NexentaStor 5.2
Installation Guide

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# Table of Contents

Table of Contents ....................................................................................................................... 2  
Preface ........................................................................................................................................ 3  
Intended Audience 3  
Document History 3  
1  
NexentaStor Overview ......................................................................................................... 4  
Reserved Ports 4  
2  
Installing NexentaStor .......................................................................................................... 6  
NexentaStor on Bare Metal ........................................................................................................ 6  
Prerequisites 6  
Installing NexentaStor from a CD-ROM 6  
Installing NexentaStor from a USB Flash Drive 6  
Installing NexentaStor from a Virtual CD-ROM Drive 6  
Installation Process 7  
NexentaStor on VMware ............................................................................................................ 8  
Prerequisites 8  
Installing NexentaStor from the OVA 9  
Installing NexentaStor from the ISO 9  
Preparing for NexentaStor VSA High Availability 10  
3  
NexentaStor Post-Installation Steps ................................................................................... 11  
Activating the License ............................................................................................................... 11  
4  
Upgrading to the Latest NexentaStor 5.x Version ................................................................ 13  
Setting Up Proxy 13  
With Internet Connection 13  
Without Internet Connection 14  
Upgrading to a Specific Release Other than the Latest ............................................................ 16  
Upgrading Clustered Nodes ...................................................................................................... 17  
Recovering Lost Cluster Configuration 20  
Exploring CLI ............................................................................................................................. 22  
Viewing Logs 22  
Updating System Passwords and Profile 22  
Exploring REST API .................................................................................................................... 24  
Additional Resources ................................................................................................................ 25
Preface

This documentation presents information specific to Nexenta products. The information is for reference purposes and is subject to change.

Intended Audience

This Admin Guide demonstrates the basic steps and commands for configuring and managing the NexentaStor 5.x on bare-metal or on VMware using the ISO or OVA.

This document includes the instructions to install NexentaStor and covers the following tasks:
- Ensure that the NexentaStor installation requirements are met.
- This document covers supported hardware and software versions and configurations.
- Deploy NexentaStor appliance in any of the following ways:
  - Upgrade to the latest version from a previously installed version.
  - Perform a new installation.
- Activate the product license.

For additional user documentation, see https://nexenta.com/products/documentation.

Document History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ns-5.2-installationguide-RevB</td>
<td>April, 2019</td>
<td>5.2.1 GA version</td>
</tr>
</tbody>
</table>
NexentaStor Overview

NexentaStor is a software-based storage appliance providing network-attached storage (NAS) and storage-attached network (SAN) solutions. NexentaStor supports file and block services and a variety of advanced storage features such as replication between various storage systems and unlimited snapshots. You can install NexentaStor either on a bare-metal server or in a virtualized environment and manage NexentaStor 5.x appliances with its Command Line Interface (CLI) and REST APIs, or with the NexentaFusion graphical user interface (GUI).

NexentaStor 5.x appliance uses the ports listed in Table 1. You must add these ports as exceptions when configuring your firewall to allow connections to the corresponding NexentaStor services.

Reserved Ports

Table 1: List of Network Ports for Firewall Rules

<table>
<thead>
<tr>
<th>Protocols and Services</th>
<th>Port Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incoming to NexentaStor Management Interface</td>
<td>TCP ports 22 (SSH), 6557, 5557, 8443 (REST API)</td>
</tr>
<tr>
<td>Outgoing from NexentaStor appliance</td>
<td>SNMP (UDP 161, 162), DNS (53 UDP/TCP), NTP (UDP 123), ICAP (port 1344)</td>
</tr>
<tr>
<td>Outgoing to Internet</td>
<td><a href="https://licensingservice.nexenta.com/">https://licensingservice.nexenta.com/</a> (443) (ssl)</td>
</tr>
<tr>
<td></td>
<td><a href="https://logcollector.nexenta.com">https://logcollector.nexenta.com</a> (443/20/21/7000-8000) (ssl/ftp)</td>
</tr>
<tr>
<td></td>
<td><a href="https://logcollector02.nexenta.com">https://logcollector02.nexenta.com</a> (443/20/21/7000-8000) (ssl/ftp)</td>
</tr>
<tr>
<td></td>
<td><a href="https://prodpkg.nexenta.com">https://prodpkg.nexenta.com</a> (443) (ssl)</td>
</tr>
<tr>
<td></td>
<td>For the list of updated URLs and IP addresses can be accessed from the support portal.</td>
</tr>
<tr>
<td></td>
<td>For Support bundles, Dial home, License activation and upgrades.</td>
</tr>
<tr>
<td>Outgoing to the mail server</td>
<td>TCP port 25 or 587 for relay only (SMTP)</td>
</tr>
<tr>
<td>Between the interfaces with the hpr.dataAddress for Replication Data Protocol</td>
<td>TCP port 6000 by default but can be changed</td>
</tr>
<tr>
<td>Between NexentaStor Management Interfaces of the clustered nodes</td>
<td>UDP and TCP port 1195</td>
</tr>
<tr>
<td>For data traffic on any data interfaces:</td>
<td></td>
</tr>
<tr>
<td>iSCSI Target</td>
<td>TCP port 3260</td>
</tr>
<tr>
<td>SMB</td>
<td>UDP ports: 137, 138, TCP ports 137, 139</td>
</tr>
<tr>
<td>CIFS</td>
<td>UDP and TCP port 445</td>
</tr>
<tr>
<td>Protocol</td>
<td>UDP Ports</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
</tr>
<tr>
<td>NFSv3</td>
<td>111, 2049, 4045, 32768-65535</td>
</tr>
<tr>
<td>NFSv4</td>
<td>TCP port: 2049</td>
</tr>
</tbody>
</table>
2 Installing NexentaStor

