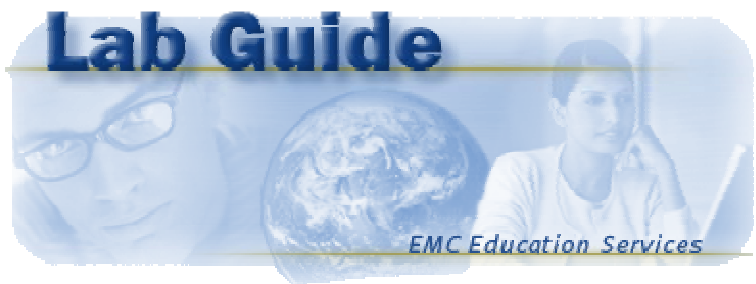


ControlCenter Foundations

Lab Guide



Education Services

April, 2006

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Document Revision History:

Rev #	File Name	Date
4.0	ControlCenter Lab Guide.Doc	18-April-2005

Table of Contents: Course Name

Copyright :	2
Trademark Information:	3
Document Revision History:	4
Table of Contents: Course Name	5
Lab Exercise 1: Host and Storage Installation.....	6
Lab Exercise 1.....	7
Part 1: Launching the ControlCenter Simulator Tool	7
Lab Exercise 1.....	9
Part 2: Install Host Agents and Explore your Environment	9
Lab Exercise 1.....	18
Part 3: Install Symmetrix Agents.....	18
Lab Exercise 1.....	26
Part 4: Stopping/Starting the Agents.....	26
Lab Exercise 2: Views and Monitoring	40
Lab Exercise 2.....	41
Part 1: Exploring the ControlCenter User Interface.....	41
Lab Exercise 2.....	47
Part 2 : Examining Properties View	47
Lab Exercise 2.....	57
Part 3: Using Visual Storage.....	57
Lab Exercise 2.....	60
Part 4: Host Information.....	60
Lab Exercise 2.....	66
Part 5: Alerts.....	66
Examine the different views of information gathered by ControlCenter	
Examine host resources	
Examine logical relationships	
Explore connectivity information	

Lab Exercise 1: Host and Storage Installation

Purpose:

The purpose of this lab is to familiarize the students with installing Host Agents and Storage Array Agents.

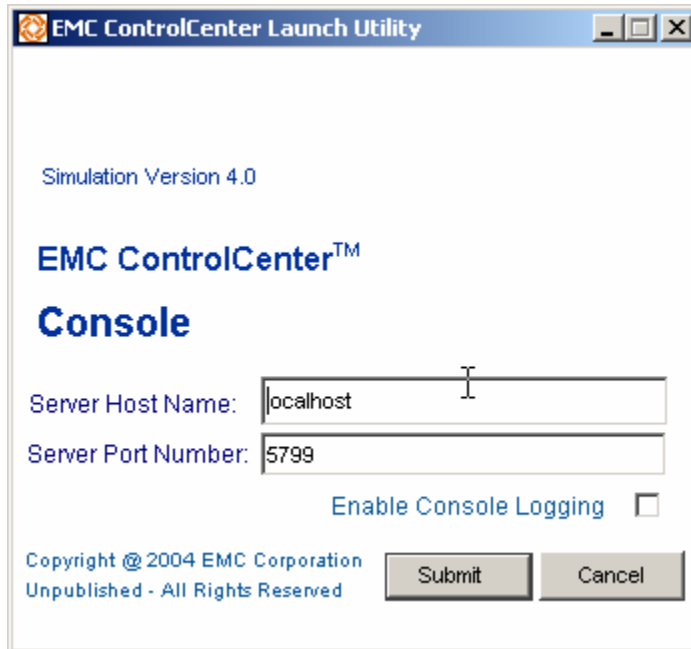
Objectives:

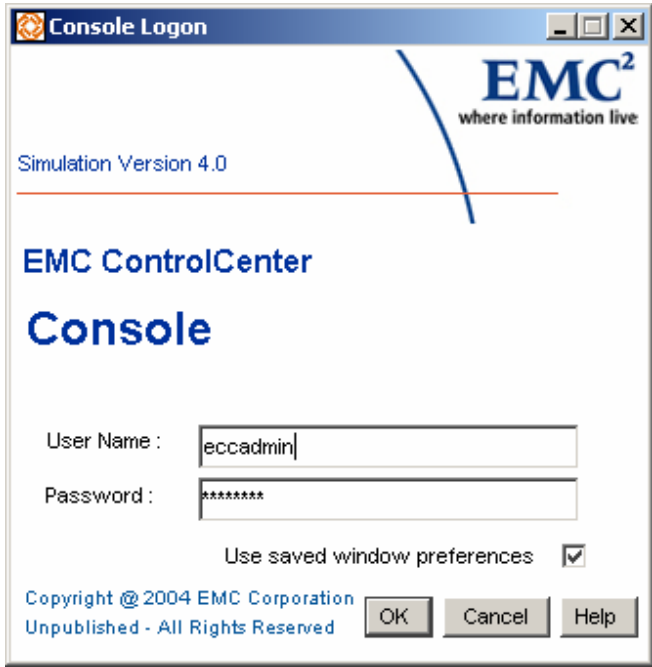
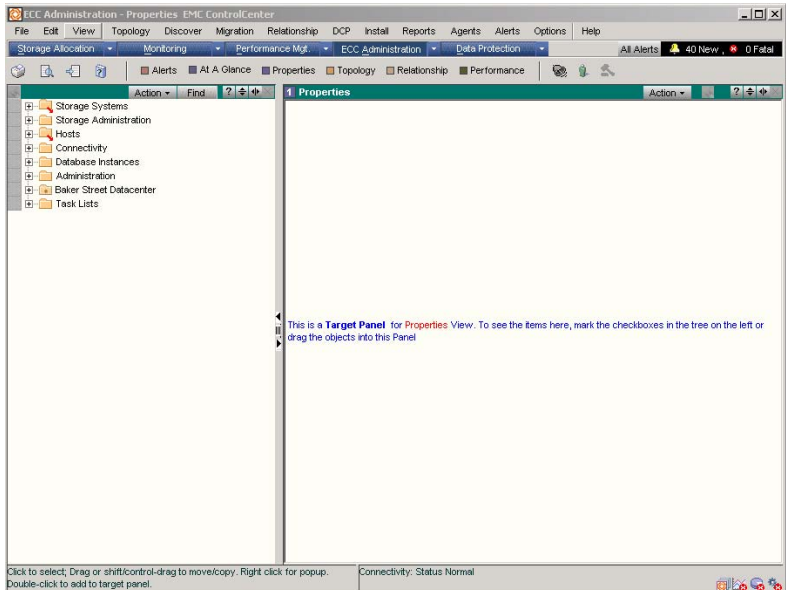
Each lab will perform the following activities:

- a) Launch the Control Center Simulator
- b) Install Host Agents and Explore your environment Installation
- c) Install Symmetrix Agents
- d) Start and Stop the Host Agent

Lab Exercise 1

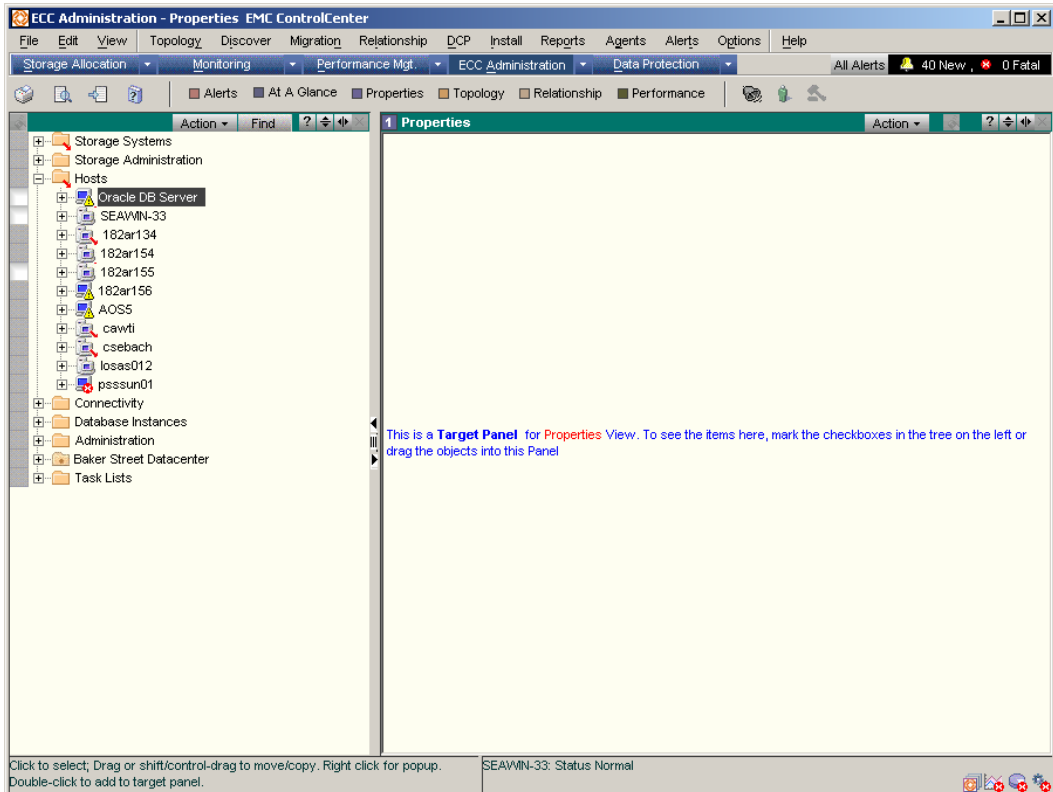
Part 1: Launching the ControlCenter Simulator Tool

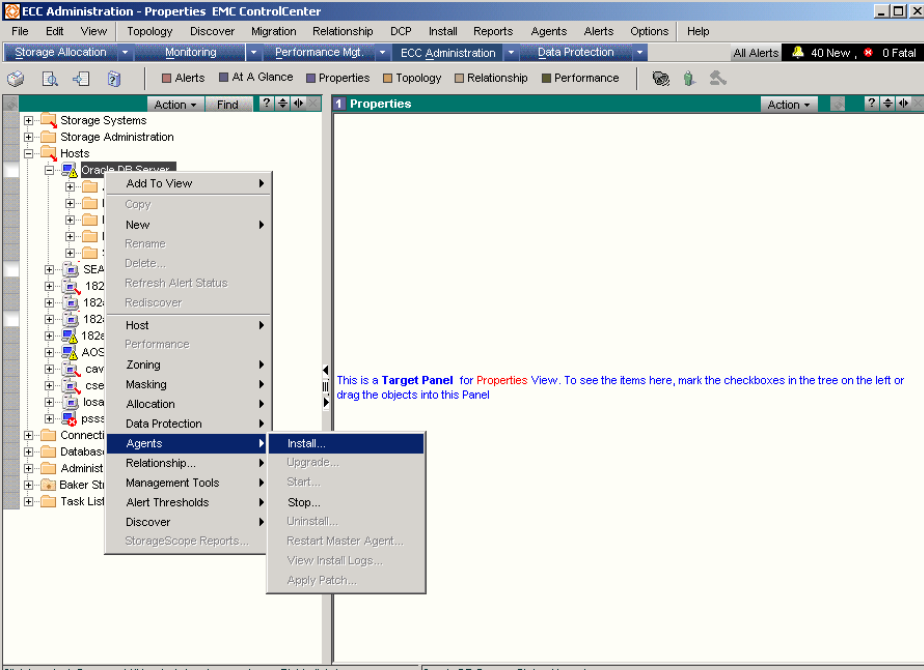
Step	Action
1	To Launch the simulation, from your Desktop window, Select Start > Program > Launch ControlCenter Simulator .
2	The ControlCenter <i>Console-Login</i> window appears with the Server Name field set to <i>localhost</i> and the Server port number field set to 5799. Select the Submit button to continue. 

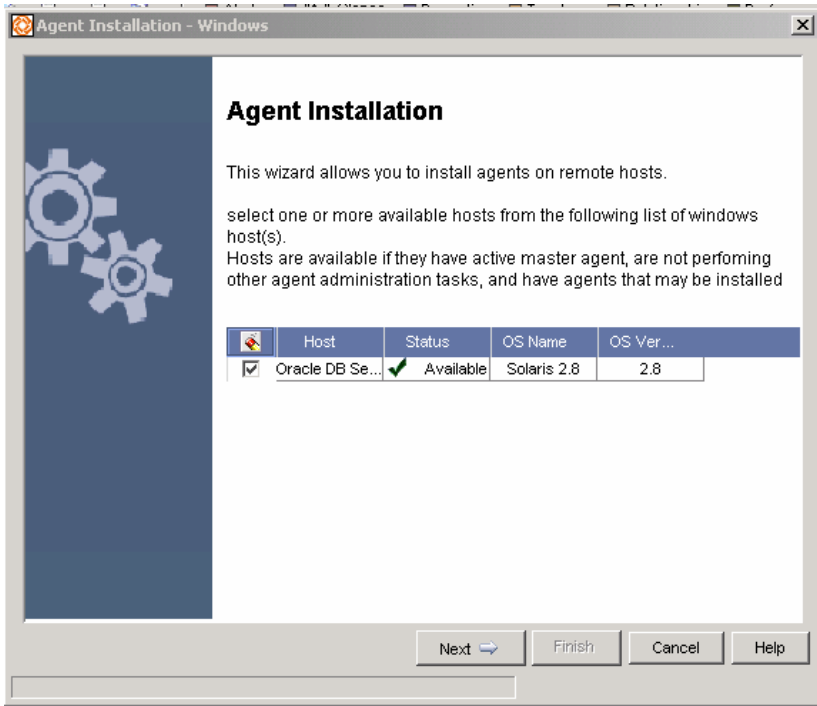
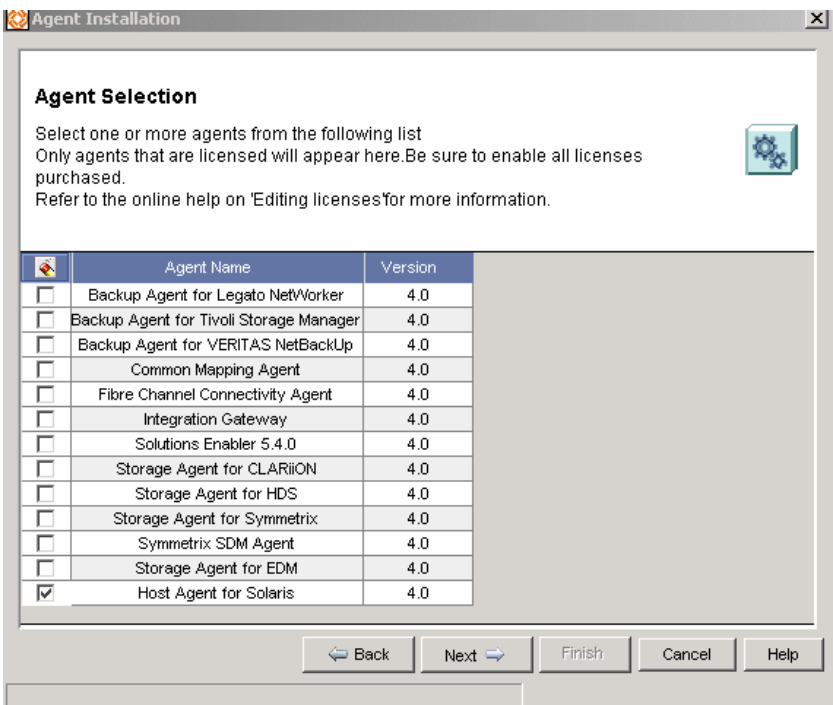
Step	Action
3	The ControlCenter <i>Console-Login</i> window appears. In the <i>User Name</i> field enter <i>eccadmin</i>. In the <i>Password</i> field enter <i>eccadmin</i> 
4	Select OK
5	You will now access the EMC ControlCenter Console Administration View. 

