SnapDrive® 5.3.2 for UNIX®

Installation and Setup Guide for Linux®

For Clustered Data ONTAP®

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NetApp®

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Product overview

SnapDrive for UNIX is a host-based storage and data management solution for UNIX environments. SnapDrive for UNIX simplifies data management, improves data availability, and increases the reliability of application data through simplified storage provisioning and file system consistent Snapshot copies.

You can use SnapDrive for UNIX as a stand-alone product or along with other SnapManager products that run on UNIX. SnapDrive for UNIX deployed along with SnapManager enables you to create application-consistent data backup.

SnapDrive highlights

SnapDrive for UNIX enables you to simplify storage management tasks. Some of the tasks that you can perform using SnapDrive for UNIX are:

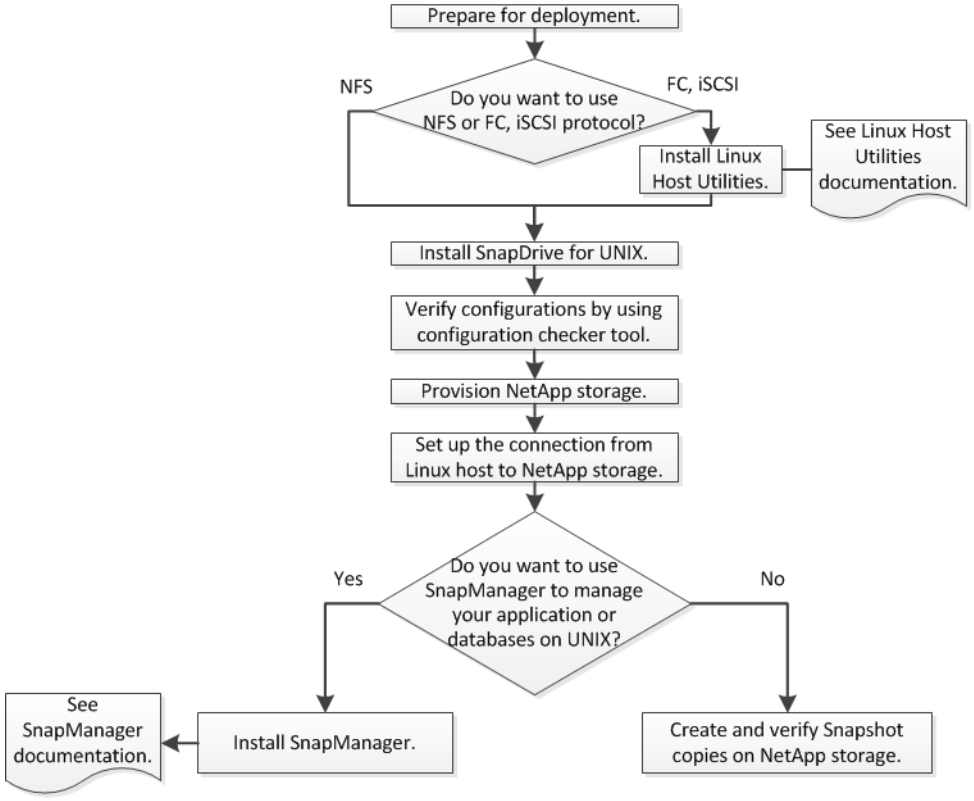
- Creating Snapshot copies using clustered Data ONTAP Snapshot technology.
  SnapDrive for UNIX enables you to create and delete Snapshot copies of a file system, volume group, host volume, or LUN and to clone storage entities from Snapshot copies.
- Provisioning and managing storage with little or no application or host downtime.
  SnapDrive for UNIX enables you to create and delete storage components, including disk groups, host volumes, file systems, and LUNs on host cluster environments. SnapDrive for UNIX also enables you to expand storage, connect storage to a host, and disconnect storage from a host.
- Providing role-based access control, which enables storage administrators to restrict the operations that SnapDrive users can perform, depending on their assigned roles.

In addition to these major features, SnapDrive offers the following advantages:

- Enhanced clone-split operation
- Volume-based SnapRestore (VBSR)
- Command-line interface (CLI) options
- Data collection utility
- Support for storage system renaming
- Support for Fibre Channel RDM LUNs in Linux guest operating systems

Deployment workflow

Before you can create Snapshot copies with SnapDrive, you must install Linux Host Utilities (if using FC or iSCSI protocol), install SnapDrive for UNIX, check the supported configurations for SnapDrive, provision the storage, and then set up connection from the Linux host to the NetApp storage system.