NexentaStor on Bare Metal

This section covers how to do a brand new installation of the NexentaStor software from the ISO. When using a bare-metal, you can install NexentaStor from any of the following devices:

- Internal CD-ROM
- External CD-ROM attached directly to the system
- USB/Flash Drive
- Virtual CD-ROM attached through IPMI

Prerequisites

Before installing NexentaStor 5.x on a bare-metal server, access the NexentaStor Hardware Certification List (HCL) to determine that you are using NexentaStor-compatible hardware.

Installing NexentaStor from a CD-ROM

When you load from an internal or external CD-ROM, the installation process is identical.

To install NexentaStor through an internal or external CD-ROM drive:

1. Download the NexentaStor image from the URL provided in the email.
2. Burn it onto a CD-ROM.
3. Set the system BIOS to load from the CD-ROM first.
4. Reboot the system.
5. Go to “Installation Process” to install NexentaStor.

Installing NexentaStor from a USB Flash Drive

When installing from a USB flash drive, ensure that the flash drive is large enough to store the image.

To install NexentaStor through a USB flash drive:

1. Download the NexentaStor image from the URL provided in the email.
2. Copy it onto a USB flash drive.
3. Set the system BIOS to load from the USB ports first.
4. Reboot the system.
5. Go to “Installation Process” to install NexentaStor.

Installing NexentaStor from a Virtual CD-ROM Drive

Virtual Media provides a virtual CD/DVD-ROM drive, which you can use to install NexentaStor from standard media from anywhere on the network.

To install NexentaStor through a virtual CD-ROM drive, using IPMI:

1. Set up the system with IPMI to create an IPMI server.
2. Download the NexentaStor CD image to the IPMI server, or a system that contains a CD-ROM that is sharable across the network.
3. Open a web browser and log in to IPMI.
4. Mount the CD-ROM as virtual media.
5. Set the system to boot from the virtual media first.
6. Reboot the system.
7. After installation, set the system to boot from the hard drive first.
8. Refer to the section “Installation Process” below to install NexentaStor.
Installation Process

This section provides instructions to deploy a new NexentaStor 5.x instance. To upgrade from an earlier version of 5.x to the latest, see the section Upgrading to the Latest NexentaStor 5.x Version.

The sequence of steps to install the NexentaStor image is outlined below.
1. Boot the host from the ISO image.
2. Select the language that matches your keyboard layout.
3. Read and accept the End User License Agreement (EULA).
4. Follow the screen prompts to complete installation.
5. Proceed with the manual installation that walks you through a small set of questions to select devices for the root pool, configure management network interfaces, set passwords, and so on.

Profile Based Installation

Profile based installation provides a way to upload a pre-defined response file to skip the interactive questions during the installation of NexentaStor. Choose this method to fully automate the installation process. For more information on the format of the response file, please contact Nexenta support services.

Nexenta offers two types of profile for the root pool:
- Single disk – Choose this if you want the NexentaStor installed on a single disk.
- Mirror – Choose this option if you want the NexentaStor appliance to be mirrored on another disk.

Here is an example of the response file:

```json
{
   "nef": {
      "node": "atomic"
   },
   "networking": {
      "interfaces": [
         {
            "adapter": "e1000g0",
            "address": "172.27.10.32/255.255.255.0"
         }
      ],
      "gateway": "172.27.10.1",
      "server1": "172.27.10.2",
      "server2": "172.27.10.3"
   },
   "storage": {
      "target": ["mirror","c1t0d0","c1t1d0"]
   },
   "general": {
```
"nef_optimization_profile": "generic",
"admin_pass": "Password@1",
"replication_pass": "Password:1",
"hostname": "nexenta",
"timezone": "PST"
},
"install": {
    "reboot_cmd": "reboot",
    "manual_reboot": "no"
}

Note: Contact Nexenta Support service to customize this response file for your environment.

NexentaStor on VMware

This section covers how to do a brand new installation of the NexentaStor software in a VMware virtual machine. This can be accomplished using either:
- Standard NexentaStor ISO image, or
- Open Virtual Appliance (OVA) for NexentaStor Virtual Storage Appliance (VSA)

Prerequisites

Supported VMware Versions
VMware ESXi 6.0 and later

Minimum Virtual Machine Configurations
The following minimum requirements apply to ISO deployments. OVA deployments programmatically comply with the Enterprise configuration.