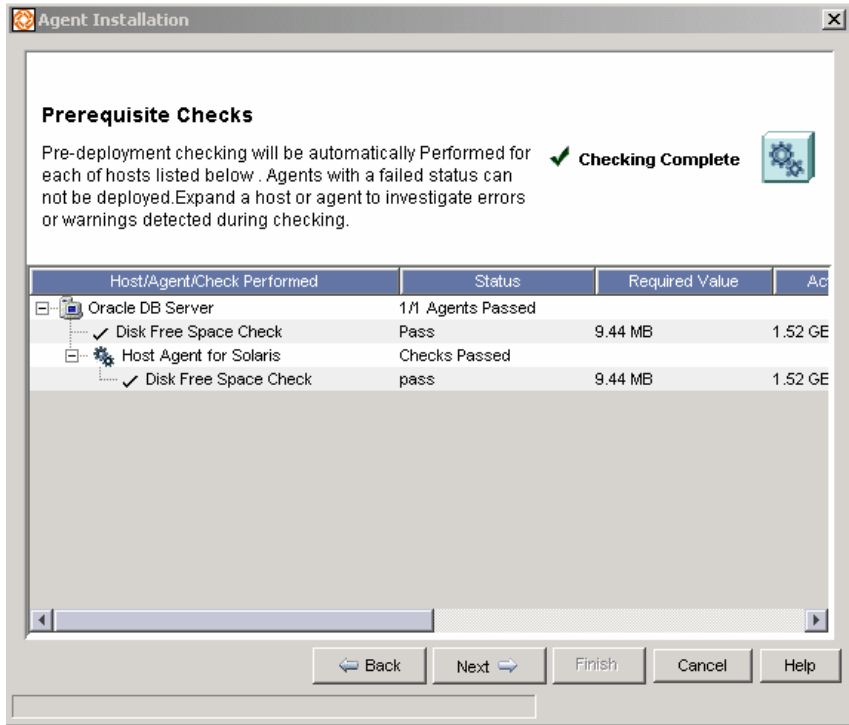
Lab Exercise 1

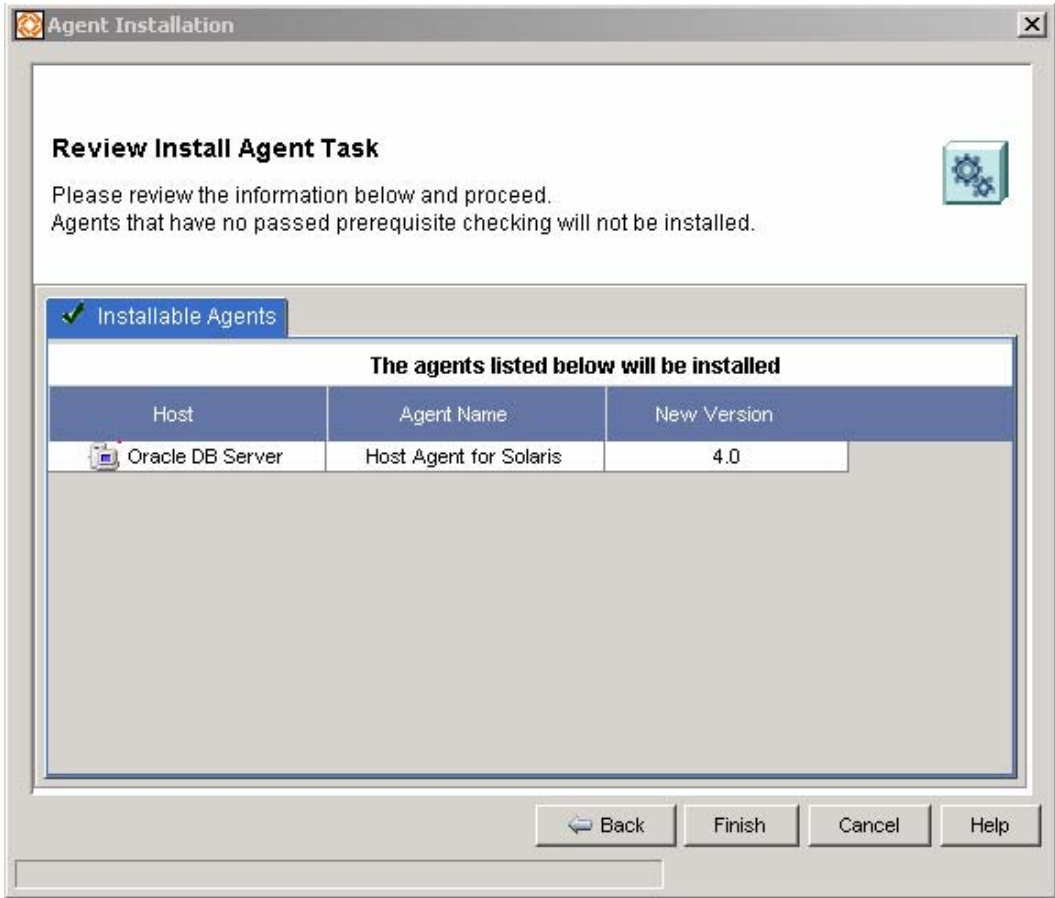
Part 2: Install Host Agents and Explore your Environment

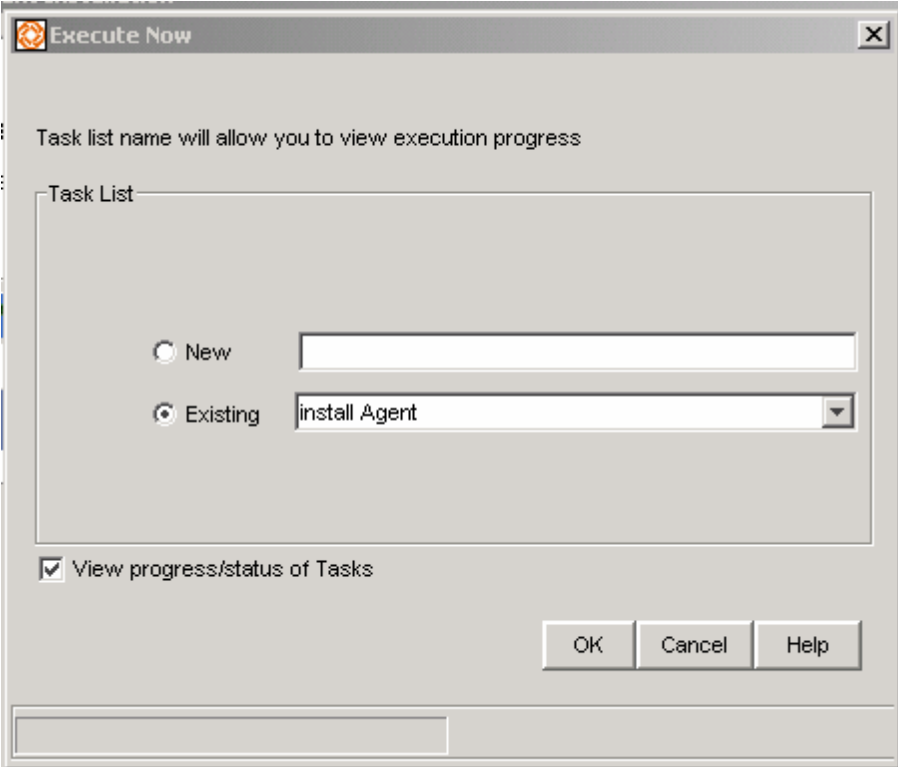
Step	Action
1	In the Console Tree panel, expand the Hosts folder and select the host on which you choose to install an agent. In this example, we will install the <i>Host Agent for Solaris</i> on the Oracle DB Server host.  Click to select; Drag or shift/control-drag to move/copy. Right click for popup. Double-click to add to target panel.

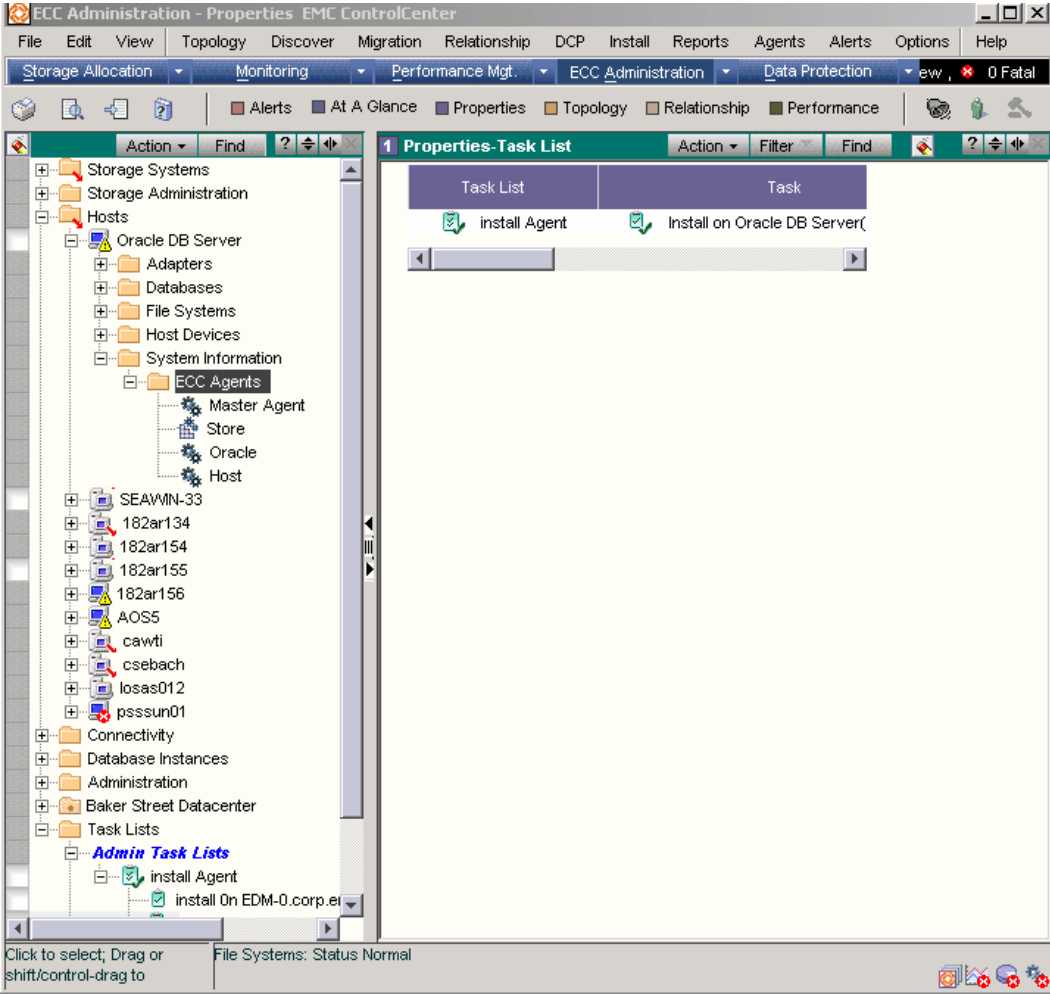
Step	Action
2	Right-click on the Host icon Oracle DB Server and select Agents>Install.  The screenshot shows the EMC ControlCenter Properties window. On the left, a tree view displays the hierarchy: Storage Systems > Storage Administration > Hosts > Oracle DB Server. A right-click context menu is open for 'Oracle DB Server'. The menu items include 'Add To View', 'Copy', 'New', 'Rename', 'Delete...', 'Refresh Alert Status', 'Rediscover', 'Host', 'Performance', 'Zoning', 'Masking', 'Allocation', 'Data Protection', 'Agents', 'Relationship...', 'Management Tools', 'Alert Thresholds', 'Discover', and 'StorageScope Reports...'. The 'Agents' item is selected, and a sub-menu is displayed with the following options: 'Install...', 'Upgrade...', 'Start...', 'Stop...', 'Uninstall...', 'Restart Master Agent...', 'View Install Logs...', and 'Apply Patch...'. The 'Install...' option is highlighted. A blue tooltip points to the right pane, stating: 'This is a Target Panel for Properties View. To see the items here, mark the checkboxes in the tree on the left or drag the objects into this Panel'. At the bottom of the window, a status bar indicates 'Oracle DB Server: Status Normal'.

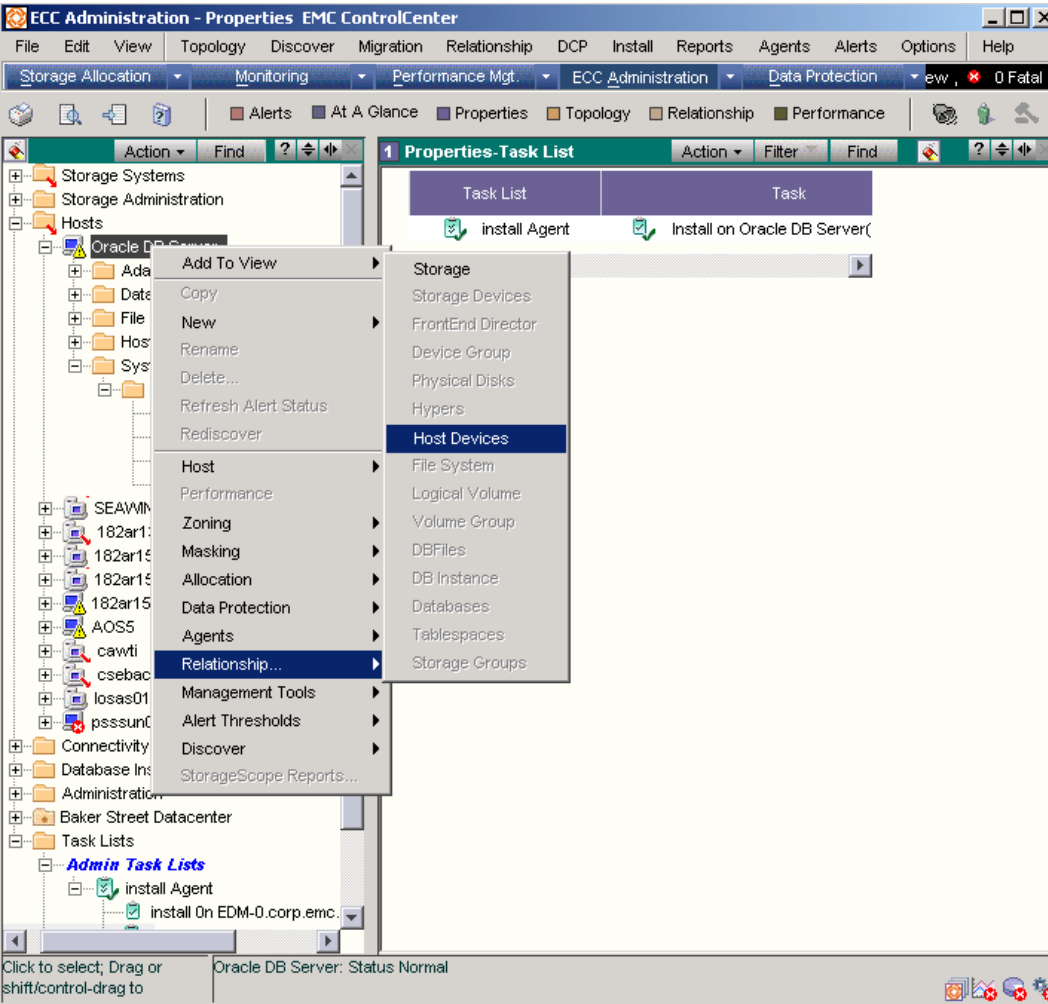
Step	Action
3	When the <i>Agent Installation</i> wizard appears, wait for the <i>Status</i> field to show <i>Available</i>, then click Next. 
4	Select the Host Agent for Solaris, and then click Next. 

