

CLUSTERED DATA ONTAP ADMINISTRATION, 8.2 UPDATE PART 1 SETUP

EXERCISE

In this exercise, you configure a two-node cluster called cluster1, investigate changes in licensing and create a new single-node cluster called cluster2.

NOTE: This is a simulated environment. The clustered Data ONTAP 8.2 vsims are not high-availability (HA) pairs. This is not a supported configuration. The only non-high-availability configuration that is supported is a single-node cluster.

FEATURED NETAPP PRODUCTS

- Clustered Data ONTAP 8.2
- NetApp OnCommand System Manager

KEY FEATURES TO DEMONSTRATE

- RAID 4 and RAID-DP technology
- Licensing
- Single-node clusters

HIGH-LEVEL VALUE PROPOSITION

- Clustered Data ONTAP 8.2 provides a feature-rich environment that is often the best fit for customers.
- Clustered Data ONTAP 8.2 lets you configure a single node as a cost-efficient cluster for small workloads.

OBJECTIVES

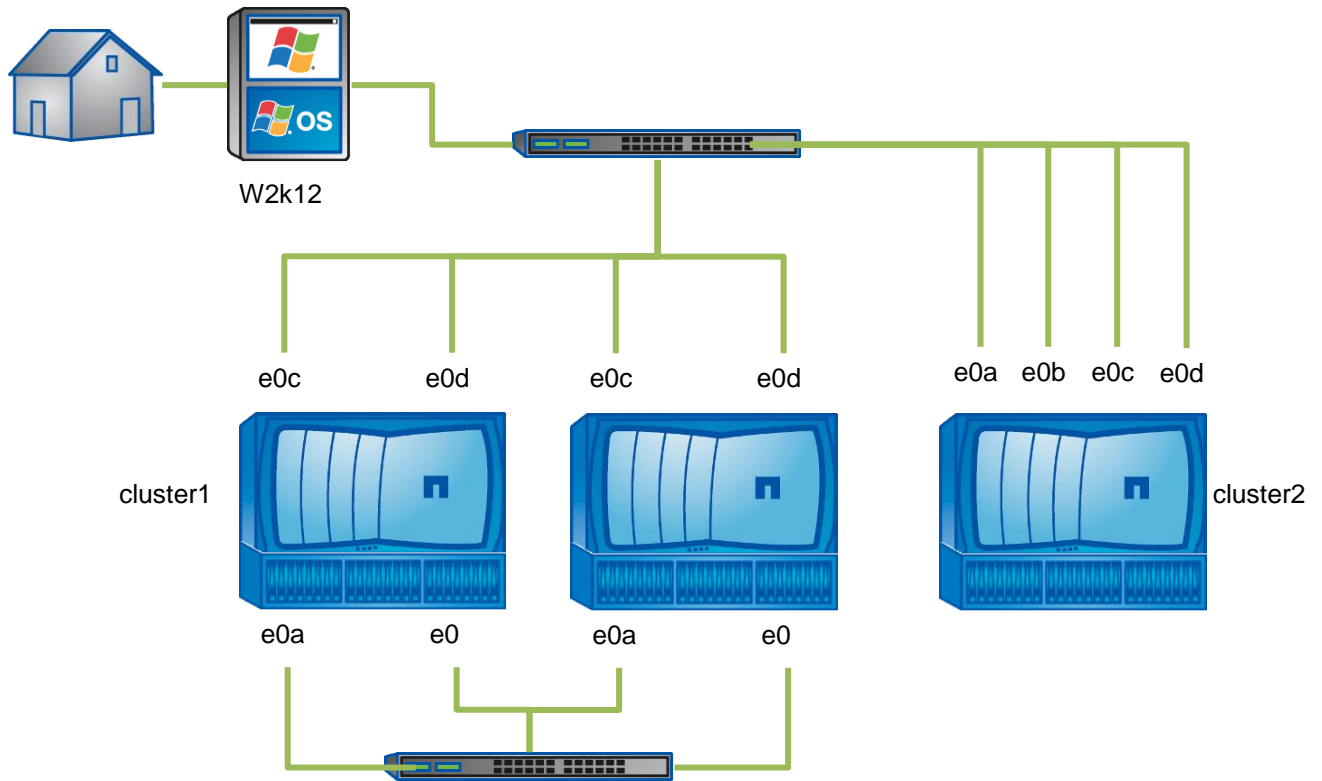
By the end of this exercise, you should be able to:

- Install OnCommand System Manager
- Create a cluster
- Add the cluster to NetApp OnCommand System Manager
- Join a node to the cluster
- Manage licenses in Data ONTAP 8.2
- Create a data aggregate
- Create a single-node cluster
- Add the single-node cluster to NetApp OnCommand System Manager

EXERCISE ENVIRONMENT

This environment consists of:

- (1) Windows Server 2012 Active Directory
- (2) Two-node cluster: cluster1
- (3) Single-node cluster: cluster2


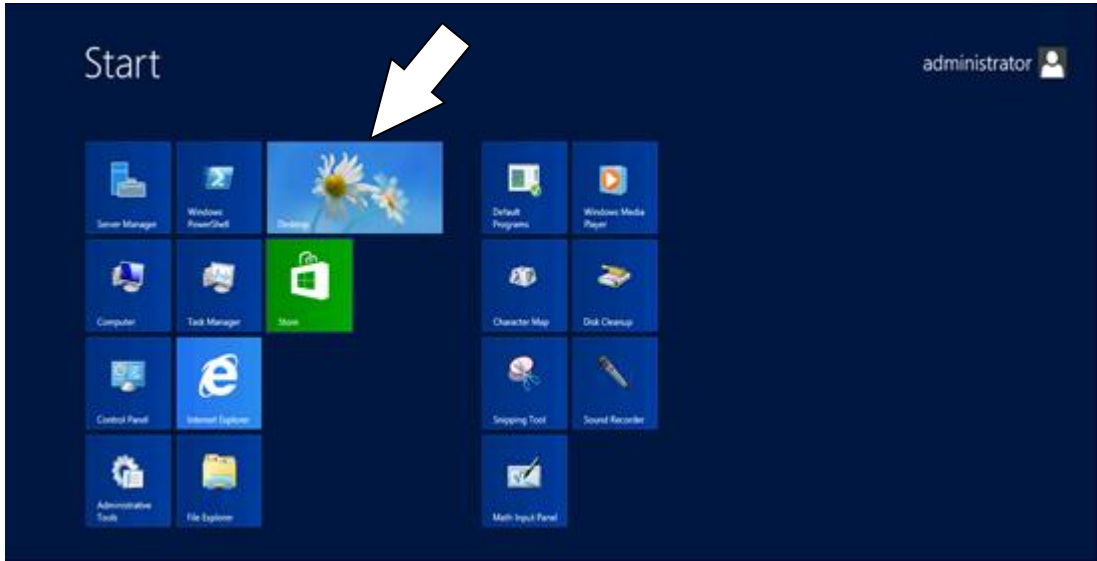



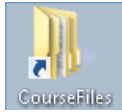
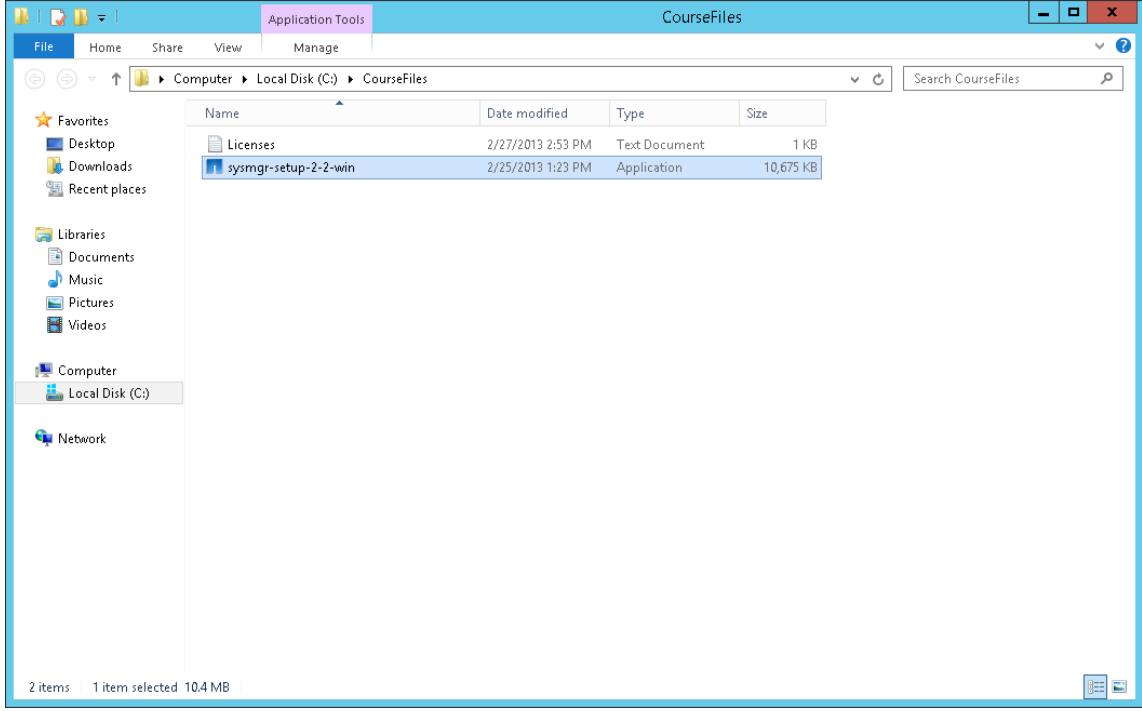
Host Name	IP Address(es)	Username	Password
w2k12	192.168.0.11	Administrator	Netapp123
cluster1	192.168.0.101	admin	Netapp123
cluster1-01	192.168.0.91	admin	Netapp123
cluster1-02	192.168.0.92	admin	Netapp123
cluster2	192.168.0.102	admin	Netapp123
cluster2-01	192.168.0.93	admin	Netapp123

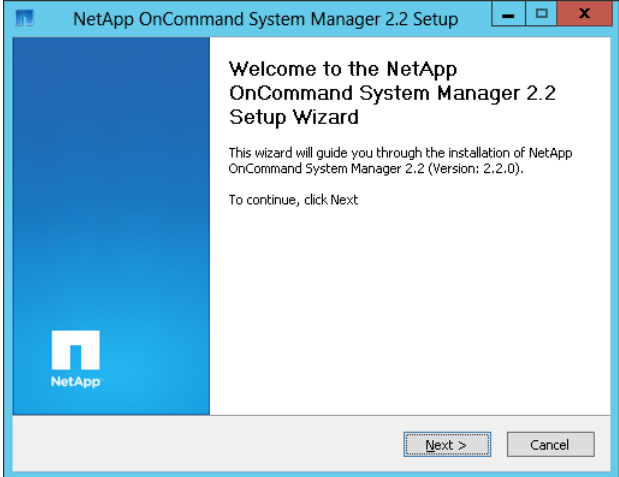
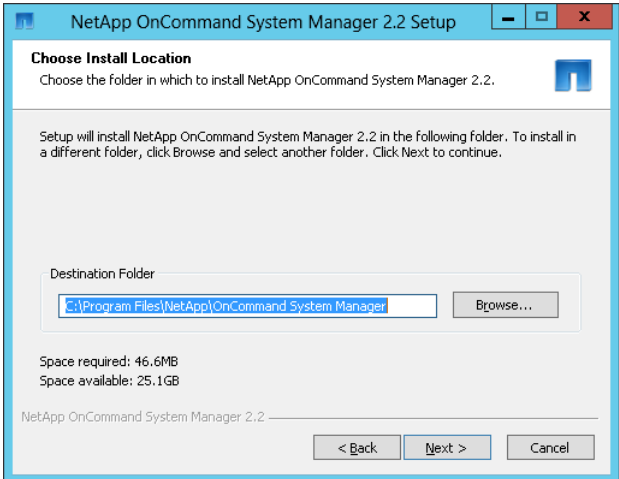
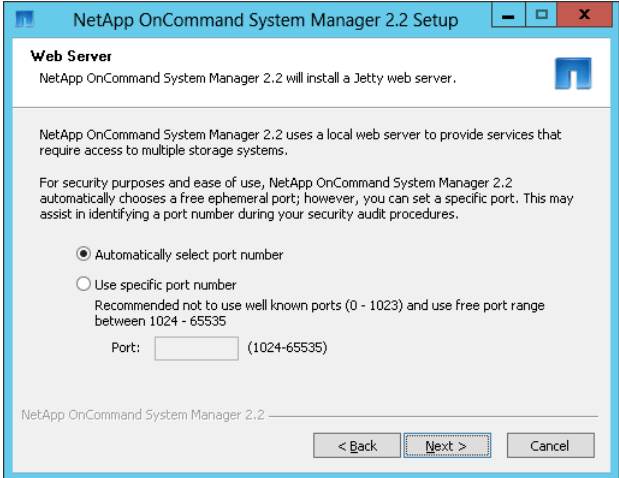
NOTE: This table lists only the lab components. Please refer to the tasks that follow for the detailed steps.

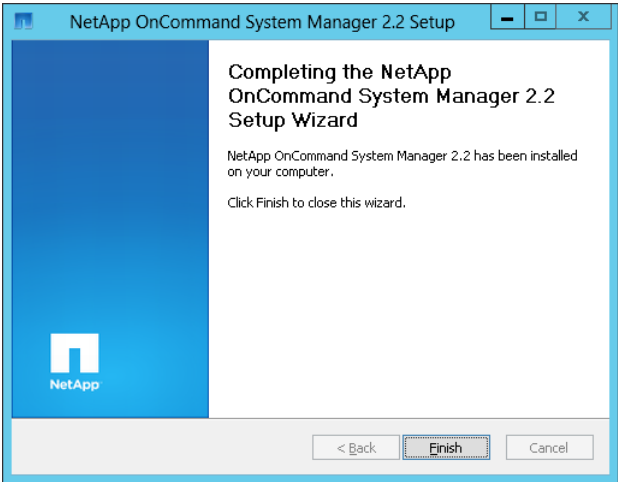
TASK 1: INSTALL ONCOMMAND SYSTEM MANAGER

In this task, you install OnCommand System Manager on your Windows Server.

STEP	ACTION
1.	<p>Verify you see the Modern view of your assigned Windows Server:</p> 
2.	<p>Click the Desktop tile:</p> 


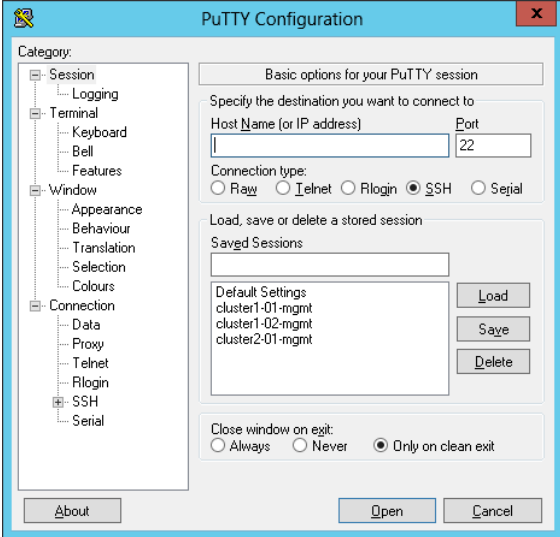
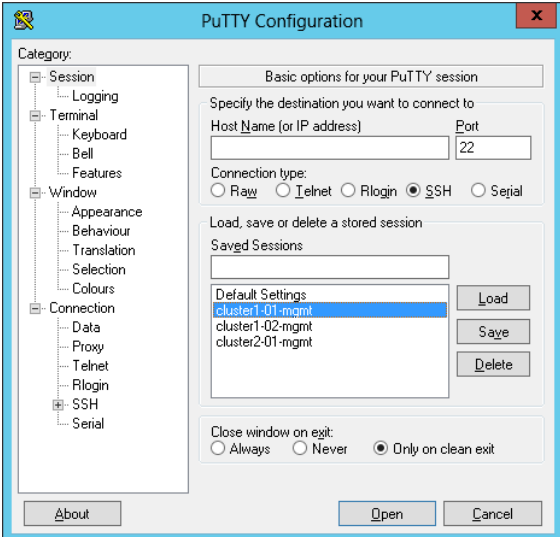
STEP	ACTION
3.	<p>Verify that you see the administrator's desktop:</p> 
4.	<p>On your Windows Server's desktop, double-click the CourseFiles shortcut:</p> 
5.	<p>Verify the C:\CourseFiles directory opens:</p> 
6.	<p>Double-click sysmgr-setup-2-2-win.exe.</p>

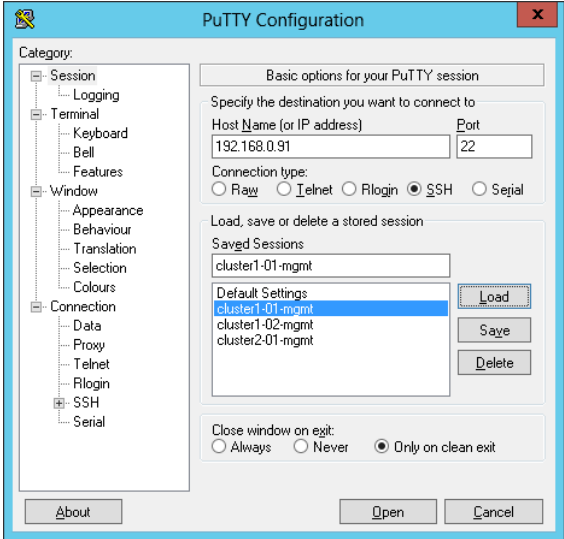
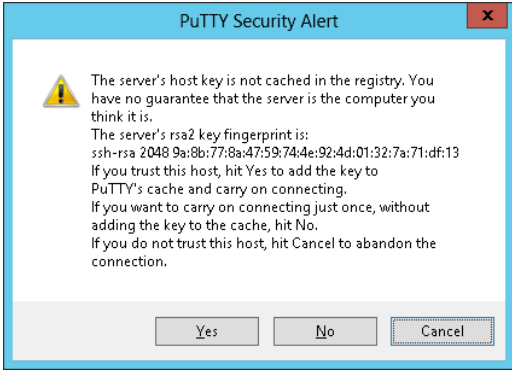
STEP	ACTION
7.	<p>Verify the NetApp OnCommand System Manager Setup Wizard appears:</p> 
8.	<p>Click Next to start the wizard.</p>
9.	<p>Accept the default installation location and click Next:</p> 
10.	<p>Select Automatically select port number:</p> 

STEP	ACTION
11.	Click Next .
12.	After installation, verify that the install completed successfully: 
13.	Click Finish .


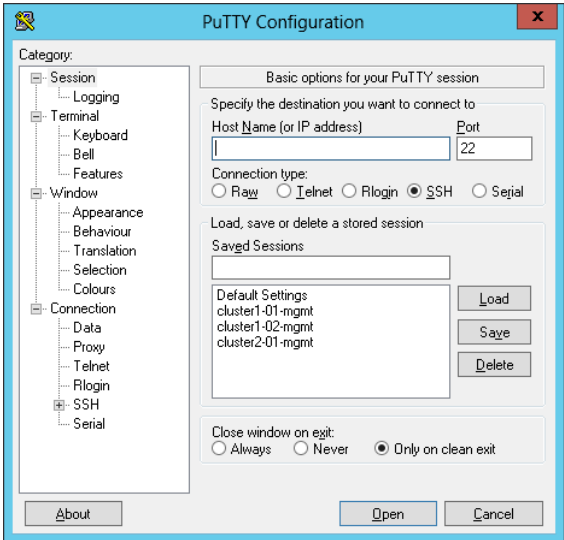
TASK 2: CREATE A CLUSTER

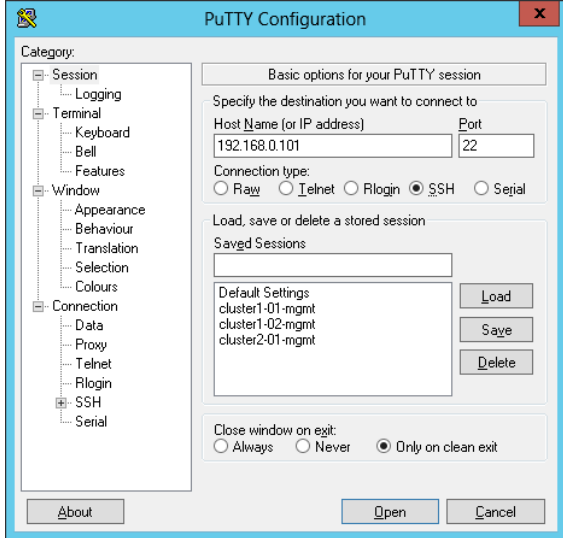
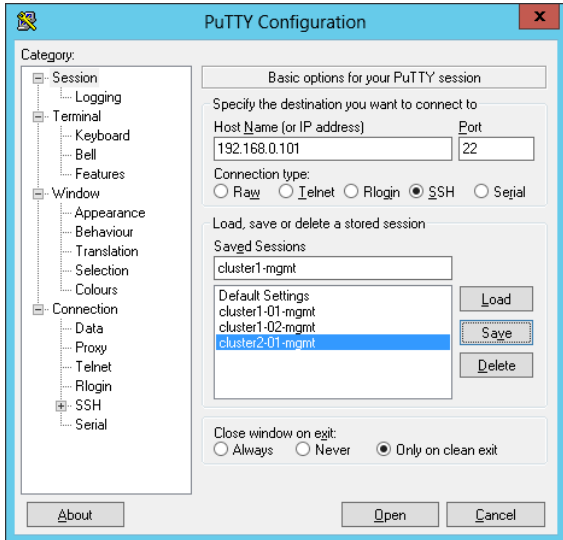
In this task, you log in to your assigned node 1 and create a cluster. Your node 1 is in the state immediately after disk initialization. Cluster interconnect switches have been configured and cabled to the appropriate ports for this node. In order to provide remote access, this node has been configured with a node management logical interface (LIF). You use the LIF to initiate a Secure Shell (SSH) session with node 1.

