NetApp

3. Deploy the Element Storage System on the HCI Storage Nodes: NetApp HCI with RHV

NetApp Solutions

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Basic NetApp Element Storage Setup

NetApp Element cluster setup is performed in a manner similar to a standalone NetApp SolidFire storage setup. These steps begin after the nodes have been racked, and cabled, and the IPMI port has been configured on each node using the console. To setup a storage cluster, complete the following steps:

1. Access the out-of-band management console for the storage nodes in the cluster and log in with the default credentials ADMIN/ADMIN.

2. Click the Remote Console Preview image in the center of the screen to download a JNLP file launched by Java Web Start, which launches an interactive console to the system.
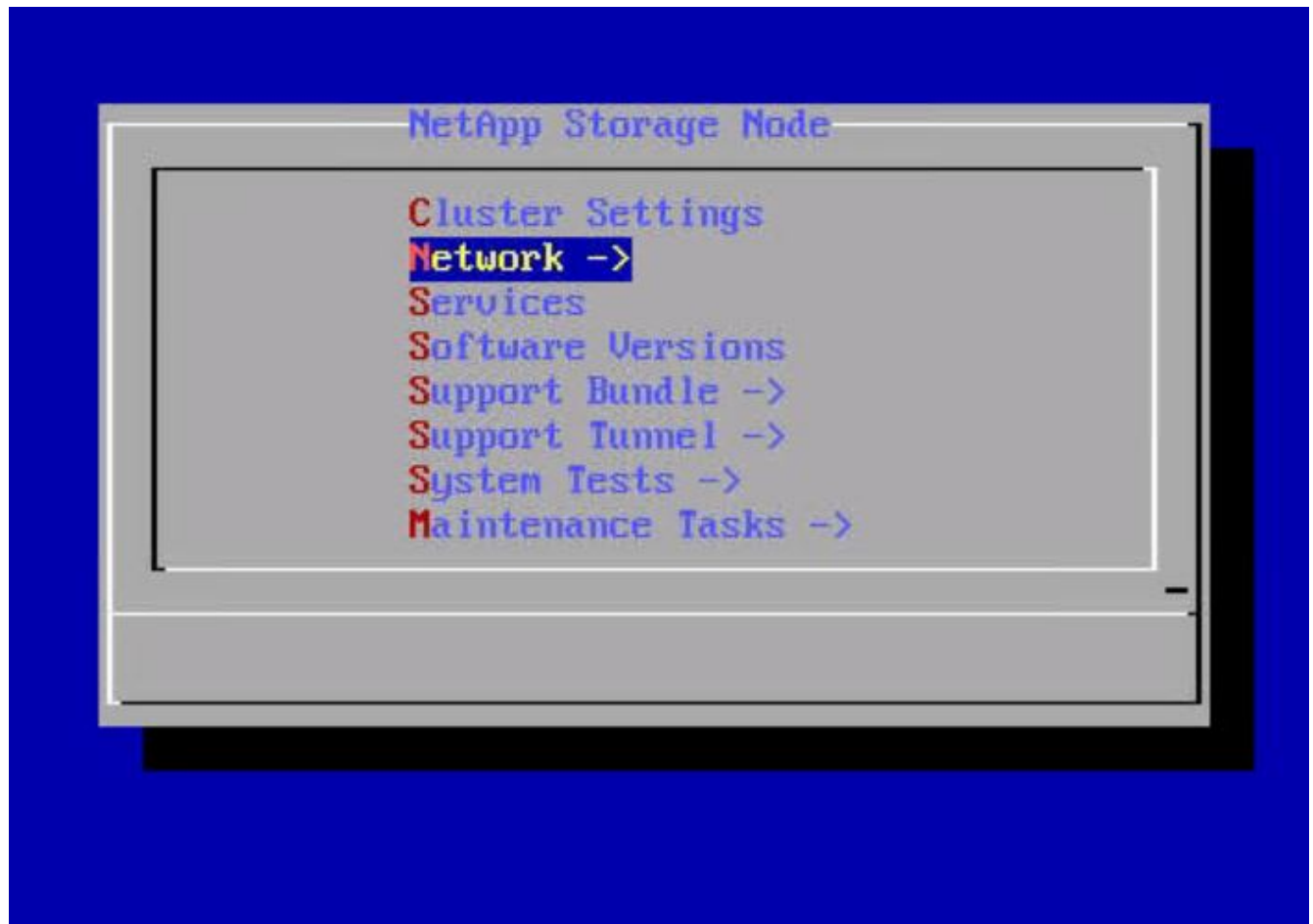
3. Navigate to Network > Network Config > Bond1G (Management) and configure the Bond1G interface. The Bond1G interface should be in ActivePassive bond mode and must have an IP, a netmask, and a gateway set statically. Its VLAN must correspond to IB Management network and DNS servers defined for the environment. Then click OK.

```
NetApp Storage Node -> Network -> Network Config -> Bond1G
-------------------------------------------------------------
Hit 'tab' to navigate between the form and buttons. Use ↑/↓ to
navigate between fields. Start typing or hit ←/→ to enter the
field to make changes. Press 'enter' with a field selected, or hit
'tab' then 'enter' to submit all pending changes.
* denotes required fields.

Method:              static
Link speed:          1000
*IPv4 Address:       10.63.172.136
*IPv4 Subnet_Mask:   255.255.255.0
*IPv4 Gateway:       10.63.172.1
Mtu:                 1500
Dns:                 10.61.184.251, 10.61.184.252
Domains:             cie.netapp.com
IPv6 Address:
IPv6 Gateway:
*Bond mode:          ActivePassive
*Status:             UpAndRunning
Vlan:                1172


        <  OK  >          <Cancel>         < Help >
```