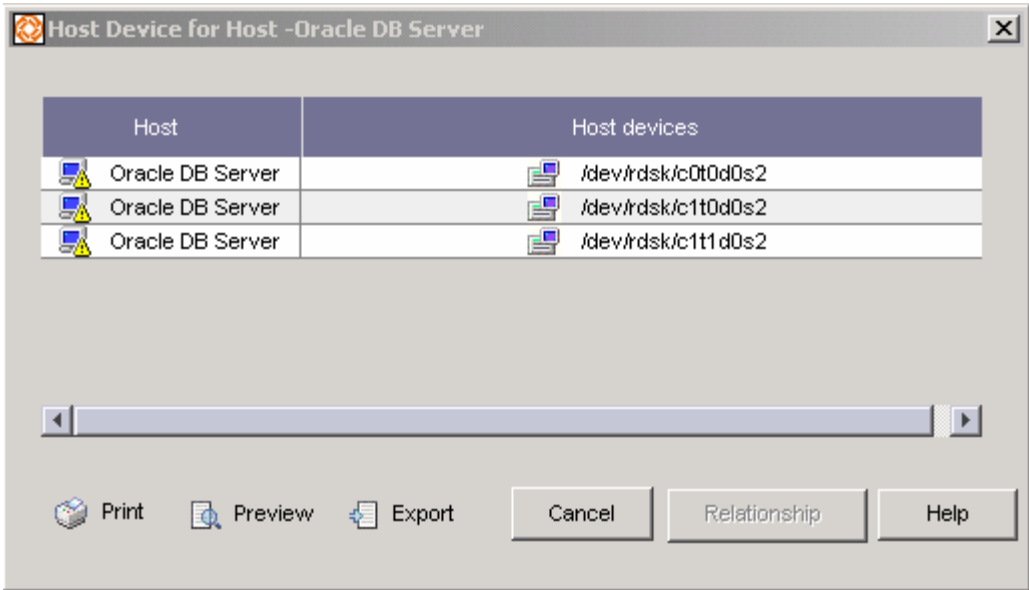
Step	Action
5	In the <i>Prerequisite Checks</i> window, expand the entry in the left hand column and view the Prerequisite Checking information. Click Next to continue. 

Step	Action
6	The <i>Review Install Agent Task</i> window shows which agents will be installed. Click Finish to exit the wizard. 

Step	Action
7	To execute the Install Agent Task, click OK. The progress/status of the tasks will be displayed. 

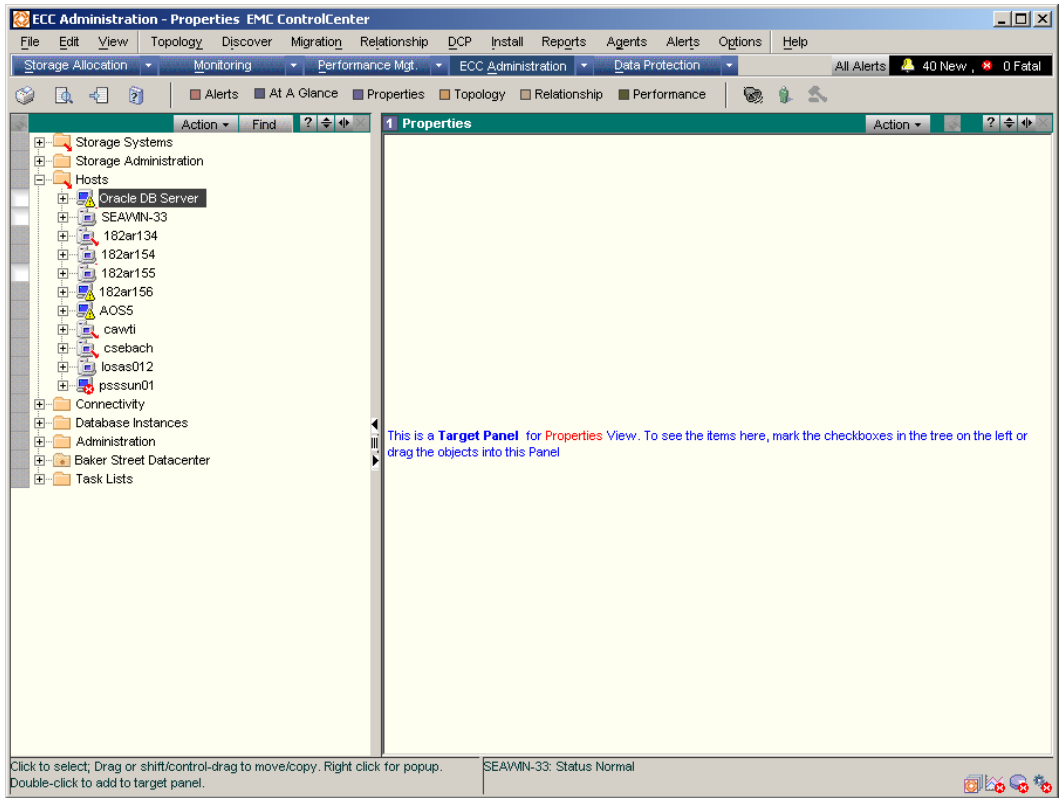
Step	Action
8	To Verify the Host Agent started properly: In the ControlCenter (CC) Console tree, expand the Hosts folder, then select Hosts>Oracle DB Server >System Information>ECC Agents  Verify that <i>Host Agent</i> appears with a blue gear icon under <i>Oracle DB Server</i>.

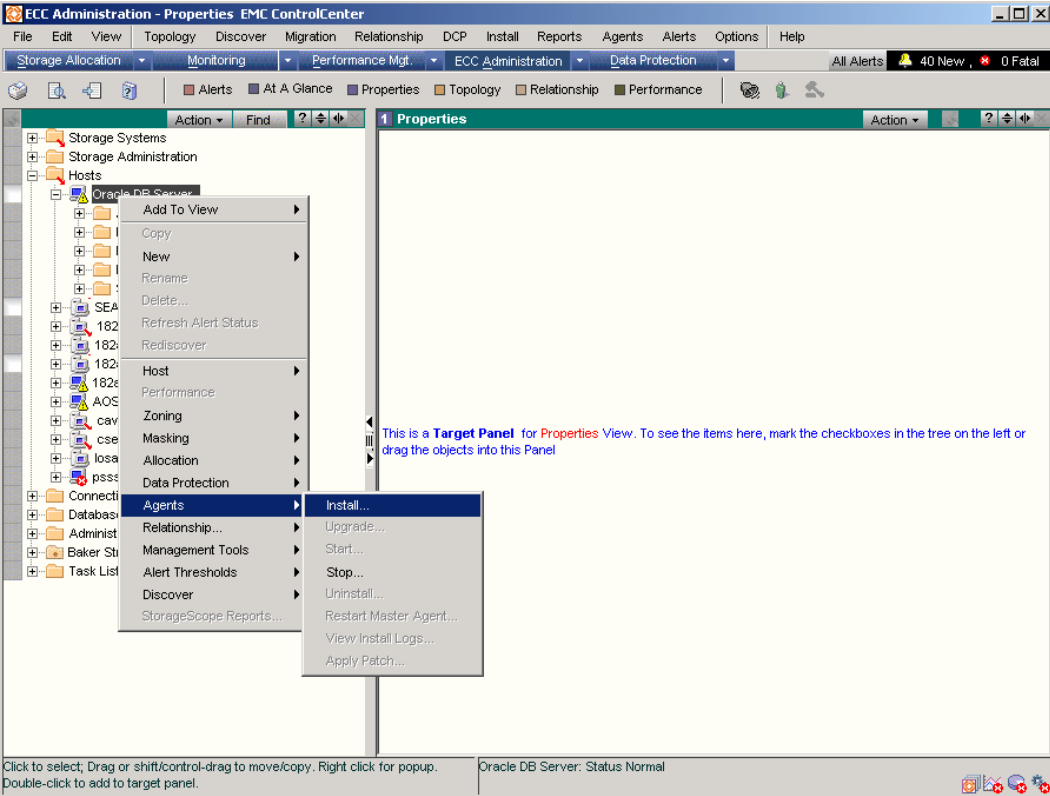
Step	Action
9	To explore your host using the Host Agent: Select Host > Oracle DB Server. Then Right-click on your <i>hostname</i>. Select Relationship > Host Devices. 

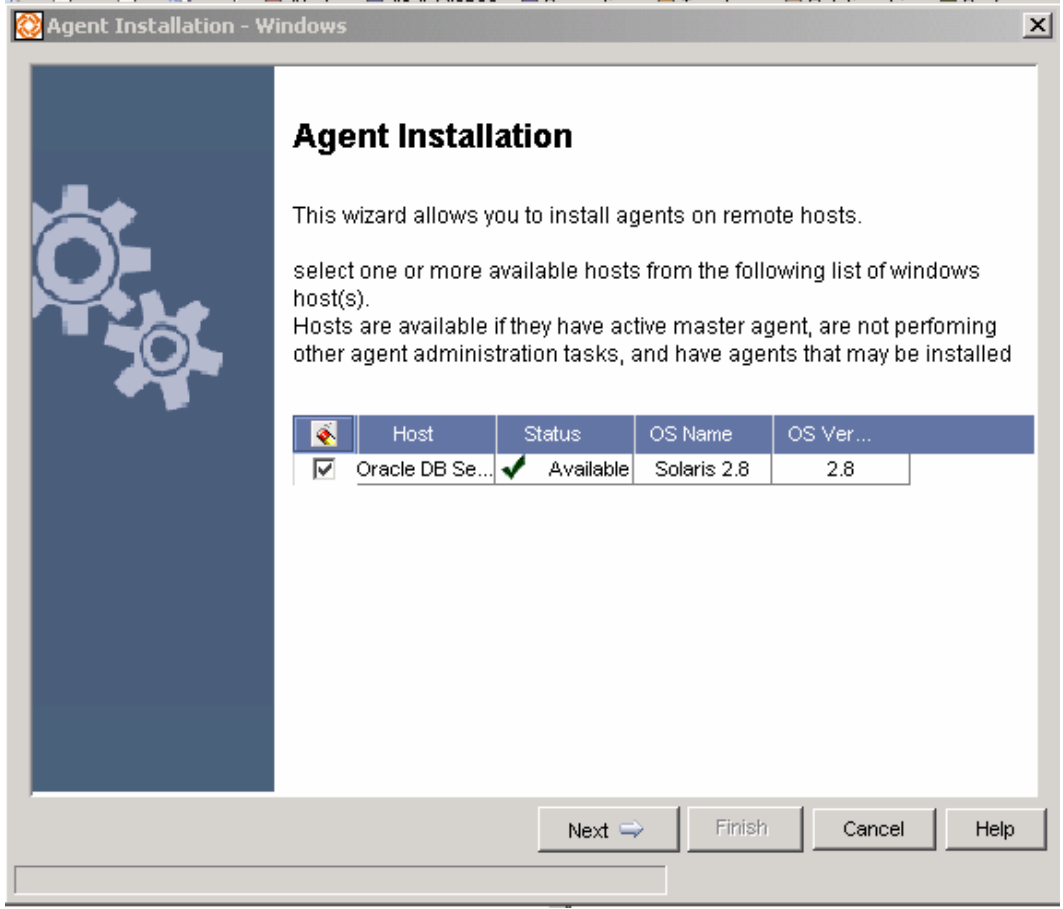
Step	Action								
10	The Host Device display appears with physical devices discovered by <i>Oracle DB Server</i>.  <table border="1"><thead><tr><th>Host</th><th>Host devices</th></tr></thead><tbody><tr><td> Oracle DB Server</td><td> /dev/rdisk/c0t0d0s2</td></tr><tr><td> Oracle DB Server</td><td> /dev/rdisk/c1t0d0s2</td></tr><tr><td> Oracle DB Server</td><td> /dev/rdisk/c1t1d0s2</td></tr></tbody></table>	Host	Host devices	 Oracle DB Server	 /dev/rdisk/c0t0d0s2	 Oracle DB Server	 /dev/rdisk/c1t0d0s2	 Oracle DB Server	 /dev/rdisk/c1t1d0s2
Host	Host devices								
 Oracle DB Server	 /dev/rdisk/c0t0d0s2								
 Oracle DB Server	 /dev/rdisk/c1t0d0s2								
 Oracle DB Server	 /dev/rdisk/c1t1d0s2								
11	Click Cancel to close the display window.								