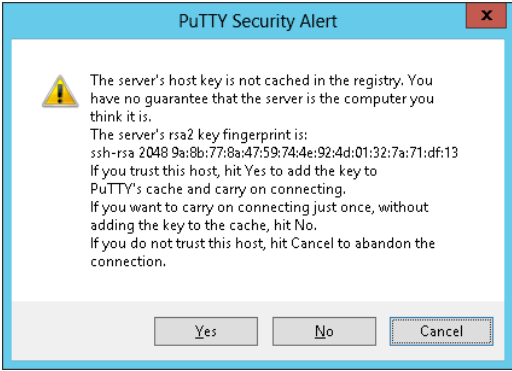
STEP	ACTION
1.	<p>On your Windows desktop, double-click the link to PuTTY icon:</p> 
2.	<p>Verify that the PuTTY Configuration dialog appeared:</p> 
3.	<p>Under Saved Sessions, select the cluster1-01-mgmt saved session:</p> 

STEP	ACTION
4.	<p>Click Load:</p> 
5.	Click Open to open a session with your storage system.
6.	<p>The PuTTY Security Alert dialog box appears (your SSH fingerprint might differ from example shown):</p> 
7.	Click Yes to confirm the SSH fingerprint key.
8.	<p>Verify that you see the login prompt.</p> <pre>login as:</pre>
9.	At the login prompt, type admin .
10.	The admin login account does not have a password assigned to it yet. Press Enter .
11.	<p>Verify that you see the command prompt.</p> <pre>cluster1-01::></pre>
12.	<p>Start the cluster setup wizard:</p> <pre>cluster1-01::> cluster setup</pre>

STEP	ACTION
13.	In response to the question “Do you want to create a new cluster or join an existing cluster,” enter create to create a cluster for the first node.
14.	In the response to the question “Do you intend for this node to be used as a single node cluster,” enter no for this cluster will be a multiple node cluster.
15.	Verify the default values for the cluster interconnect: Private cluster network ports [e0a,e0b]. Cluster port MTU values will be set to 1500. NOTE: The exercise environment is a simulated environment. If you use physical hardware, these values are different. For details about recommended cluster interconnect ports and MTU sizes, see the NetApp Support site (http://support.netapp.com).
16.	In response to the question “do you want to use these defaults,” enter yes .
17.	At step 1 of 5, enter the cluster name cluster1 . NOTE: Cluster names in clustered Data ONTAP are case-sensitive. “Cluster1” is not the same as “cluster1.”
18.	Enter the cluster base license code: ETYYFLXUQUMADFAAAAAAAAAAAAAA NOTE: You can also cut and paste the license code from Licenses.txt in C:\CourseFiles. Look for the cluster base license code for cluster1. If you mistype the license code, the setup script will continue to prompt you for the correct code.
19.	At step 2 of 5, enter the CIFS license: KCBNKHHTVDDCMAOZFAAAAAAAAAAAAA NOTE: You can also cut and paste the license code from Licenses.txt in C:\CourseFiles. Look for the CIFS license code for cluster1-01.
20.	On prompt “Enter an additional license key,” press Enter to indicate that you are finished adding license codes.
21.	At step 3 of 5, enter a password for the cluster administrator (admin) account. For example, you can use Netapp123 .
22.	Enter the password again.
23.	Press Enter to select the default cluster management interface port: e0c
24.	Enter this IP address for the cluster management interface: 192.168.0.101
25.	Enter this network mask for the cluster management interface: 255.255.255.0
26.	Enter this default gateway for the cluster management interface: 192.168.0.1
27.	Enter this Domain Name System (DNS) domain name: learn.netapp.local
28.	Enter this name server IP address: 192.168.0.11
29.	At step 4 of 5, note the statement about storage failover (SFO). Because this is not a high-availability system, it will not use SFO.

STEP	ACTION
30.	<p>At step 5 of 5, in the text box, enter the location of the controller.</p> <p>NOTE: You should enter the physical address of the storage system, because NetApp Global Support uses this information for delivering parts. For this educational environment, you can enter anything value.</p>
31.	<p>Press Enter to select the default node management interface port: e0c</p>
32.	<p>Press Enter to use the defined IP address, 192 . 168 . 0 . 91, for this node.</p> <p>NOTE: The node management interface was set when the lab environment was prepared.</p>
33.	<p>Press Enter to use the defined network mask, 255 . 255 . 255 . 0, for this node.</p>
34.	<p>Enter this default gateway for the cluster management interface: 192 . 168 . 0 . 1</p>
35.	<p>This completes the cluster setup wizard. Verify you now see the cluster shell prompt:</p> <pre>cluster1::></pre>
36.	<p>Close the PuTTY session for the node management LIF.</p> <p>You can now use SSH to log in to the cluster management port from another PuTTY session.</p>
37.	<p>Click the icon to open another PuTTY window:</p> 
38.	<p>Verify that the PuTTY Configuration dialog appears:</p> 

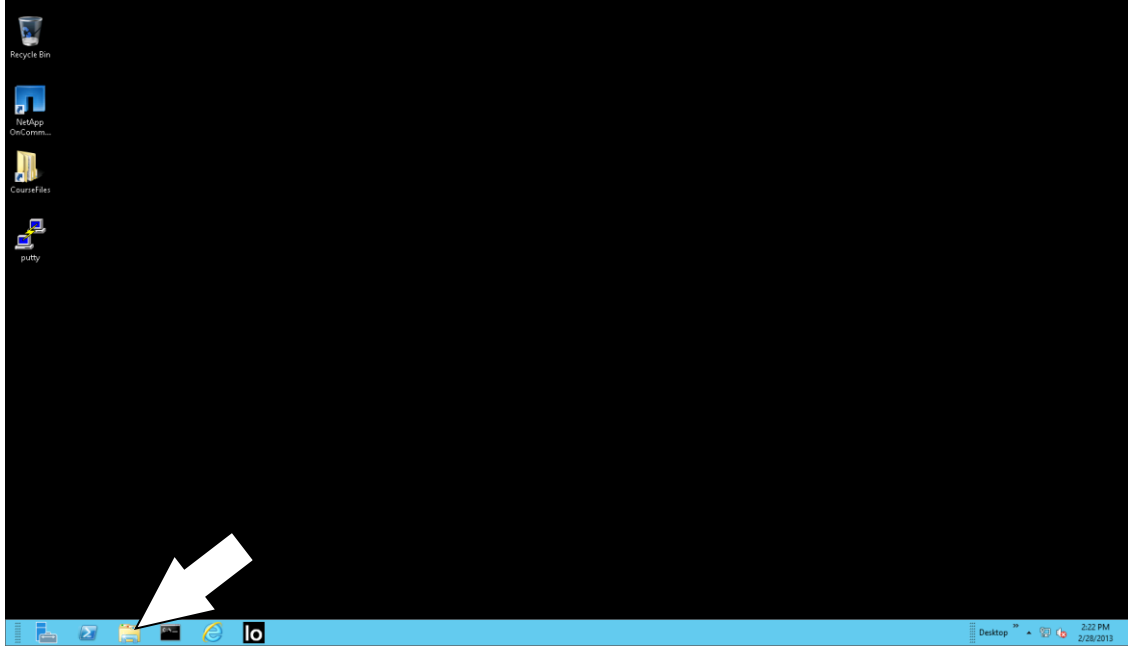
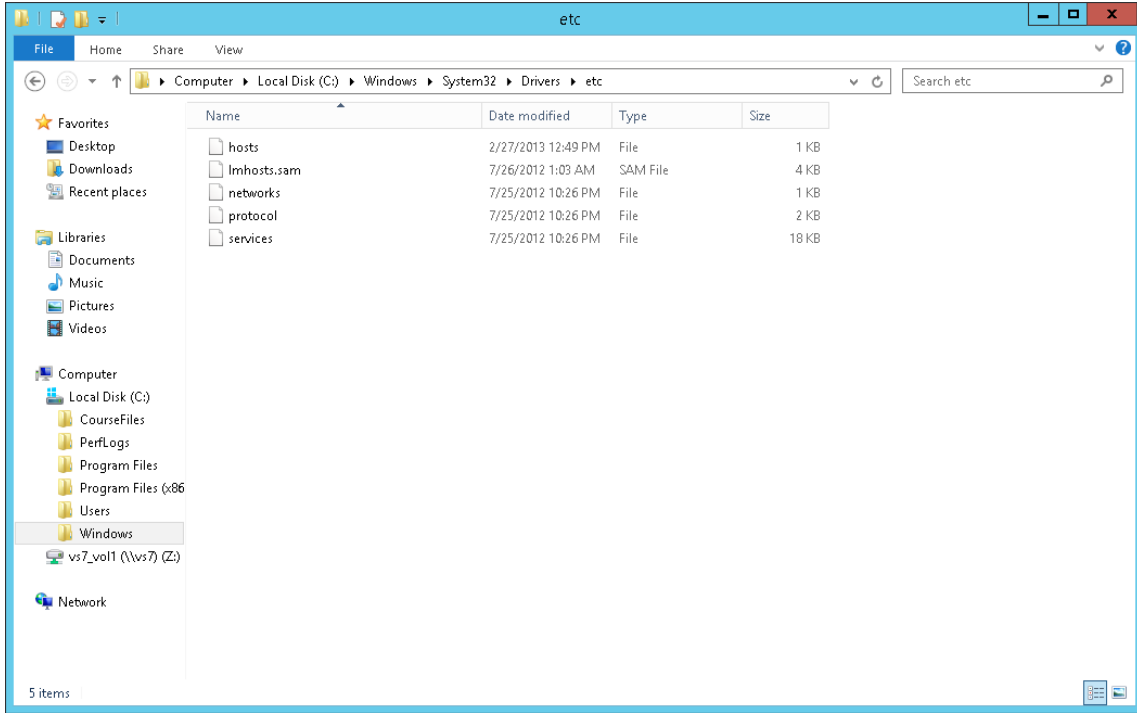
STEP	ACTION
39.	<p>Enter the IP address of the cluster management LIF: 192.168.0.101</p> 
40.	Verify that SSH is selected as the connection type.
41.	<p>Type a new session for this session: cluster1-mgmt</p> 
42.	Click Save .
43.	Click Open to start the session.

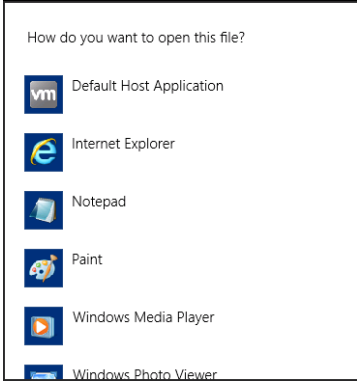
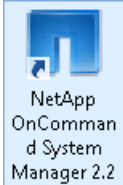
STEP	ACTION												
44.	<p>Verify the PuTTY Security Alert dialog box appears (your SSH fingerprint might differ from this one):</p>  <p>If you don't see the security alert, then you might have entered an incorrect IP address either at (step 24 or step 39).</p>												
45.	Click Yes to approve the SSH fingerprint key.												
46.	<p>Verify that you see the login prompt.</p> <pre>login as:</pre>												
47.	Authenticate as: admin												
48.	Enter the password you provided in step 21 of this task (the suggested password was Netapp123).												
49.	<p>Verify that you see the clustershell prompt:</p> <pre>cluster1::></pre>												
50.	<p>Check the cluster health:</p> <pre>cluster1::> cluster show</pre> <p>Sample output:</p> <table border="1"> <thead> <tr> <th>Node</th> <th>Health</th> <th>Eligibility</th> </tr> </thead> <tbody> <tr> <td>cluster1-01</td> <td>true</td> <td>true</td> </tr> </tbody> </table>	Node	Health	Eligibility	cluster1-01	true	true						
Node	Health	Eligibility											
cluster1-01	true	true											
51.	<p>Verify the version of the Data ONTAP:</p> <pre>cluster1::> system node image show</pre> <p>Sample output:</p> <table border="1"> <thead> <tr> <th>Node</th> <th>Image</th> <th>Is Default</th> <th>Is Current</th> <th>Version</th> <th>Install Date</th> </tr> </thead> <tbody> <tr> <td>cluster1-01</td> <td>image1</td> <td>true</td> <td>true</td> <td>8.2X15</td> <td>-</td> </tr> </tbody> </table>	Node	Image	Is Default	Is Current	Version	Install Date	cluster1-01	image1	true	true	8.2X15	-
Node	Image	Is Default	Is Current	Version	Install Date								
cluster1-01	image1	true	true	8.2X15	-								

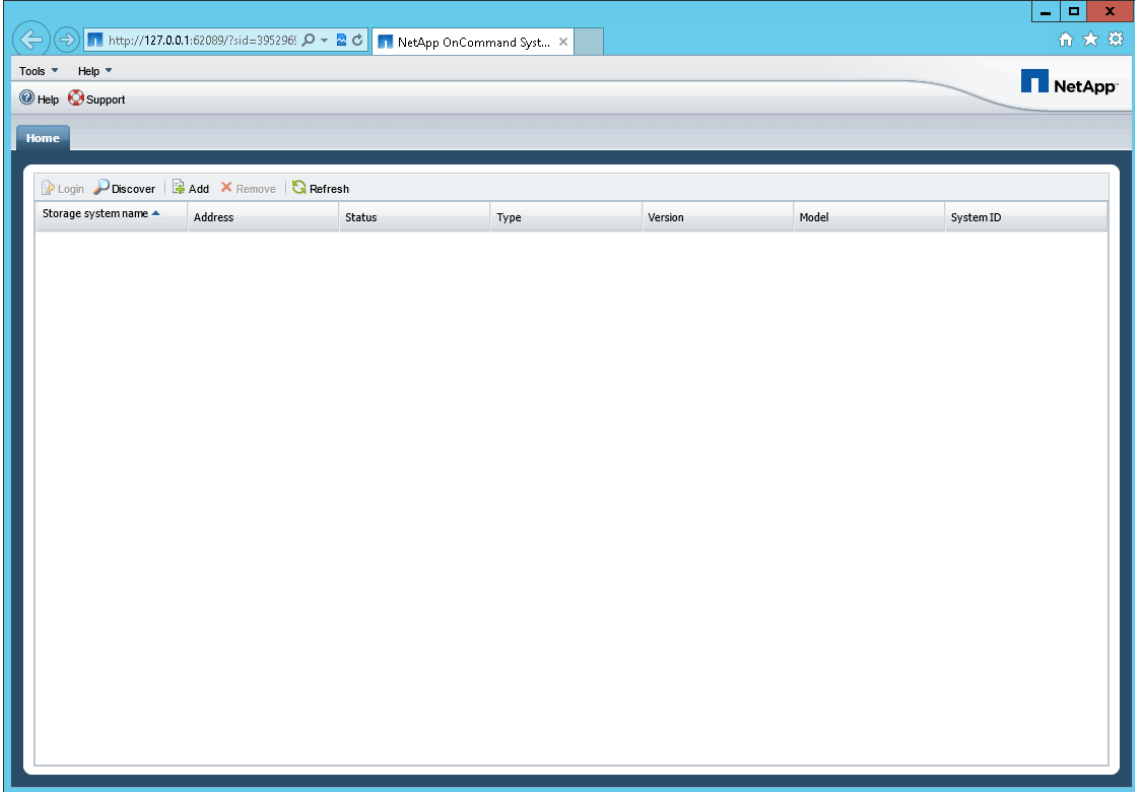
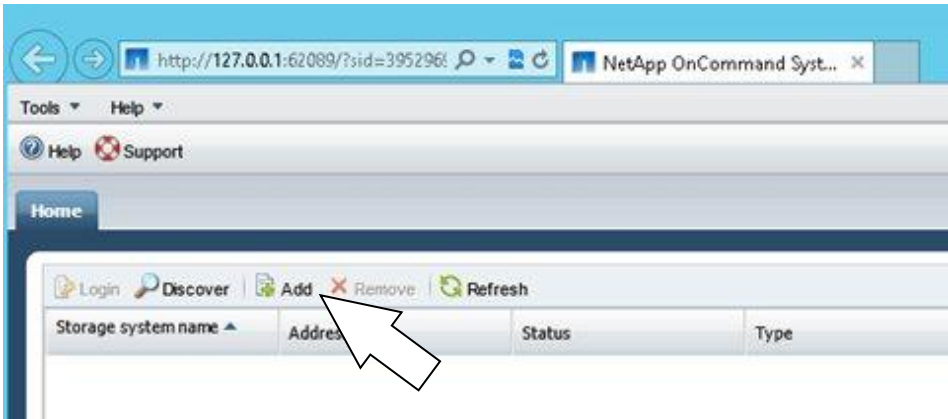
TASK 3: ADD THE CLUSTER TO ONCOMMAND SYSTEM MANAGER

In this task, you add your cluster management port to the local hosts file, launch System Manager, and add your newly created cluster.

NOTE: For more details about configuring a storage system with System Manager, see the *Clustered Data ONTAP Administration* course.

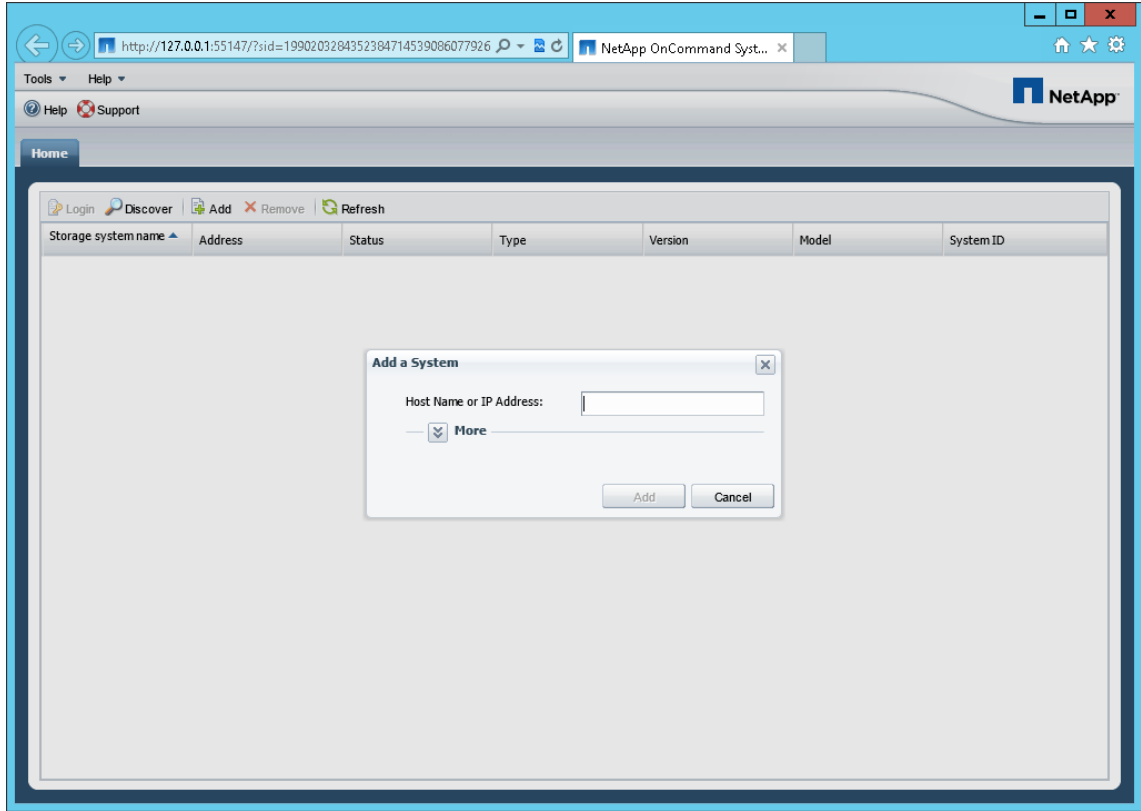
STEP	ACTION																								
1.	<p>On the administrator desktop, open File Explorer:</p>  <p>The screenshot shows a Windows desktop with several icons on the left: Recycle Bin, NetApp OnComm..., CourseFiles, and putty. The taskbar at the bottom contains icons for Start, Internet Explorer, File Explorer (highlighted with a white arrow), and a taskbar search icon. The system tray on the right shows the Desktop icon, network status, and the time 2:22 PM on 2/28/2013.</p>																								
2.	<p>Navigate to: C:\Windows\System32\Drivers\etc</p>  <p>The screenshot shows a File Explorer window titled 'etc'. The address bar displays the path 'Computer > Local Disk (C:) > Windows > System32 > Drivers > etc'. The main pane shows a list of files:</p> <table border="1"><thead><tr><th>Name</th><th>Date modified</th><th>Type</th><th>Size</th></tr></thead><tbody><tr><td>hosts</td><td>2/27/2013 12:49 PM</td><td>File</td><td>1 KB</td></tr><tr><td>lmhosts.sam</td><td>7/26/2012 1:03 AM</td><td>SAM File</td><td>4 KB</td></tr><tr><td>networks</td><td>7/25/2012 10:26 PM</td><td>File</td><td>1 KB</td></tr><tr><td>protocol</td><td>7/25/2012 10:26 PM</td><td>File</td><td>2 KB</td></tr><tr><td>services</td><td>7/25/2012 10:26 PM</td><td>File</td><td>18 KB</td></tr></tbody></table> <p>The left sidebar shows the navigation pane with 'Windows' selected. The status bar at the bottom indicates '5 items'.</p>	Name	Date modified	Type	Size	hosts	2/27/2013 12:49 PM	File	1 KB	lmhosts.sam	7/26/2012 1:03 AM	SAM File	4 KB	networks	7/25/2012 10:26 PM	File	1 KB	protocol	7/25/2012 10:26 PM	File	2 KB	services	7/25/2012 10:26 PM	File	18 KB
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protocol	7/25/2012 10:26 PM	File	2 KB																						
services	7/25/2012 10:26 PM	File	18 KB																						
3.	<p>Double-click hosts.</p>																								

STEP	ACTION
4.	Verify that the operation dialog appears. 
5.	Select Notepad to open the hosts file in this tool.
6.	Append to the end of the file the following information: <i>cluster_management_LIF_IP_address cluster_name</i> Specifically, you should enter: 192.168.0.101 cluster1
7.	Save the file.
8.	Exit Notepad .
9.	Close File Explorer .
10.	On your Windows Server desktop, double-click the NetApp OnCommand System Manager icon. 