4. Select Bond10G (Storage) and configure the Bond10G interface. The Bond 10G interface must be in LACP bonding mode and have the MTU set to 9000 to enable jumbo frames. It must be assigned an IP address and netmask that are available on the defined storage VLAN. Click OK after entering the details.

```
NetApp Storage Node -> Network -> Network Config -> Bond10G
-------------------------------------------------------------
Hit 'tab' to navigate between the form and buttons. Use ↑/↓ to
navigate between fields. Start typing or hit ←/→ to enter the
field to make changes. Press 'enter' with a field selected, or hit
'tab' then 'enter' to submit all pending changes.
* denotes required fields.

 Method:              static
 Link speed:          50000
 *IPv4 Address:       172.21.87.130
 *IPv4 Subnet_Mask:   255.255.255.0
 IPv4 Gateway:
 Mtu:                 9000
 *Bond mode:          LACP
 *Status:             UpAndRunning
 Vlan:                3343




       <  OK  >         <Cancel>       < Help >
```

5. Go back to the initial screen, navigate to Cluster Settings, and click Change Settings. Enter the Cluster Name of your choice and click OK.

```
Change Cluster Settings
----------------------------------------------------------------
Hit 'tab' to navigate between the form and buttons. Use ↑/↓ to
navigate between fields. Start typing or hit ←/→ to enter the
field to make changes. Press 'enter' with a field selected, or hit
'tab' then 'enter' to submit all pending changes.
* denotes required fields.

  *Hostname:               SF-1A94
  Cluster:                 RHV-Store
  *Management Interface:   Bond1G




              <  OK  >              <Cancel>
```

6. Repeat steps 1 to 5 for all HCI storage nodes.

7. After all the storage nodes are configured, use a web browser to log into the IB Management IP of one of the storage nodes. This presents the setup page with the Create a New Cluster dialog. Management VIP, storage VIP, and other details of the Element cluster are configured on this page. The storage nodes that were configured in the previous step are automatically detected. Make sure that any nodes that you do not want in the cluster are unchecked before proceeding. Accept the End User License Agreement and click Create New Cluster to begin the cluster creation process. It takes a few minutes to get the cluster up.

> **i** In some cases, visiting the IB management address automatically connects on port 442 and launches the NDE setup wizard. If this happens, delete the port specification from the URL and reconnect to the page.

Create a New Cluster

Node: SF-1A94   **Status:** Searching for cluster RHV-Store

Management VIP : `10.63.172.140`

ISCSI (Storage) VIP : `172.21.87.140`

Data Protection : **Double Helix (2 replicas)**

Create Username : `admin`

Create Password : `••••••••`

Repeat Password : `••••••••`

Nodes

IP Address	Version	Include
172.21.87.30	12.0.0.333	☑
172.21.87.32	12.0.0.333	☑
172.21.87.130	12.0.0.333	☑
172.21.87.132	12.0.0.333	☑

8. After the cluster is created, it redirects to the Element cluster management interface available at the assigned MVIP address. Log in with the credentials provided in the previous step.

9. After you log in, the cluster automatically detects the number of available drives and requests for confirmation to add all drives. Click Add Drives to add all drives at once.

10. The Element cluster is ready to use. Navigate to Cluster > Nodes, and all four nodes should be in a healthy state with active drives.

■ NetApp   ⊞ Reporting   🔧 Management   🛡 Data Protection   👥 Users   ≡ Cluster   ≡ RHV-Store   ≡ API Log

Settings SNMP LDAP Drives **Nodes** FC Ports Network

Active Pending PendingActive   🔽 Filter   0 Selected ✎ Bulk Actions ▾

	Node ID	Node Name	Node Role	Node Type	Active Drives	Management IP	Cluster IP	Storage IP	Management VLAN ID	Storage VLAN ID
☐	4	SF-1D1B	Ensemble Node	H410S-1	6	10.63.172.138 ⬀	172.21.87.132	172.21.87.132	1172	3343
☐	3	SF-1A94	Ensemble Node	H410S-1	6	10.63.172.136 ⬀	172.21.87.130	172.21.87.130	1172	3343
☐	2	SF-34F7	Cluster Master, Ensemble Node	H410S-1	6	10.63.172.139 ⬀	172.21.87.32	172.21.87.32	1172	3343
☐	1	SF-1FA7	-	H410S-1	6	10.63.172.137 ⬀	172.21.87.30	172.21.87.30	1172	3343

Showing 1 - 4 of 4 Nodes

Element Storage Configuration to Support RHV Deployment

In our NetApp HCI for Red Hat Virtualization solution, we use a NetApp Element storage system to provide the backend storage support for RHV's requirement of shared storage domains. The self-hosted engine architecture of RHV deployment requires two storage domains at a minimum—one for the hosted engine storage domain and one for the guest VM data domain.