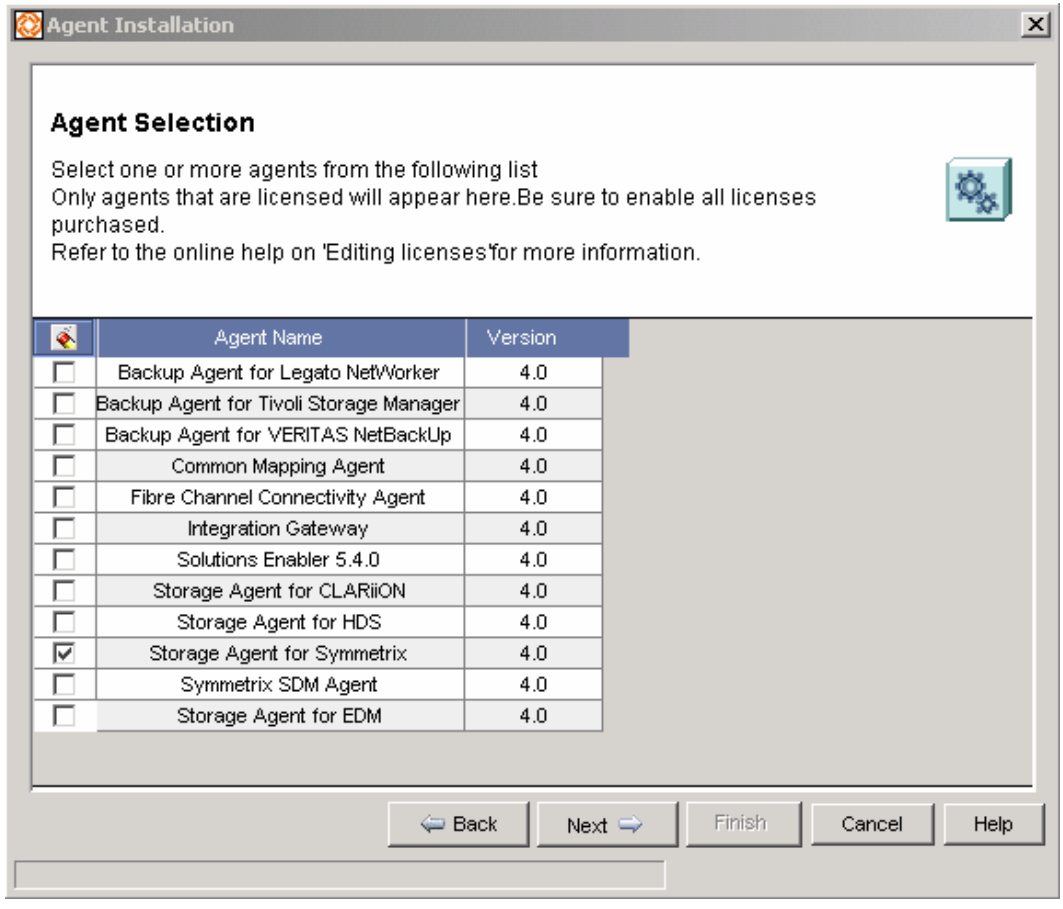
Lab Exercise 1

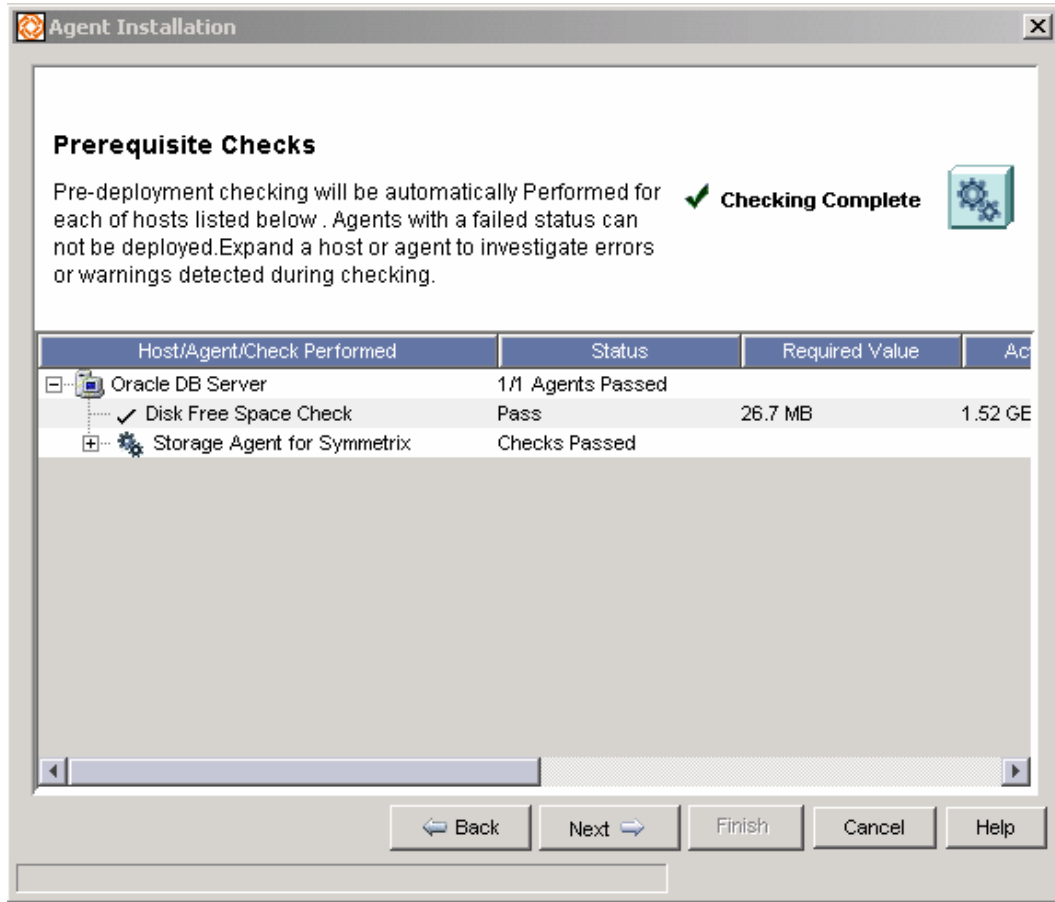
Part 3: Install Symmetrix Agents

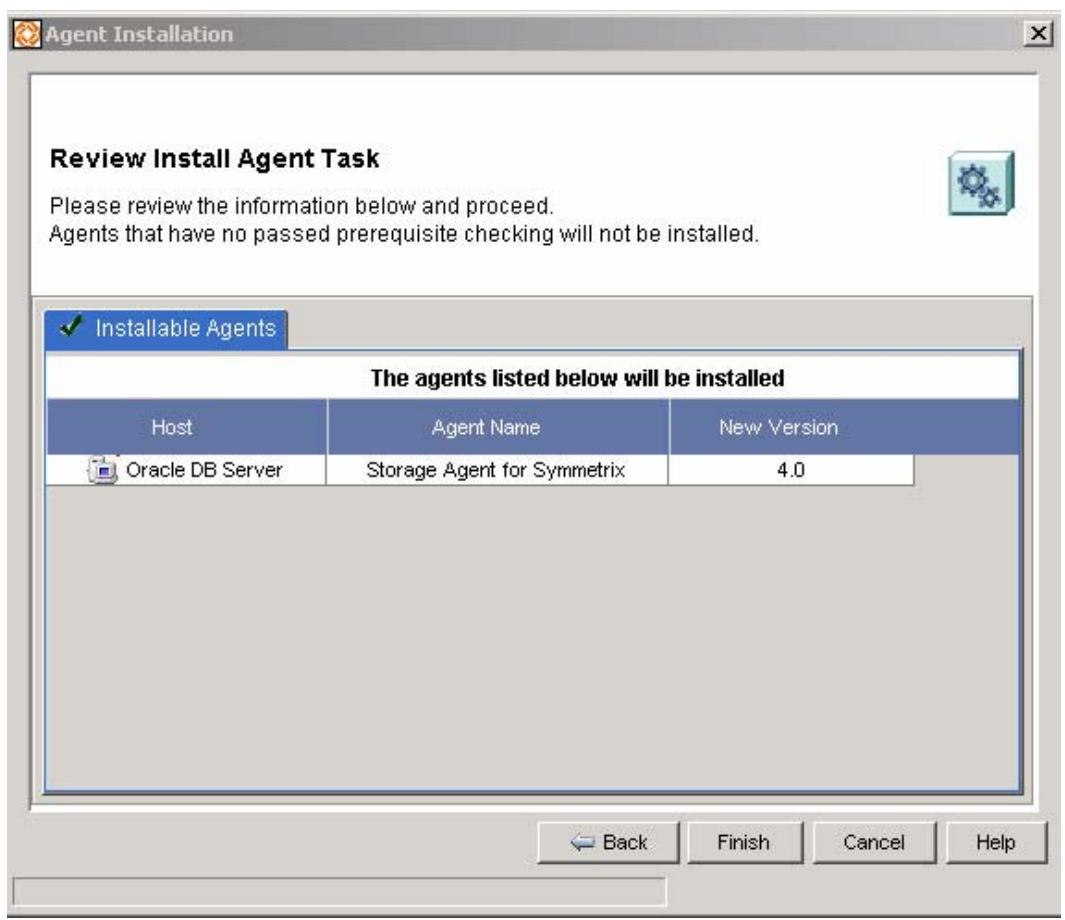
Step	Action
1	In the Console Tree panel, expand the Hosts folder and select the <i>Oracle DB Server</i> host.  The screenshot shows the EMC ControlCenter interface. The title bar reads 'ECC Administration - Properties EMC ControlCenter'. The menu bar includes File, Edit, View, Topology, Discover, Migration, Relationship, DCP, Install, Reports, Agents, Alerts, Options, and Help. Below the menu bar is a toolbar with icons for Storage Allocation, Monitoring, Performance Mgt., ECC Administration, and Data Protection. A status bar at the top right indicates 'All Alerts 40 New, 0 Fatal'. The main area is divided into two panels. The left panel, titled 'Console Tree', shows a hierarchical tree structure with folders like Storage Systems, Storage Administration, Hosts, Connectivity, Database Instances, Administration, Baker Street Datacenter, and Task Lists. The 'Hosts' folder is expanded, showing a list of hosts including Oracle DB Server, SEAWIN-33, 182ar134, 182ar154, 182ar155, 182ar156, AOS5, cawti, csebach, losas012, and pssun01. The 'Oracle DB Server' host is selected. The right panel, titled 'Properties', is currently empty. A tooltip message in the Properties panel states: 'This is a Target Panel for Properties View. To see the items here, mark the checkboxes in the tree on the left or drag the objects into this Panel'. At the bottom of the console tree, a status bar indicates 'SEAWIN-33: Status Normal'.

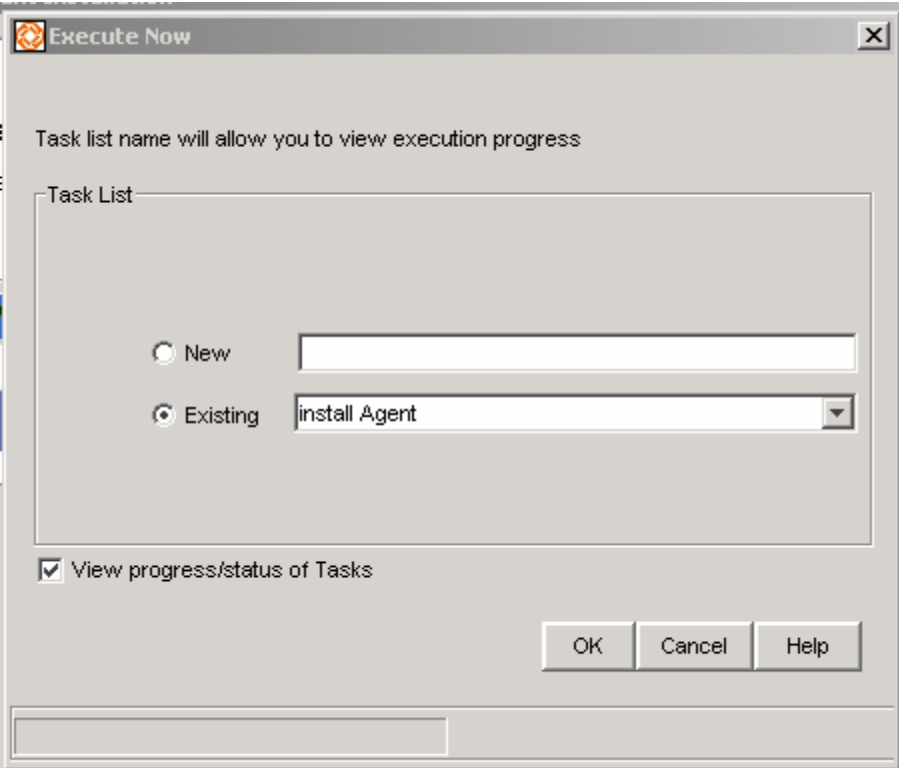
Step	Action
2	Right-click on the Host icon Oracle DB Server and select Agents>Install.  The screenshot shows the 'ECC Administration - Properties EMC ControlCenter' window. The left pane displays a tree view with 'Storage Systems', 'Storage Administration', and 'Hosts'. Under 'Hosts', 'Oracle DB Server' is selected. A right-click context menu is open, showing options like 'Add To View', 'Copy', 'New', 'Rename', 'Delete...', 'Refresh Alert Status', 'Rediscover', 'Host', 'Performance', 'Zoning', 'Masking', 'Allocation', 'Data Protection', 'Agents', 'Relationship...', 'Management Tools', 'Alert Thresholds', 'Discover', and 'StorageScope Reports...'. The 'Agents' option is expanded, and 'Install...' is selected. The right pane is titled 'Properties' and contains a message: 'This is a Target Panel for Properties View. To see the items here, mark the checkboxes in the tree on the left or drag the objects into this Panel'. The status bar at the bottom indicates 'Oracle DB Server: Status Normal'.

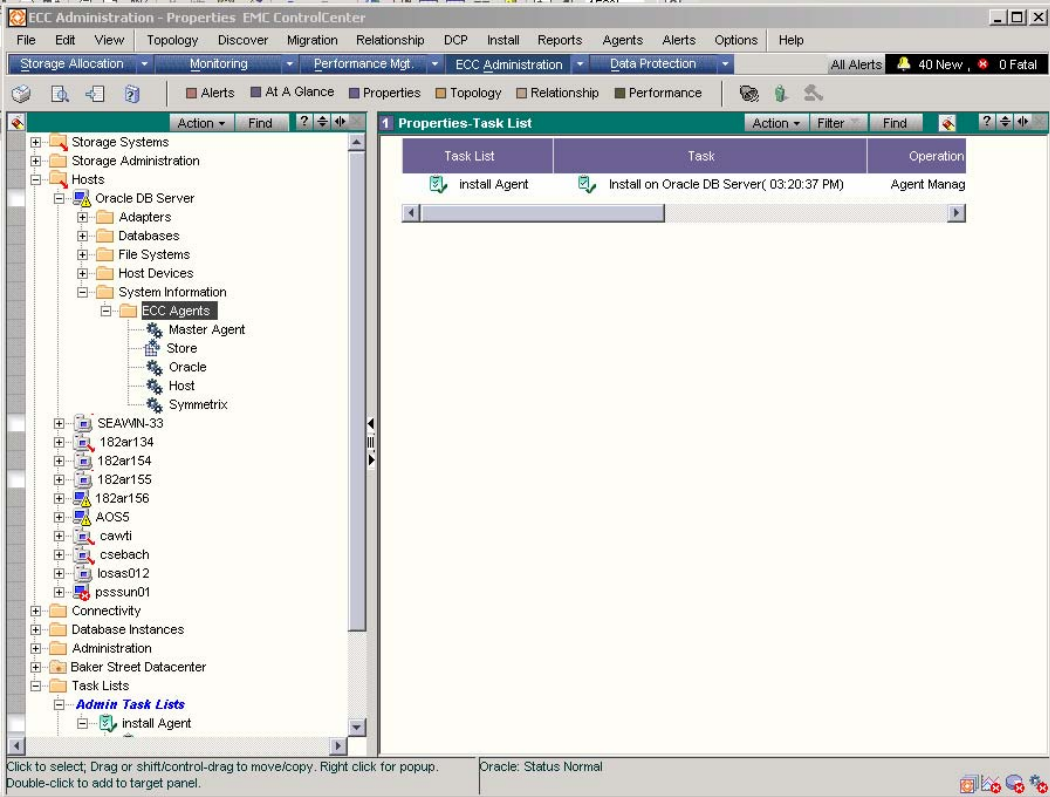
Step	Action
3	When the <i>Agent Installation</i> wizard appears, wait for the <i>Status</i> field to show <i>Available</i>, then click Next. 