STEP	ACTION
11.	<p>Verify that System Manager launches:</p> 
12.	<p>Click Add, which associates the new storage system (cluster1) with System Manager:</p> 

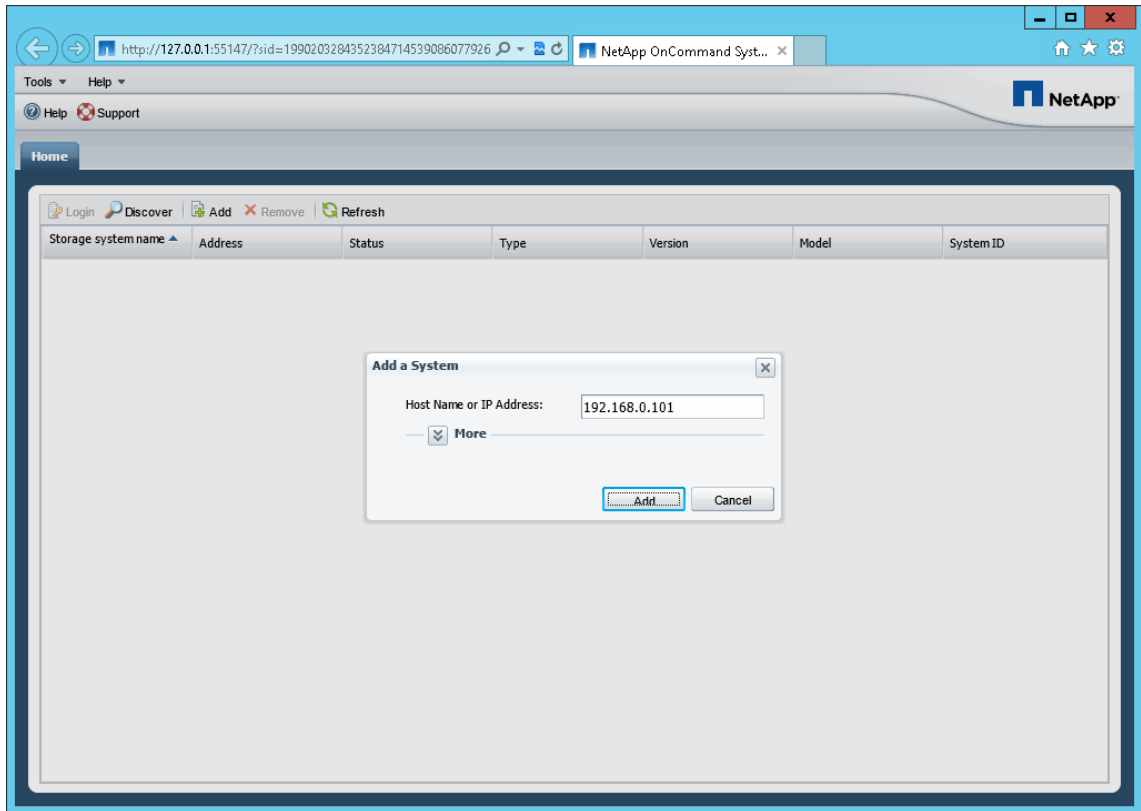
STEP ACTION

13. Verify the Add a System dialog box appears.



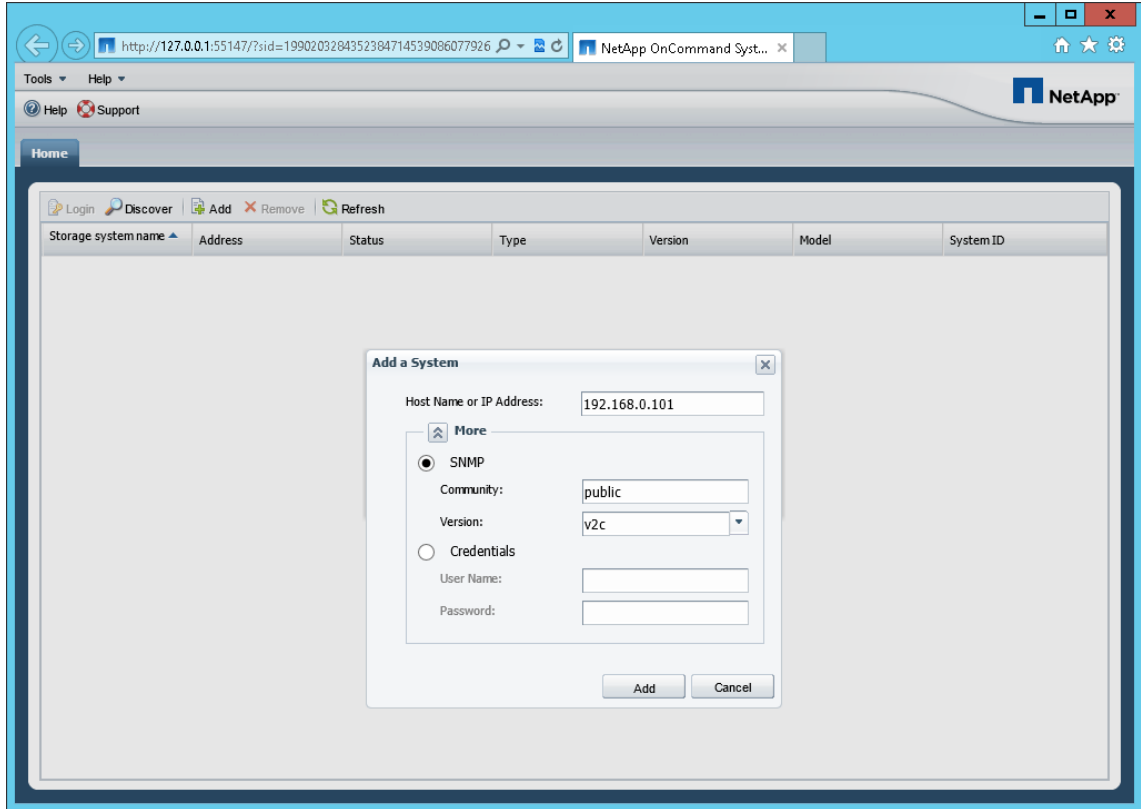
STEP ACTION

14. In the Host Name or IP Address text box, enter the IP address of the cluster management LIF:
192.168.0.101

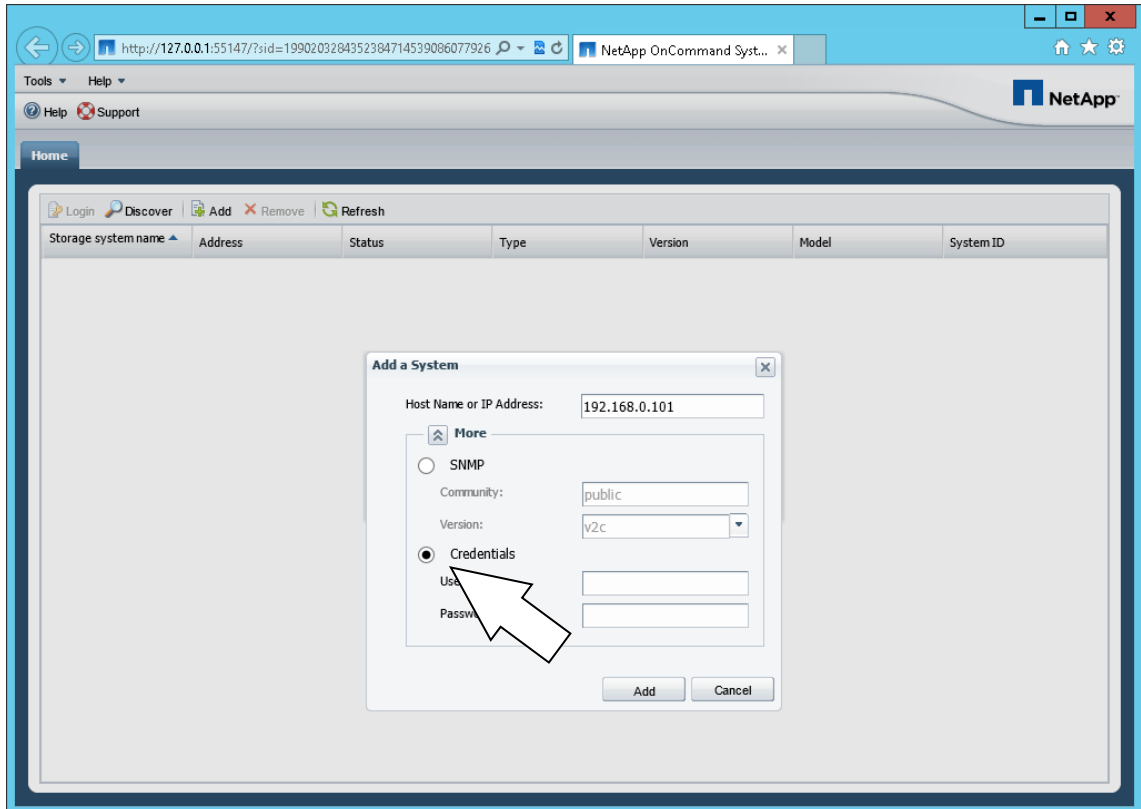


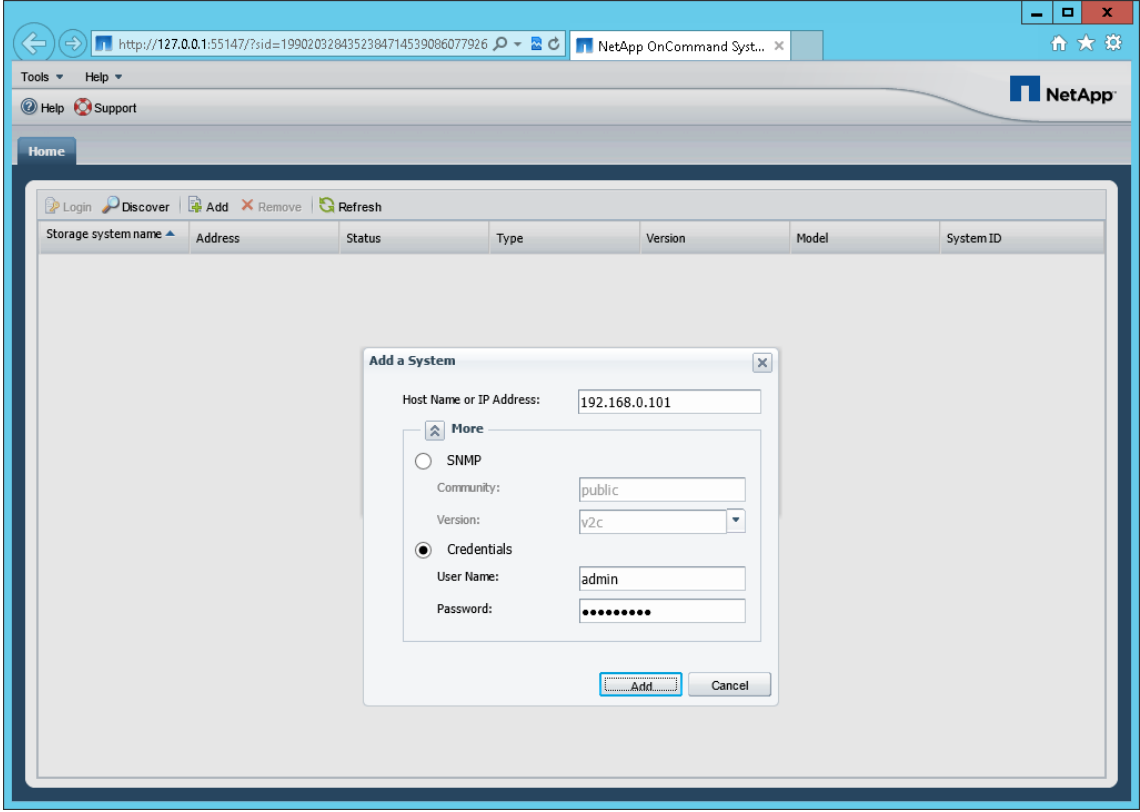
STEP ACTION

15. Click the **More** button, expanding the dialog box:



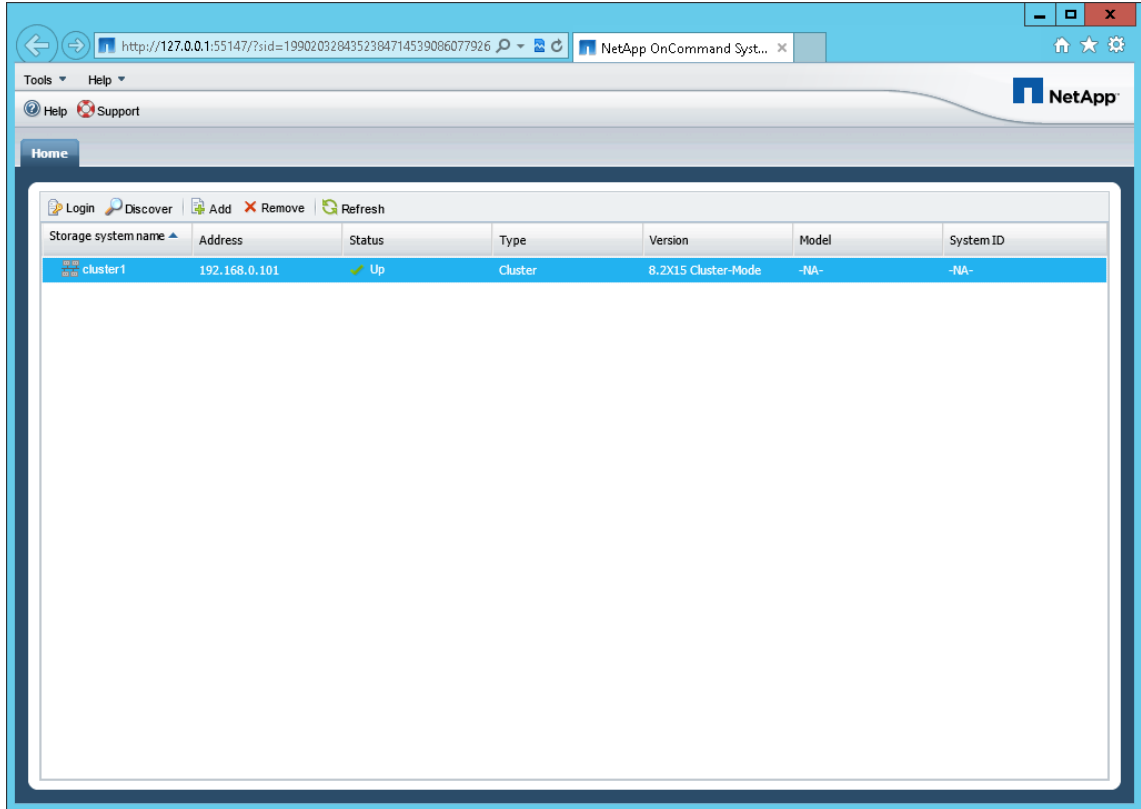
16. Select the **Credentials** button:



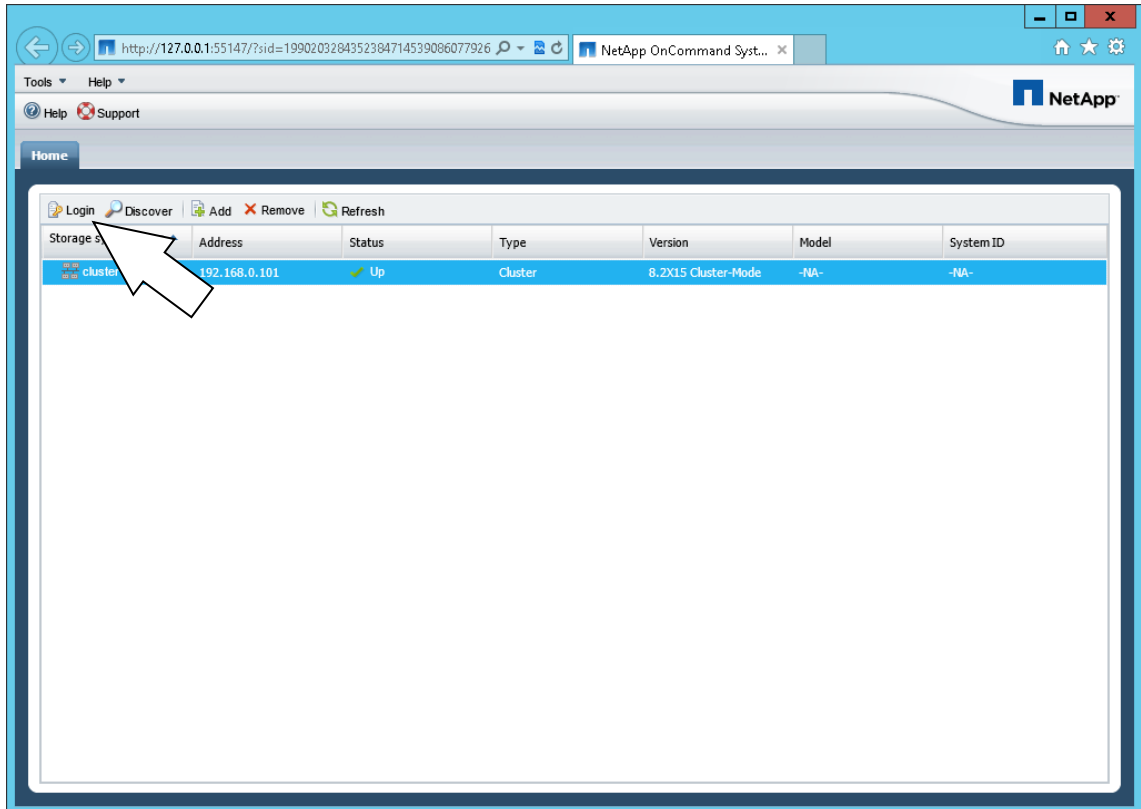
STEP	ACTION
17.	<p>Authenticate as admin with the password you provided in Step 21 of Task 2:</p> 
18.	Click Add .

STEP ACTION

19. The cluster should be added to the list of storage systems:



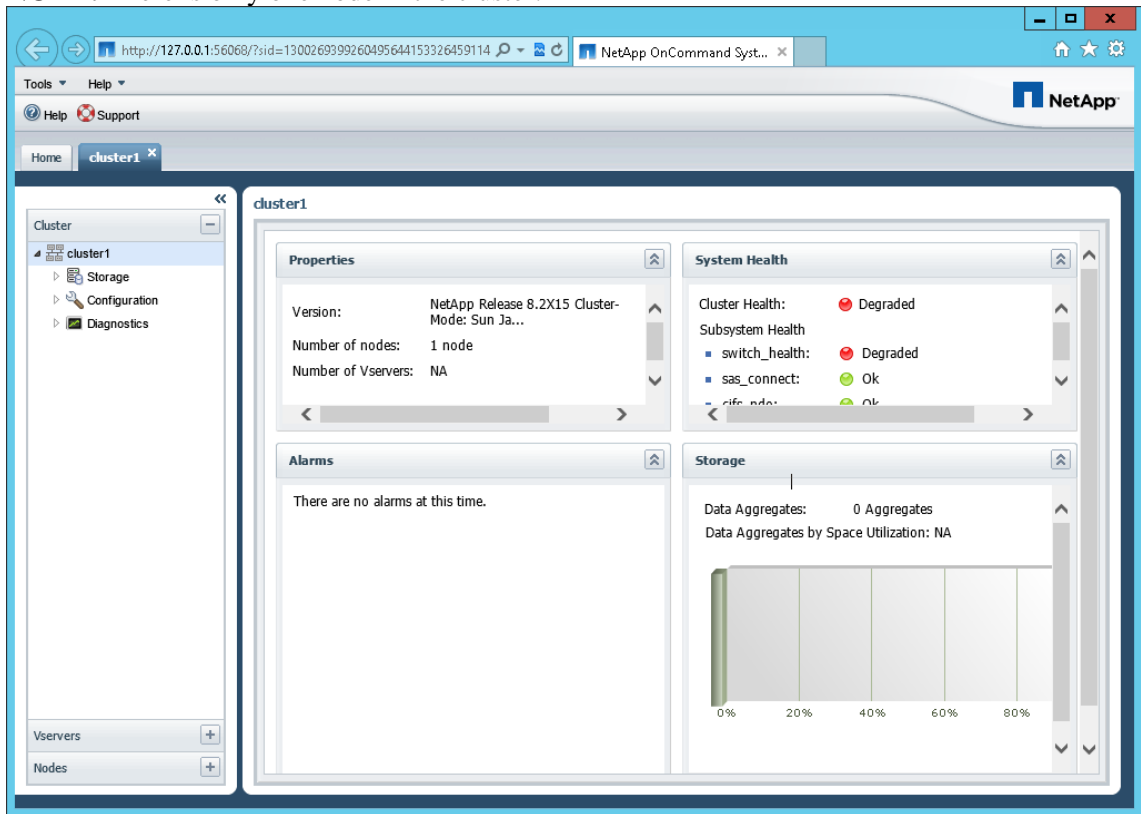
20. Ensure that cluster1 is selected and click **Login**:



STEP ACTION


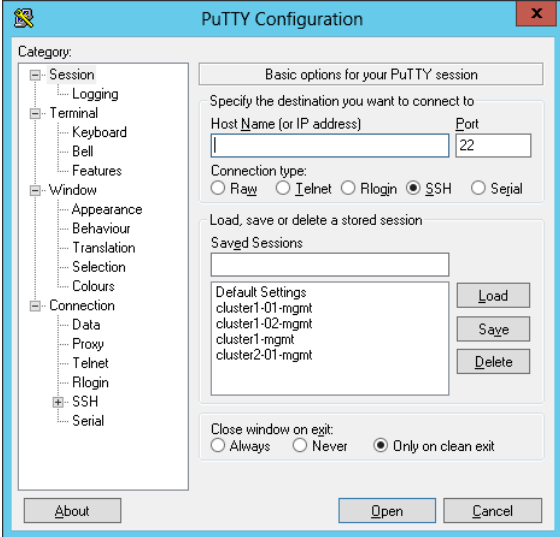
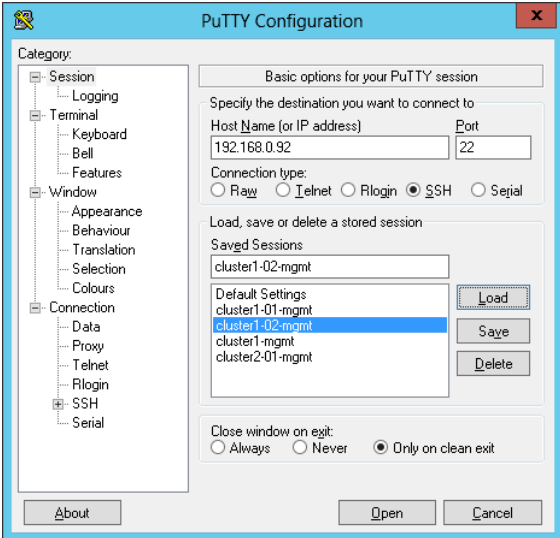
21. In the left pane of System Manager, expand **cluster1**.

NOTE: There is only one node in the cluster:

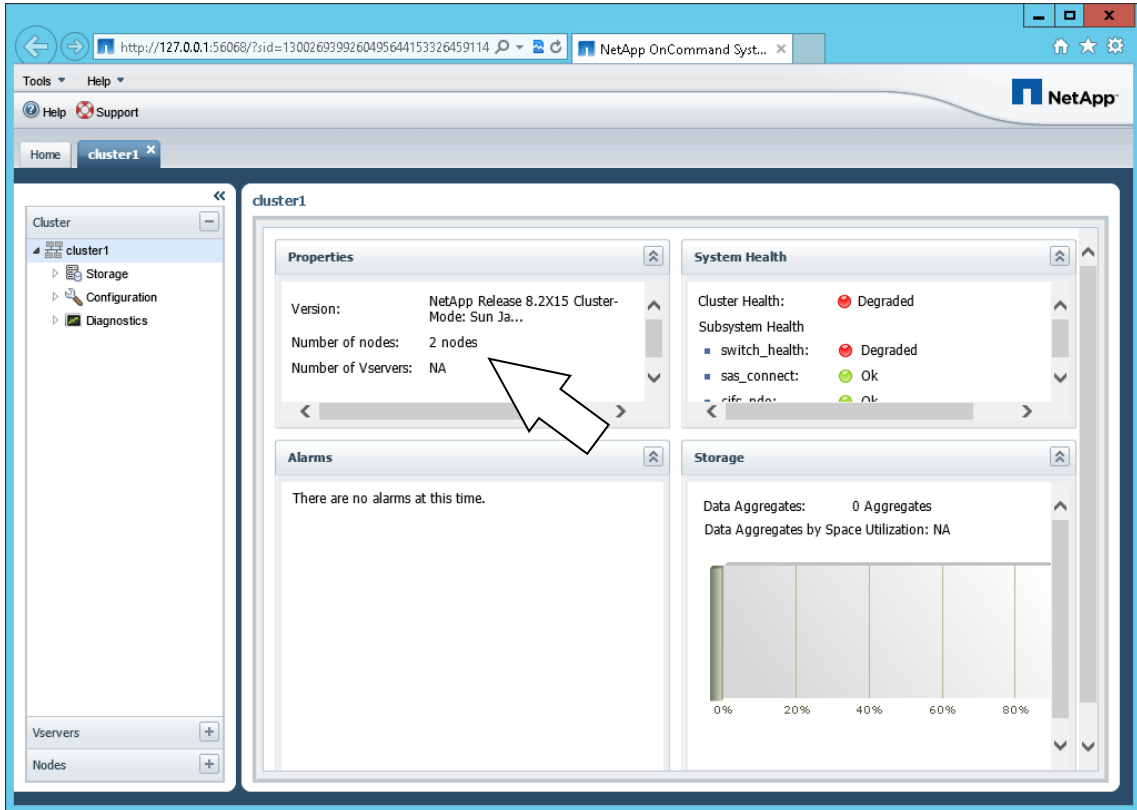


TASK 4: JOIN A NODE TO THE CLUSTER

In this task, you add your second assigned node to the cluster. Just like node 1, node 2 is in the state immediately after disk initialization. The cluster interconnect switches have been configured and cabled to the appropriate ports for this node. In order to provide remote access, this node has been configured with a node management LIF. You use the LIF to initiate an SSH session with node 2.