Community
- Guest OS: Oracle Solaris 11 64-bit
- One single core CPU
- 4GB RAM
- One 16GB virtual disk for the OS installation
- SCSI Controller: LSI Logic Parallel – Default Settings
- One NIC (VMXNet3) for storage services and management

Enterprise
- Guest OS: Oracle Solaris 11 64-bit
- Two single core CPUs
- At least 8GB RAM is recommended
- One 80GB virtual disk for the OS installation
- Three or more virtual disks for pool creation
- SCSI Controller: LSI Logic Parallel – Default Settings
- Two NICs (VMXNet3): Separate NICs for management and storage services

Note: Production deployments must comply with the Enterprise configuration minimums.
Installing NexentaStor from the OVA

Deployment of the OVA can be done through the VMware vCenter web UI. Note that in the event of a slower connection to the internet, the OVFTool will be needed to avoid a timeout.

To install NexentaStor through VMware vCenter:
1. Log in to VMware vCenter Web UI.
2. Navigate to Hosts and Clusters.
3. Right-Click on any cluster and select “Deploy OVF Template”.
4. Enter the URL for the NexentaStor VSA found under the VMware section on http://nexenta.github.io
5. Accept the SSL Certificate.
6. Set the VM Name and Location.
7. Select the appropriate compute resources, it is advised to deploy on a HA enabled vSphere cluster.
8. Choose your configuration size. This will set the vCPU, Memory and initial drive sizes.
9. Select the storage location and drive type.
10. Choose your data and management networks. These networks should reside on different subnets.
11. Confirm the initial drive size. These VMDK can be edited prior to pool creation or removed post install when deploying a HA Cluster second node.
12. Complete the wizard and the new VSA will be listed in your vCenter Inventory.
13. Power On the VSA.
14. Open VM console and log into NexentaStor using the default password Psswd1234.
15. Complete the basic appliance configuration through the interactive question session by running the following command:

   CLI@VSA> system setup

   Now you will be prompted with configuration questions to complete the initial configuration. The default entries will be listed in square brackets. To choose the default entry, skip to the next question leaving a blank space.

Installing NexentaStor from the ISO

To install NexentaStor through VMware vCenter:
1. Log in to VMware vCenter Web UI.
2. Navigate to Hosts and Clusters.
3. Create a new Virtual Machine:
   - Select Oracle Solaris 11 64-bit Operating System.
   - Specify Memory and CPU.
   - Add two network interfaces.
     Choose VMXNet3. They should be on separate subnets dedicated for management/client data.
   - Add VMDKs (if you plan to configure HA you must have shared storage, you should have at least 2 VMDKs per pool).
4. Select NexentaStor ISO for virtual CD ROM.
5. Power On the VSA.
6. Open VM console.
7. Select the language that matches your keyboard layout.
8. Read and accept the End User License Agreement (EULA).
9. Follow the screen prompts to complete installation.
10. Proceed with the manual installation that walks you through a small set of questions to select devices for the root pool, configure management network interfaces, set passwords, and so on.
Preparing for NexentaStor VSA High Availability

Deployment of an HA Cluster requires two VSAs to be created with shared VMDKs. The VSAs should be set on different ESXi Hosts with affinity rules set within VMware to not allow them to co-exist on the same ESXi host.

Preparing Virtual Machines
You must configure the appliances to see the shared VMDK using the steps below.

1. Power Off VSA 1 and VSA 2.
2. Edit Settings on VSA 1.
3. Add new device: SCSI Controller 1; configure the SCSI controller to be an LSI Logic Parallel controller with Bus Sharing set physical.
4. Remove all the non shared VMDK drives except the boot drive.
5. Create new VMDKs to be shared, these disks must be configured as Thick Provisioned-Eager Zero and connected to SCSI Controller 1.
6. Edit Settings on VSA 2.
7. Add new device: SCSI Controller 1; configure the SCSI controller to be an LSI Logic Parallel controller with Bus Sharing set physical.
8. Remove all the non shared VMDK drives except the boot drive.
9. Add new device: Existing Hard Disk; point to the VDMKs on VSA 1 that were created as part of Step 4; select each shared VMDK individually and confirm it is connected to SCSI Controller 1.
10. Power On both VSAs and follow the instructions for configuring a HA Cluster.
3 NexentaStor Post-Installation Steps

Activating the License

To use NexentaStor, you must activate a license. NexentaStor supports either online or offline license activation. The online activation process uses the activation key you received from Nexenta Systems.

Nexenta offers 2 main license types for NexentaStor 5.x:

- **Enterprise Edition.** This perpetual license is sold based on total raw capacity in the system and includes core storage features such as file service, iSCSI service, snaps, clones, inline data reduction and schedule replication. It also includes the right to use NexentaFusion as the Graphical User Interface for the licensed system. Additional options (e.g. HA cluster, MetroHA, FC support, etc.) are sold separately.

- **Community Edition.** This license is provided free of charge and can be used in non-production environments. It includes a limited set of features (no HA, no MetroHA, no replication for example) and limits how much capacity can be allocated on the system. All support issues must be handled through the Nexenta community forums.