Step	Action																																							
4	Select the Storage Agent for Symmetrix and then click Next.  Agent Selection Select one or more agents from the following list Only agents that are licensed will appear here. Be sure to enable all licenses purchased. Refer to the online help on 'Editing licenses' for more information. <table border="1"><thead><tr><th></th><th>Agent Name</th><th>Version</th></tr></thead><tbody><tr><td>☐</td><td>Backup Agent for Legato NetWorker</td><td>4.0</td></tr><tr><td>☐</td><td>Backup Agent for Tivoli Storage Manager</td><td>4.0</td></tr><tr><td>☐</td><td>Backup Agent for VERITAS NetBackup</td><td>4.0</td></tr><tr><td>☐</td><td>Common Mapping Agent</td><td>4.0</td></tr><tr><td>☐</td><td>Fibre Channel Connectivity Agent</td><td>4.0</td></tr><tr><td>☐</td><td>Integration Gateway</td><td>4.0</td></tr><tr><td>☐</td><td>Solutions Enabler 5.4.0</td><td>4.0</td></tr><tr><td>☐</td><td>Storage Agent for CLARiiON</td><td>4.0</td></tr><tr><td>☐</td><td>Storage Agent for HDS</td><td>4.0</td></tr><tr><td>☒</td><td>Storage Agent for Symmetrix</td><td>4.0</td></tr><tr><td>☐</td><td>Symmetrix SDM Agent</td><td>4.0</td></tr><tr><td>☐</td><td>Storage Agent for EDM</td><td>4.0</td></tr></tbody></table> Back Next Finish Cancel Help		Agent Name	Version	☐	Backup Agent for Legato NetWorker	4.0	☐	Backup Agent for Tivoli Storage Manager	4.0	☐	Backup Agent for VERITAS NetBackup	4.0	☐	Common Mapping Agent	4.0	☐	Fibre Channel Connectivity Agent	4.0	☐	Integration Gateway	4.0	☐	Solutions Enabler 5.4.0	4.0	☐	Storage Agent for CLARiiON	4.0	☐	Storage Agent for HDS	4.0	☒	Storage Agent for Symmetrix	4.0	☐	Symmetrix SDM Agent	4.0	☐	Storage Agent for EDM	4.0
	Agent Name	Version																																						
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☒	Storage Agent for Symmetrix	4.0																																						
☐	Symmetrix SDM Agent	4.0																																						
☐	Storage Agent for EDM	4.0																																						

Step	Action
5	In the <i>Prerequisite Checks</i> window, expand the entry in the left hand column and view the Prerequisite Checking information. Click Next to continue. 

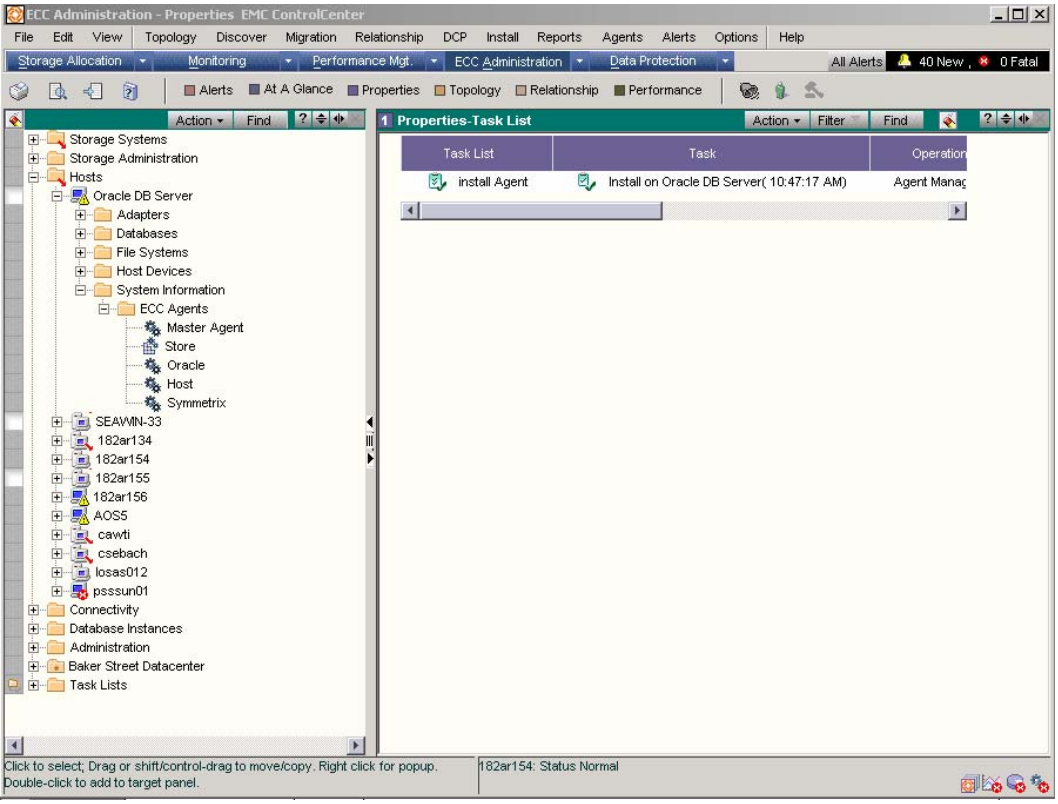
Step	Action						
6	The Review Install Agent Task window shows which agents will be installed. Click Finish to exit the wizard.  Review Install Agent Task Please review the information below and proceed. Agents that have not passed prerequisite checking will not be installed. Installable Agents The agents listed below will be installed <table><tr><th>Host</th><th>Agent Name</th><th>New Version</th></tr><tr><td> Oracle DB Server</td><td>Storage Agent for Symmetrix</td><td>4.0</td></tr></table> Back Finish Cancel Help	Host	Agent Name	New Version	 Oracle DB Server	Storage Agent for Symmetrix	4.0
Host	Agent Name	New Version					
 Oracle DB Server	Storage Agent for Symmetrix	4.0					

Step	Action
7	To execute the Install Agent Task, click OK. The progress/status of the tasks will be displayed. 

Step	Action
8	Verify that the Symmetrix Agent started properly. In the Tree panel, select: Hosts >Oracle DB Server>System Information>ECC Agents  Verify that the Symmetrix Agent appears with a blue gear icon under Oracle DB Server.

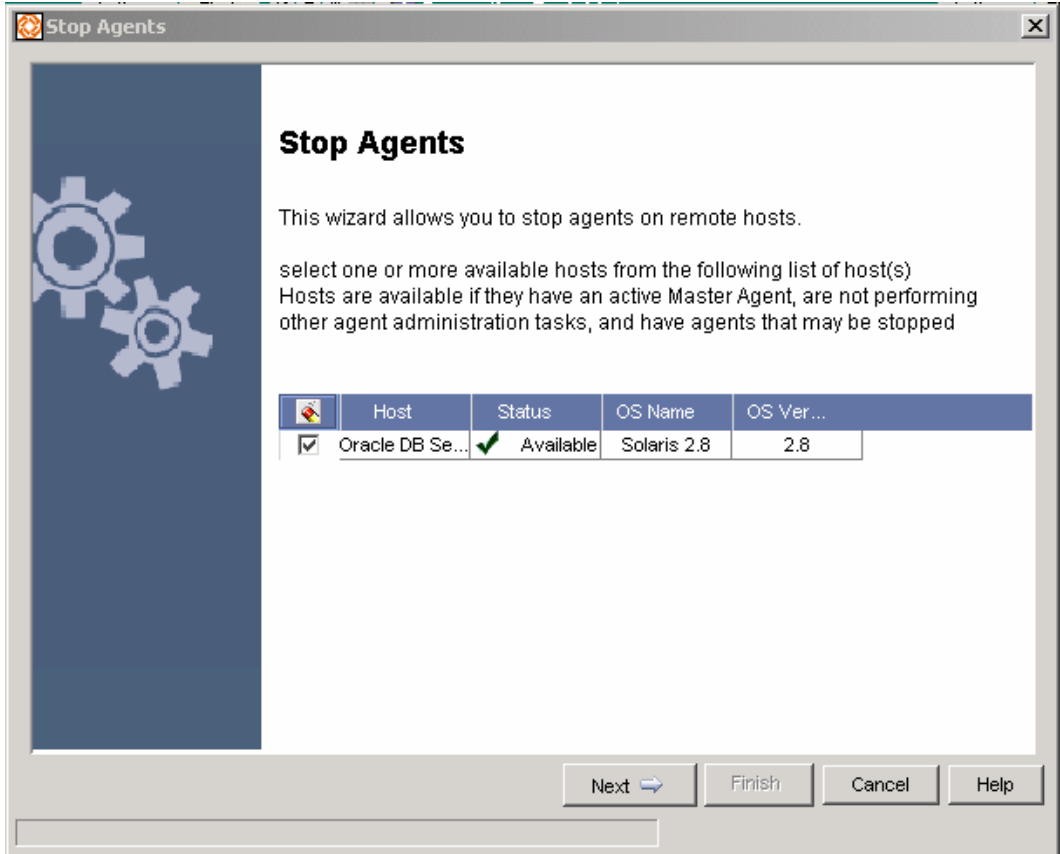
Lab Exercise 1

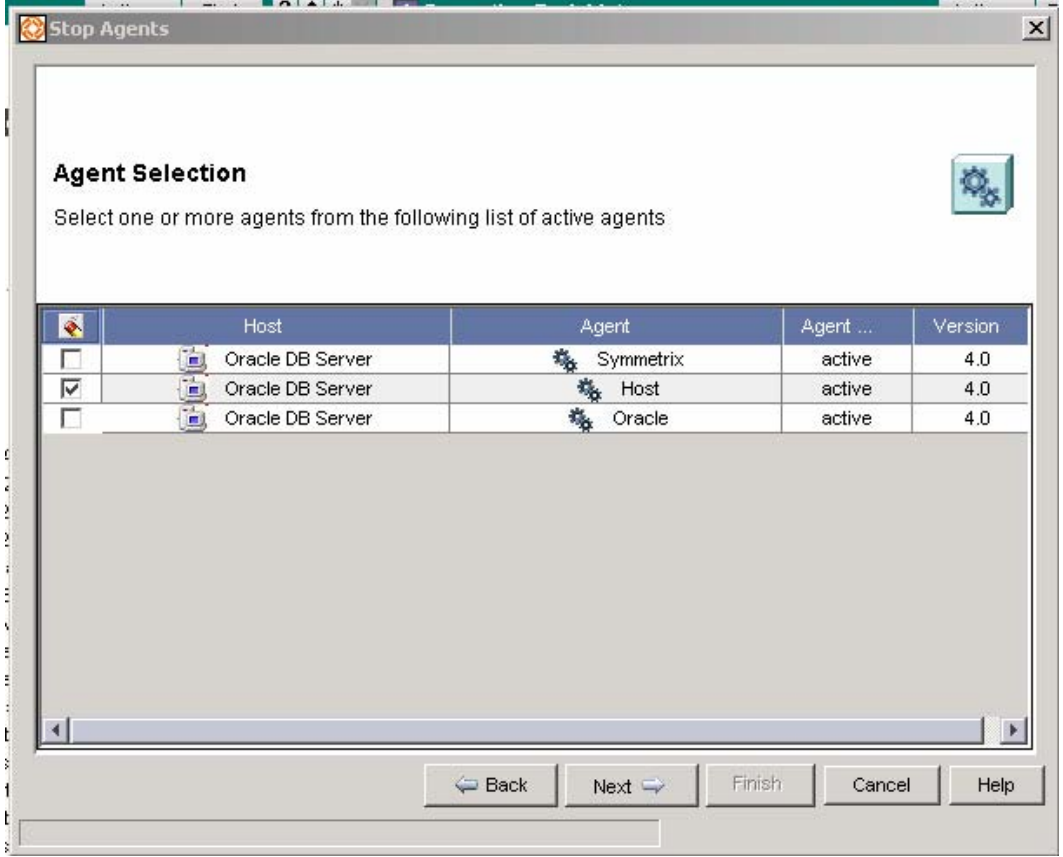
Part 4: Stopping/Starting the Agents

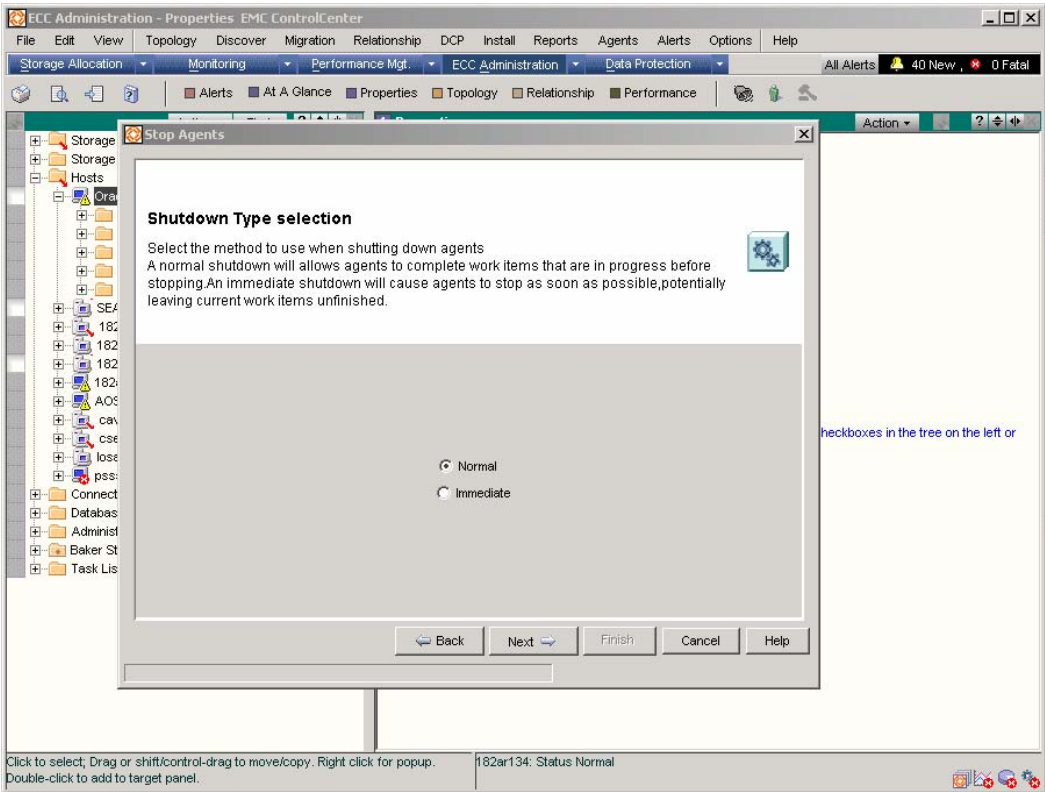
Step	Action
1	In the Tree panel, expand the Hosts folder down to <i>your Agent Host</i>, and select Hosts>Oracle DB Server> System Information>ECCAgents 