STEP	ACTION
1.	<p>On your Windows desktop, double-click the link to PuTTY icon:</p> 
2.	<p>Verify that the PuTTY dialog has appears:</p> 
3.	<p>Select the cluster1-02-mgmt saved session.</p>
4.	<p>Click Load:</p> 
5.	<p>Click Open to start the session.</p>

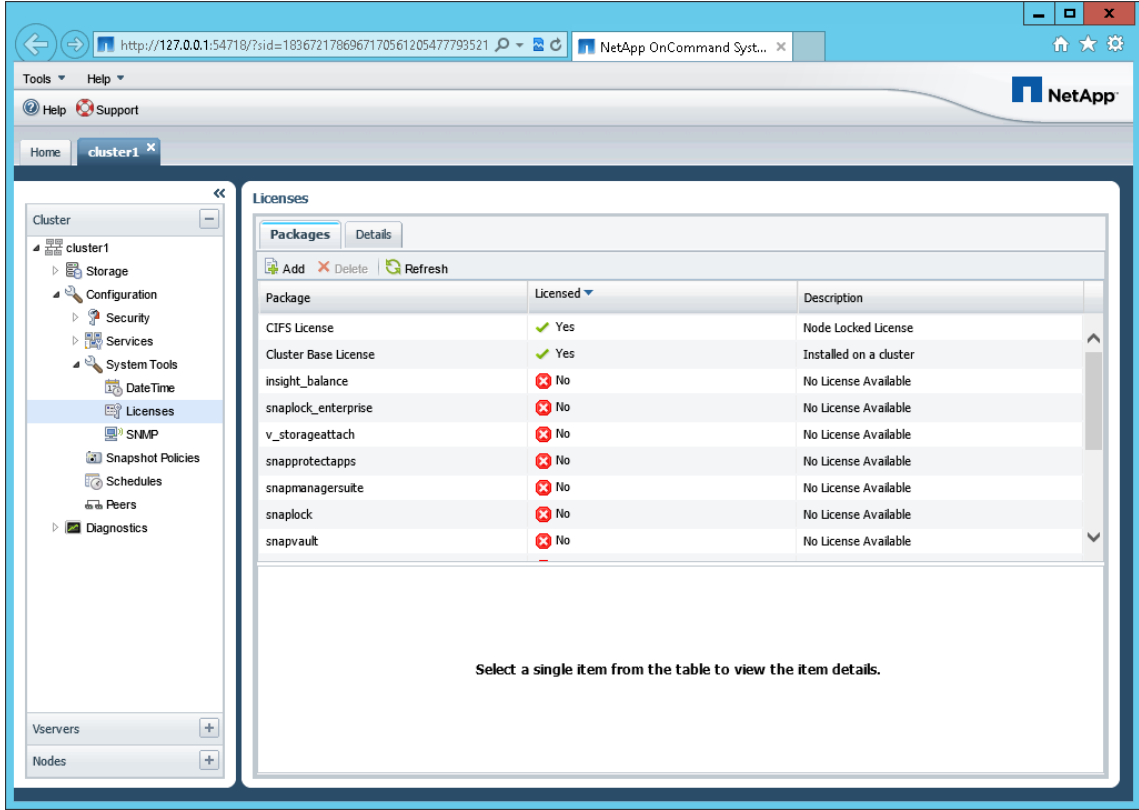
STEP	ACTION
6.	The PuTTY Security Alert should appear.
7.	Click Yes to confirm the SSH fingerprint key.
8.	Verify that you see the login prompt. login as:
9.	At the login prompt, type: admin
10.	The admin login account does not have a password assigned to it. Press Enter .
11.	Verify the command prompt appears: cluster1-02::>
12.	Start the cluster setup wizard: cluster1-02::> cluster setup
13.	In response to the question “Do you want to create a new cluster or join an existing cluster,” enter join .
14.	Verify the default values for the cluster network: Private cluster network ports [e0a,e0b]. Cluster port MTU values will be set to 1500. NOTE: The exercise environment is a simulated environment. If you use physical hardware, these values are different.
15.	In response to the question “Do you want to use these defaults,” enter yes .
16.	At Step 1 of 3, verify that the cluster was correctly identified on the valuable clusters to join: cluster1
17.	Press Enter to select the cluster1 cluster.
18.	In Step 2 of 3, note the statement about storage failover (SFO). This is a non-high-availability system and so will not use SFO.
19.	In Step 3 of 3, press Enter to select the default node management interface port: e0c
20.	The node management interface set during the setup of the lab environment. Press Enter to use the predefined IP address. The IP address for this node should be 192.168.0.92 .
21.	Press Enter to use the predefined network mask. The network mask should be 255.255.255.0 for this node.
22.	Enter the following default gateway for the cluster management interface: 192.168.0.1
23.	Verify the cluster setup wizard completes successfully.
24.	Close the node management LIF SSH PuTTY session.
25.	Switch back to the PuTTY SSH session with the cluster management LIF.

STEP	ACTION
26.	<p>Enter this command to check the cluster health:</p> <pre>cluster1::> cluster show</pre> <p>Sample output:</p> <pre>Node Health Eligibility ----- cluster1-01 true true cluster1-02 true true 2 entries were displayed.</pre>
27.	<p>In System Manager, verify that both nodes are visible:</p>  <p>The screenshot shows the NetApp System Manager interface for a cluster named 'cluster1'. The interface is divided into several sections:</p> <ul style="list-style-type: none"> Cluster: A sidebar on the left shows the navigation tree with 'cluster1' selected. Properties: A central panel showing cluster details: <ul style="list-style-type: none"> Version: NetApp Release 8.2X15 Cluster-Mode: Sun Ja... Number of nodes: 2 nodes (indicated by a mouse cursor) Number of Vservers: NA System Health: A panel showing the overall status: <ul style="list-style-type: none"> Cluster Health: Degraded (indicated by a red lightbulb icon) Subsystem Health: <ul style="list-style-type: none"> switch_health: Degraded (red lightbulb icon) sas_connect: Ok (green lightbulb icon) cif_nde: Ok (green lightbulb icon) Alarms: A panel stating 'There are no alarms at this time.' Storage: A panel showing 'Data Aggregates: 0 Aggregates' and a bar chart for 'Data Aggregates by Space Utilization: NA' with a scale from 0% to 80%.

TASK 5: EXPLORE HOW TO LICENSE PACKAGES

In this task, you use System Manager to license the SnapVault package, which is new to clustered Data ONTAP 8.2. Then you use an SSH session to the cluster management LIF to explore licensing packages from the CLI.

STEP	ACTION
1.	Within the cluster1 tab, select Cluster > cluster1 > Configuration > System Tools > Licenses .
2.	<p>Verify that the CIFS package and the base package are licensed.</p> <p>There are three types of licenses:</p> <ul style="list-style-type: none">▪ Licenses, which System Manager describes as “Node Locked License.” Each node license is locked to a node in the cluster. You should install node licenses for each node in the cluster. The CIFS license is a node license.▪ Site licenses, which System Manager describes as “Installed on a cluster.” The base cluster license is a site license.▪ Demonstration licenses, which System Manager describes as “Demo License expires on <i>end_date</i>” These licenses are not locked to a particular node.



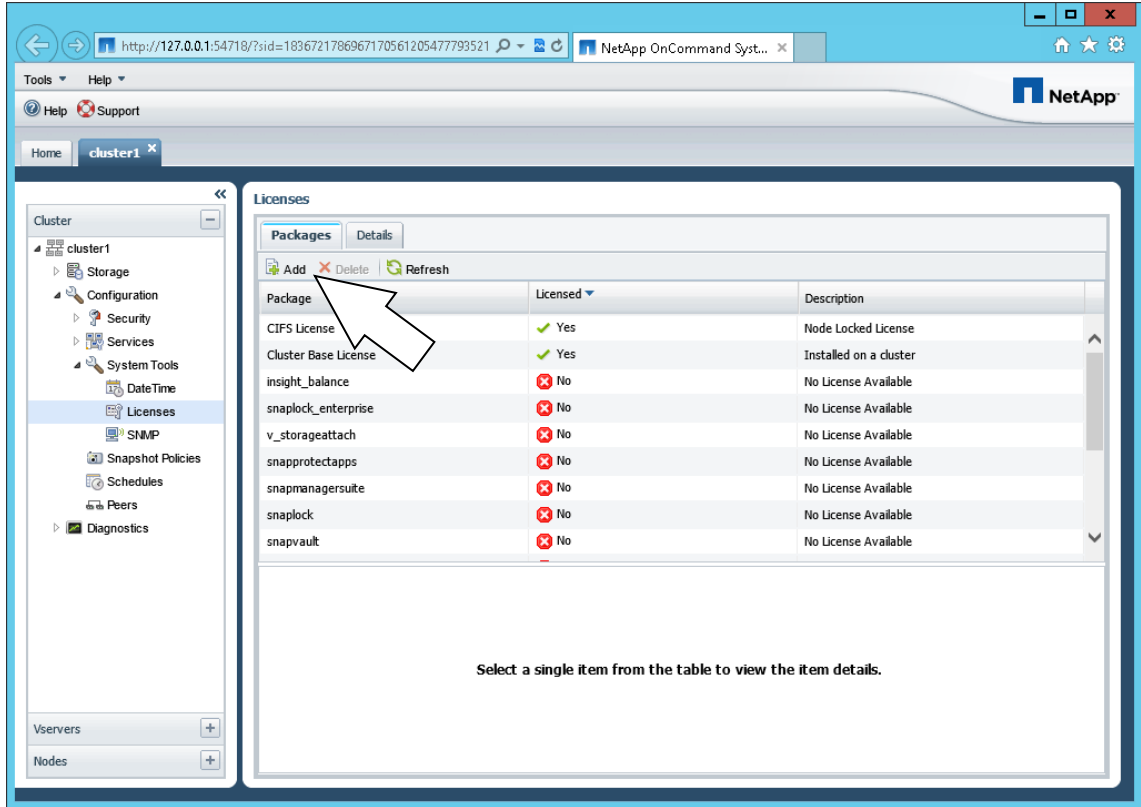
The screenshot shows the NetApp System Manager interface for cluster1. The left sidebar shows the navigation tree with 'Licenses' selected under 'System Tools'. The main content area shows the 'Licenses' page with a table of installed and available licenses.

Package	Licensed	Description
CIFS License	Yes	Node Locked License
Cluster Base License	Yes	Installed on a cluster
insight_balance	No	No License Available
snaplock_enterprise	No	No License Available
v_storageattach	No	No License Available
snapprotectapps	No	No License Available
snapmanagersuite	No	No License Available
snaplock	No	No License Available
snapvault	No	No License Available

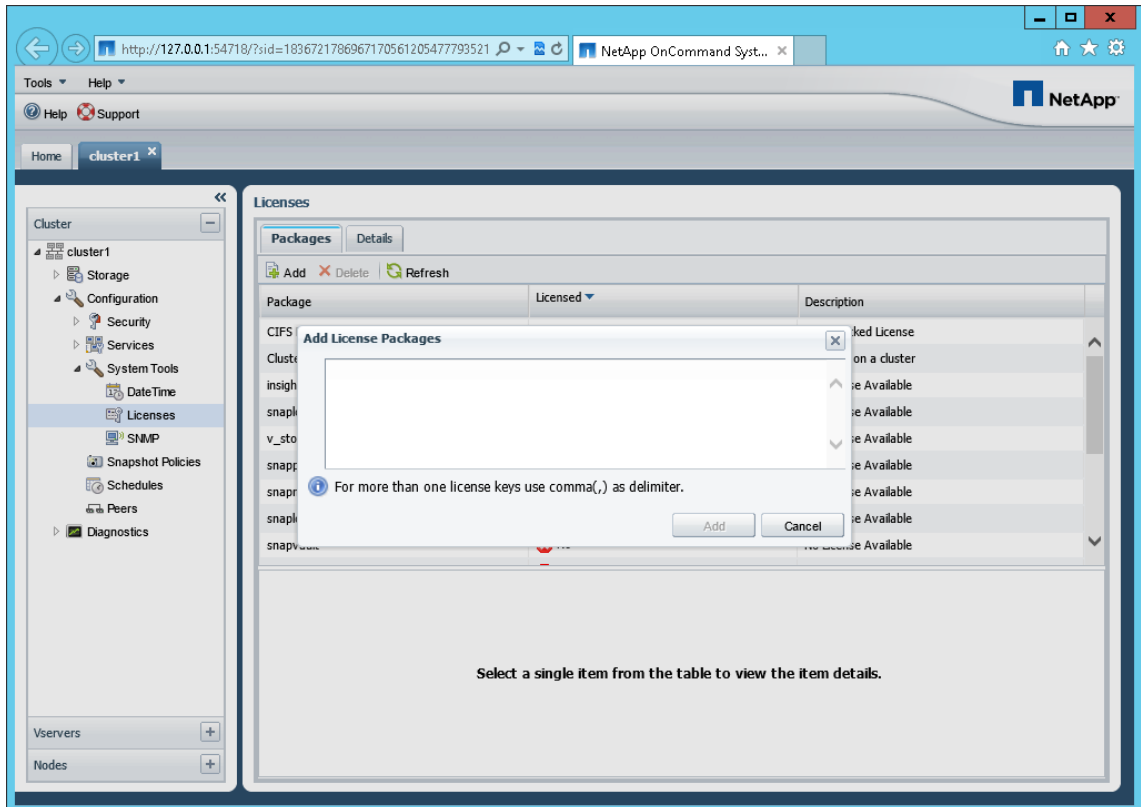
Select a single item from the table to view the item details.

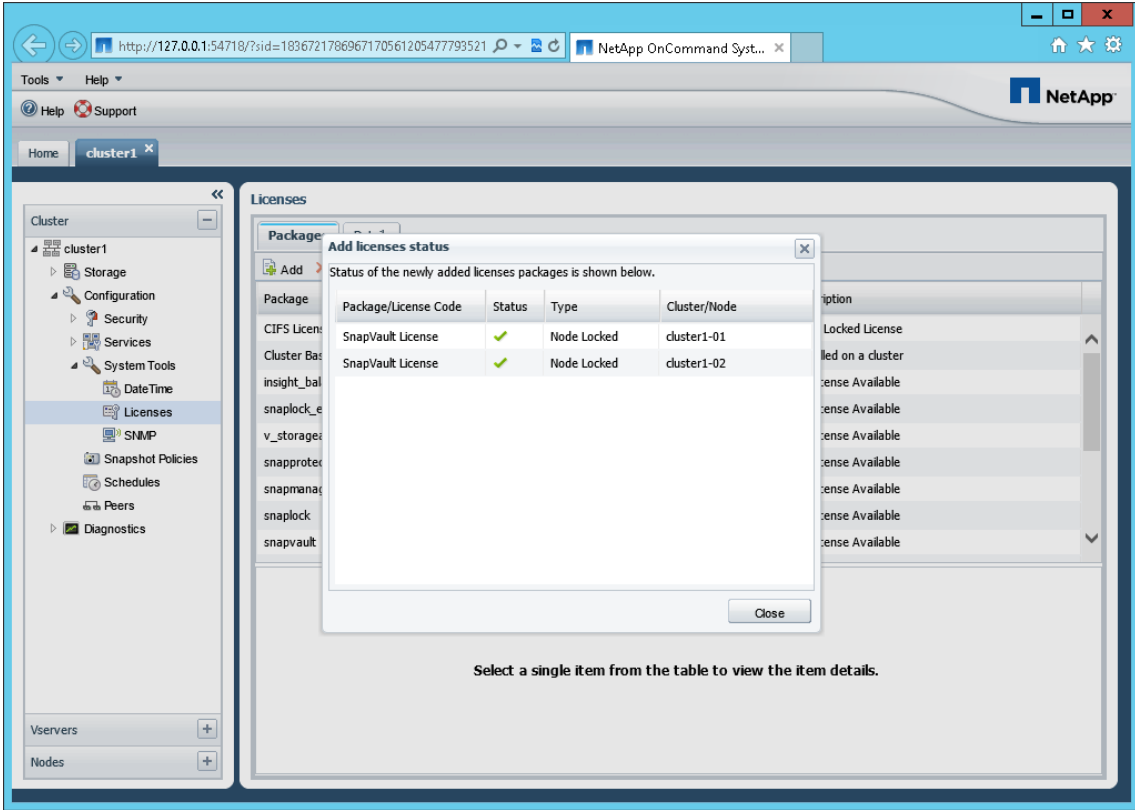
STEP ACTION

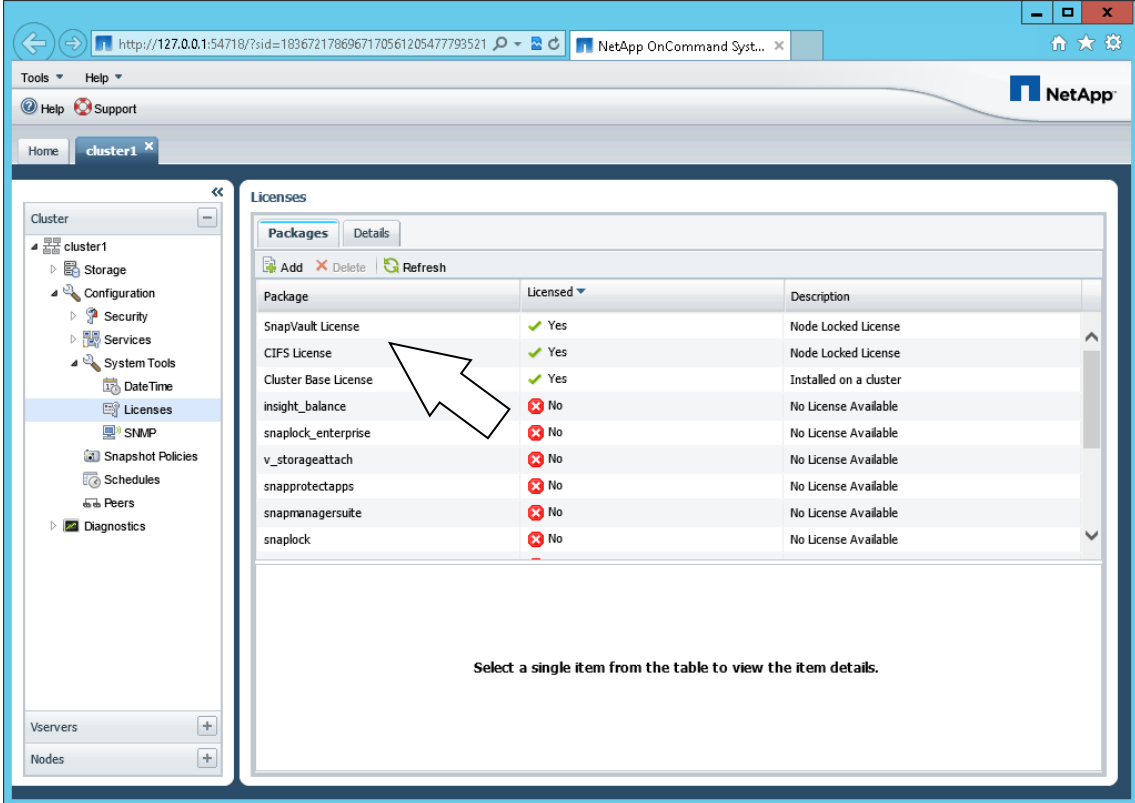
3. Next, you will add new licenses for the SnapVault feature. Click **Add**:



4. Verify that the Add License Packages dialog appears:



STEP	ACTION												
5.	<p>Enter the license codes for SnapVault software for node 1 and node 2: QPLNOHHTVDDCMAOZFAAAAAAAAAAAA , EXSBQNSVQFGEYAOZFAAAAAAAAAAAA</p> <p>NOTE: You can also cut and paste the license codes from the Licenses.txt file in C:\CourseFiles. Look for the SnapVault license codes for cluster1-01 and cluster1-02. If you paste in a code but the Add button is not available, delete the last character and then re-add the license code. The Add button should become available.</p>												
6.	Click Add .												
7.	<p>Verify that the SnapVault package was correctly identified. The two license codes are locked to the nodes in the cluster:</p>  <p>The screenshot shows the NetApp OnCommand System Manager interface. The main window displays the 'Licenses' page for a cluster named 'cluster1'. A modal window titled 'Add licenses status' is open, showing the status of newly added licenses. The modal contains a table with the following data:</p> <table border="1"> <thead> <tr> <th>Package/License Code</th> <th>Status</th> <th>Type</th> <th>Cluster/Node</th> </tr> </thead> <tbody> <tr> <td>SnapVault License</td> <td>✓</td> <td>Node Locked</td> <td>cluster1-01</td> </tr> <tr> <td>SnapVault License</td> <td>✓</td> <td>Node Locked</td> <td>cluster1-02</td> </tr> </tbody> </table> <p>The modal also includes a 'Close' button and a message: 'Select a single item from the table to view the item details.'</p>	Package/License Code	Status	Type	Cluster/Node	SnapVault License	✓	Node Locked	cluster1-01	SnapVault License	✓	Node Locked	cluster1-02
Package/License Code	Status	Type	Cluster/Node										
SnapVault License	✓	Node Locked	cluster1-01										
SnapVault License	✓	Node Locked	cluster1-02										
8.	Click Close .												