**To activate the license online:**

Use online license installation if the deployment node has access to the Internet. You enter the activation key with the `license activate` command. `license activate <Activation Token>` contacts the Nexenta license server, which uses the activation key to generate your license. This command downloads your license and installs it in the system.

1. To activate the license on each NexentaStor appliance, use the following command.

   ```bash
   CLI@nexenta> license activate <Activation Token>
   ```

2. Scroll to the end of the license agreement by using the scroll bar and type `y` to agree to the license agreement.

3. You can view the license attributes with the command below. Table 2 lists the significant license attributes.

   ```bash
   CLI@nexenta> license show
   ```

**To activate the license offline using the REST API:**

Use offline license installation if the deployment node does not have access to the Internet.

1. Log in to the NexentaStor deployment node.
2. Display the system GUID using the following command.

   ```bash
   CLI@nexenta> config list | grep -iRn guid
   ```
3. From a system that has access to the internet log into the Nexenta self-service portal (https://portal.nexenta.com) to enter the System GUID to generate and download the license file.

4. Save the license as a text file in a location where it is accessible from the deployment node or load onto the deployment node.

5. Verify if the swagger API documentation is enabled.
   
   CLI@nexenta> config get all rest.useSwagger

6. Enable the swagger API documentation if it is not enabled.
   
   - Log in to the CLI as admin.
   - Run the following command:
     
     CLI@nexenta> config set rest.useSwagger=true

7. Open a browser and connect to the swagger API documentation through https://<management IP>:8443/docs.

8. Login as admin on the swagger API documentation interface.

9. Navigate to the Settings section and click on post method settings/system license.

10. Click on Choose file and upload the license file.

11. Click on Try it out.

12. Successful application will return OK.

13. Check if license is activated by running CLI@nexenta> license show.

14. Optionally, disable swagger API documentation. Note: Best practice is to not enable swagger in a production environment. Regardless of whether the swagger API documentation interface is enabled or not, the API is always available for use.

### Table 2: License Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expiration date</td>
<td>The date when the license expires. The trial license is limited to 45 days from the activation date. When the license expires: ‘READ’ operations in CLI like the show or list commands will continue to work. However, you will be blocked from performing any configuration change to the system using the REST API or CLI. In the NexentaFusion GUI, the appliance will be greyed-out from the appliance list blocking any drill-down operations to view and modify configurations.</td>
</tr>
<tr>
<td>Capacity limit</td>
<td>Refers to the total licensed maximum capacity limit, including hot spares, log and cache devices. When you reach the limit, you will not be able to create or import new pools, or add devices to existing pools. However, IO will continue.</td>
</tr>
<tr>
<td>Subscription</td>
<td>Refers to the maintenance period when you are entitled to receive software upgrades and fixes from Nexenta.</td>
</tr>
<tr>
<td>Features</td>
<td>Lists the features enabled in the NexentaStor ISO. For example: highAvailability, fibrechannel, continuousReplication, allFlash Obtain the allFlash license if you want to configure an all-flash pool.</td>
</tr>
</tbody>
</table>
4 Upgrading to the Latest NexentaStor 5.x Version

You can upgrade to the latest version from an earlier NexentaStor 5.x version using the steps described here.

1. Check the current version of the NexentaStor by running the following command.
   
   CLI@nexenta> software version
   
   Note the current version number to validate later that the upgrade completed successfully.

2. Verify if there are any updates available.
   
   CLI@nexenta> software updates
   
<table>
<thead>
<tr>
<th>VERSION</th>
<th>PACKAGINGDATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2.1</td>
<td>Mar 8 03:50:34</td>
</tr>
</tbody>
</table>

Setting Up Proxy

3. Configure the proxy server if you need to use one to access the repositories for upgrading NexentaStor software packages.
   
   CLI@nexenta> config set system.webProxy = http://example.com:8443
   
   To view the proxy server that you set up:
   
   CLI@nexenta> config list system.webProxy
   
   If you need to unset the proxy:
   
   CLI@nexenta> config reset system.webProxy

With Internet Connection

4. The upgrade process grabs the images from the following locations, bypassing the need to download images. Make sure that you can reach the location specified here.
   
   CLI@nexenta> publisher list
   
<table>
<thead>
<tr>
<th>PUBLISHER</th>
<th>STATUS</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>nexenta</td>
<td>online</td>
<td><a href="https://prodpkg.nexenta.com/nstor/pkg5/">https://prodpkg.nexenta.com/nstor/pkg5/</a></td>
</tr>
<tr>
<td>HighAvailability</td>
<td>online</td>
<td><a href="https://prodpkg.nexenta.com/thirdparty/HAC/rsf/pkg5/">https://prodpkg.nexenta.com/thirdparty/HAC/rsf/pkg5/</a></td>
</tr>
</tbody>
</table>

5. Upgrade to the latest version from an earlier NexentaStor 5.x version.
   
   CLI@nexenta> software upgrade
   
   By default, this allows you to upgrade to the latest version.

6. Reboot once the upgrade completes.
7. Or to reboot automatically once the upgrade has successfully completed, use the \(-y\) option along with the upgrade command.

