmp_restore_interval      | (Symantec Dynamic Multi-Pathing) The time interval in seconds the restore daemon analyzes the condition of paths.                                           |
| dmp_restore_policy        | (Symantec Dynamic Multi-Pathing) The policy used by DMP path restoration thread.                                                                            |
| dmp_restore_state         | (Symantec Dynamic Multi-Pathing) Whether kernel thread for DMP path restoration is started.                                                                 |
| dmp_retry_count           | (Symantec Dynamic Multi-Pathing) The number of times a path reports a path busy error consecutively before DMP marks the path as failed.                    |
| dmp_scsi_timeout          | (Symantec Dynamic Multi-Pathing) The timeout value for any SCSI command sent via DMP.                                                                       |
| dmp_sfg_threshold         | (Symantec Dynamic Multi-Pathing) The status of the subpaths failover group (SFG) feature.                                                                   |
| dmp_stat_interval         | (Symantec Dynamic Multi-Pathing) The time interval between gathering DMP statistics.                                                                        |

**Table B-1** Supported tunable parameters (*continued*)

| Tunable                       | Description                                                                                                                                                |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| fssmartmovethreshold          | (Veritas Volume Manager) The file system usage threshold for SmartMove (percent). This tunable must be set after Veritas Volume Manager is started.        |
| reclaim_on_delete_start_time  | (Veritas Volume Manager) Time of day to start reclamation for deleted volumes. This tunable must be set after Veritas Volume Manager is started.           |
| reclaim_on_delete_wait_period | (Veritas Volume Manager) Days to wait before starting reclamation for deleted volumes. This tunable must be set after Veritas Volume Manager is started.   |
| same_key_for_alldgs           | (Veritas Volume Manager) Use the same fencing key for all disk groups. This tunable must be set after Veritas Volume Manager is started.                   |
| sharedminorstart              | (Veritas Volume Manager) Start of range to use for minor numbers for shared disk groups. This tunable must be set after Veritas Volume Manager is started. |
| storage_connectivity          | (Veritas Volume Manager) The CVM storage connectivity type. This tunable must be set after Veritas Volume Manager is started.                              |
| usefssmartmove                | (Veritas Volume Manager) Configure SmartMove feature (all, thinonly, none). This tunable must be set after Veritas Volume Manager is started.              |

# Configuring the secure shell or the remote shell for communications

This appendix includes the following topics:

- [About configuring secure shell or remote shell communication modes before installing products](#)
- [Manually configuring and passwordless ssh](#)
- [Restarting the ssh session](#)
- [Enabling and disabling rsh for Solaris](#)

## About configuring secure shell or remote shell communication modes before installing products

Establishing communication between nodes is required to install Symantec software from a remote system, or to install and configure a system. The system from which the installer is run must have permissions to run `rsh` (remote shell) or `ssh` (secure shell) utilities. You need to run the installer with superuser privileges on the systems where you plan to install Symantec software.

You can install products to remote systems using either secure shell (`ssh`) or remote shell (`rsh`). Symantec recommends that you use `ssh` as it is more secure than `rsh`.

This section contains an example of how to set up `ssh` password free communication. The example sets up `ssh` between a source system (`sys1`) that contains the installation directories, and a target system (`sys2`). This procedure also applies to multiple target systems.

---

**Note:** The script- and web-based installers support establishing passwordless communication for you.

---

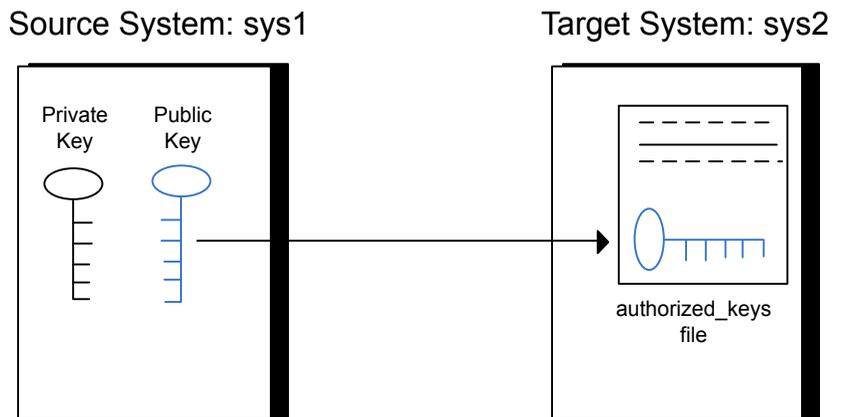
## Manually configuring and passwordless ssh