Preparing for deployment

The hosts on which you install SnapDrive for UNIX must meet the specific software, hardware, browser, database, and operating system requirements. For more information about the requirements, see the Interoperability Matrix tool.

Steps

1. Verify that you have the required licenses.
2. Verify SnapDrive support for your configuration.
3. Verify that your Linux host meets SnapDrive requirements.

Related references

SnapDrive for UNIX license requirements on page 6
Supported configurations on page 6
Linux host requirements on page 7

Related information

NetApp Interoperability Matrix Tool

SnapDrive for UNIX license requirements

Before you install SnapDrive for UNIX, you must ensure that you have the appropriate licenses for the required software and protocols.

SnapDrive for UNIX license requirements are as follows:

License	Description	Where installed
SnapRestore	A required license that enables SnapDrive for UNIX to restore Snapshot copies.	On NetApp storage systems
FlexClone	An optional license for cloning Snapshot copies.	On NetApp storage systems
Protocols	Required for LUNs, the iSCSI or FC license.	On NetApp storage systems

Supported configurations

You should use the NetApp Interoperability Matrix Tool (IMT) to verify SnapDrive support for your configuration before installing SnapDrive for UNIX.

Related information

NetApp Interoperability Matrix Tool

Linux host requirements

You must prepare the Linux host before you can install SnapDrive for UNIX.

- You must download and install the Linux Host Utilities from the NetApp Support Site if you are using the FC or iSCSI protocol.
  NetApp Downloads: Software
  You must verify that the Linux Host Utilities are installed successfully by using the `sanlun version` command.
- You must install the `sg3_utils` package in all Linux systems so that the SnapDrive for UNIX commands function properly.

  Note: You must ensure that the `sg3_utils` and `sg3_utils-libs` libraries are available for Red Hat Enterprise Linux (RHEL) and Oracle Enterprise Linux (OEL). The `sg3_utils` libraries are available in the `scsi*` package for SUSE Linux Enterprise Server (SLES) 10 and earlier and in the `sg3_utils*` package for SLES 11 and later.
- You must download and install these libraries or binary packages if your host is a 64-bit Linux operating system and you are trying to install the 32-bit SnapDrive for UNIX.
  - 32-bit version of the `glibc`, `libnl`, `libhba`, `libgcc` packages from the *Red Hat Enterprise Linux site*.
    Red Hat Enterprise Linux site
    The SnapDrive for UNIX installation fails if the 32-bit version of the`glibc` package is missing in the host system.
  - 32-bit binaries of the `QConvergeConsoleCLI` package from the *QLogic site* . You must also change `qla2xxx64 /usr/lib64/libqlsdm.so` to `qla2xxx /usr/lib/libqlsdm.so` in the `/etc/hba.conf` file for QLogic HBAs if your host is a 64-bit Linux operating system and install 32-bit binaries of Emulex OnCommand Manager packages for Emulex HBA.
    QLogic site
  - You must install the `libHBAAPI` package or a vendor-specific package if the transport protocol is `FC` for SnapDrive for UNIX to work on the host.
- You must install the supported host Service Packs on the host before installing SnapDrive for UNIX.
  The *Interoperability Matrix tool* has more information about the supported service packs.
  NetApp Interoperability Matrix Tool

Related information

NetApp Interoperability Matrix Tool
NetApp Support
Linux Unified Host Utilities 7.1 Installation Guide

Installing SnapDrive for UNIX

You can install SnapDrive for UNIX on the Linux host from the command-line interface.

Steps

1. Download the SnapDrive for UNIX for Linux installer from the NetApp Support Site *NetApp Downloads: Software* and copy the file to the Linux host.
2. Log in to the host system as the root user.

   If you are running the installer file remotely and if the system configuration does not allow you to log in as the root user, use the `su` command to log in as root user.
3. Navigate to the directory on your Linux host to which you have copied the installer.
4. Install SnapDrive for UNIX:

   `rpm -ivh installer_file_name`

Result

The SnapDrive daemon starts automatically after the installation.

```
Starting snapdrive daemon: Successfully started daemon
```

Verifying the installation

After you install SnapDrive for UNIX you must verify that the installation is successful. SnapDrive for UNIX installs multiple files on the host, such as executables, configuration files, uninstall files, diagnostic files, and man pages.