   CLI@nexenta> software upgrade \(-y\)

   Note: Upgrading from NexentaStor 4.0.x to 5.x is not supported.

8. Verify that you have successfully upgraded to the latest version. The system output shows the expected version number as in the following example.

   CLI@nexenta> system status
   Host name                   ANS5QA40-1
   Version                     5.2.1
   Cluster name                Not clustered
   Management IP address       10.3.199.163:8443

9. Confirm that the upgrade version is activated and to see your boot environment list.

   CLI@nexenta> software list
   NAME        SPACE  ACTIVENOW  ACTIVEAFTERREBOOT  CREATIONTIME
   nexenta     6.3M   no         no                 Sep  6 16:29:04
   nexenta-1   2.77G  yes        yes                Sep 19 15:02:56

10. Reboot the appliance.

11. Validate the software version.

   CLI@nexenta> software version
   PUBLISHER  VERSION    PACKAGINGDATE
   nexenta    5.2.1      Mon May 6 08:49:24 2017

## Without Internet Connection

Upgrading without an internet connection requires the use of a special dark site upgrade ISO, available from support@nexenta.com.

Once you have the dark site upgrade ISO, you can either:
- mount the ISO through IPMI management console, or
- create a loadable DVD to be used for the upgrade.

### Using Loadable Image into the DVD Slot

1. Log in to the NexentaStor node that does not have internet connection.
2. Load the DVD you created from the loadable image into the DVD Slot.

   The ISO gets mounted automatically.

### Using IPMI Management Console

1. Log in to the NexentaStor node that does not have internet connection.
2. Log in to the IPMI management console and mount the ISO file through virtual media.

### Verify Availability of Media

   CLI@nexenta> publisher discover
   MEDIA   PUBLISHER         LOCATION
   NS_UpgradeCD   nexenta           /media/NS_UpgradeCD/nexenta
   NS_UpgradeCD   HighAvailability /media/NS_UpgradeCD/rsf
To upgrade the NexentaStor ISO:

1. From the CLI, update the publisher origin.
   Destroy the current publisher first.
   
   CLI@nexenta> publisher destroy <publisher of the repository to remove>
   Example:
   CLI@nexenta> publisher destroy nexenta
   CLI@nexenta> publisher destroy HighAvailability

2. Set the publisher to pick the ISO from the dark site DVD.
   CLI@nexenta> publisher create nexenta /media/NS_UpgradeCD/nexenta

3. Set the publisher to pick the HighAvailability image from the dark site DVD.
   CLI@nexenta> publisher create HighAvailability /media/NS_UpgradeCD/rsf

4. Verify the publisher list.
   CLI@nexenta> publisher list
   
   PUBLISHER         STATUS  LOCATION
   nexenta           online  file:////media/NS_UpgradeCD/nexenta
   HighAvailability  online  file:////media/NS_UpgradeCD/rsf

5. Now dry-run the upgrade.
   CLI@nexenta> software upgrade -n
   Would perform upgrade from version 5.0.0.43.1 to 5.2.1

6. Validate that the upgrade is in place.
7. Now run the actual upgrade.
   
   CLI@nexenta> software upgrade
   By default, this allows you to upgrade to the latest version.

8. Reboot once the upgrade completes.
9. Or to reboot automatically once the upgrade has successfully completed, use the –y option along with the upgrade command.
   CLI@nexenta> software upgrade -y

10. Validate the software version.
    
    CLI@nexenta> software version
    
    PUBLISHER  VERSION    PACKAGINGDATE
    nexenta    5.2.1      Mon Nov 6 08:49:24 2018
Upgrading to a Specific Release Other than the Latest

This section is applicable for 5.0.3-FP1 and later users looking to upgrade to a specific release. The following example shows a 5.0.3-FP1 user upgrading to a specific release 5.1.2-FP1.

1. To upgrade to a specific version, first verify if there are any updates available.
   ```
   CLI@nexenta> software updates -v
   
   VERSION    PACKAGINGDATE
   5.1.2-FP1  Sep 26 22:43:07
   5.2.0-FP1  Nov  2 07:19:57
   ```

2. Specify the software version number you want to upgrade to as an argument in the following command. If you do not specify a particular intermediate software version number `<version>` in the following command, the upgrade procedure will default to the latest version.
   ```
   CLI@nexenta> software upgrade <version>
   
   Example:
   ```
   CLI@nexenta> software upgrade 5.1.2-FP1
   ```

3. Reboot once the upgrade completes.
4. Or to reboot automatically once the upgrade has successfully completed, use the --y option along with the upgrade command.
   ```
   CLI@nexenta> software upgrade 5.1.2-FP1 --y
   
   Upgrading system software...
   
   Upgrade done.
Upgrading Clustered Nodes

This example shows two pools (PoolA and PoolB) with PoolA on NodeA and PoolB on NodeB and HA services (PoolA) running on NodeA and HA service (PoolB) running on NodeB.