STEP	ACTION																														
9.	<p>Verify the new package is licensed in the list:</p>  <table border="1" data-bbox="540 472 1393 751"> <thead> <tr> <th>Package</th> <th>Licensed</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>SnapVault License</td> <td>✓ Yes</td> <td>Node Locked License</td> </tr> <tr> <td>CIFS License</td> <td>✓ Yes</td> <td>Node Locked License</td> </tr> <tr> <td>Cluster Base License</td> <td>✓ Yes</td> <td>Installed on a cluster</td> </tr> <tr> <td>insight_balance</td> <td>✗ No</td> <td>No License Available</td> </tr> <tr> <td>snaplock_enterprise</td> <td>✗ No</td> <td>No License Available</td> </tr> <tr> <td>v_storageattach</td> <td>✗ No</td> <td>No License Available</td> </tr> <tr> <td>snapprotectapps</td> <td>✗ No</td> <td>No License Available</td> </tr> <tr> <td>snapmanagersuite</td> <td>✗ No</td> <td>No License Available</td> </tr> <tr> <td>snaplock</td> <td>✗ No</td> <td>No License Available</td> </tr> </tbody> </table>	Package	Licensed	Description	SnapVault License	✓ Yes	Node Locked License	CIFS License	✓ Yes	Node Locked License	Cluster Base License	✓ Yes	Installed on a cluster	insight_balance	✗ No	No License Available	snaplock_enterprise	✗ No	No License Available	v_storageattach	✗ No	No License Available	snapprotectapps	✗ No	No License Available	snapmanagersuite	✗ No	No License Available	snaplock	✗ No	No License Available
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10.	<p>Switch back to the cluster management LIF SSH PuTTY session. Authenticate as admin using the password defined in Task 2 Step 21 if necessary.</p>																														
11.	<p>View the cluster's serial ID:</p> <pre>cluster1::> cluster identity show</pre> <p>Sample output:</p> <pre> Cluster UUID: a9e342a1-81e5-11e2-93a8-123478563412 Cluster Name: cluster1 Cluster Serial Number: 1-80-000011 Cluster Location: Cluster Contact: </pre> <p>For this sample output, the serial number is 1-80-000011.</p>																														

STEP	ACTION
12.	<p>Identify the serial number of each system in the cluster:</p> <pre>cluster1::> system node show -fields node,serialnumber</pre> <p>Sample output:</p> <pre>node serialnumber ----- cluster1-01 4044744-72-1 cluster1-02 4044744-72-2 2 entries were displayed.</pre>
13.	<p>Navigate to the license hierarchy:</p> <pre>cluster1::> license</pre> <p>The prompt changes to the system license hierarchy:</p> <pre>cluster1::system license></pre>
14.	<p>List the available commands:</p> <pre>cluster1::system license> ?</pre> <p>Sample output:</p> <pre>add Add one or more licenses clean-up Remove unnecessary licenses delete Delete a license show Display licenses status> Display license status</pre>

STEP	ACTION																												
15.	<p>View the current licensed commands:</p> <pre>cluster1::system license> show</pre> <p>Sample output:</p> <pre>Serial Number: 1-80-000011 Owner: cluster1</pre> <table border="1"> <thead> <tr> <th>Package</th> <th>Type</th> <th>Description</th> <th>Expiration</th> </tr> </thead> <tbody> <tr> <td>Base</td> <td>site</td> <td>Cluster Base License</td> <td>-</td> </tr> </tbody> </table> <pre>Serial Number: 1-81-00000000000000004044744721 Owner: cluster1-01</pre> <table border="1"> <thead> <tr> <th>Package</th> <th>Type</th> <th>Description</th> <th>Expiration</th> </tr> </thead> <tbody> <tr> <td>CIFS</td> <td>license</td> <td>CIFS License</td> <td>-</td> </tr> <tr> <td>SnapVault</td> <td>license</td> <td>SnapVault License</td> <td>-</td> </tr> </tbody> </table> <pre>Serial Number: 1-81-00000000000000004044744722 Owner: cluster1-02</pre> <table border="1"> <thead> <tr> <th>Package</th> <th>Type</th> <th>Description</th> <th>Expiration</th> </tr> </thead> <tbody> <tr> <td>SnapVault</td> <td>license</td> <td>SnapVault License</td> <td>-</td> </tr> </tbody> </table> <p>4 entries were displayed.</p>	Package	Type	Description	Expiration	Base	site	Cluster Base License	-	Package	Type	Description	Expiration	CIFS	license	CIFS License	-	SnapVault	license	SnapVault License	-	Package	Type	Description	Expiration	SnapVault	license	SnapVault License	-
Package	Type	Description	Expiration																										
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STEP	ACTION																																																			
16.	<p>List details about the available license packages:</p> <pre>cluster1::system license> status show</pre> <p>Sample output:</p> <table border="1"> <thead> <tr> <th>Package</th> <th>Licensed Method</th> <th>Expiration</th> </tr> </thead> <tbody> <tr><td>Base</td><td>site</td><td>-</td></tr> <tr><td>NFS</td><td>none</td><td>-</td></tr> <tr><td>CIFS</td><td>license</td><td>-</td></tr> <tr><td>iSCSI</td><td>none</td><td>-</td></tr> <tr><td>FCP</td><td>none</td><td>-</td></tr> <tr><td>CDMI</td><td>none</td><td>-</td></tr> <tr><td>SnapRestore</td><td>none</td><td>-</td></tr> <tr><td>SnapMirror</td><td>none</td><td>-</td></tr> <tr><td>FlexClone</td><td>none</td><td>-</td></tr> <tr><td>SnapVault</td><td>license</td><td>-</td></tr> <tr><td>SnapLock</td><td>none</td><td>-</td></tr> <tr><td>SnapManagerSuite</td><td>none</td><td>-</td></tr> <tr><td>SnapProtectApps</td><td>none</td><td>-</td></tr> <tr><td>V_StorageAttach</td><td>none</td><td>-</td></tr> <tr><td>SnapLock_Enterprise</td><td>none</td><td>-</td></tr> <tr><td>Insight_Balance</td><td>none</td><td>-</td></tr> </tbody> </table> <p>16 entries were displayed.</p>	Package	Licensed Method	Expiration	Base	site	-	NFS	none	-	CIFS	license	-	iSCSI	none	-	FCP	none	-	CDMI	none	-	SnapRestore	none	-	SnapMirror	none	-	FlexClone	none	-	SnapVault	license	-	SnapLock	none	-	SnapManagerSuite	none	-	SnapProtectApps	none	-	V_StorageAttach	none	-	SnapLock_Enterprise	none	-	Insight_Balance	none	-
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SnapLock_Enterprise	none	-																																																		
Insight_Balance	none	-																																																		
17.	<p>Add a demonstration license for SnapMirror software:</p> <pre>cluster1::system license> add -license-code SAQJNHHTVDDCMAOZFAAAAAAAAAAAA</pre> <p>NOTE: You can also cut and paste the license code from the Licenses.txt file in C:\CourseFiles. Look for the SnapMirror license code.</p> <p>Sample output:</p> <pre>License for package "SnapMirror" installed successfully. (1 of 1 added successfully)</pre>																																																			

STEP	ACTION
18.	<p>Verify the demo license:</p> <pre>cluster1::system license> show</pre> <p>Sample output:</p> <pre>Serial Number: 1-80-000011 Owner: cluster1 Package Type Description Expiration ----- Base site Cluster Base License - SnapMirror demo SnapMirror License 10/5/2015 08:00:00 Serial Number: 1-81-0000000000000004044744721 Owner: cluster1-01 Package Type Description Expiration ----- CIFS license CIFS License - SnapVault license SnapVault License - Serial Number: 1-81-0000000000000004044744722 Owner: cluster1-02 Package Type Description Expiration ----- SnapVault license SnapVault License - 5 entries were displayed.</pre>
19.	<p>Delete the new SnapMirror license:</p> <pre>cluster1::system license> delete -serial-number 1-80-000011 -package SnapMirror</pre> <p>Sample output:</p> <pre>Warning: The following license will be removed: SnapMirror 1-80-000011</pre>
20.	<p>Confirm the deletion:</p> <pre>Do you want to continue? {y n}: y</pre>

STEP	ACTION																																
21.	<p>Add the CIFS license for node 2:</p> <pre>cluster1::system license> add -license-code YJIBMNSVQFGEYAOZFAAAAAAAAAAAA</pre> <p>YNSHQZOA HJMIWBOZFAAAAAAAAAAAA</p> <p>NOTE: You can also cut and paste the license code from the Licenses.txt file in C:\CourseFiles. Look for the CIFS license code for cluster1-02.</p> <p>Sample output:</p> <pre>License for package "CIFS" and serial number "1-81- 00000000000000004044744722" installed successfully. (1 of 1 added successfully)</pre>																																
22.	<p>Verify the new CIFS license was added:</p> <pre>cluster1::system license> show</pre> <p>Sample output:</p> <pre>Serial Number: 1-80-000011 Owner: cluster1</pre> <table border="1"> <thead> <tr> <th>Package</th> <th>Type</th> <th>Description</th> <th>Expiration</th> </tr> </thead> <tbody> <tr> <td>Base</td> <td>site</td> <td>Cluster Base License</td> <td>-</td> </tr> </tbody> </table> <pre>Serial Number: 1-81-00000000000000004044744721 Owner: cluster1-01</pre> <table border="1"> <thead> <tr> <th>Package</th> <th>Type</th> <th>Description</th> <th>Expiration</th> </tr> </thead> <tbody> <tr> <td>CIFS</td> <td>license</td> <td>CIFS License</td> <td>-</td> </tr> <tr> <td>SnapVault</td> <td>license</td> <td>SnapVault License</td> <td>-</td> </tr> </tbody> </table> <pre>Serial Number: 1-81-00000000000000004044744722 Owner: cluster1-02</pre> <table border="1"> <thead> <tr> <th>Package</th> <th>Type</th> <th>Description</th> <th>Expiration</th> </tr> </thead> <tbody> <tr> <td>CIFS</td> <td>license</td> <td>CIFS License</td> <td>-</td> </tr> <tr> <td>SnapVault</td> <td>license</td> <td>SnapVault License</td> <td>-</td> </tr> </tbody> </table> <p>5 entries were displayed.</p>	Package	Type	Description	Expiration	Base	site	Cluster Base License	-	Package	Type	Description	Expiration	CIFS	license	CIFS License	-	SnapVault	license	SnapVault License	-	Package	Type	Description	Expiration	CIFS	license	CIFS License	-	SnapVault	license	SnapVault License	-
Package	Type	Description	Expiration																														
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SnapVault	license	SnapVault License	-																														
Package	Type	Description	Expiration																														
CIFS	license	CIFS License	-																														
SnapVault	license	SnapVault License	-																														

STEP	ACTION
23.	<p>Add the FCP license for a node that is not currently in the cluster:</p> <pre>cluster1::system license> add -license-code YNSHQZOAHIWBOZFAAAAAAAAAAAA</pre> <p>NOTE: You might add a license for a node that does not exist to “preload” the license for a node that you will soon add. You can also cut and paste the license code from the Licenses.txt file in C:\CourseFiles. Look for the FCP license code for cluster1-xx.</p> <p>Sample output:</p> <pre>License for package "FCP" and serial number " 1-81- 00000000000000004044744724" installed successfully. (1 of 1 added successfully)</pre>

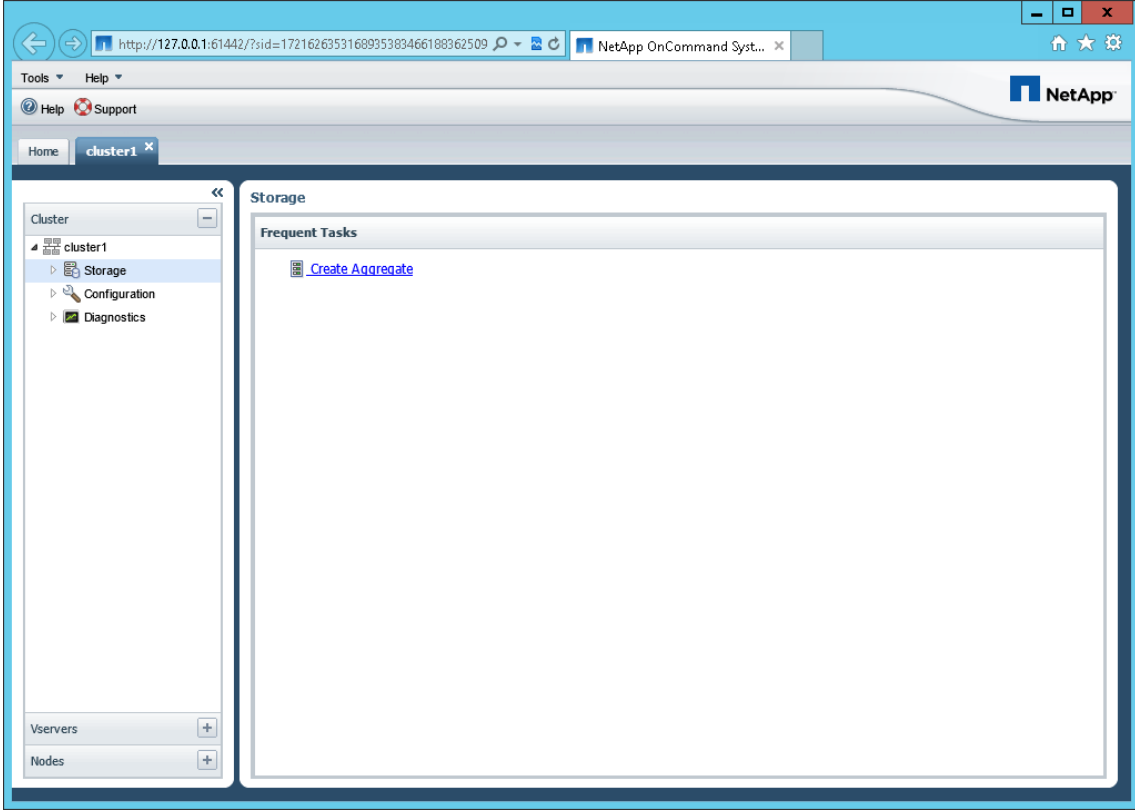
STEP	ACTION
24.	<p>Verify the new FCP license was added:</p> <pre>cluster1::system license> show</pre> <p>Sample output:</p> <pre>Serial Number: 1-80-000011 Owner: cluster1 Package Type Description Expiration ----- Base site Cluster Base License - Serial Number: 1-81-0000000000000004044744721 Owner: cluster1-01 Package Type Description Expiration ----- CIFS license CIFS License - SnapVault license SnapVault License - Serial Number: 1-81-0000000000000004044744722 Owner: cluster1-02 Package Type Description Expiration ----- CIFS license CIFS License - SnapVault license SnapVault License - Serial Number: 1-81-0000000000000004044744724 Owner: none Package Type Description Expiration ----- FCP license FCP License - 6 entries were displayed.</pre>
25.	<p>Type the following command and then press tab:</p> <pre>cluster1::system license> clean-up -</pre> <p>Sample output:</p> <pre>-unused -expired -simulate</pre> <pre>cluster1::system license> clean-up -</pre> <p>NOTE: You can select expired or unused licenses to be removed. An unused license is a license that is associated with node that doesn't belong to the cluster.</p>

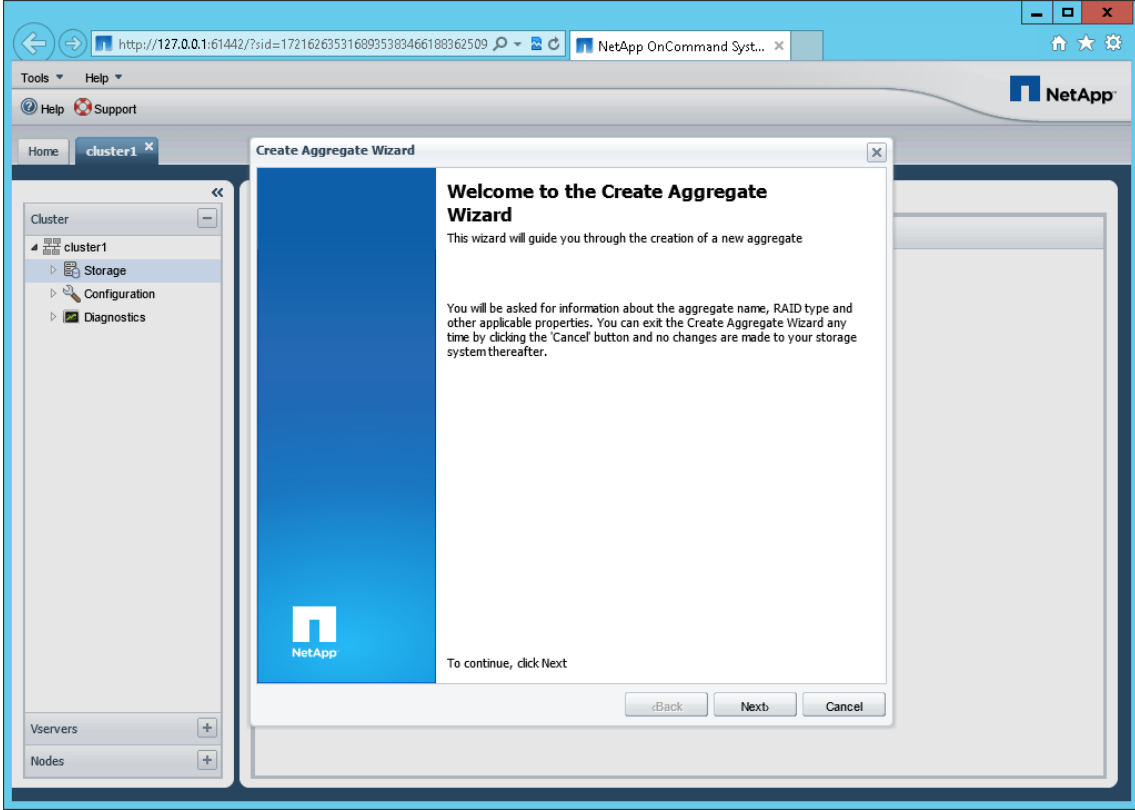
Tab, not Enter

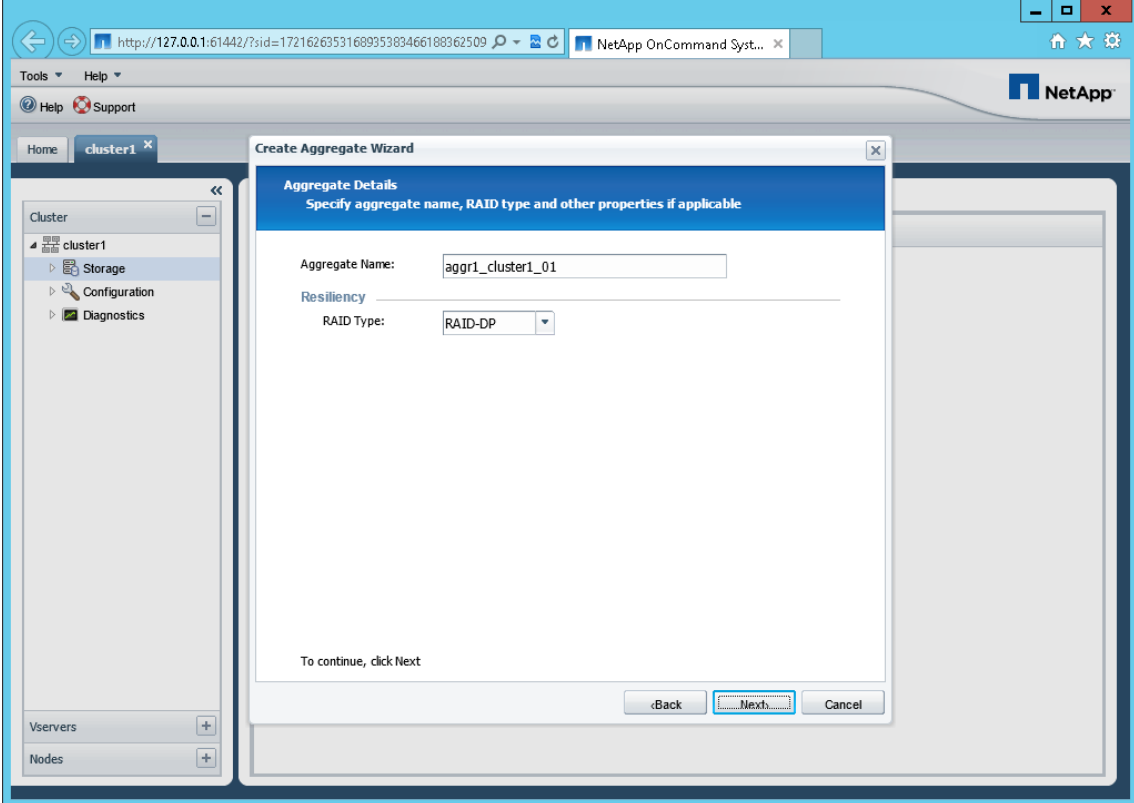
STEP	ACTION																																
26.	<p>Verify what will be cleaned up with the <code>unused</code> command:</p> <pre>cluster1::system license> clean-up -unused -simulate</pre> <p>Sample output:</p> <p>The following licenses will be cleaned up:</p> <p>Serial number: 1-81-0000000000000004044744724</p> <p>Owner: none</p> <table border="1"> <thead> <tr> <th>Package</th> <th>Reason</th> </tr> </thead> <tbody> <tr> <td>FCP</td> <td>Serial number is not used by any node in the cluster</td> </tr> </tbody> </table>	Package	Reason	FCP	Serial number is not used by any node in the cluster																												
Package	Reason																																
FCP	Serial number is not used by any node in the cluster																																
27.	<p>Clean up the unused licenses:</p> <pre>cluster1::system license> clean-up -unused</pre> <p>Sample output:</p> <pre>unused license deleted.</pre>																																
28.	<p>Verify that the FCP license was removed:</p> <pre>cluster1::system license> show</pre> <p>Sample output:</p> <p>Serial Number: 1-80-000011</p> <p>Owner: cluster1</p> <table border="1"> <thead> <tr> <th>Package</th> <th>Type</th> <th>Description</th> <th>Expiration</th> </tr> </thead> <tbody> <tr> <td>Base</td> <td>site</td> <td>Cluster Base License</td> <td>-</td> </tr> </tbody> </table> <p>Serial Number: 1-81-0000000000000004044744721</p> <p>Owner: cluster1-01</p> <table border="1"> <thead> <tr> <th>Package</th> <th>Type</th> <th>Description</th> <th>Expiration</th> </tr> </thead> <tbody> <tr> <td>CIFS</td> <td>license</td> <td>CIFS License</td> <td>-</td> </tr> <tr> <td>SnapVault</td> <td>license</td> <td>SnapVault License</td> <td>-</td> </tr> </tbody> </table> <p>Serial Number: 1-81-0000000000000004044744722</p> <p>Owner: cluster1-02</p> <table border="1"> <thead> <tr> <th>Package</th> <th>Type</th> <th>Description</th> <th>Expiration</th> </tr> </thead> <tbody> <tr> <td>CIFS</td> <td>license</td> <td>CIFS License</td> <td>-</td> </tr> <tr> <td>SnapVault</td> <td>license</td> <td>SnapVault License</td> <td>-</td> </tr> </tbody> </table> <p>5 entries were displayed.</p>	Package	Type	Description	Expiration	Base	site	Cluster Base License	-	Package	Type	Description	Expiration	CIFS	license	CIFS License	-	SnapVault	license	SnapVault License	-	Package	Type	Description	Expiration	CIFS	license	CIFS License	-	SnapVault	license	SnapVault License	-
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TASK 6: CREATE A DATA AGGREGATE

In this task, you use System Manager to create a data aggregate for volumes used in a Virtual Storage Server (Vserver). To learn how to create a Vserver, see the *Clustered Data ONTAP Administration, 8.2 Update Part 2: Quality of Service* exercise in this series.