Steps

1. Verify that the `snapdrive.conf` file is located at `/opt/NetApp/snapdrive/` folder.
2. Verify that the SnapDrive for UNIX executables for a Linux operating system are installed in the following locations:
   - `/opt/NetApp/snapdrive/bin/snapdrive`
   - `/opt/NetApp/snapdrive/bin/snapdrived`
3. Verify that the SnapDrive for UNIX diagnostic files are installed in the `/opt/NetApp/snapdrive/diag` folder.
4. Verify that the SnapDrive for UNIX man pages are installed in the `/opt/NetApp/snapdrive/docs` folder.
5. Verify the details of the installed configuration components in the `/var/log/sdconfcheck.out` file.

Performing post-installation tasks

After the installation is complete, you must configure additional features and functions. You must install the server certificate and configure SnapDrive for UNIX to use a secure connection with the storage system and daemon service.

Steps

1. Install the server certificate that is used by SnapDrive for UNIX in the `sdu-daemoncertificate-path=/opt/NetApp/snapdrive/snapdrive.pem` location if you are using a secure connection with the storage system and daemon service.

   The certificate path is defined in the `sdu-daemoncertificate-path` configuration variable in the `snapdrive.conf` file.

2. Set *`use-https-to-sdu-daemon=on`* in the `snapdrive.conf` file to use HTTPS for a secure connection with the storage system and daemon service.

   Note: SnapDrive 5.0 for UNIX and later versions support HTTPS for daemon communication. By default, this optional parameter is disabled.

3. Restart the SnapDrive daemon service:

   `snapdrived start`

   Note: You must restart the SnapDrive daemon every time you manually change the configuration file.

Verifying Linux host configurations using the configuration checker tool

The configuration checker tool helps you to confirm that all the necessary components and correct versions are available in the Linux host before using SnapDrive for UNIX.

Importing data files

You can download the latest support matrix data and update the configuration checker tool before running the tool, so that the tool lists the latest supported configuration for SnapDrive for UNIX. The configuration checker tool with the updated data file checks for the configurations supported by SnapDrive for UNIX and lists all the supported components in the system.

Steps

1. Download the latest data file from the ToolChest.
2. Import the latest data file:

   `sdconfcheck import -file ./confcheck_data.tar.gz`

Related information

NetApp Downloads: SnapDrive for UNIX Configuration Checker

Verifying the supported configurations

You can verify the supported configurations in SnapDrive for UNIX by examining the components in the host system (such as, operating system, version of software installed on the host, protocol, file systems on the host, and so on) and the value specified for each configuration parameter in the `snapdrive.conf` file.

Step

1. Verify the supported configurations:

   `sdconfcheck check`

Example

```
[root@scspr0023764001 bin]# sdconfcheck check

NOTE: SnapDrive Configuration Checker is using the data file version
v12052013
  Please make sure that you are using the latest version.
  Refer to the SnapDrive for Unix Installation and Administration
Guide for more details.

Detected Intel/AMD x64 Architecture
Detected Linux OS
Detected sg3_utils 1.28
Detected Kernel Version 2.6.32-358.el6.x86_64
Detected LVM_SUPPRESS_FD_WARNINGS has not set
Detected Multipathing version 0.4.9
Detected /etc/multipath.conf file not found
Detected Host OS Red Hat Enterprise Linux 6.0 Update 4
```

```
Detected NFSv3 FileSystem on Linux
Detected Software iSCSI on Linux
Detected NFSv4 Filesystem on Linux
Detected   Ext4 File System
Detected   Linux Native LVM2
Detected   Linux Native MPIO

Did not find any supported cluster solutions.

Did not find any supported HU tool kits.

Trace-Enabled: on
Trace-Level: 7

Supported Configurations on this host by SDU Version 5.2.2
------------------------------------------------------------
Linux NFS Configuration
[root@scspr0023764001 bin]#
```

Check the components listed in the output and install or configure the missing components.

Provisioning storage

SnapDrive for UNIX enables you to provision storage and connect to an existing storage system by using command-line options from the host. You can also provision storage using Data ONTAP.

Provisioning volumes

Data ONTAP enables you to provision storage by creating a volume on the storage system and mounting the volume to the host with NFS protocol enabled.

Related information

Data ONTAP 8.2 Storage Management Guide For 7-Mode

Provisioning RDM LUNs

SnapDrive for UNIX enables you to create and provision RDM LUNs with the FC protocol enabled on a guest operating system in a VMware virtual environment. You can also provision RDM LUNs by using ONTAP.

Before you begin

- NetApp Virtual Storage Console (VSC) must be installed and configured with VMware vCenter™.
- The backup and recovery capability of NetApp Virtual Storage Console for VMware vSphere™ must be installed in the Windows operating system that is registered with vCenter™.
- `default-transport` must be set as `fcp` in the `snapdrive.conf` file, and the SnapDrive for UNIX daemon must be restarted.