The section covers the following steps:

1. Failover a HA service (PoolA) running on NodeA to NodeB.
2. Upgrade NodeA.
3. Failover the HA service (PoolA) back to NodeA and the HA service (PoolB) to NodeA after upgrading NodeA.
4. Now upgrade Node B.
5. Move the service back to its original configuration.

To upgrade the clustered nodes:

1. List the HA services running on the clustered nodes.

```
CLI@NodeA> haservice list
NAME    DESCRIPTION       NODES        RUNNING  STOPPED  BROKEN
poolA   myclusterservice  NodeA,NodeB   NodeA     NodeB    -
poolB   testclusterservice NodeA,NodeB  NodeB    NodeA   
```

2. Verify the existing pools on both the nodes.

```
CLI@NodeA> pool list
NAME   SIZE    ALLOC   FREE   AVAIL  DEDUP  EXPANDSZ  FRAG  HEALTH
poolA  9.63G   100.2M  9.53G  99%    1.00x  -         0%    ONLINE
rpool  12.47G  7.41G   5.06G  41%    1.00x  -         26%   ONLINE

CLI@NodeB> pool list
NAME   SIZE    ALLOC   FREE   AVAIL  DEDUP  EXPANDSZ  FRAG  HEALTH
poolB  9.63G   100.2M  9.53G  99%    1.00x  -         0%    ONLINE
rpool  12.47G  7.41G   5.06G  41%    1.00x  -         26%   ONLINE
```

3. Failover the HA service running on NodeA to the other node (NodeB) in the cluster.
4. The example here shows one cluster service running on NodeA. If you have more than one service on the node, when failing over all the services will fail over to the other node in the cluster.

```
CLI@NodeA> haservice failover <from-node> <to-node>
Example:
CLI@NodeA> haservice failover NodeA NodeB
System response:
The following services can be moved:
PoolA
Move 1 service(s) from node ‘NodeA’ to node ‘NodeB’? [y/N] y
Moving service 'PoolA' ... OK
All running services have been successfully moved.

Now the HA Service failed over to NodeB and the poolA imported to NodeB.
```

5. From NodeA or NodeB, verify that the HA Service failed over to NodeB.

```
CLI@NodeB> haservice status
System response:
service: PoolA
```
NODE      STATUS   MODE    UNBLOCKED
NodeA     stopped  manual  yes
NodeB     running  manual  yes

service:  PoolB
NODE      STATUS   MODE    UNBLOCKED
NodeA     stopped  manual  yes
NodeB     running  manual  yes

6. From NodeB, verify that the PoolA from NodeA imported to NodeB.
   CLI@NodeB> pool list
   NAME   SIZE    ALLOC   FREE   AVAIL  DEDUP  EXPANDSZ  FRAG  HEALTH
   poolA  9.63G   100.2M  9.53G  99%    1.00x  -         0%    ONLINE
   poolB  9.63G   100.2M  9.53G  99%    1.00x  -         0%    ONLINE
   rpool  12.47G  7.41G   5.06G  41%    1.00x  -         26%   ONLINE

7. Now upgrade NodeA. Before the actual upgrade, do a dry run to ensure that you are upgrading to the intended version.
   CLI@NodeA> software upgrade -n
   System response:
   Would perform upgrade from version 5.2-FP1 to 5.2.1

8. Now run the actual upgrade.
   CLI@nexenta> software upgrade
   By default, this allows you to upgrade to the latest version.

9. Reboot once the upgrade completes by typing y when prompted.
10. Or to reboot automatically once the upgrade has successfully completed, use the --y option along with the upgrade command.
    CLI@nexenta> software upgrade --y

11. Confirm that the upgrade version is activated and to see your boot environment list.
    CLI@NodeA> software list
    NAME           SPACE  ACTIVENOW  ACTIVEAFTERREBOOT  CREATIONTIME
    nexenta        6.3M   no         no                 Feb  1 16:29:04
    nexentastor-1  2.77G  no          yes                Feb  6 15:02:56

12. Validate the software version.
    CLI@NodeB> software version
    PUBLISHER  VERSION    PACKAGINGDATE
    nexenta    5.2.1      Mon Feb 6 08:49:24 2017

13. From NodeB verify that the NodeA is listed in the cluster after upgrading NodeA.
    CLI@NodeB> hacluster status
    == Cluster status ==
<table>
<thead>
<tr>
<th>NAME</th>
<th>STATUS</th>
<th>NODES</th>
<th>SERVICES</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>GACluster</td>
<td>ok</td>
<td>2/2</td>
<td>1/1</td>
<td>5.2 HA Cluster</td>
</tr>
</tbody>
</table>

== Nodes ==

<table>
<thead>
<tr>
<th>NODE</th>
<th>STATUS</th>
<th>SERVICES</th>
<th>ADDRESS</th>
<th>HostId</th>
<th>Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>NodeA</td>
<td>up</td>
<td>0/1</td>
<td>10.3.65.9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>NodeB</td>
<td>up</td>
<td>1/1</td>
<td>10.3.65.8</td>
<td>808b556b</td>
<td>3.12.0</td>
</tr>
</tbody>
</table>