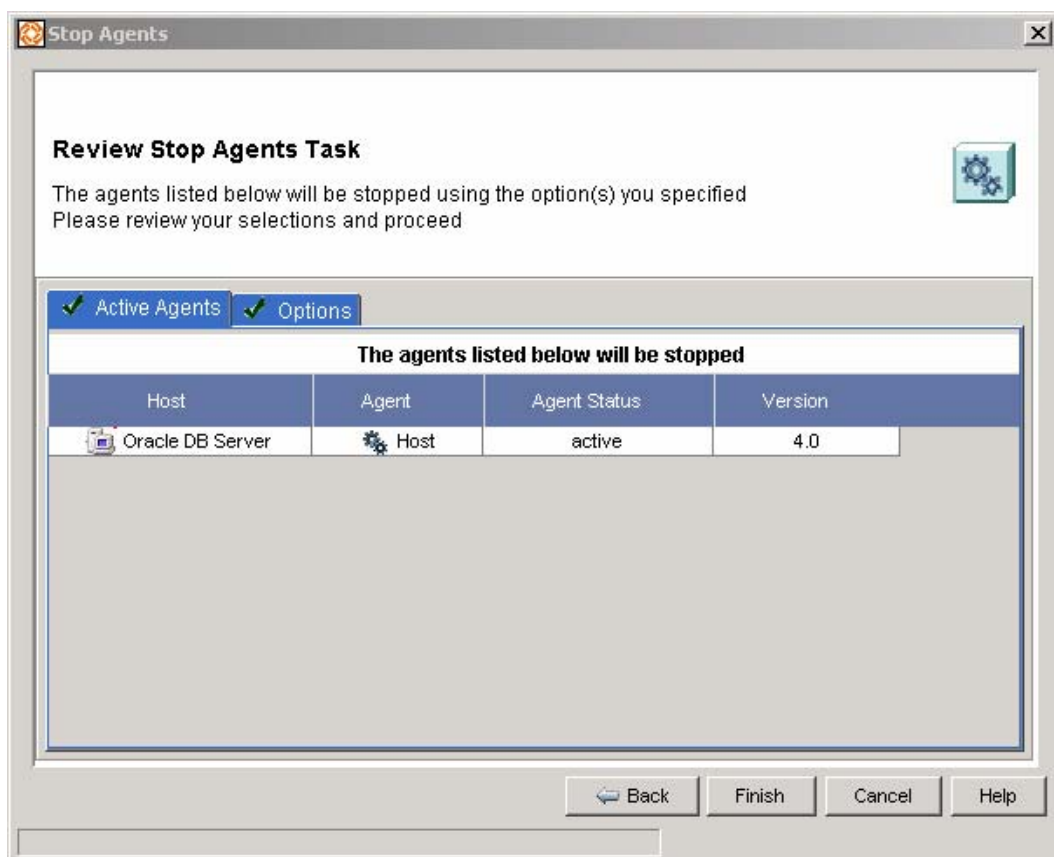
Step	Action
2	Right-click the Host Agent under Oracle DB Server and select Agent> Stop .

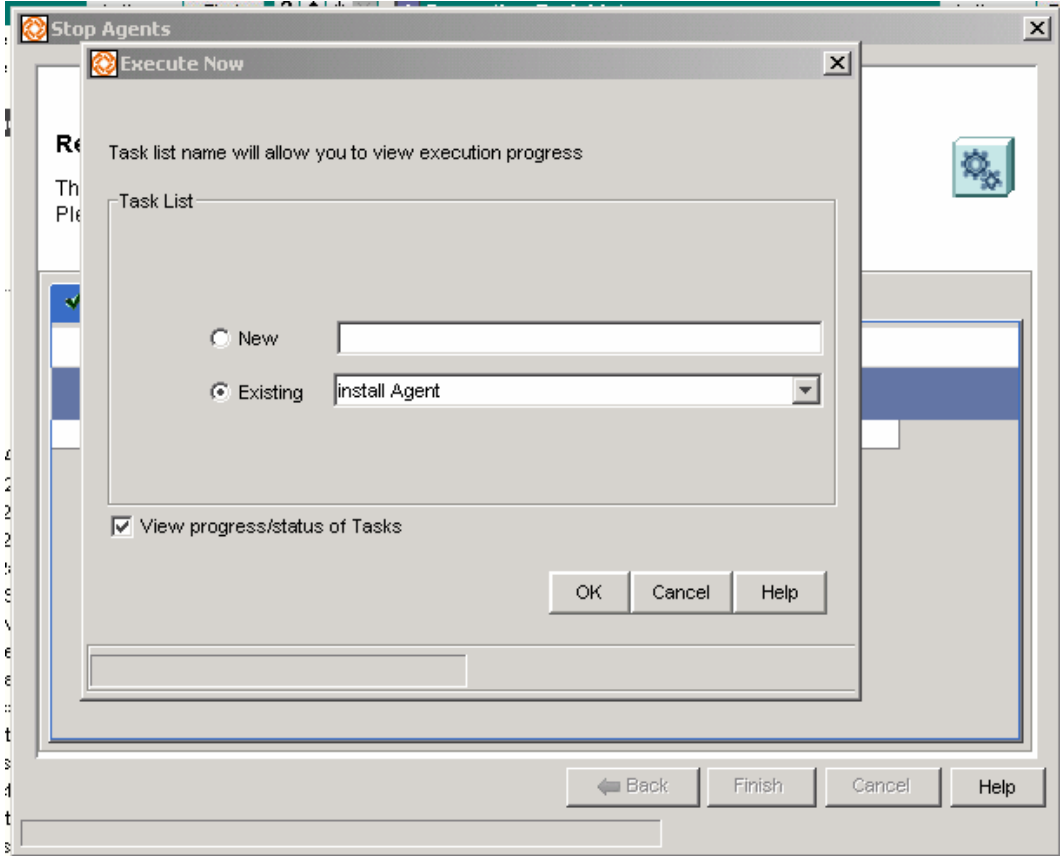
The screenshot displays the EMC ControlCenter interface. On the left, a tree view shows the hierarchy: Storage Systems > Storage Administration > Hosts > Oracle DB Server > Host Agents. The 'Host Agents' folder is selected, and a right-click context menu is open. The menu options include 'Add To View', 'Copy', 'New', 'Rename', 'Delete...', 'Refresh Alert Status', 'Rediscover', 'Host', 'Performance', 'Zoning', 'Masking', 'Allocation', 'Data Protection', 'Agents', 'Relationship...', 'Management Tools', 'Alert Thresholds', 'Discover', and 'StorageScope Reports...'. The 'Agents' option is highlighted, and a sub-menu is open showing 'Install...', 'Upgrade...', 'Start...', 'Stop...', 'Uninstall...', 'Restart Master Agent...', 'View Install Logs...', and 'Apply Patch...'. The 'Stop...' option is selected. The main pane on the right shows the 'Properties-Task List' for the selected agent, with a table containing one row: 'Install Agent' with a status of 'Install on Oracle DB Server(10:47:17 AM)' and an operation of 'Agent Manag'. The bottom status bar indicates 'Oracle DB Server: Status Normal'.

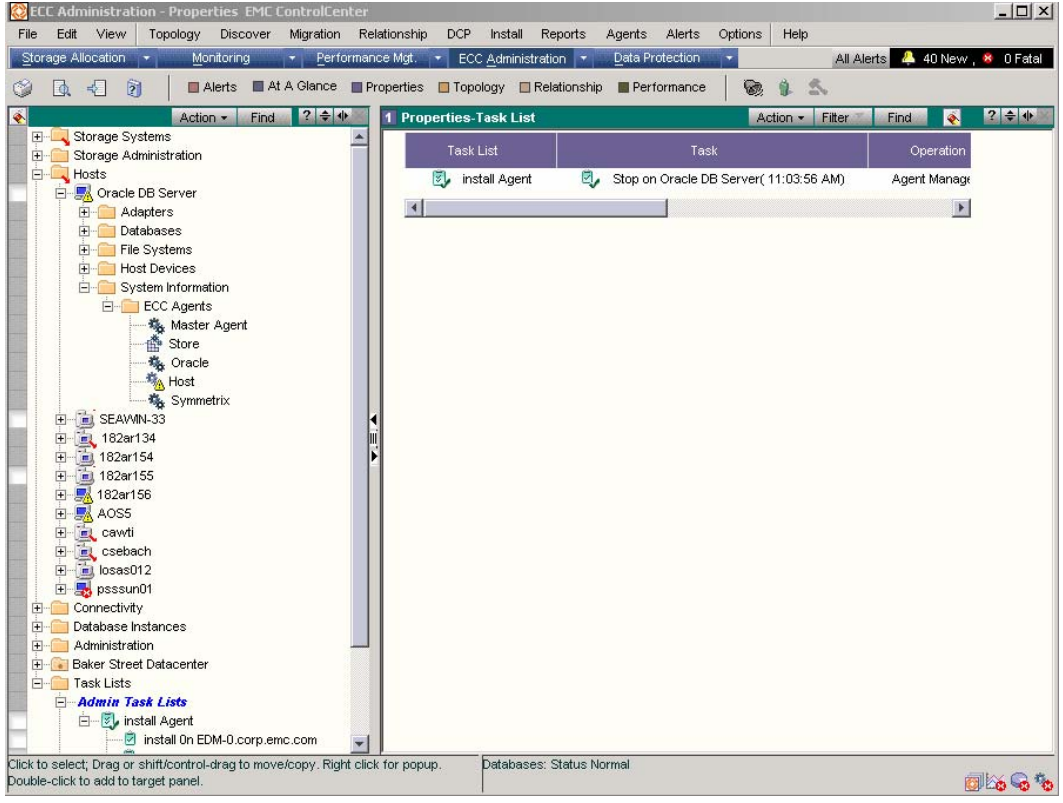
Step	Action
3	When the Stop Agents wizard appears, wait for the <i>Status</i> field to show <i>Available</i>, then click Next. 

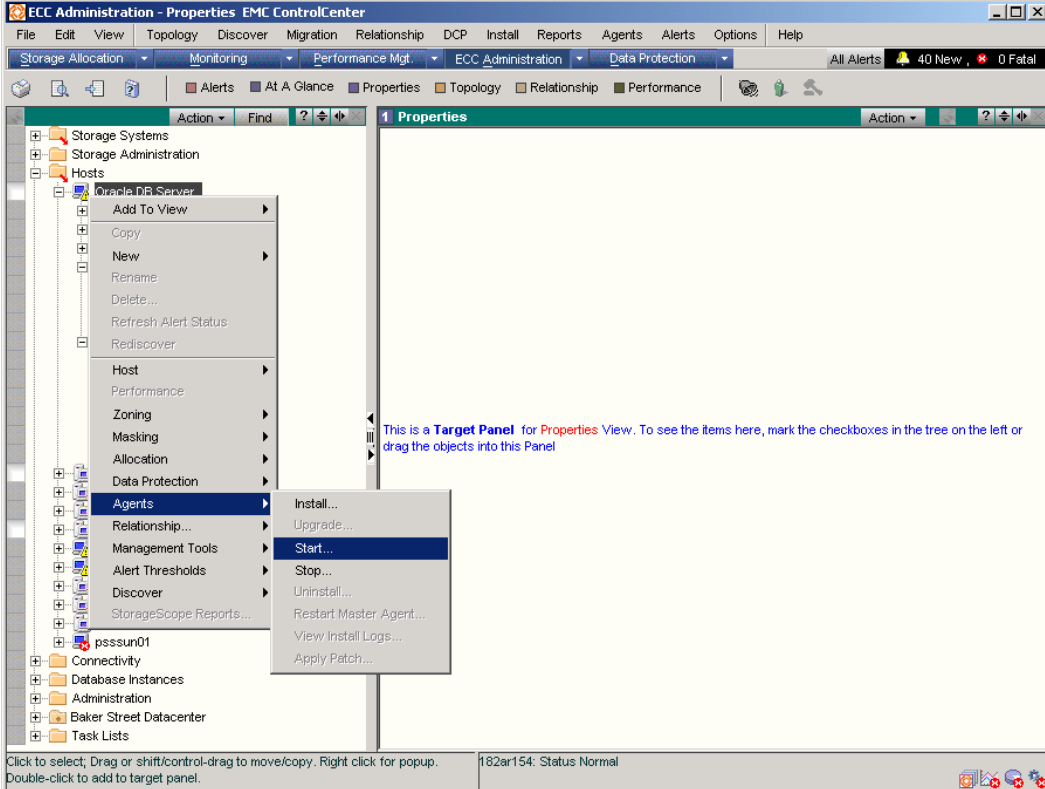
Step	Action
4	Select the agent name in the white box, in this example, Host Agent on Oracle DB Server. Click Next. 