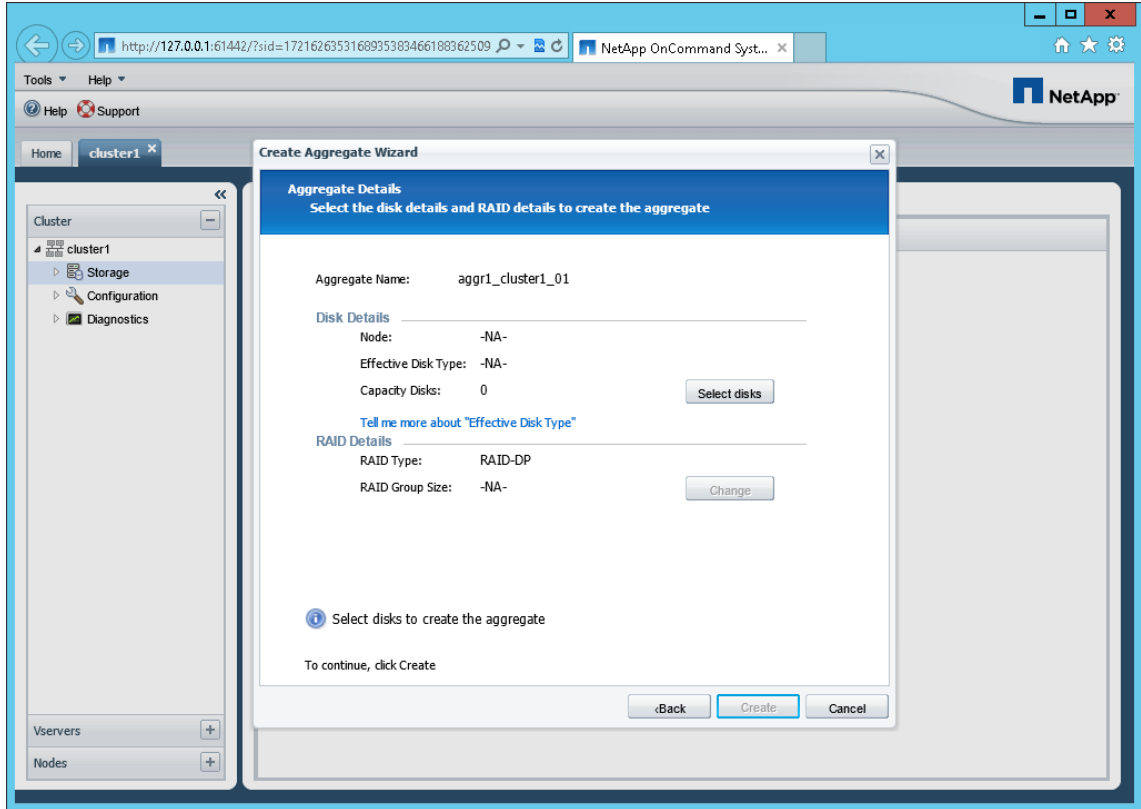
STEP	ACTION
1.	<p>In System Manager; in the left pane, click Storage:</p> 
2.	<p>Click Create Aggregate.</p>

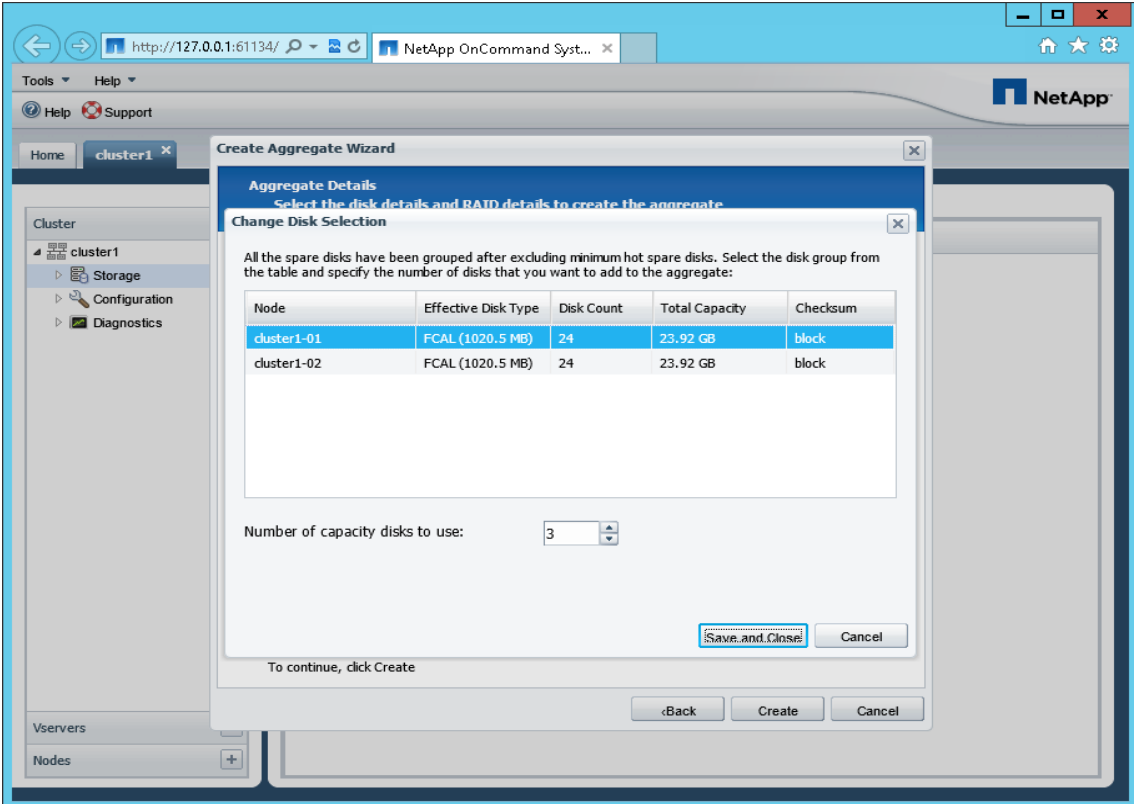
STEP	ACTION
3.	<p>Verify the Create Aggregate Wizard appears:</p> 
4.	Click Next .

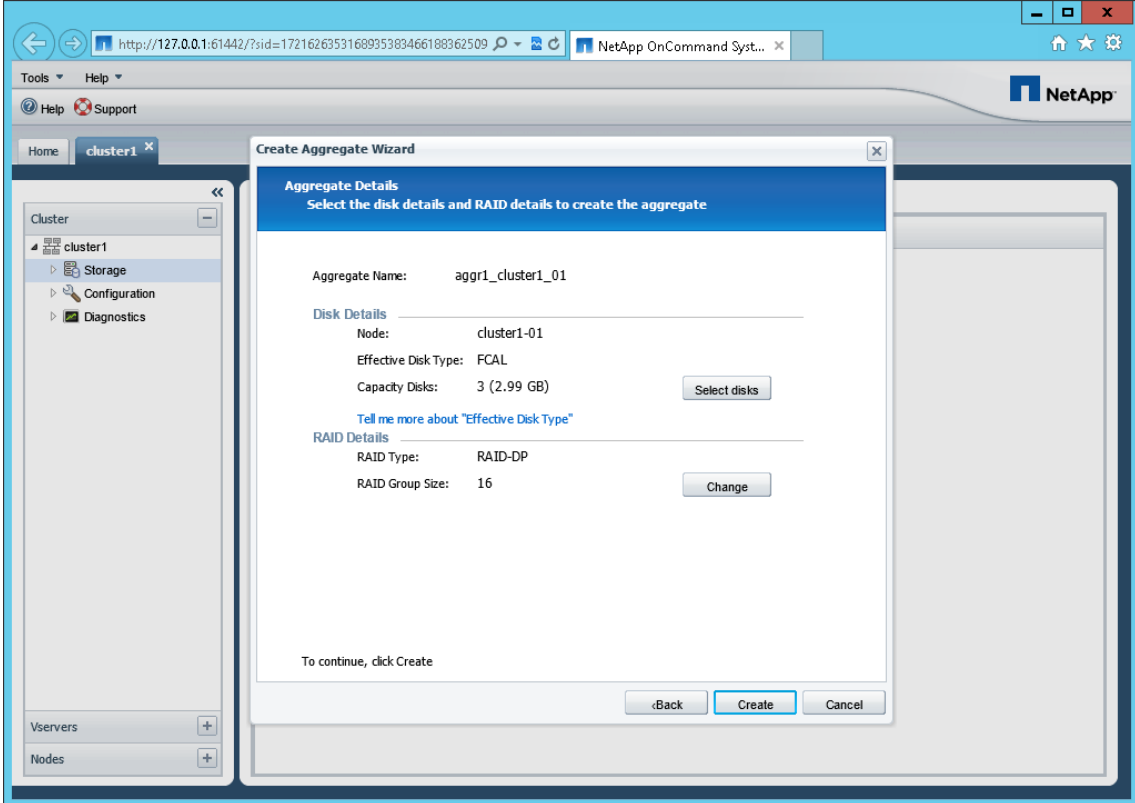
STEP	ACTION
5.	<p>On the Aggregate Details page, specify the following:</p> <ul style="list-style-type: none">Aggregate Name: aggr1_cluster1_01RAID Type: RAID-DP 
6.	Click Next .

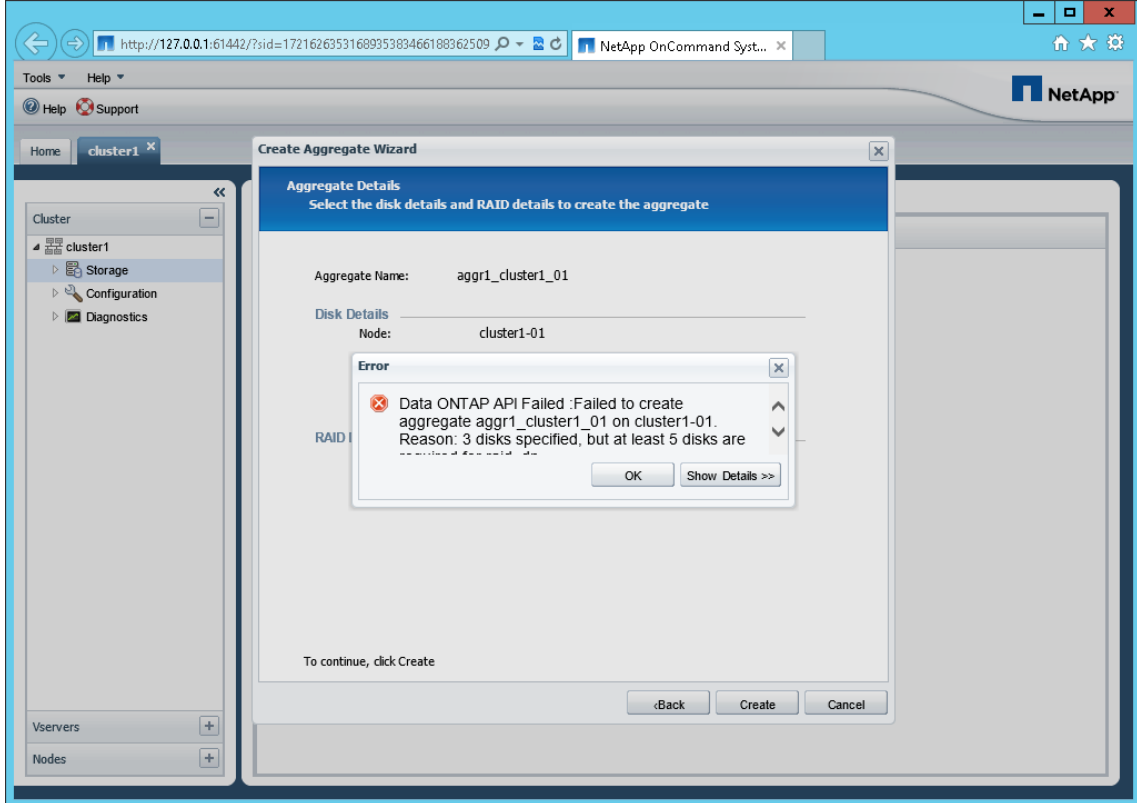
STEP ACTION

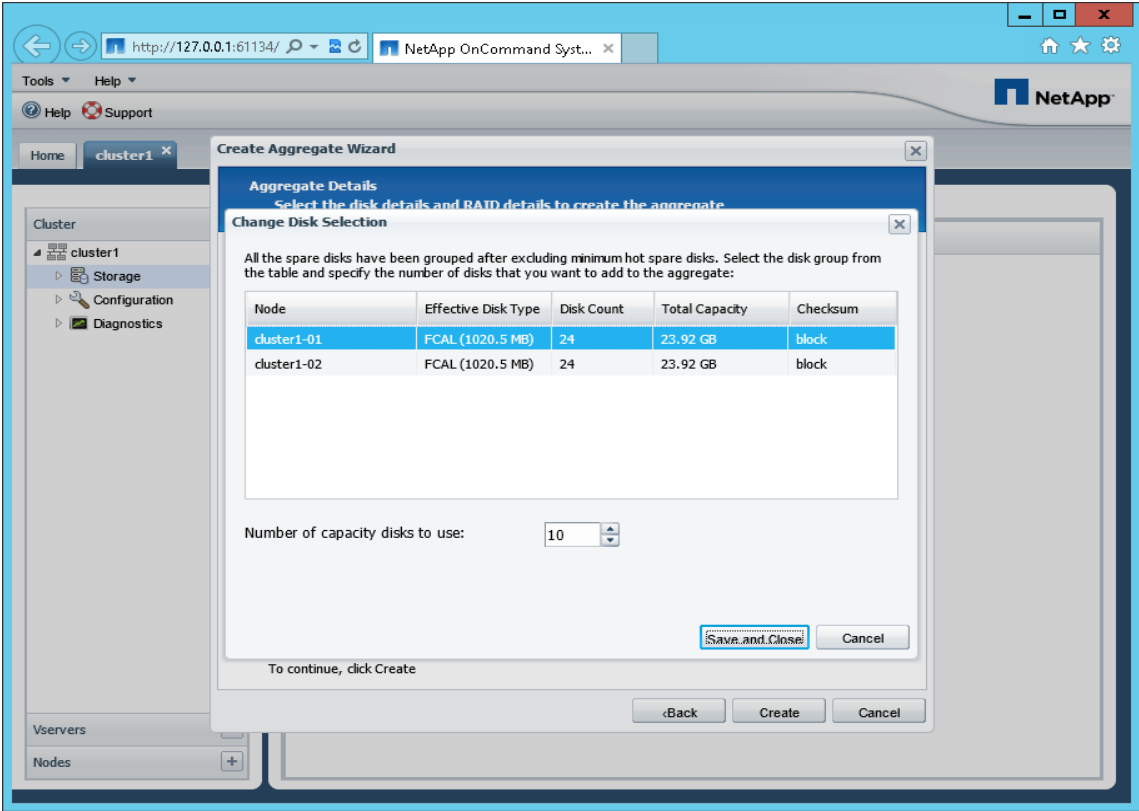
7. On the Aggregate Details page, click **Select disks**:

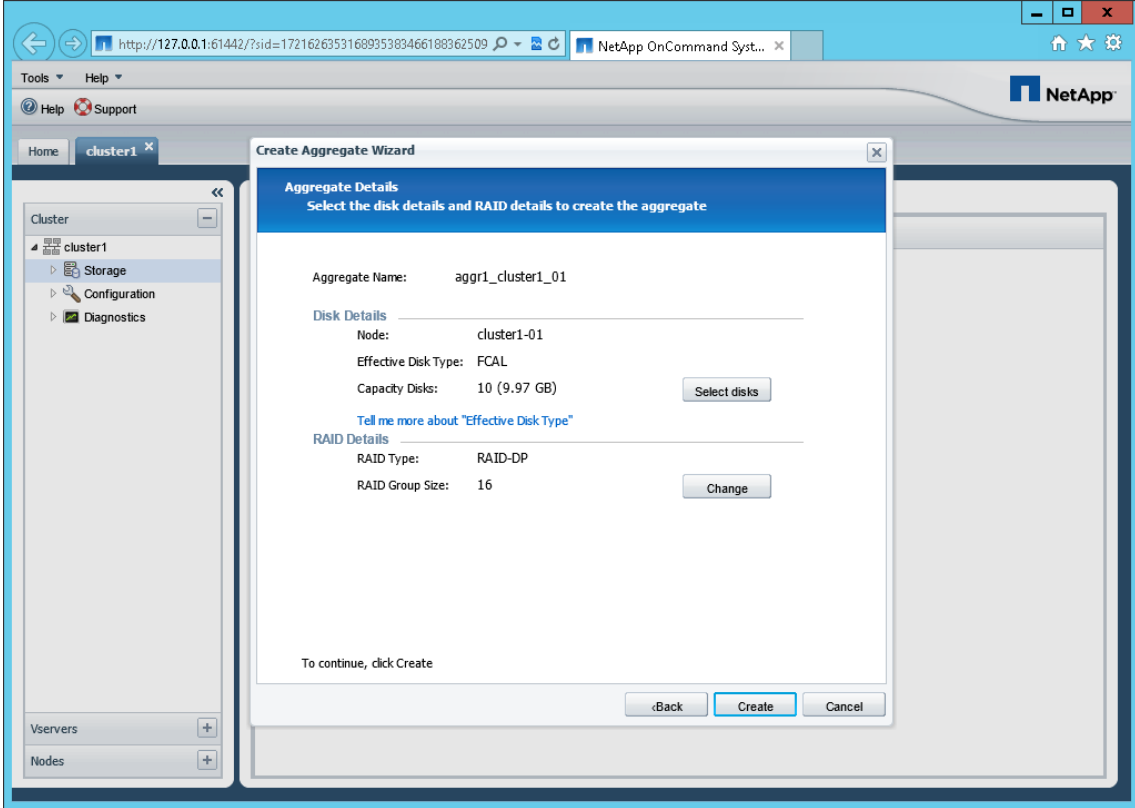


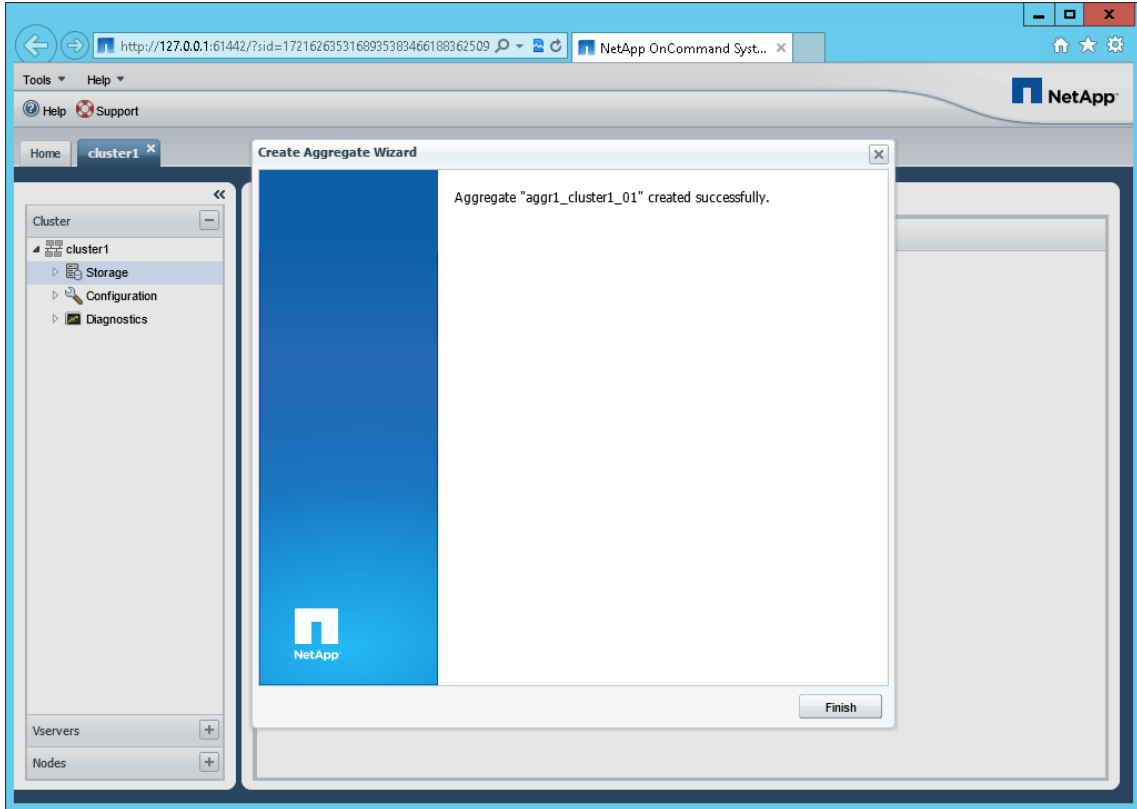
STEP	ACTION
8.	<p>On the Change Disk Selection dialog box, select the following:</p> <ul style="list-style-type: none"> ▪ Disk group: cluster1-01 FCAL ▪ Number of capacity disks to use: 3  <p>NOTE: If you don't see both nodes on the list, close System Manager, restart it, and log back in to cluster 1. After that, restart this task.</p>
9.	Click Save and Close .

STEP	ACTION
10.	<p>Review the information on the Aggregate Details page:</p> 
11.	Click Create .

STEP	ACTION
12.	<p>An error message appears, because in Data ONTAP 8.2 and later, you must have at least five disks to create a RAID-DP aggregate. (For a RAID 4 aggregate, you must have at least three disks). This change is to ensure that your data is well-protected:</p> 
13.	Click OK to acknowledge the error.
14.	Click Select disks again.

STEP	ACTION															
<p>15.</p>	<p>On the Change Disk Selection page, select the following:</p> <ul style="list-style-type: none"> ▪ Disk group: cluster1-01 FCAL ▪ Number of capacity disks to use: 10  <p>The screenshot shows the 'Create Aggregate Wizard' dialog box in the NetApp OnCommand System Manager. The 'Change Disk Selection' window is open, displaying a table of disk groups. The 'cluster1-01' group is selected. Below the table, the 'Number of capacity disks to use' is set to 10. The 'Save and Close' button is highlighted.</p> <table border="1" data-bbox="537 558 1187 762"> <thead> <tr> <th>Node</th> <th>Effective Disk Type</th> <th>Disk Count</th> <th>Total Capacity</th> <th>Checksum</th> </tr> </thead> <tbody> <tr> <td>cluster1-01</td> <td>FCAL (1020.5 MB)</td> <td>24</td> <td>23.92 GB</td> <td>block</td> </tr> <tr> <td>cluster1-02</td> <td>FCAL (1020.5 MB)</td> <td>24</td> <td>23.92 GB</td> <td>block</td> </tr> </tbody> </table> <p>Number of capacity disks to use: <input type="text" value="10"/></p> <p>Save and Close Cancel</p> <p>To continue, click Create</p> <p>Back Create Cancel</p>	Node	Effective Disk Type	Disk Count	Total Capacity	Checksum	cluster1-01	FCAL (1020.5 MB)	24	23.92 GB	block	cluster1-02	FCAL (1020.5 MB)	24	23.92 GB	block
Node	Effective Disk Type	Disk Count	Total Capacity	Checksum												
cluster1-01	FCAL (1020.5 MB)	24	23.92 GB	block												
cluster1-02	FCAL (1020.5 MB)	24	23.92 GB	block												
<p>16.</p>	<p>Click Save and Close.</p>															

STEP	ACTION
17.	<p>Review the information on the Aggregate Details page:</p> 
18.	Click Create .

STEP	ACTION
19.	<p>Verify the aggregate was successfully created:</p>  <p>The screenshot shows a web browser window with the URL <code>http://127.0.0.1:61442/?sid=1721626353168935383466188362509</code>. The browser title is "NetApp OnCommand Syst...". The page header includes "Tools", "Help", and the NetApp logo. The main content area shows a "Create Aggregate Wizard" dialog box with a blue background and the text "Aggregate 'aggr1_cluster1_01' created successfully." and a "Finish" button. The background interface shows a navigation pane with "Cluster" expanded to "cluster1", and sub-items "Storage", "Configuration", and "Diagnostics".</p>
20.	Click Finish .
21.	In the left pane, expand Storage and click Aggregates .