14. After NodeA is upgraded, failover the service back to NodeA from NodeB using the following command on NodeB:

   CLI@NodeB> haservice failover NodeB NodeA

15. Now verify from NodeA that the HA Service (PoolA) is up and running on NodeA.

   CLI@NodeA> haservice status

   System response:
   service: PoolA
   NODE   STATUS | MODE | UNBLOCKED |
   NodeA running manual yes
   NodeB stopped manual yes

   service: PoolB
   NODE   STATUS | MODE | UNBLOCKED |
   NodeA running manual yes
   NodeB stopped manual yes

16. Also verify that the pools moved from NodeB to NodeA.

   CLI@NodeA> pool list

<table>
<thead>
<tr>
<th>NAME</th>
<th>SIZE</th>
<th>ALLOC</th>
<th>FREE</th>
<th>AVAIL</th>
<th>DEDUP</th>
<th>EXPANDSZ</th>
<th>FRAG</th>
<th>HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>poolA</td>
<td>9.63G</td>
<td>100.2M</td>
<td>9.53G</td>
<td>99%</td>
<td>1.00x</td>
<td>-</td>
<td>0%</td>
<td>ONLINE</td>
</tr>
<tr>
<td>poolB</td>
<td>9.63G</td>
<td>100.2M</td>
<td>9.53G</td>
<td>99%</td>
<td>1.00x</td>
<td>-</td>
<td>0%</td>
<td>ONLINE</td>
</tr>
<tr>
<td>rpool</td>
<td>12.47G</td>
<td>7.41G</td>
<td>5.06G</td>
<td>41%</td>
<td>1.00x</td>
<td>-</td>
<td>26%</td>
<td>ONLINE</td>
</tr>
</tbody>
</table>

17. Now upgrade NodeB.

   CLI@nexenta> software upgrade

   By default, this allows you to upgrade to the latest version.

18. Reboot once the upgrade completes.
19. Or to reboot automatically once the upgrade has successfully completed, use the --y option along with the upgrade command.

   CLI@nexenta> software upgrade --y

   Upgrading system software...

   Upgrade done.

   On the next boot the Boot Environment NexentaStor-5.2.1 will be mounted on /.
20. Confirm that the upgrade version is activated and to see your boot environment list.

    CLI@NodeB> software list

    NAME           SPACE  ACTIVENOW  ACTIVEAFTERREBOOT  CREATIONTIME
    nexenta        6.3M   no         no                 Sep  6 16:29:04
    nexentastor-1  2.77G  no         yes                Sep 19 15:02:56

21. From NodeA verify that the NodeB is back in the cluster after upgrading NodeB.

    CLI@NodeA> hacluster status
    == Nodes ==
    NODE      STATUS  SERVICES  ADDRESS    HostId    Release
    NodeA     up     1/1       10.3.65.9  -         -
    NodeB     up      0 /1       10.3.65.8  808b556b  3.12.0

22. From NodeA move PoolB back to NodeB so the cluster is back in its original configuration with PoolA on NodeA and PoolB on NodeB.

    CLI@NodeB> haservice move <service> Node B
    Example:
    CLI@NodeB> haservice move PoolB NodeB

23. Now verify from both the nodes that the HA service is up and running from their original configuration. Run the following commands from both the nodes.

    CLI@NodeA> haservice status
    CLI@NodeB> haservice status

    CLI@NodeA> haservice list
    NAME   GUID                    VIPs  NODES        RUNNING  STOP
    poolA  14089758145006079395    Avip  NodeA,Node B  NodeA    NodeB

    CLI@NodeB> haservice list
    NAME   GUID                    VIPs  NODES        RUNNING  STOP
    poolB  14089758145006079395    Avip  NodeA,NodeB  NodeA    NodeB

Recovering Lost Cluster Configuration

When you upgrade, if the cluster configuration is lost as shown in the examples below, run the “hacluster recover” command to recover the cluster settings.

    CLI@rsf-k1> haservice list

    No cluster defined

    CLI@rsf-k1> hacluster status

    No cluster defined
To recover the cluster configuration, run the following command.

CLI@rsf-k1> hacluster recover

Recover cluster database? [y/N] y
Exploring CLI

To start executing the NexentaStor CLI commands:

1. Log in using **admin** and the password you set during installation.
2. Type **help** to see the list of available CLI commands and utilities.
3. Type **man <command>** to see the man page for a specific command.
4. Type **<command> <subcommand> --help** to see usage information on a specific subcommand.

Viewing Logs

The following commands will help you troubleshoot your NexentaStor deployment:

- **CLI@nexenta> journal list -o name,file** - to list installation and syslog message logs.
  