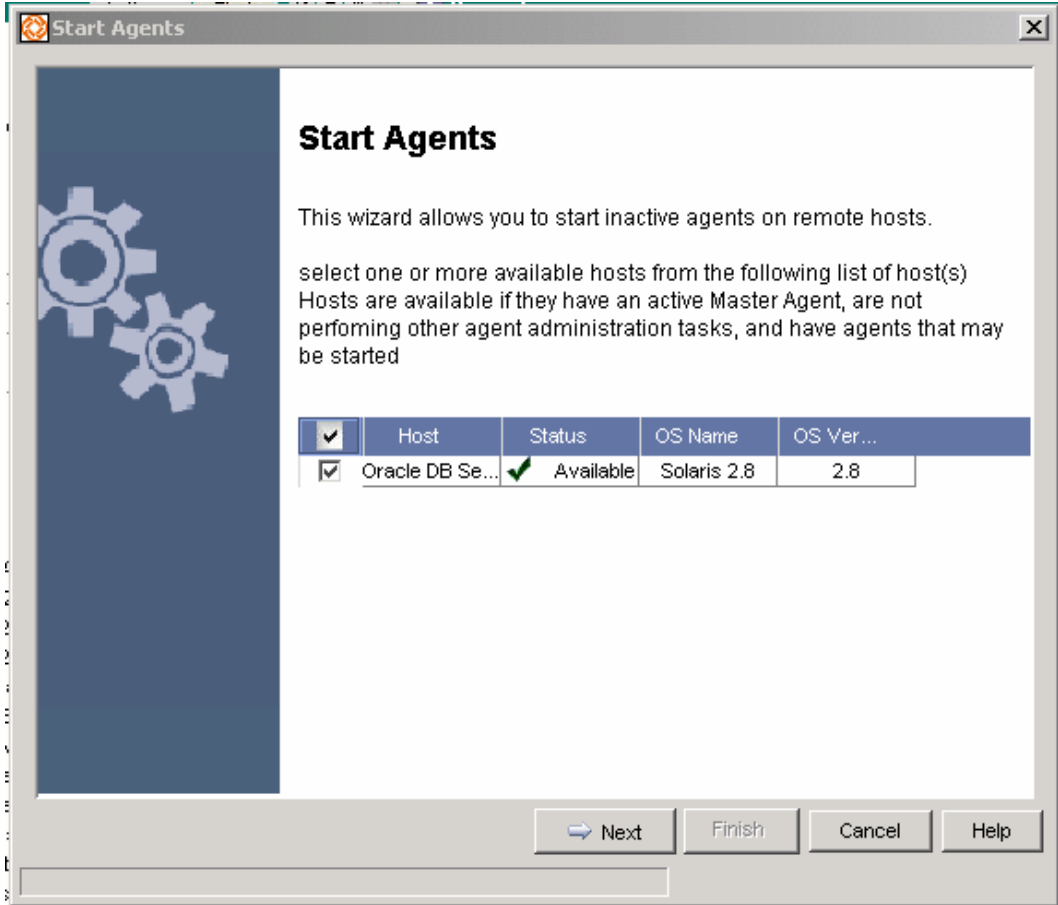
Step	Action
5	Select the Normal radio button as the Shutdown Type. Click Next.  The screenshot shows the 'Stop Agents' dialog box in the EMC ControlCenter. The dialog has a title bar 'Stop Agents' and a close button. Inside, there's a section titled 'Shutdown Type selection' with a gear icon. Below the title, it says: 'Select the method to use when shutting down agents. A normal shutdown will allow agents to complete work items that are in progress before stopping. An immediate shutdown will cause agents to stop as soon as possible, potentially leaving current work items unfinished.' There are two radio buttons: 'Normal' (which is selected) and 'Immediate'. At the bottom of the dialog are five buttons: 'Back', 'Next', 'Finish', 'Cancel', and 'Help'. The background of the screenshot shows the EMC ControlCenter interface. On the left is a tree view with folders like 'Storage', 'Hosts', 'SE4', '182', 'AO5', 'cav', 'cse', 'lose', 'pss', 'Connect', 'Databas', 'Administ', 'Baker St', and 'Task Lis'. At the bottom, there's a status bar that says '182ar134: Status Normal'. The top of the screenshot shows the 'ECC Administration - Properties EMC ControlCenter' window with various tabs like 'File', 'Edit', 'View', 'Topology', 'Discover', 'Migration', 'Relationship', 'DCP', 'Install', 'Reports', 'Agents', 'Alerts', 'Options', and 'Help'. There are also dropdown menus for 'Storage Allocation', 'Monitoring', 'Performance Mgt.', 'ECC Administration', and 'Data Protection'. A status bar at the top right says 'All Alerts 40 New 0 Fatal'.

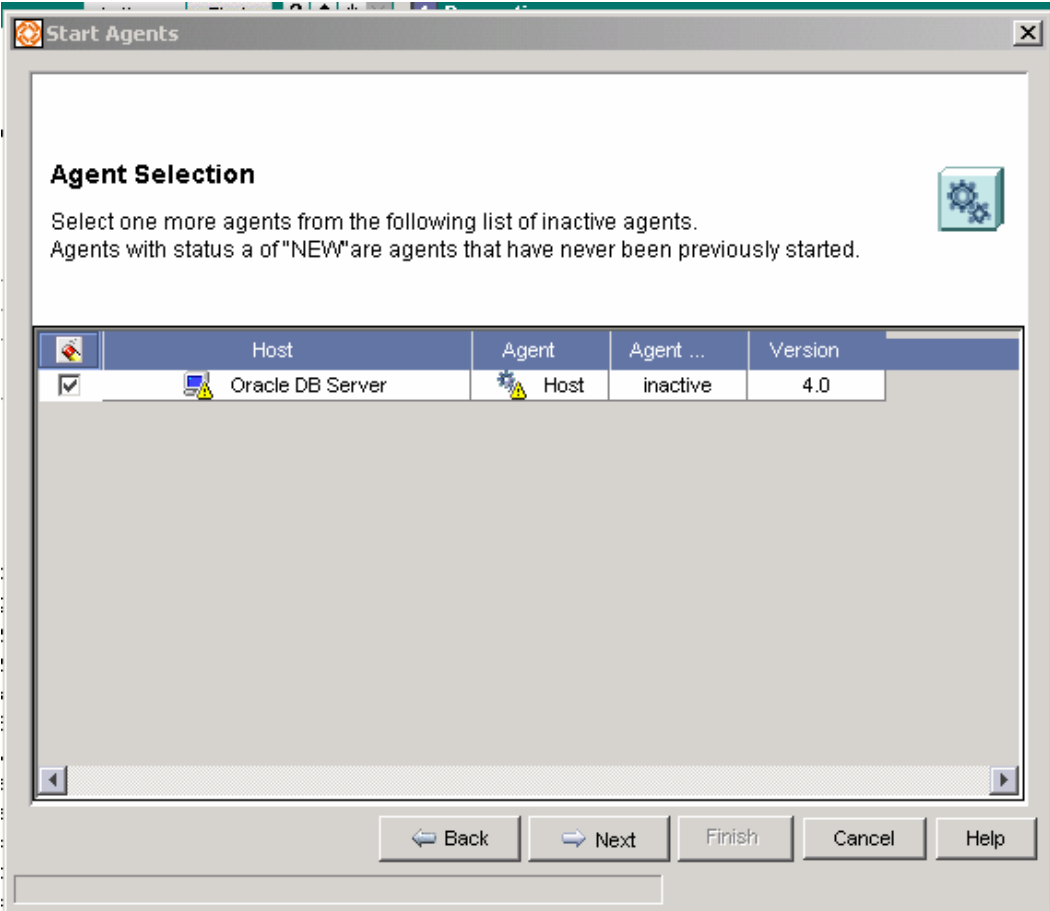
Step	Action								
6	Review the Stop Agents Task message box, then select Finish.  The agents listed below will be stopped <table><tr><th>Host</th><th>Agent</th><th>Agent Status</th><th>Version</th></tr><tr><td> Oracle DB Server</td><td> Host</td><td>active</td><td>4.0</td></tr></table> Back Finish Cancel Help	Host	Agent	Agent Status	Version	 Oracle DB Server	 Host	active	4.0
Host	Agent	Agent Status	Version						
 Oracle DB Server	 Host	active	4.0						

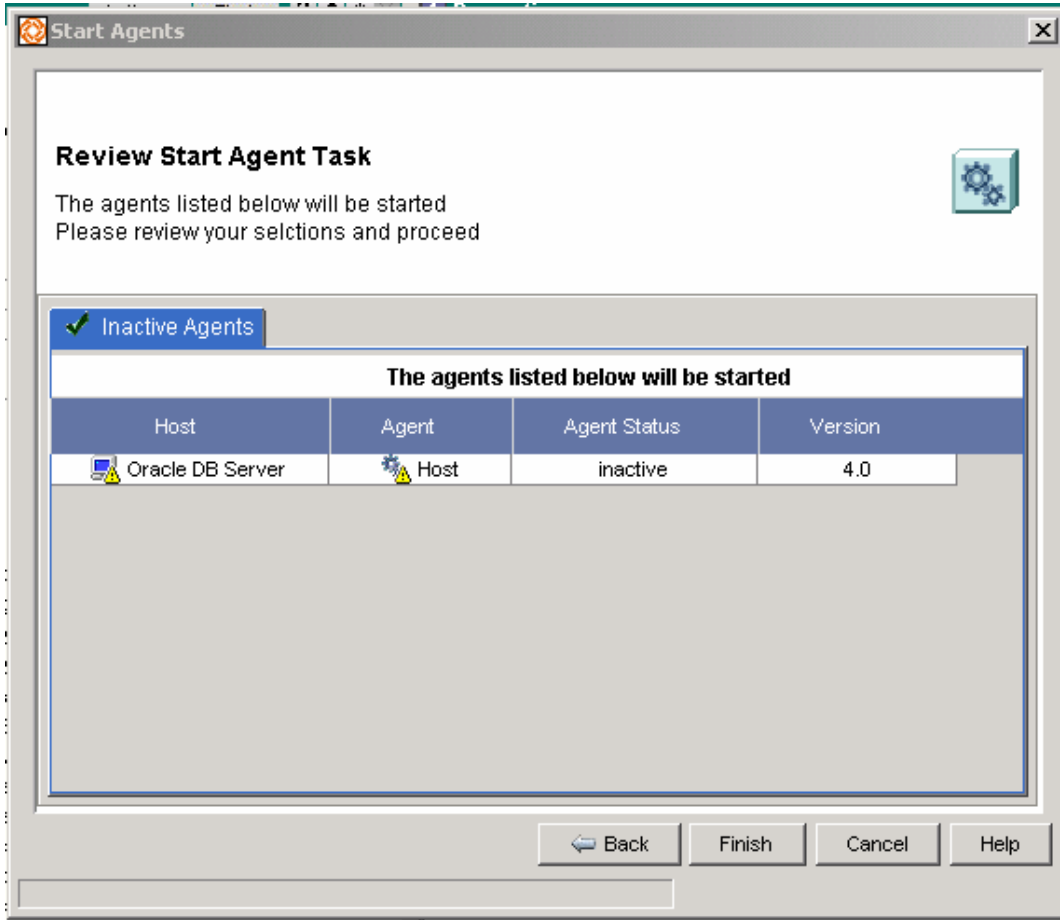
Step	Action
7	To execute the Stop Agent Task, click OK. The progress/status of the tasks will be displayed. 

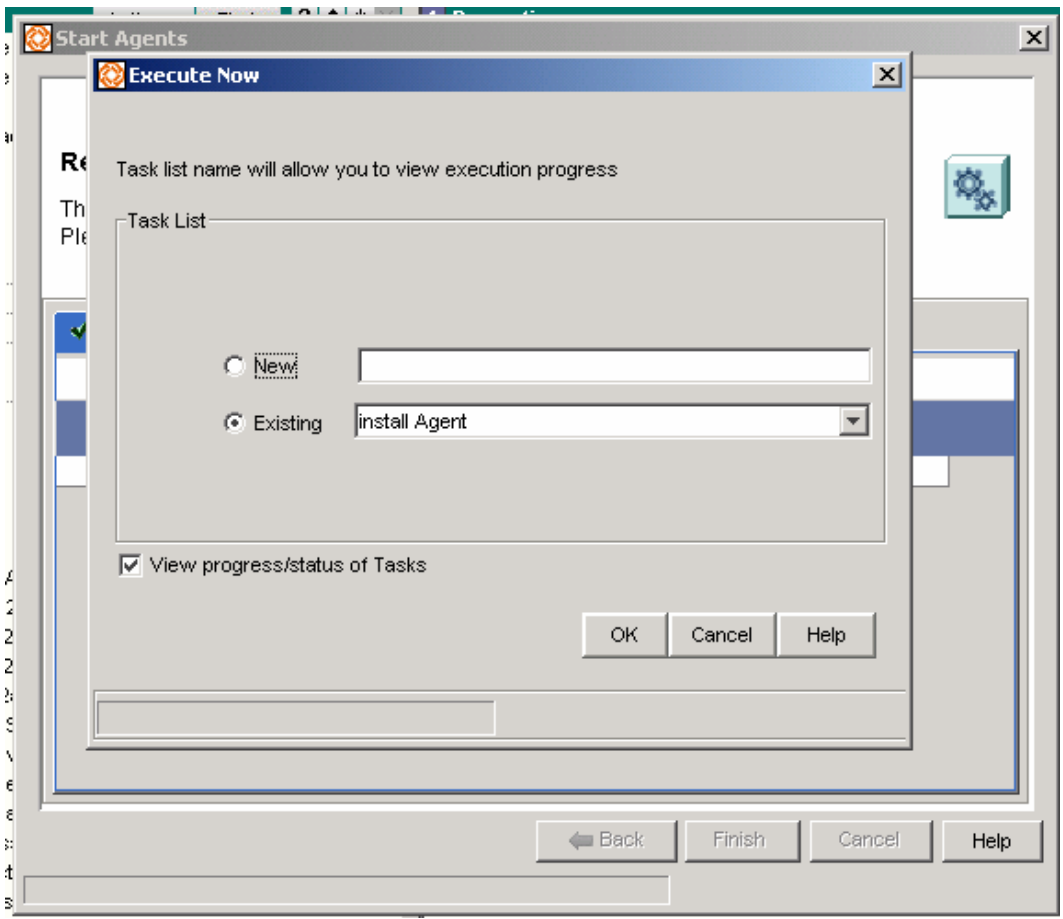
Step	Action
8	What is the icon that appears beside the Host Agent?  The screenshot shows the EMC ControlCenter interface. The left pane displays a tree view of the system hierarchy. Under 'Hosts', the 'Oracle DB Server' is expanded, showing 'ECC Agents'. The 'ECC Agents' folder is expanded, showing 'Master Agent', 'Store', 'Oracle', 'Host', and 'Symmetrix'. The 'Host' agent is selected, and its 'Properties-Task List' is displayed on the right. The task list shows two tasks: 'install Agent' and 'Stop on Oracle DB Server(11:03:56 AM)'. The 'install Agent' task has a green checkmark icon next to it.

Step	Action
9	Right-click the Oracle DB Server and select Agent>Start. 

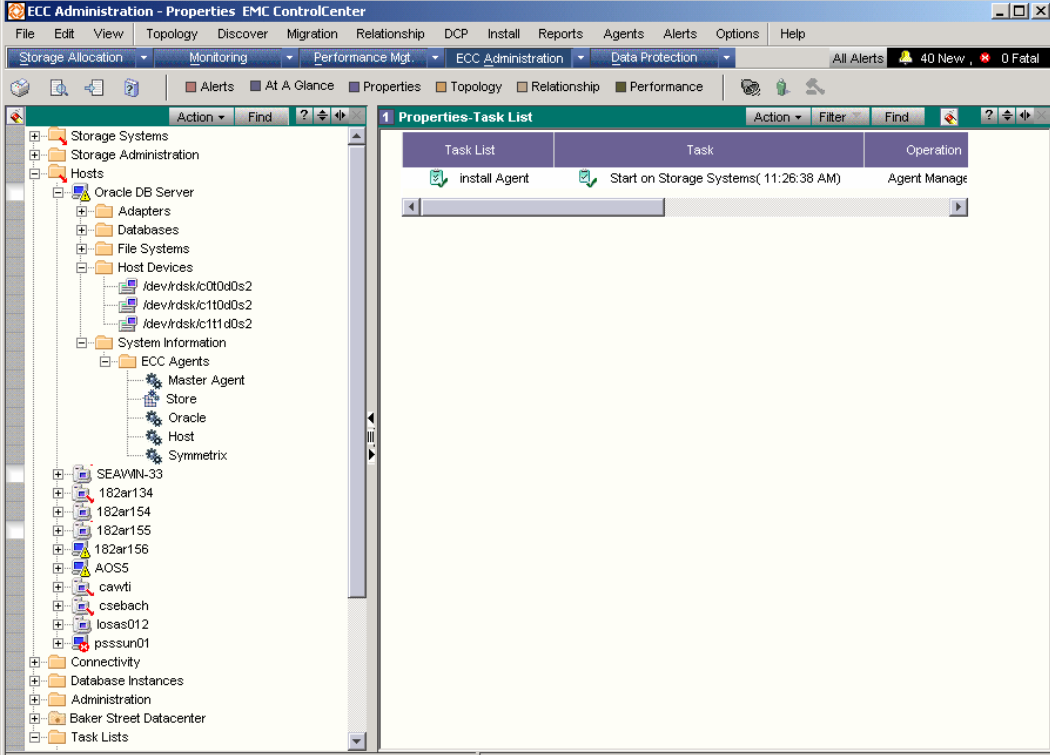
Step	Action
10	When the Start Agents wizard appears, wait for the <i>Status</i> field to show <i>Available</i>, then click Next 

Step	Action
11	At the Agent Selection message box, select the inactive agent you wish to start, then click Next. 