Steps

1. Configure the guest operating system for creating an RDM LUN:

   `snapdrive config set -viadmin` ***`user viadmin_name`***

   - *`user`* is the name of the virtual interface system.
   - *`viadmin_name`* is the name of the IP address of the virtual interface system.

2. Verify the login information for Virtual Storage Console:

   `snapdrive config list`

   This command displays the user name or virtual interface that is specified in SnapDrive for UNIX.

3. Verify that the guest operating system can communicate with the storage system:

   `storage show -all` ***`command`***

4. Create an RDM LUN on the storage system:

   `snapdrive storage create -lun` ***`long_lun_name`*** **`-lunsize`** ***`size_of_the_lun`***

5. Connect the RDM LUN to the host:

   `snapdrive storage connect -lun` ***`long_lun_name`***

Related information

Virtual Storage Console, VASA Provider, and Storage Replication Adapter for VMware vSphere Administration Guide for 7.2 release

Data ONTAP 8.2 Storage Management Guide For 7-Mode

Connecting Linux hosts to storage systems

For successful SnapDrive for UNIX operations, you must set up your storage virtual machines (SVMs, formerly known as Vservers)

Before you begin

- You must have assigned the aggregates that contain volumes to the SVMs aggregate list to execute the SnapDrive for UNIX operations.
- You must have one or more SVMs created to serve data from the cluster.
  The IP address of the SVM management logical interface (LIF) must be mapped with the SVM name, either in the Domain Name Service (DNS) or in the `/etc/hosts` file.

Steps

1. If you are running ONTAP 8.2.2 or earlier, create a user on the cluster management server, also called adminSVM:

   `snapdrive config set -cserver` ***`csadmin_name cserver_name`***

   If you are running ONTAP 8.2.3 or later, then skip this step.

2. Create a user on the data SVM:

   `snapdrive config set`
   `vsadmin_name Vserver_name`

3. Verify that the SVM is configured in SnapDrive for UNIX:

   `snapdrive config list`

   The command lists the user name and IP address of the cluster management server and data SVM.

4. Modify the management interface path to the data interface path of the SVM:

   `snapdrive config set -mgmtpath` ***`management_interface_path data_interface_path`***

5. Verify that all data and management interfaces are configured properly:

   `snapdrive config list -mgmtpath`

Creating Snapshot copies

SnapDrive for UNIX when deployed as a stand-alone product uses NetApp Snapshot technology, which enables you to create and manage Snapshot copies of the host data. You can use the Snapshot copies to restore the data.

Related tasks

Creating a Snapshot copy on page 15
Verifying the Snapshot copy on page 15

Creating a Snapshot copy

You can create Snapshot copies of multiple file systems, host volumes, LUNs, or disk groups by using a single command while using storage area network (SAN) and NFS volumes in network-attached storage (NAS).

Step

1. Create a Snapshot copy:

   `snapdrive snap create -fs` ***`file_spec`*** **`-snapname`** ***`snapshot_copy_name`***

Verifying the Snapshot copy

You can verify your Snapshot copy by restoring the data.

For more information, see *SnapDrive 5.3.2 for UNIX Administration Guide for Linux*.

Where to go next

After configuring SnapDrive for UNIX and creating a Snapshot copy, you can perform a restore operation, connect a Snapshot copy, and create a clone. You can also explore other important SnapDrive features, such as role-based access control (RBAC), enhanced clone-splitting, and volume-based SnapRestore.

You can find more information about these features, as well as release-specific information about SnapDrive for UNIX, in the following documentation, available on the NetApp Support Site:

- *SnapDrive 5.3.2 for UNIX Administration Guide for Linux*
  Describes how to configure various features on SnapDrive for UNIX after the deployment is complete. Topics include how to configure igroups, configure SnapDrive for UNIX, configure RBAC, and use the data collection utility to diagnose issues with SnapDrive for UNIX.
- *SnapDrive 5.3.2 for UNIX Release Notes (AIX, Linux, and Solaris)*
  Describes new features, important cautions, known problems, and limitations for SnapDrive 5.3.2 for UNIX.
- *SnapManager 3.4 for Oracle Installation and Setup Guide for UNIX for Clustered Data ONTAP*
  Describes initial tasks you must perform to deploy SnapManager for Oracle with clustered-mode in UNIX environment. Topics include how to install and configure the product and how to back up the databases.
- NetApp Technical Report 4212: Best Practice Guide for SnapDrive for UNIX 5.3
  Describes SnapDrive for UNIX best practices.

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