The ssh program enables you to log into and execute commands on a remote system. ssh enables encrypted communications and an authentication process between two untrusted hosts over an insecure network.

In this procedure, you first create a DSA key pair. From the key pair, you append the public key from the source system to the `authorized_keys` file on the target systems.

Figure C-1 illustrates this procedure.

**Figure C-1** Creating the DSA key pair and appending it to target systems



Read the ssh documentation and online manual pages before enabling ssh. Contact your operating system support provider for issues regarding ssh configuration.

Visit the OpenSSH website that is located at: <http://openssh.org> to access online manuals and other resources.

**To create the DSA key pair**

- 1 On the source system (sys1), log in as root, and navigate to the root directory.

```
sys1 # cd /
```

- 2 Make sure the `/.ssh` directory is on all the target installation systems (sys2 in this example). If that directory is not present, create it on all the target systems and set the write permission to root only:

Solaris 10:

```
sys2 # mkdir /.ssh
```

Solaris 11:

```
sys2 # mkdir /root/.ssh
```

Change the permissions of this directory, to secure it.

Solaris 10:

```
sys2 # chmod go-w /.ssh
```

Solaris 11:

```
sys2 # chmod go-w /root/.ssh
```

- 3 To generate a DSA key pair on the source system, type the following command:

```
sys1 # ssh-keygen -t dsa
```

System output similar to the following is displayed:

```
Generating public/private dsa key pair.
```

```
Enter file in which to save the key (//.ssh/id_dsa):
```

For Solaris 11:

```
Your identification has been saved in /root/.ssh/id_dsa.
```

```
Your public key has been saved in /root/.ssh/id_dsa.pub.
```

- 4 Press Enter to accept the default location of `/.ssh/id_dsa`.
- 5 When the program asks you to enter the passphrase, press the Enter key twice.

```
Enter passphrase (empty for no passphrase):
```

Do not enter a passphrase. Press Enter.

```
Enter same passphrase again:
```

Press Enter again.

### To append the public key from the source system to the `authorized_keys` file on the target system, using secure file transfer

- 1 Make sure the secure file transfer program (SFTP) is enabled on all the target installation systems (sys2 in this example).

To enable SFTP, the `/etc/ssh/sshd_config` file must contain the following two lines:

```
PermitRootLogin yes
Subsystem sftp /usr/lib/ssh/sftp-server
```

- 2 If the lines are not there, add them and restart ssh.

To restart ssh on Solaris 10 and Solaris 11, type the following command:

```
sys1 # svcadm restart ssh
```

- 3 From the source system (sys1), move the public key to a temporary file on the target system (sys2).

Use the secure file transfer program.

In this example, the file name `id_dsa.pub` in the root directory is the name for the temporary file for the public key.

Use the following command for secure file transfer:

```
sys1 # sftp sys2
```

If the secure file transfer is set up for the first time on this system, output similar to the following lines is displayed:

```
Connecting to sys2 ...
The authenticity of host 'sys2 (10.182.00.00)'
can't be established. DSA key fingerprint is
fb:6f:9f:61:91:9d:44:6b:87:86:ef:68:a6:fd:88:7d.
Are you sure you want to continue connecting (yes/no)?
```

- 4 Enter `yes`.