For this part of deployment, you must configure an account, two volumes of appropriate size, and the associated initiators. Then map these components to an access group that allows the RHV hosts to map the

block volumes for use. Each of these actions can be performed through the web user interface or through the native API for the Element system. For this deployment guide, we go through the steps with the GUI.

Log in to the NetApp Element cluster GUI at its MVIP address using a web browser. Navigate to the Management tab and complete the following steps:

1. To create accounts, go to the Accounts sub-tab and click Create Account. Enter the name of your choice and click Create Account.

Create a New Account   ✖

Account Details

Username

```
RHV-Account
```

CHAP Settings

Initiator Secret

```
leave blank to auto-generate
```

Target Secret

```
leave blank to auto-generate
```

Create Account   Cancel

2. To create volumes, complete the following steps:

    a. Navigate to the Volumes sub-tab and click Create Volume.

    b. To create the volume for the self-hosted engine storage domain, enter the name of your choice, select the account you created in the last step, enter the size of the volume for the self-hosted engine storage domain, configure the QoS setting, and click Create Volume.

Volume Details

Volume Name

RHV-HostedEngine

Volume Size

200   GI ▼

Block Size

◉ 512e ○ 4k

Account

RHV-Account   ▼

Quality of Service

○ Policy

◉ Custom Settings

IO Size	Min IOPS	Max IOPS	Burst IOPS
4 KB	50	15000	15000
8 KB	31 IOPS	9375 IOPS	9375 IOPS
16 KB	19 IOPS	5556 IOPS	5556 IOPS
262 KB	1 IOPS	385 IOPS	385 IOPS
Max Bandwidth		104.86 MB/sec	104.86 MB/sec

Create Volume   Cancel

The minimum size for the hosted engine volume is 75GB. In our design, we added additional space to allow for future extents to be added to the RHV-M VM if necessary.

c. To create the volume for the guest VMs data storage domain, enter the name of your choice, select the account you created in the last step, enter the size of the volume for the data storage domain, configure the QoS setting and click Create Volume.

Volume Details

Volume Name

RHV-DataDomain

Volume Size

1536 ⇕ GI ▼

Block Size

◉ 512e ○ 4k

Account

RHV-Account ▼

Quality of Service

○ Policy

◉ Custom Settings

IO Size	Min IOPS	Max IOPS	Burst IOPS
4 KB	50	15000	15000
8 KB	31 IOPS	9375 IOPS	9375 IOPS
16 KB	19 IOPS	5556 IOPS	5556 IOPS
262 KB	1 IOPS	385 IOPS	385 IOPS
Max Bandwidth		104.86 MB/sec	104.86 MB/sec

Create Volume   Cancel

The size of the data domain depends on the kind of VMs run in the environment and the space required to support them. Adjust the size of this volume to meet the needs of your environment.

3. To create initiators, complete the following steps:

   a. Go to the Initiators sub-tab and click Create Initiator.

   b. Select the Bulk Create Initiators radio button and enter the initiators' details of both the RHV-H nodes with comma separated values. Then click Add Initiators, enter the aliases for the initiators, and click the tick button. Verify the details and click Create Initiators.

Create a New Initiator ✖

○ Create a Single Initiator

IQN/WWPN

Alias

● Bulk Create Initiators

Initiators	2
Name	Alias (optional)
iqn.1994-05.com.redhat:rhv-host-node-01	RHV-H01 ✖
iqn.1994-05.com.redhat:rhv-host-node-02	RHV-H02 ✖

Create Initiators   Cancel

4. To create access groups, complete the following steps:

   a. Go to the Access Groups sub-tab and click Create Access Groups.

   b. Enter the name of your choice, select the initiators for both RHV-H nodes that were created in the previous step, select the volumes, and click Create Access Group.

Volume Access Group Details

Name

RHV-AccessGroup

Add Initiators

Initiators

Select an Initiator ▾   Create Initiator?

Initiators		2 ⌄	
ID	Name	Alias	
3	iqn.1994-05.com.redhat:rhv-host-node-01	RHV-H01	✖
4	iqn.1994-05.com.redhat:rhv-host-node-02	RHV-H02	✖

☐ Delete orphan initiators ⓘ

Attach Volumes

Volumes

Select a Volume ▾

Attached Volumes		2 ⌄
ID	Name	
1	RHV-HostedEngine	✖
2	RHV-DataDomain	✖

Create Access Group   Cancel

Next: 4. Deploy the RHV-H Hypervisor on the HCI Compute Nodes