<table>
<thead>
<tr>
<th>NAME</th>
<th>FILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>install/caiman</td>
<td>/var/log/install/install_log</td>
</tr>
<tr>
<td>install/nef</td>
<td>/var/log/install/nef_log</td>
</tr>
<tr>
<td>install/messages</td>
<td>/var/log/install/messages</td>
</tr>
<tr>
<td>messages</td>
<td>/var/adm/messages</td>
</tr>
</tbody>
</table>

- **CLI@nexenta> config list** - to view values for the system parameters
- **CLI@nexenta> software version** and **software list** - to query what version of NexentaStor was installed and whether it is activated
- **CLI@nexenta> license show** - to display license terms
- **CLI@nexenta> system status** - to get a summary of system metrics

Updating System Passwords and Profile

Following are the two system profiles available for enhancing performance on an appliance:

- **Default**: This is the default system profile for Hybrid and All-Disk configurations.
- **allFlash**: This profile is to be used for All-flash configurations.

Should you want to change the values for the following entities from the values you entered during installation, using these commands:

- **CLI@nexenta> profile show** Lists all the available appliance profiles.
  
<table>
<thead>
<tr>
<th>NAME</th>
<th>ACTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>allFlash</td>
<td>False</td>
</tr>
<tr>
<td>default</td>
<td>True</td>
</tr>
</tbody>
</table>

- **CLI@nexenta> profile activate <profile name>** Selects a different system profile. Values are Default for hybrid or all-HDD systems, or AllFlash to use preset kernel settings to optimize performance for an all-SSD appliance.

- **CLI@nexenta> user passwd -p <passwd> <username>** Resets the admin user password.

- **CLI@nexenta> hpr password-set -password=<string>** Resets the replication password. The replication password must be the same for all nodes in the replication group for the data protection feature to work.
Note: Passwords should be at least 9 characters long and contain at least 3 of the following classes of characters: lowercase, uppercase, numeric, and special (for example, !, @, CLI@nexenta>, $, %, ^). Passwords should not be based on English dictionary or slang words, nor English first names or surnames.

To change to an User password that overrides the strict password policy:

In order to change to a password that overrides the strict password policy, you must use an additional parameter -i.

```
user passwd -p <new weak password> -i admin
```
Exploring REST API

Once you successfully installed NexentaStor, you can get online access to the swagger API documentation using the static IP address you set up during the NexentaStor installation.

Note: The swagger API documentation is a developmental tool and access is disabled by default. Enabling access in a production environment is not recommended.

If you must enable access to the detailed swagger API documentation, follow these steps:

1. Run `config set rest.useSwagger=true` (case-sensitive parameter)
   
   Enabling swagger access in a production environment is not recommended. Regardless of whether the swagger documentation interface is enabled or not, the API is always available for use.

2. Point your browser to `https://<NexentaStorStaticIpAddress>:8443/docs/`
Additional Resources

After installing NexentaStor 5.2 and NexentaFusion 1.2.1, use the resources listed in Table 4 for more information. These documents are posted in https://nexenta.com/products/documentation.

NexentaStor & NexentaFusion Product Guide
This document includes an overview of NexentaStor and its core components, describes key features, and provides relevant CLI commands. This manual is intended as a guide to NexentaStor concepts and not as a configuration guide.

NexentaStor 5.x Hardware Certification List (HCL)
This document provides a list of certified hardware for NexentaStor 5.x and is intended for Nexenta Partners and Nexenta customer-facing organizations. The latest version of Nexenta Hardware Certification List (HCL) is posted on Partner Portal.

NexentaStor 5.2 Installation Guide - RevB
This document includes the instructions to install and upgrade NexentaStor.

NexentaStor 5.2 CLI Configuration Guide - RevB
This guide demonstrates the basic steps and commands to configure and manage NexentaStor 5.2 appliances. Use this document in conjunction with the NexentaStor 5.2 CLI Reference Guide, and the NexentaStor 5.2 HA CLI Admin Guide.

NexentaStor 5.2 CLI Reference Guide - RevB
This reference guide provides a summary of the CLI commands. Use it in conjunction with the NexentaStor 5.2 CLI Configuration Guide.

NexentaStor 5.2 HA CLI Configuration Guide - RevB
This guide demonstrates the basic steps and commands to configure and manage the NexentaStor 5.2 High Availability (HA) cluster using the NexentaStor 5.2 Command Line Interface (CLI).

NexentaStor 5.2 vCenter Plugin QuickStart - RevB
This guide includes instructions to install NexentaStor 5.2 vCenter Web Client Plugin (vCenter Plugin), which enables VMware customers to configure and manage storage and virtualization through a single interface. You can use this plugin to access summary and detailed analytics and real time status monitoring of single and clustered NexentaStor appliances.

NexentaStor 5.2 High Performance Replication (HPR) User Guide - RevB
This document demonstrates how to configure High Performance Replication (HPR) to replicate datasets using the NexentaStor Command Line Interface (CLI) and using the NexentaFusion GUI. For details on the list, see portal.nexenta.com.

NexentaFusion 1.2 Installation Guide - RevB
This document includes the instructions to install and upgrade NexentaFusion.

NexentaFusion 1.2 User Guide - RevB
This documentation provides easy to follow step-by-step instructions for common configuration and monitoring tasks.

Multi-Tenant File Services NexentaStor 5.2 CLI User Guide - RevB
This guide demonstrates the basic steps and includes tenant specific commands to create a tenant and manage its resources from a host storage system as a host admin.