STEP ACTION

22. Verify the list of aggregates:

The screenshot shows the NetApp OnCommand System Manager interface. The left sidebar shows the navigation tree with 'cluster1' selected. The main area displays the 'Aggregates' page. A table lists the following aggregates:

Name	Node	Used (%)	Available S...	Used Space	Total Space	Volume Count	Disk Count	Status	Flash Po...
aggr0	cluster1-01	95	43.47 MB	856.53 MB	900 MB	1	3	online	-NA-
aggr0_cluster1_...	cluster1-02	96	39.01 MB	860.99 MB	900 MB	1	3	online	-NA-
aggr1_cluster1_01	cluster1-01	0	7.03 GB	184 KB	7.03 GB	0	10	online	-NA-

Below the table, the details for the selected aggregate 'aggr0' are shown:

- Name: aggr0
- Status: online
- RAID Type: raid_dp, normal
- Type: Aggregate
- Root: Yes
- Files: 96
- Maximum Files: 30384

23. Select the new aggregate: **aggr1_cluster1_01** and review the aggregate details:

The screenshot shows the NetApp OnCommand System Manager interface. The left sidebar shows the navigation tree with 'cluster1' selected. The main area displays the 'Aggregates' page. A table lists the following aggregates:


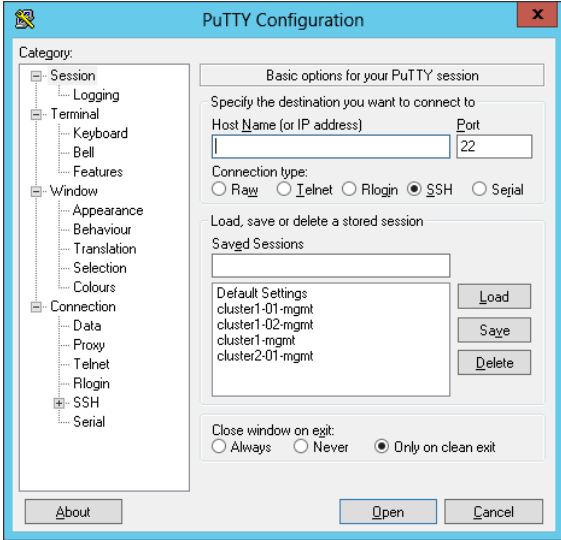
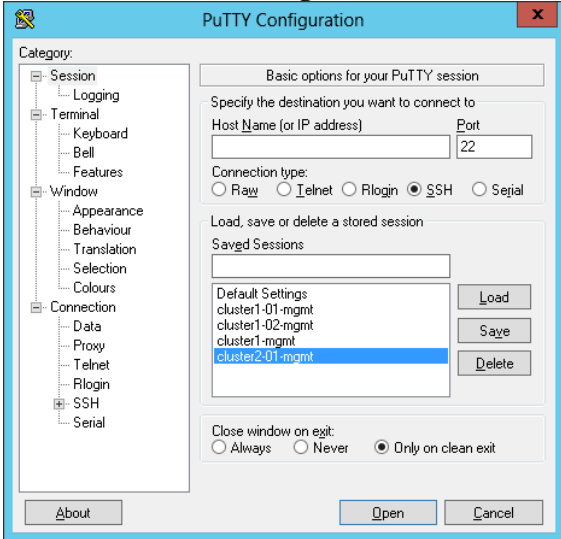
Name	Node	Used (%)	Available S...	Used Space	Total Space	Volume Count	Disk Count	Status	Flash Po...
aggr0	cluster1-01	95	43.47 MB	856.53 MB	900 MB	1	3	online	-NA-
aggr0_cluster1_...	cluster1-02	96	39.01 MB	860.99 MB	900 MB	1	3	online	-NA-
aggr1_cluster1_01	cluster1-01	0	7.03 GB	184 KB	7.03 GB	0	10	online	-NA-

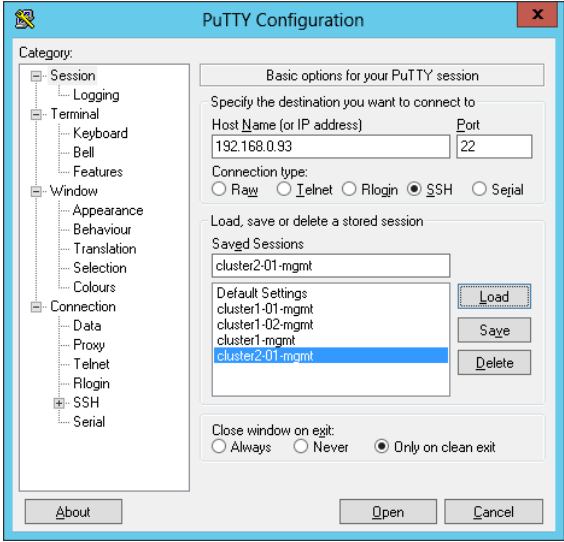
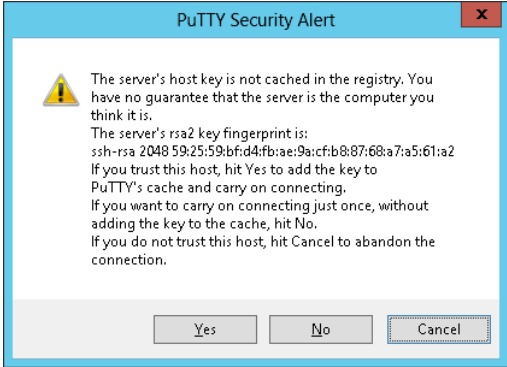
Below the table, the details for the selected aggregate 'aggr1_cluster1_01' are shown:

- Name: aggr1_cluster1_01
- Status: online
- RAID Type: raid_dp, normal
- Type: Aggregate
- Root: No
- Files: 96
- Maximum Files: 31142


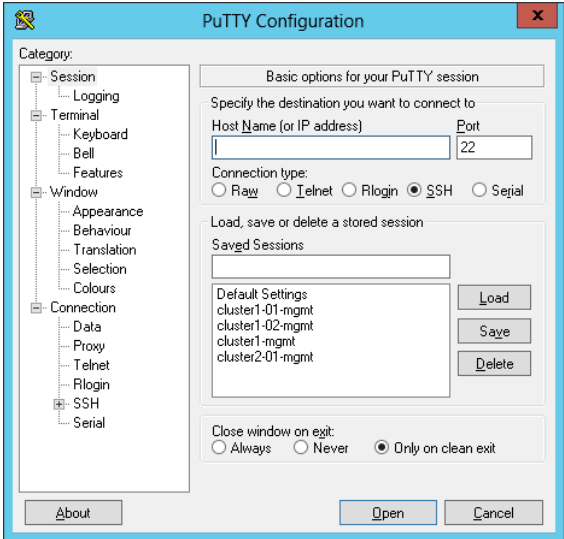
TASK 7: CREATE A SINGLE-NODE CLUSTER

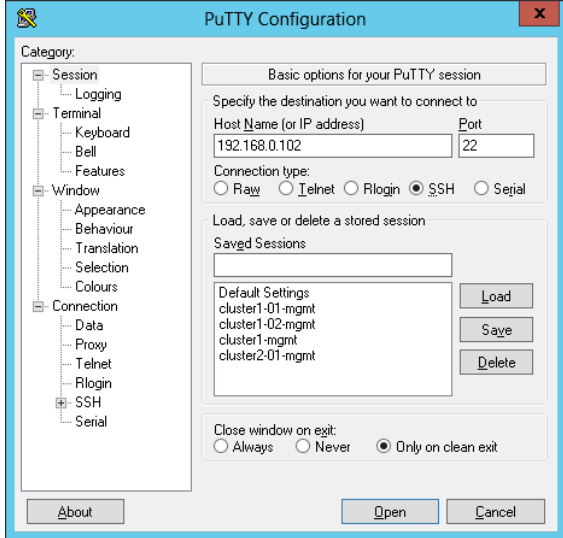
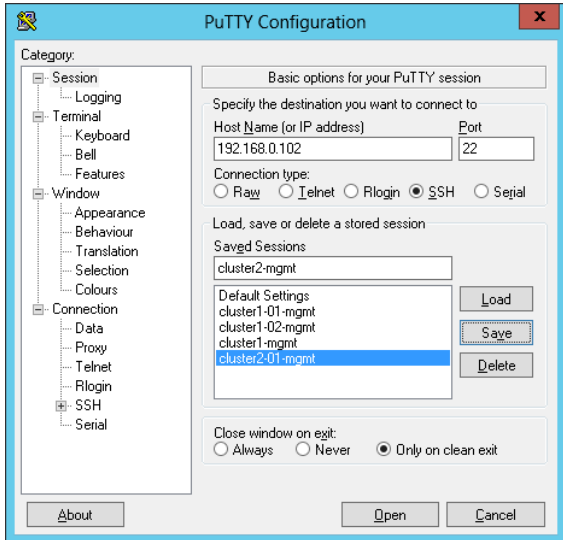
In this task, you log in to your assigned node 3 and create a cluster called cluster2.


STEP	ACTION
1.	<p>On your Windows desktop, double-click the link to PuTTY icon:</p> 
2.	<p>Verify that the PuTTY Configuration dialog appeared:</p> 
3.	<p>Select the cluster2-01-mgmt saved session:</p> 

STEP	ACTION
4.	<p>Click Load:</p> 
5.	Click Open to open a session with your storage system.
6.	<p>The PuTTY Security Alert dialog box appears (your SSH fingerprint will differ):</p> 
7.	Click Yes to confirm the SSH fingerprint key.
8.	<p>Verify the login prompt appears:</p> <pre>login as:</pre>
9.	At the login prompt, type: admin
10.	The admin login account does not have a password assigned to it. Press Enter .
11.	<p>Verify the command prompt appears:</p> <pre>cluster2-01::></pre>
12.	<p>Start the cluster setup wizard:</p> <pre>cluster2-01::> cluster setup</pre>
13.	In response to the question “Do you want to create a new cluster or join an existing cluster,” enter create to create a cluster.

STEP	ACTION
14.	In the response to the question “Do you intend for this node to be used as a single node cluster,” enter yes to create a single-node cluster.
15.	At step 1 of 5, enter the cluster name cluster2 . NOTE: Cluster names in clustered Data ONTAP are case-sensitive. “Cluster1” is not the same as “cluster1.”
16.	Enter the cluster base license code: GINBJXTZGYSEBGAAAAAAAAAAAAA NOTE: You can also cut and paste the license code from the Licenses.txt file in C:\CourseFiles. Look for the cluster base license code for cluster2. If you mistype the license code, the setup script will continue to prompt you for the correct code.
17.	When asked for an additional license code, enter the CIFS license: MRPPNTDYLHJGKBOZFAAAAAAAAAAAA NOTE: You can also cut and paste the license code from the Licenses.txt file in C:\CourseFiles. Look for the CIFS license code for cluster2-01.
18.	At step 2 of 5, when additional license codes are requested, enter the SnapVault license: SEAQRTDYLHJGKBOZFAAAAAAAAAAAA NOTE: You can also cut and paste the license code from the Licenses.txt file in C:\CourseFiles. Look for the SnapVault license code for cluster2-01.
19.	On a blank line, press Enter to indicate that you are finished adding license codes.
20.	At step 3 of 5, enter a password for the cluster administrator (admin) account. For example, you can use Netapp123 .
21.	Retype the password and press Enter .
22.	Press Enter to select the default cluster management interface port: e0a
23.	Enter this IP address for the cluster management interface: 192.168.0.102
24.	Enter this network mask for the cluster management interface: 255.255.255.0
25.	Enter this default gateway for the cluster management interface: 192.168.0.1
26.	Enter this DNS domain name: learn.netapp.local
27.	Enter the name server IP address: 192.168.0.11
28.	In screen display Step 4 of 5, note the statement about storage failover (SFO). This is a non-high-availability system and so will not use SFO.
29.	In screen display Step 5 of 5, in the text box, enter a value for the controller location. NOTE: You must enter the physical address of the storage system, because NetApp Global Support uses this information for delivering parts.
30.	Press Enter to select the default node management interface port: e0c

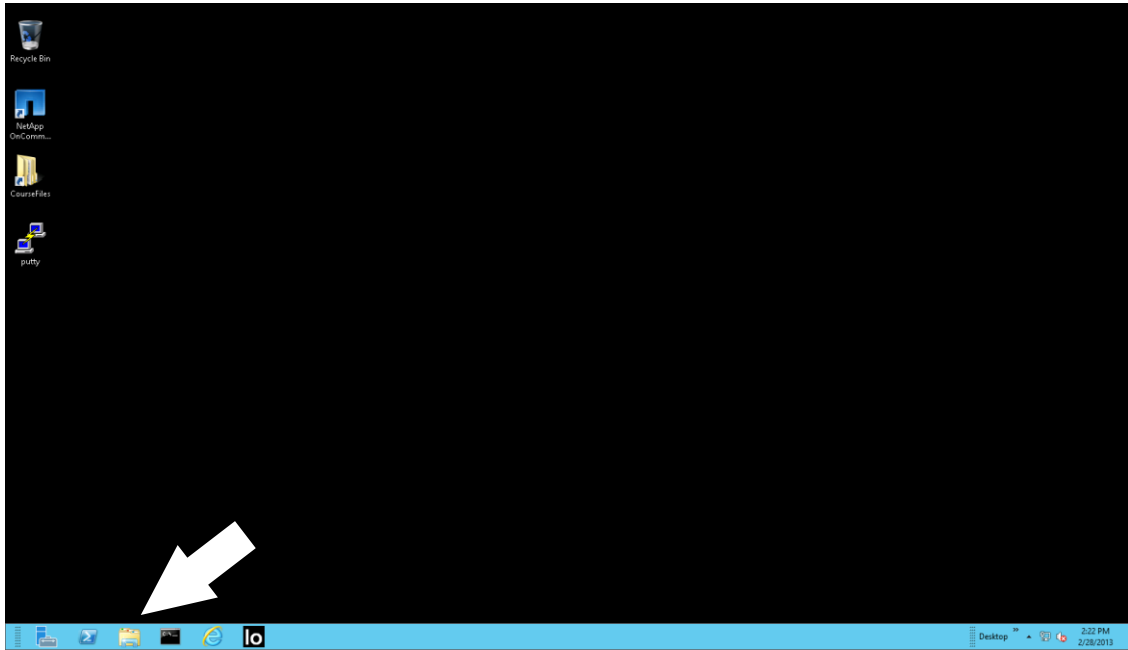
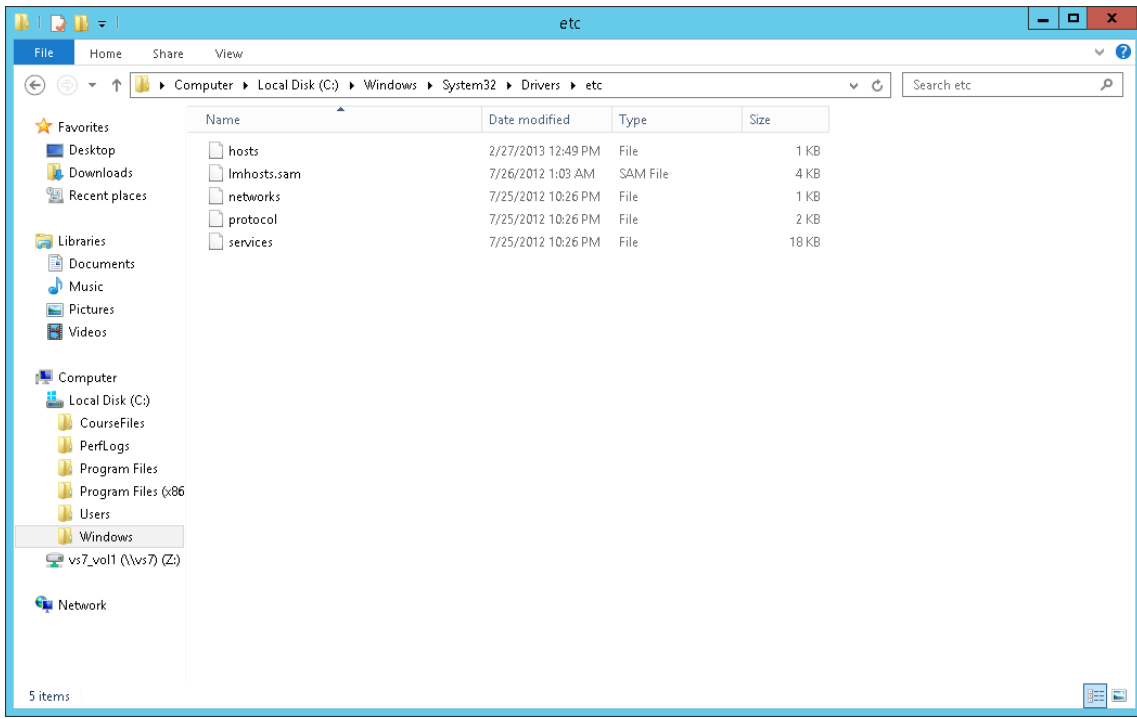
STEP	ACTION
31.	Press Enter to use the defined IP address, 192 . 168 . 0 . 93 , for this node. NOTE: The node management interface was set when the lab environment was prepared.
32.	Press Enter to use the defined network mask, 255 . 255 . 255 . 0 , for this node.
33.	Enter the following default gateway for the cluster management interface: 192 . 168 . 0 . 1
34.	This completes the cluster setup wizard. Verify you now see the cluster shell prompt: <code>cluster2::></code>
35.	Close the node management LIF SSH PuTTY session. You can now use SSH to log in to the cluster management port through another PuTTY session.
36.	Open another PuTTY window: 
37.	Verify that the PuTTY Configuration dialog appears: 







STEP	ACTION
38.	<p>Enter the IP address of the cluster management LIF: 192.168.0.102</p> 
39.	Verify that SSH is selected as the connection type.
40.	<p>Type a new session for this session: cluster2-mgmt</p> 
41.	Click Save .
42.	Click Open to start the session.

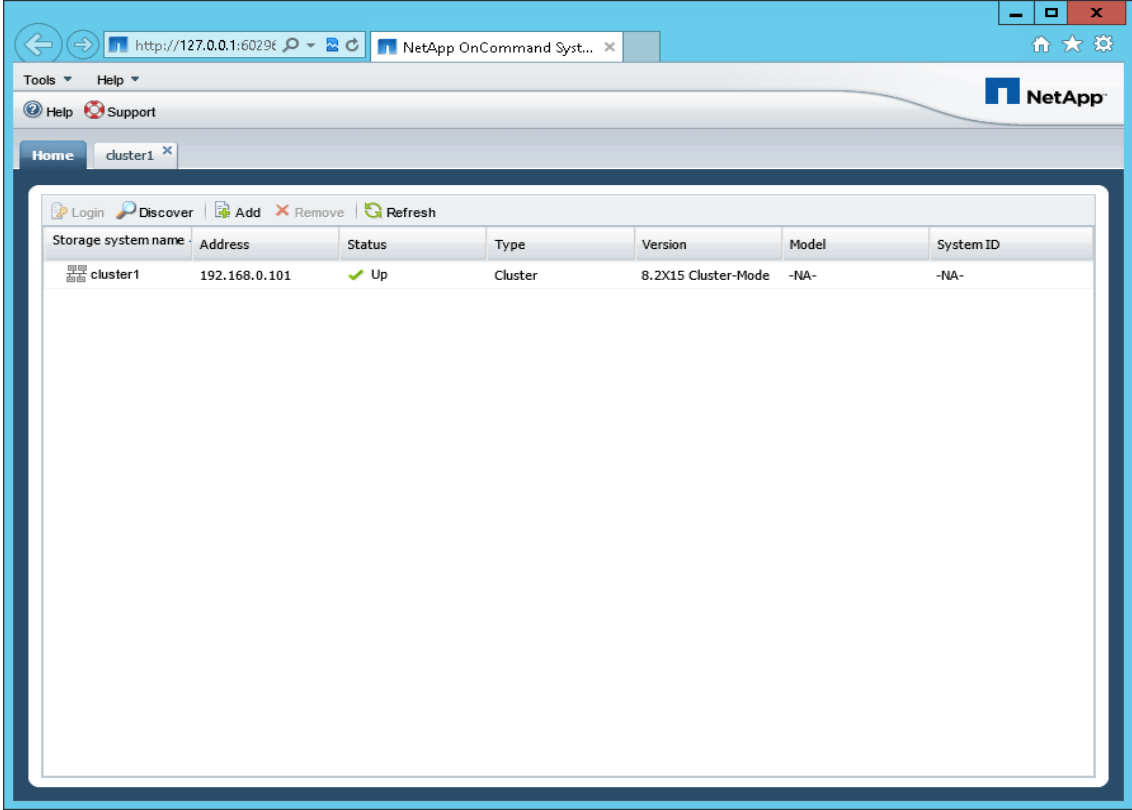
STEP	ACTION						
43.	Verify the PuTTY Security Alert dialog box appears (your SSH fingerprint will differ):  <p>The screenshot shows a 'PuTTY Security Alert' dialog box with a yellow warning icon. The text inside reads: 'The server's host key is not cached in the registry. You have no guarantee that the server is the computer you think it is. The server's rsa2 key fingerprint is: ssh-rsa 2048 59:25:59:bf:d4:fb:ae:9a:cf:b8:87:68:a7:a5:61:a2. If you trust this host, hit Yes to add the key to PuTTY's cache and carry on connecting. If you want to carry on connecting just once, without adding the key to the cache, hit No. If you do not trust this host, hit Cancel to abandon the connection.' At the bottom are three buttons: 'Yes', 'No', and 'Cancel'.</p>						
44.	Click Yes to approve the SSH fingerprint key.						
45.	Verify that you see the login prompt: login as:						
46.	Authenticate as admin and press Enter .						
47.	Enter the password you provided in step 19 of this task and press Enter . Suggested password was: Netapp123						
48.	Verify the clustershell prompt appears: cluster2::>						
49.	Check the cluster health: cluster2::> cluster show Sample output: <table border="1" data-bbox="293 1184 1036 1283"> <thead> <tr> <th>Node</th> <th>Health</th> <th>Eligibility</th> </tr> </thead> <tbody> <tr> <td>cluster2-01</td> <td>true</td> <td>true</td> </tr> </tbody> </table>	Node	Health	Eligibility	cluster2-01	true	true
Node	Health	Eligibility					
cluster2-01	true	true					

TASK 8: ADD THE SINGLE-NODE CLUSTER TO ONCOMMAND SYSTEM MANAGER

In this task, you add the new single-node cluster to System Manager, along with the source cluster, cluster2.

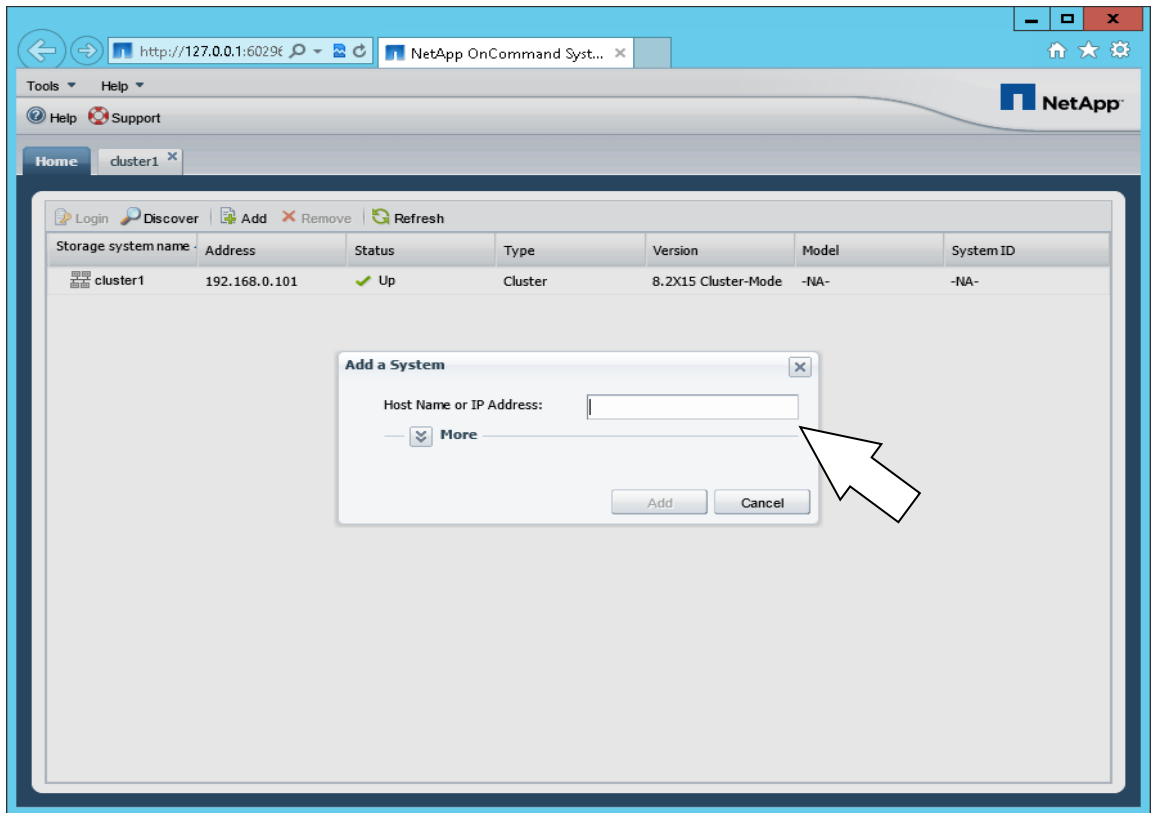
STEP	ACTION																								
1.	<p>On the administrator desktop, open File Explorer:</p> 																								
2.	<p>Navigate to: C:\Windows\System32\Drivers\etc</p>  <table border="1"><thead><tr><th>Name</th><th>Date modified</th><th>Type</th><th>Size</th></tr></thead><tbody><tr><td>hosts</td><td>2/27/2013 12:49 PM</td><td>File</td><td>1 KB</td></tr><tr><td>lmhosts.sam</td><td>7/26/2012 1:03 AM</td><td>SAM File</td><td>4 KB</td></tr><tr><td>networks</td><td>7/25/2012 10:26 PM</td><td>File</td><td>1 KB</td></tr><tr><td>protocol</td><td>7/25/2012 10:26 PM</td><td>File</td><td>2 KB</td></tr><tr><td>services</td><td>7/25/2012 10:26 PM</td><td>File</td><td>18 KB</td></tr></tbody></table>	Name	Date modified	Type	Size	hosts	2/27/2013 12:49 PM	File	1 KB	lmhosts.sam	7/26/2012 1:03 AM	SAM File	4 KB	networks	7/25/2012 10:26 PM	File	1 KB	protocol	7/25/2012 10:26 PM	File	2 KB	services	7/25/2012 10:26 PM	File	18 KB
Name	Date modified	Type	Size																						
hosts	2/27/2013 12:49 PM	File	1 KB																						
lmhosts.sam	7/26/2012 1:03 AM	SAM File	4 KB																						
networks	7/25/2012 10:26 PM	File	1 KB																						
protocol	7/25/2012 10:26 PM	File	2 KB																						
services	7/25/2012 10:26 PM	File	18 KB																						
3.	<p>Double-click hosts.</p>																								

STEP	ACTION
4.	Verify that the operation dialog appears: <div data-bbox="298 197 651 575" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>How do you want to open this file?</p> <ul style="list-style-type: none">  Default Host Application  Internet Explorer  Notepad  Paint  Windows Media Player  Windows Photo Viewer </div>
5.	Select Notepad to open the hosts file in this tool.
6.	Append to the end of the file the following information: <i>cluster_management_LIF_IP_address cluster_name</i> Specifically, you should enter: <pre>192.168.0.102 cluster2</pre>
7.	Save the file.
8.	Exit Notepad .
9.	Close File Explorer .