Output similar to the following is displayed:

```
Warning: Permanently added 'sys2,10.182.00.00'
(DSA) to the list of known hosts.
root@sys2 password:
```

- 5 Enter the root password of `sys2`.
- 6 At the `sftp` prompt, type the following command:

```
sftp> put /.ssh/id_dsa.pub
```

The following output is displayed:

```
Uploading /.ssh/id_dsa.pub to /id_dsa.pub
```

- 7 To quit the SFTP session, type the following command:

```
sftp> quit
```

- 8 To begin the `ssh` session on the target system (`sys2` in this example), type the following command on `sys1`:

```
sys1 # ssh sys2
```

Enter the root password of `sys2` at the prompt:

```
password:
```

- 9 After you log in to `sys2`, enter the following command to append the `id_dsa.pub` file to the `authorized_keys` file:

```
sys2 # cat /id_dsa.pub >> /.ssh/authorized_keys
```

- 10 After the `id_dsa.pub` public key file is copied to the target system (`sys2`), and added to the authorized keys file, delete it. To delete the `id_dsa.pub` public key file, enter the following command on `sys2`:

```
sys2 # rm /id_dsa.pub
```

- 11 To log out of the `ssh` session, enter the following command:

```
sys2 # exit
```

- 12 Run the following commands on the source installation system. If your `ssh` session has expired or terminated, you can also run these commands to renew the session. These commands bring the private key into the shell environment and make the key globally available to the user `root`:

```
sys1 # exec /usr/bin/ssh-agent $SHELL
sys1 # ssh-add
```

```
Identity added: //./ssh/id_dsa
```

This shell-specific step is valid only while the shell is active. You must execute the procedure again if you close the shell during the session.

### To verify that you can connect to a target system

- 1 On the source system (`sys1`), enter the following command:

```
sys1 # ssh -l root sys2 uname -a
```

where `sys2` is the name of the target system.

- 2 The command should execute from the source system (`sys1`) to the target system (`sys2`) without the system requesting a passphrase or password.
- 3 Repeat this procedure for each target system.

## Restarting the ssh session

After you complete this procedure, `ssh` can be restarted in any of the following scenarios:

- After a terminal session is closed
- After a new terminal session is opened
- After a system is restarted
- After too much time has elapsed, to refresh `ssh`

**To restart ssh**

- 1 On the source installation system (sys1), bring the private key into the shell environment.

```
sys1 # exec /usr/bin/ssh-agent $SHELL
```

- 2 Make the key globally available for the user `root`

```
sys1 # ssh-add
```

## Enabling and disabling rsh for Solaris

The following section describes how to enable remote shell on Solaris system.

Symantec recommends configuring a secure shell environment for Symantec product installations.

See [“Manually configuring and passwordless ssh”](#) on page 185.

See the operating system documentation for more information on configuring remote shell.

**To enable rsh**

- 1 To determine the current status of `rsh` and `rlogin`, type the following command:

```
inetadm | grep -i login
```

If the service is enabled, the following line is displayed:

```
enabled online svc:/network/login:rlogin
```

If the service is not enabled, the following line is displayed:

```
disabled disabled svc:/network/login:rlogin
```

- 2 To enable a disabled `rsh/rlogin` service, type the following command:

```
inetadm -e rlogin
```

- 3 To disable an enabled `rsh/rlogin` service, type the following command:

```
inetadm -d rlogin
```

- 4 Modify the `.rhosts` file. A separate `.rhosts` file is in the `$HOME` directory of each user. This file must be modified for each user who remotely accesses the system using `rsh`. Each line of the `.rhosts` file contains a fully qualified domain name or IP address for each remote system having access to the local system. For example, if the root user must remotely access `sys1` from `sys2`, you must add an entry for `sys2.companyname.com` in the `.rhosts` file on `sys1`.

```
echo "sys2.companyname.com" >> $HOME/.rhosts
```

- 5 After you complete an installation procedure, delete the `.rhosts` file from each user's `$HOME` directory to ensure security:

```
rm -f $HOME/.rhosts
```

# DMP components

This appendix includes the following topics:

- [Symantec Dynamic Multi-Pathing installation packages](#)

## Symantec Dynamic Multi-Pathing installation packages

[Table D-1](#) shows the package name and contents for each English language package for Symantec Dynamic Multi-Pathing. The table also gives you guidelines for which packages to install based whether you want the minimum, recommended, or advanced configuration.

**Table D-1** Symantec Dynamic Multi-Pathing packages

| packages   | Contents                                                                                                                                                                                                        | Configuration |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| VRTSaslapm | Symantec Array Support Library (ASL) and Array Policy Module (APM) binaries<br><br>Required for the support and compatibility of various storage arrays.                                                        | Minimum       |
| VRTSperl   | Perl 5.16.1 for Symantec.                                                                                                                                                                                       | Minimum       |
| VRTSvlic   | Symantec License Utilities<br><br>Installs the license key layout files required to decode the Storage Foundation license keys. Provides the standard license key utilities vxlicrep, vxlicinst, and vxlictest. | Minimum       |
| VRTSvxvm   | Symantec Volume Manager binaries                                                                                                                                                                                | Minimum       |

**Table D-1** Symantec Dynamic Multi-Pathing packages (*continued*)

| packages    | Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Configuration |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| VRTSsfcp161 | <p>Symantec Storage Foundation Common Product Installer</p> <p>The Storage Foundation Common Product installer package contains the scripts that perform the following:</p> <ul style="list-style-type: none"> <li>■ installation</li> <li>■ configuration</li> <li>■ upgrade</li> <li>■ uninstallation</li> <li>■ adding nodes</li> <li>■ removing nodes</li> <li>■ etc.</li> </ul> <p>You can use this script to simplify the native operating system installations, configurations, and upgrades.</p> | Minimum       |
| VRTSsfmh    | <p>Symantec Storage Foundation Managed Host</p> <p>Discovers configuration information on a Storage Foundation managed host. This information is stored on a central database, which is not part of this release. You must download the database separately at:</p> <p><a href="http://www.symantec.com/business/storage-foundation-manager">http://www.symantec.com/business/storage-foundation-manager</a></p>                                                                                         | Recommended   |
| VRTSspt     | Symantec Software Support Tools                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Recommended   |

# Troubleshooting installation issues

This appendix includes the following topics:

- [Restarting the installer after a failed connection](#)
- [What to do if you see a licensing reminder](#)
- [About the VRTSpt package troubleshooting tools](#)
- [Incorrect permissions for root on remote system](#)
- [Inaccessible system](#)

## Restarting the installer after a failed connection

If an installation is killed because of a failed connection, you can restart the installer to resume the installation. The installer detects the existing installation. The installer prompts you whether you want to resume the installation. If you resume the installation, the installation proceeds from the point where the installation failed.

## What to do if you see a licensing reminder

In this release, you can install without a license key. In order to comply with the End User License Agreement, you must either install a license key or make the host managed by a Management Server. If you do not comply with these terms within 60 days, the following warning messages result:

```
WARNING V-365-1-1 This host is not entitled to run Symantec Storage Foundation/Symantec Cluster Server.As set forth in the End User License Agreement (EULA) you must complete one of the two options
```

set forth below. To comply with this condition of the EULA and stop logging of this message, you have <nn> days to either:

- make this host managed by a Management Server (see <http://go.symantec.com/sfhakeyless> for details and free download), or
- add a valid license key matching the functionality in use on this host using the command 'vxlicinst' and validate using the command 'vxkeyless set NONE'.

To comply with the terms of the EULA, and remove these messages, you must do one of the following within 60 days:

- Install a valid license key corresponding to the functionality in use on the host. After you install the license key, you must validate the license key using the following command:

```
/opt/VRTS/bin/vxlicrep
```

- Continue with keyless licensing by managing the server or cluster with a management server.