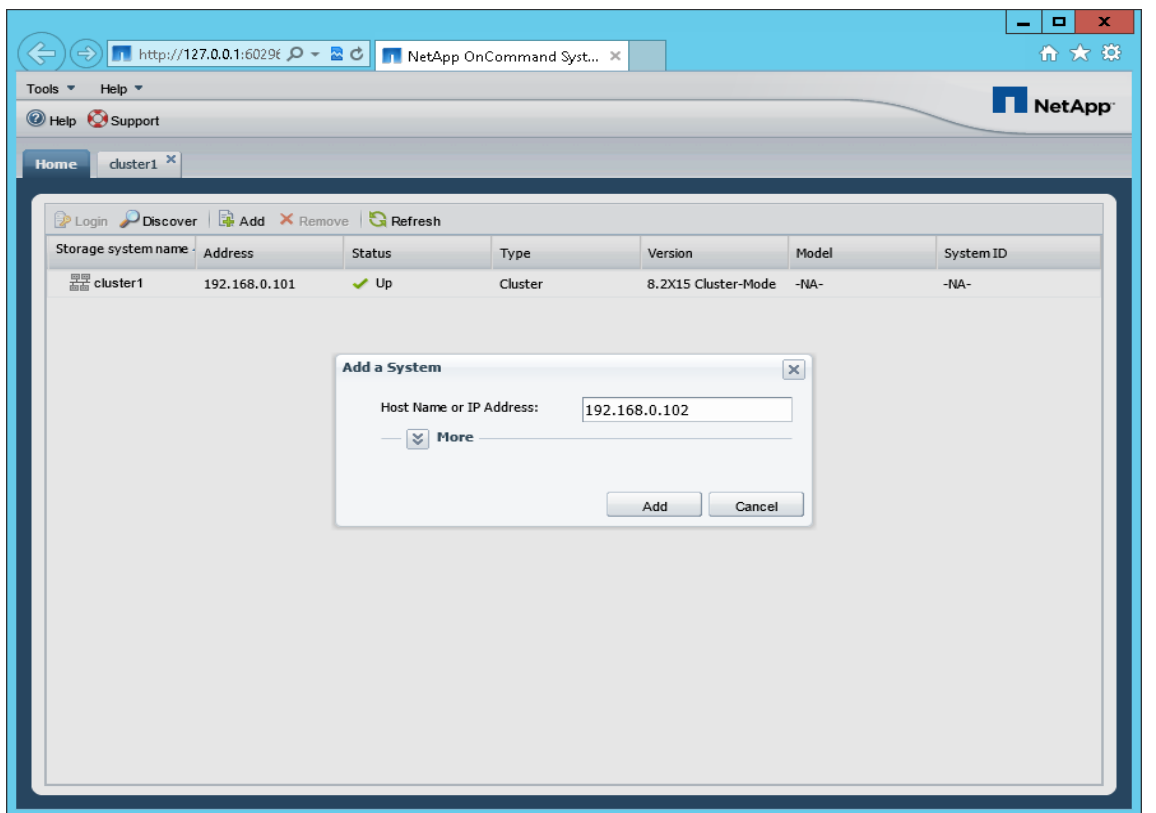
STEP	ACTION														
10.	<p>In System Manager, switch back to the Home tab.</p>  <table border="1" data-bbox="332 415 1386 968"> <thead> <tr> <th>Storage system name</th> <th>Address</th> <th>Status</th> <th>Type</th> <th>Version</th> <th>Model</th> <th>System ID</th> </tr> </thead> <tbody> <tr> <td>cluster1</td> <td>192.168.0.101</td> <td>Up</td> <td>Cluster</td> <td>8.2X15 Cluster-Mode</td> <td>-NA-</td> <td>-NA-</td> </tr> </tbody> </table>	Storage system name	Address	Status	Type	Version	Model	System ID	cluster1	192.168.0.101	Up	Cluster	8.2X15 Cluster-Mode	-NA-	-NA-
Storage system name	Address	Status	Type	Version	Model	System ID									
cluster1	192.168.0.101	Up	Cluster	8.2X15 Cluster-Mode	-NA-	-NA-									
11.	Click Add to associate your new cluster2 with System Manager.														

STEP ACTION

12. Verify the Add a System dialog box appears:

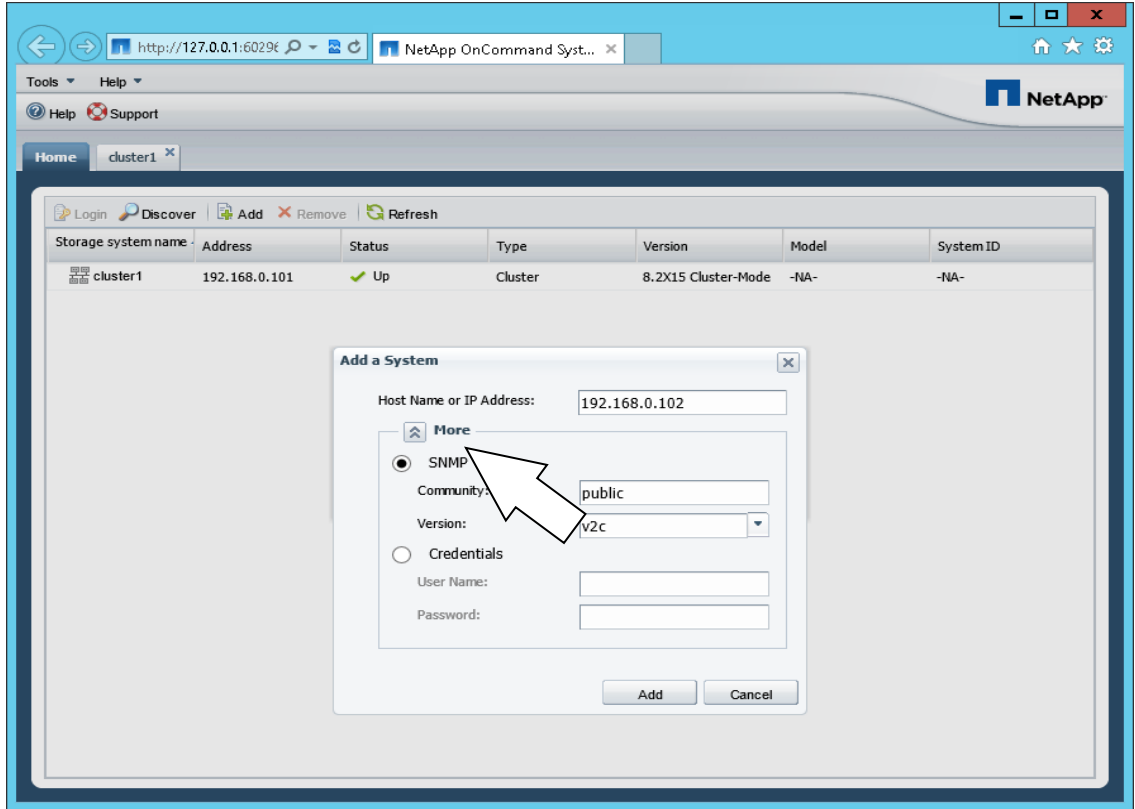


13. Enter the IP address of the cluster management LIF: 192.168.0.102

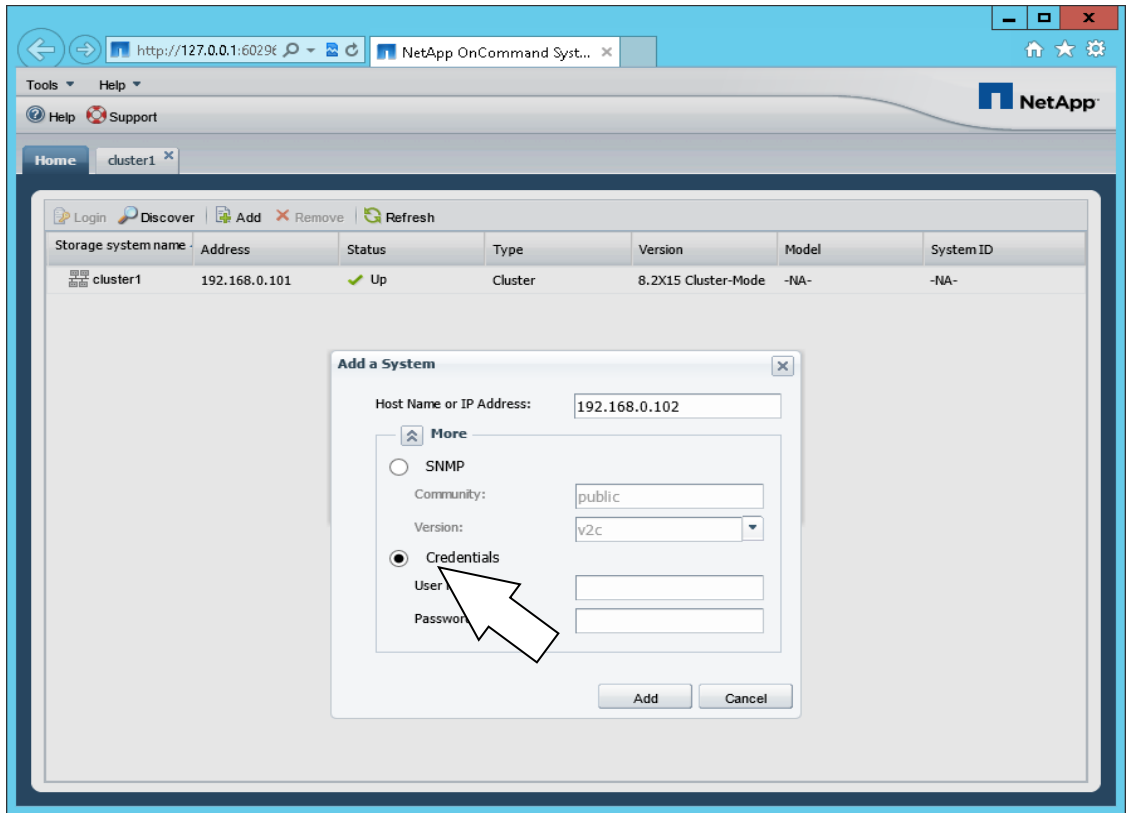


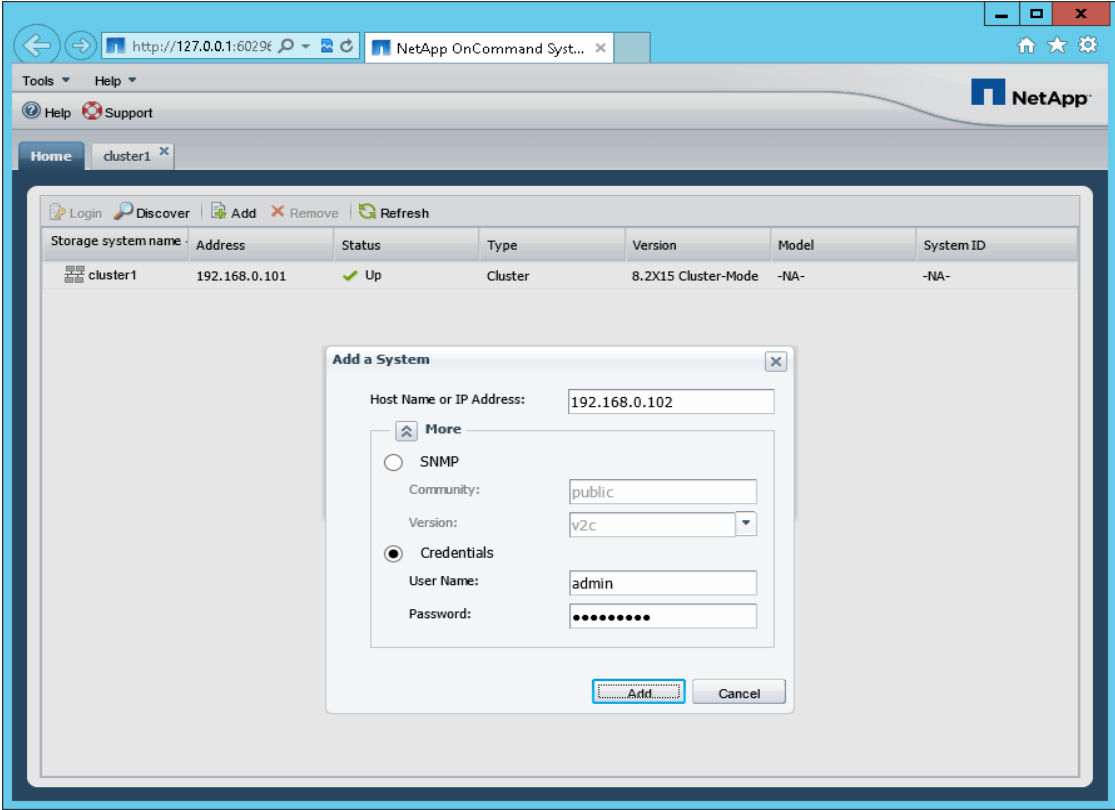
STEP ACTION

14. Click the **More** button, expanding the dialog box:



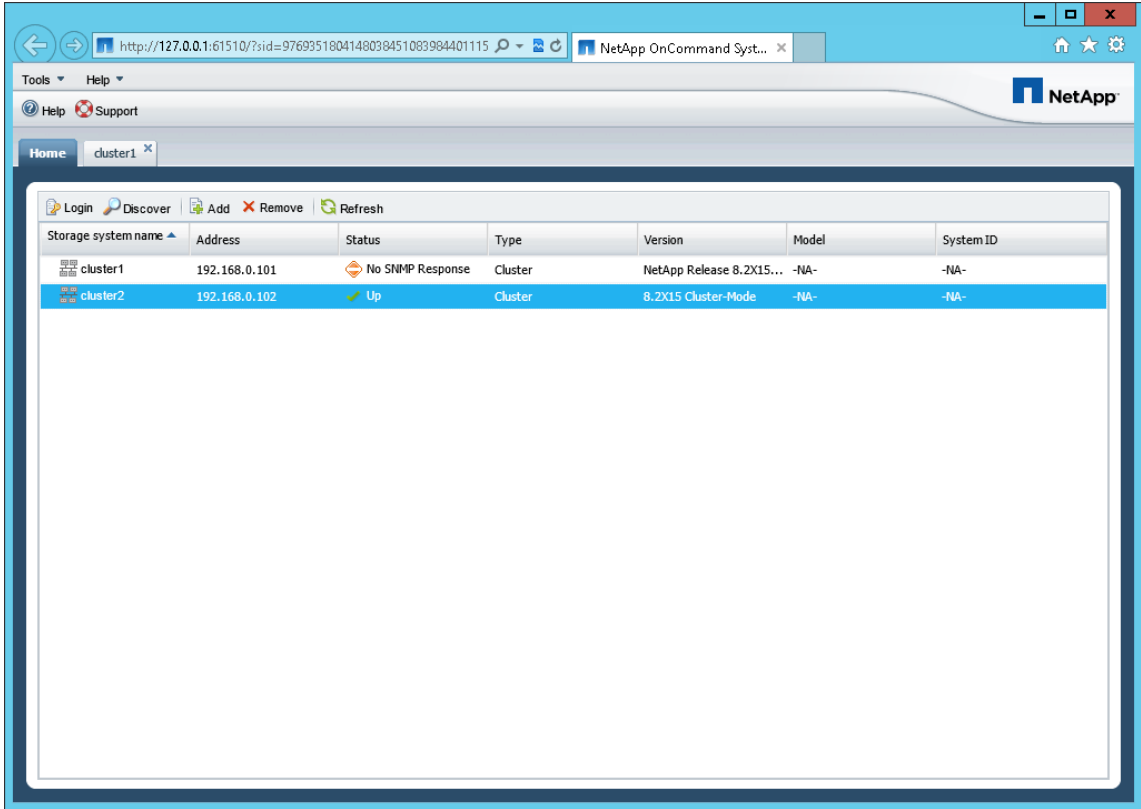
15. Select **Credentials**:



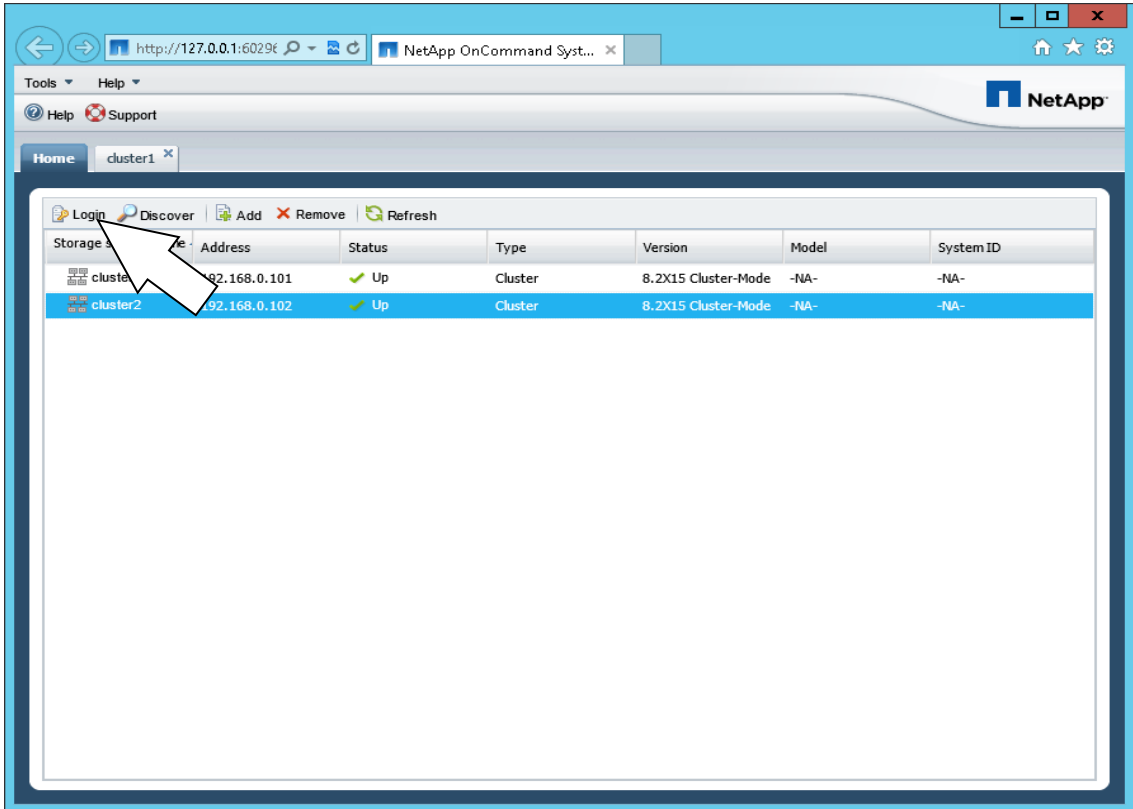
STEP	ACTION
16.	<p>Enter the user name admin and the password that you provided for this account in Step 21 of Task 7:</p> 
17.	Click Add .

STEP ACTION

18. Verify the cluster was added to the list of storage systems:



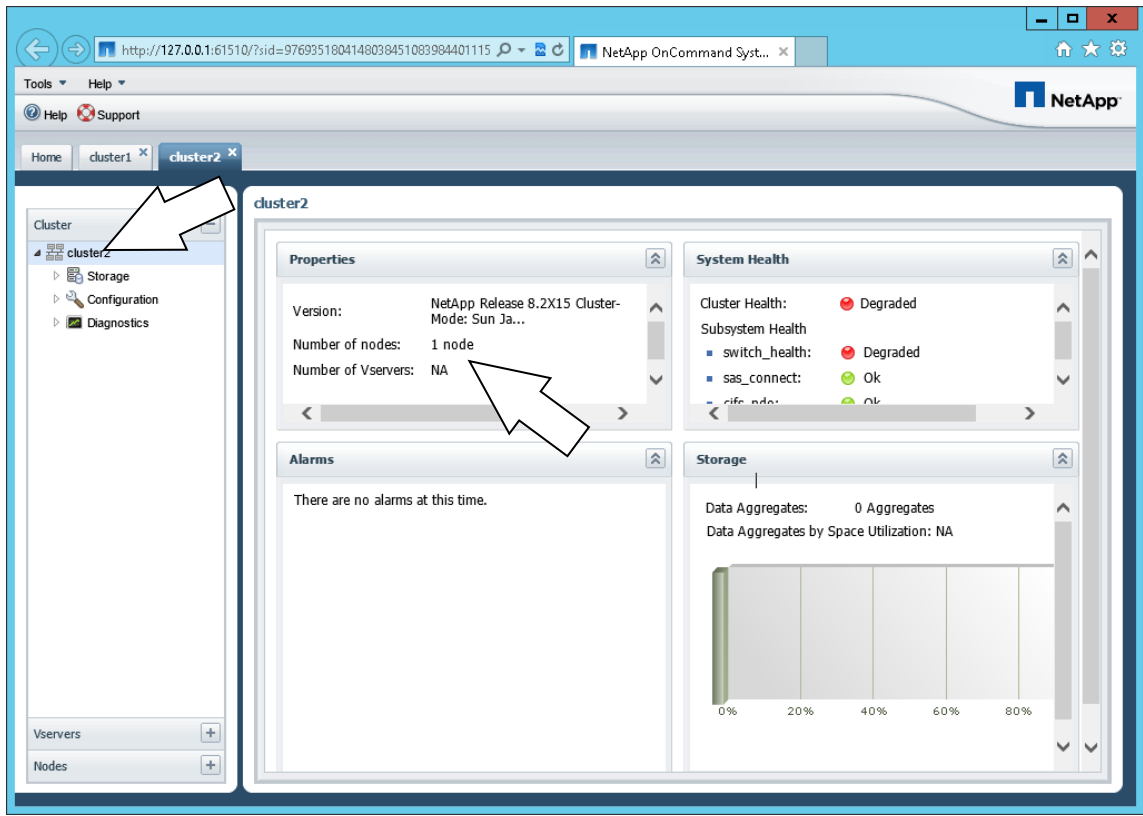
19. Ensure that cluster2 is selected and click **Login**:



STEP ACTION

20. In the left pane of System Manager, expand **cluster2**.

NOTE: there is only one node in the cluster:



END OF EXERCISE