For more information about keyless licensing, see the following URL:

<http://go.symantec.com/sfhakeyless>

## About the VRTSspt package troubleshooting tools

The VRTSspt package provides a group of tools for troubleshooting a system and collecting information on its configuration. If you install and use the VRTSspt package, it will be easier for Symantec Support to diagnose any issues you may have.

The tools can gather Veritas File System and Veritas Volume Manager metadata information and establish various benchmarks to measure file system and volume manager performance. Although the tools are not required for the operation of any Symantec product, Symantec recommends installing them should a support case be needed to be opened with Symantec Support. Use caution when you use the VRTSspt package, and always use it in concert with Symantec Support.

## Incorrect permissions for root on remote system

The permissions are inappropriate. Make sure you have remote root access permission on each system to which you are installing.

```
Failed to setup rsh communication on 10.198.89.241:
```

```
'rsh 10.198.89.241 <command>' failed
Trying to setup ssh communication on 10.198.89.241.
Failed to setup ssh communication on 10.198.89.241:
Login denied
```

```
Failed to login to remote system(s) 10.198.89.241.
Please make sure the password(s) are correct and superuser(root)
can login to the remote system(s) with the password(s).
If you want to setup rsh on remote system(s), please make sure
rsh with command argument ('rsh <host> <command>') is not
denied by remote system(s).
```

```
Either ssh or rsh is needed to be setup between the local node
and 10.198.89.241 for communication
```

```
Would you like the installer to setup ssh/rsh communication
automatically between the nodes?
Superuser passwords for the systems will be asked. [y,n,q] (y) n
```

```
System verification did not complete successfully
```

```
The following errors were discovered on the systems:
```

```
The ssh permission denied on 10.198.89.241
rsh exited 1 on 10.198.89.241
either ssh or rsh is needed to be setup between the local node
and 10.198.89.241 for communication
```

Suggested solution: You need to set up the systems to allow remote access using ssh or rsh.

See [“About configuring secure shell or remote shell communication modes before installing products”](#) on page 184.

---

**Note:** Remove remote shell permissions after completing the DMP installation and configuration.

---

## Inaccessible system

The system you specified is not accessible. This could be for a variety of reasons such as, the system name was entered incorrectly or the system is not available over the network.

Suggested solution: Verify that you entered the system name correctly; use the `ping(1M)` command to verify the accessibility of the host.

# Compatibility issues when installing DMP with other products

This appendix includes the following topics:

- [Installing, uninstalling, or upgrading Storage Foundation products when other Symantec products are present](#)
- [Installing, uninstalling, or upgrading Storage Foundation products when VOM is already present](#)
- [Installing, uninstalling, or upgrading Storage Foundation products when NetBackup is already present](#)

## **Installing, uninstalling, or upgrading Storage Foundation products when other Symantec products are present**

Installing Storage Foundation when other Symantec products are installed can create compatibility issues. For example, installing Storage Foundation products when VOM, ApplicationHA, and NetBackup are present on the systems.

## Installing, uninstalling, or upgrading Storage Foundation products when VOM is already present

If you plan to install or upgrade Storage Foundation products on systems where VOM has already been installed, be aware of the following compatibility issues:

- When you install or upgrade Storage Foundation products where VOM Central Server is present, the installer skips the VRTSsfmh upgrade and leaves the VOM Central Server and Managed Host packages as is.
- When uninstalling Storage Foundation products where VOM Central Server is present, the installer does not uninstall VRTSsfmh.
- When you install or upgrade Storage Foundation products where VOM Managed Host is present, the installer gives warning messages that it will upgrade VRTSsfmh.

## Installing, uninstalling, or upgrading Storage Foundation products when NetBackup is already present

If you plan to install or upgrade Storage Foundation on systems where NetBackup has already been installed, be aware of the following compatibility issues:

- When you install or upgrade Storage Foundation products where NetBackup is present, the installer does not uninstall VRTSspb and VRTSicsco. It does not upgrade VRTSat.
- When you uninstall Storage Foundation products where NetBackup is present, the installer does not uninstall VRTSspb, VRTSicsco, and VRTSat.

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