Step	Action
12	Review the Start Agents Task message box, then select Finish. 

Step	Action
13	To execute the Start Agent Task, click OK. The progress/status of the tasks will be displayed. 

Step	Action
14	Does your Host Agent recover? How can you verify?



The screenshot shows the EMC ControlCenter ECC Administration - Properties window. The left pane displays a tree view of storage systems and hosts. The right pane shows the 'Properties-Task List' with a table of tasks.

Task List	Task	Operation
☒	Install Agent	Agent Manage
☒	Start on Storage Systems(11:26:38 AM)	

Click to select; Drag or shift/control-drag to move/copy. Right click for popup.
Double-click to add to target panel.

AOS5: Status Normal

Lab Exercise 2: Views and Monitoring

Purpose:

The purpose of this lab is to familiarize students with the monitoring and viewing capabilities of ControlCenter.

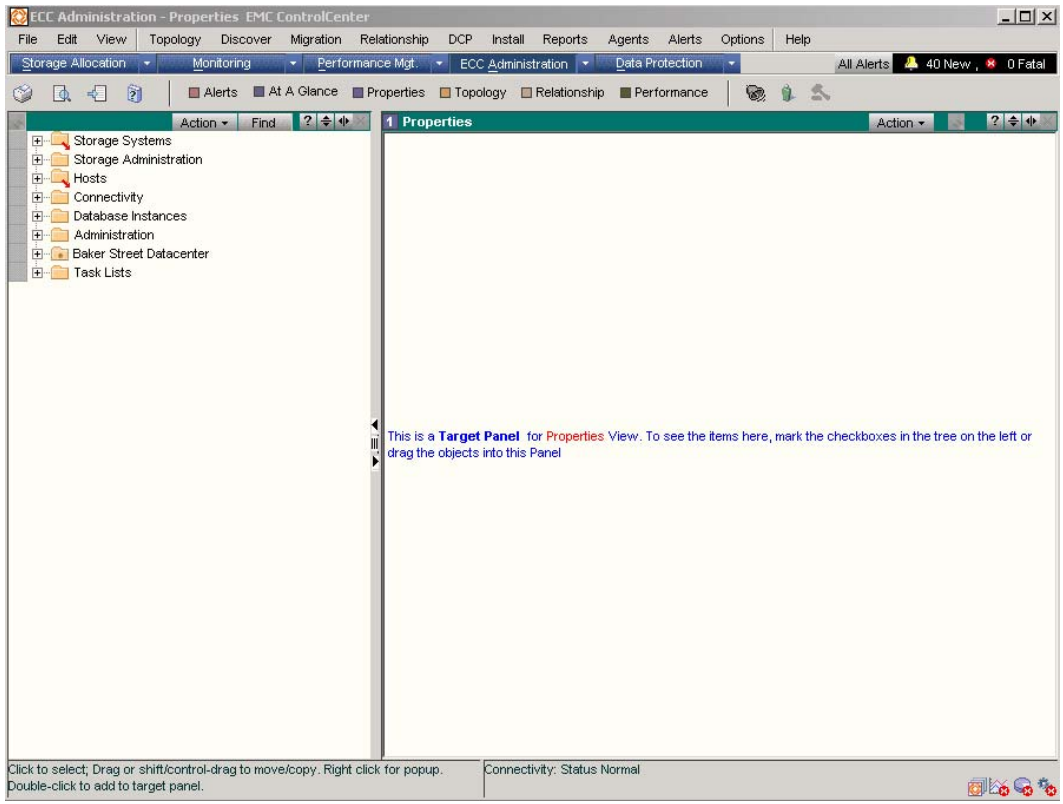
Objectives:

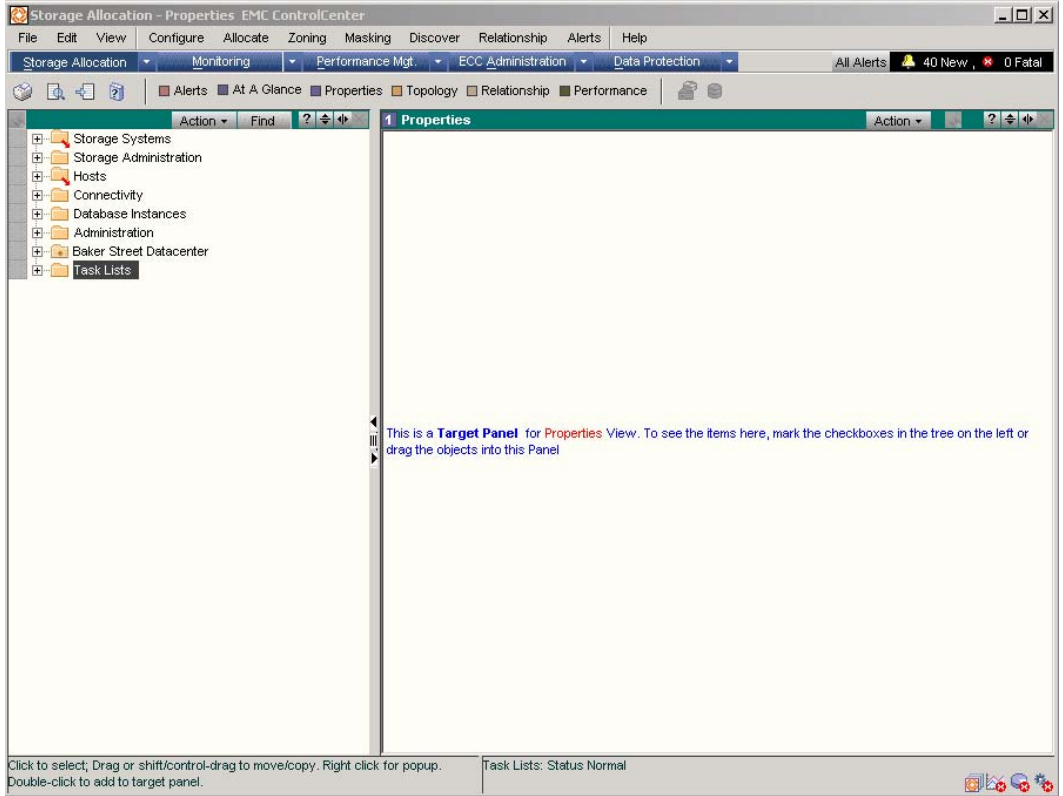
Each lab will perform the following activities:

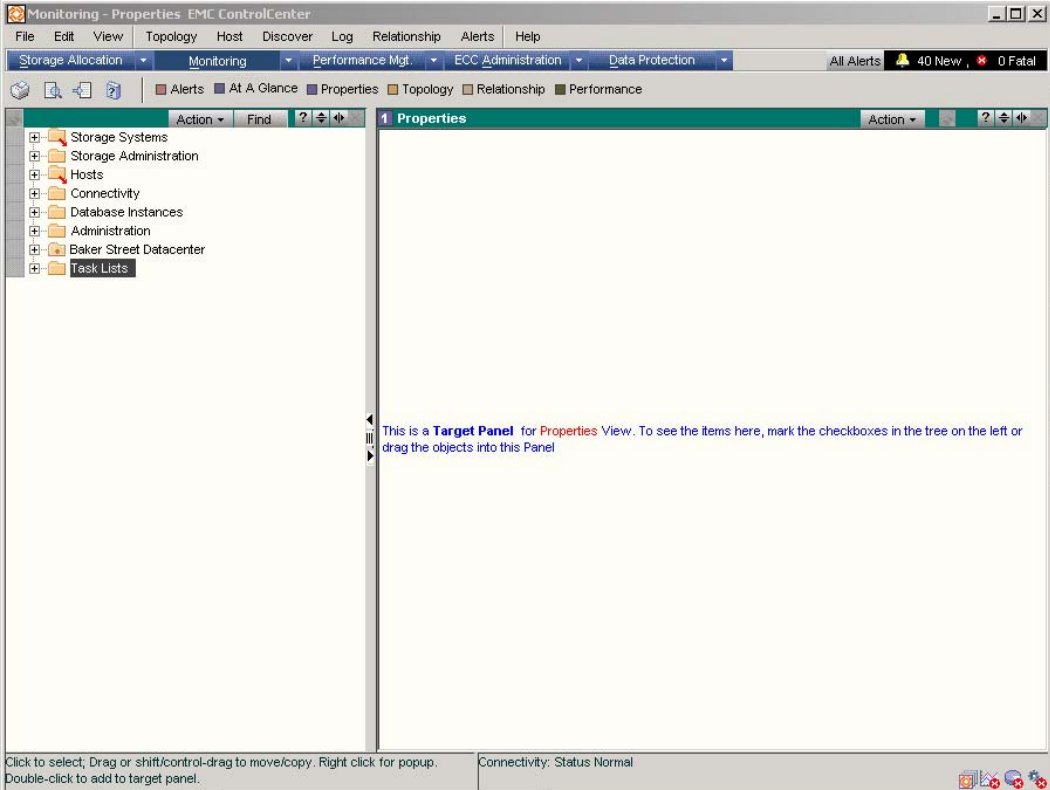
- a) Examine the different views of information gathered by ControlCenter
- b) Examine Alerts

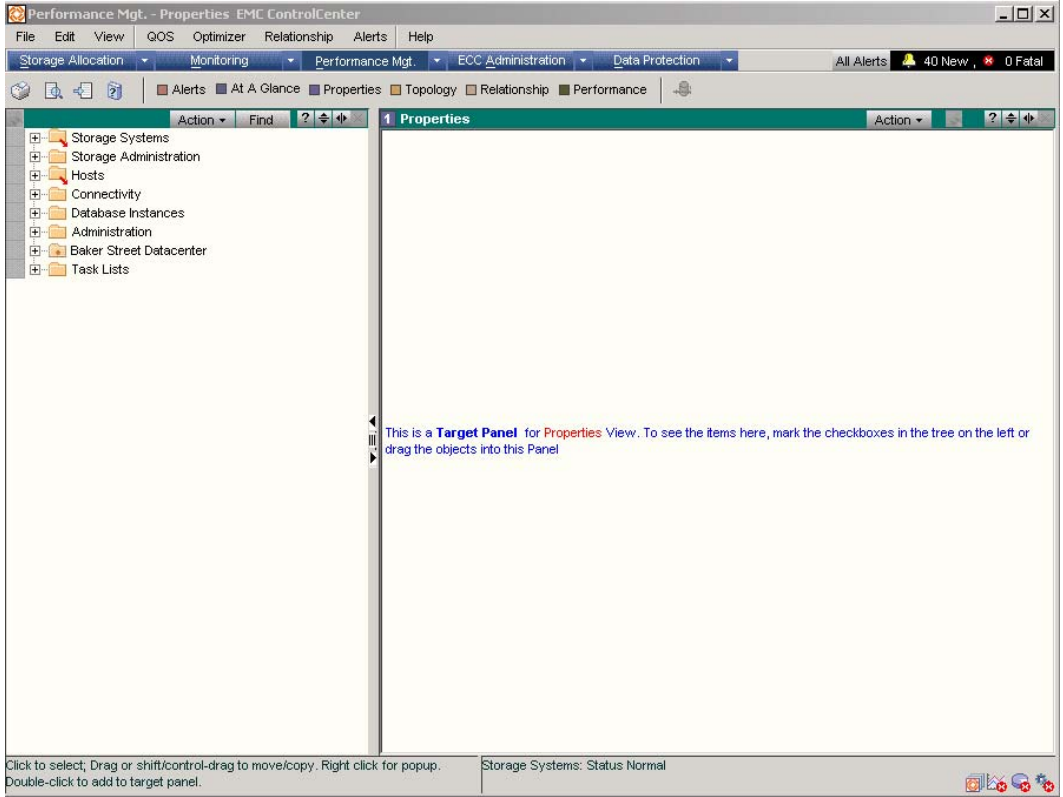
Lab Exercise 2

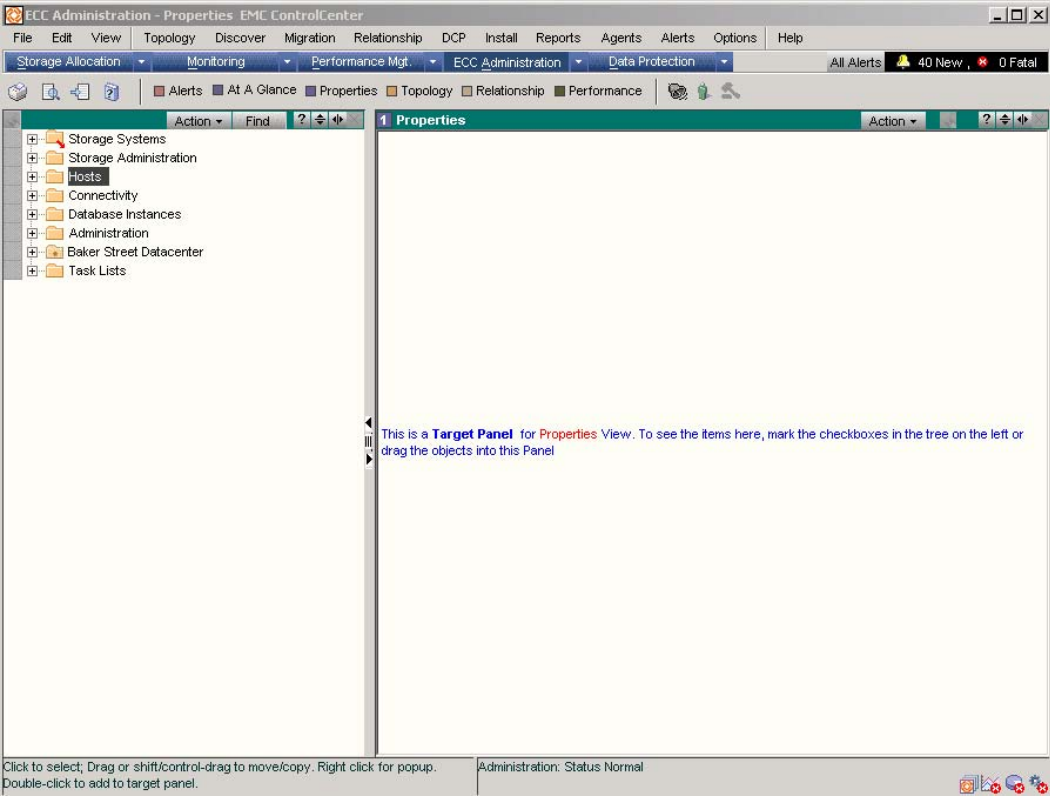
Part 1: Exploring the ControlCenter User Interface

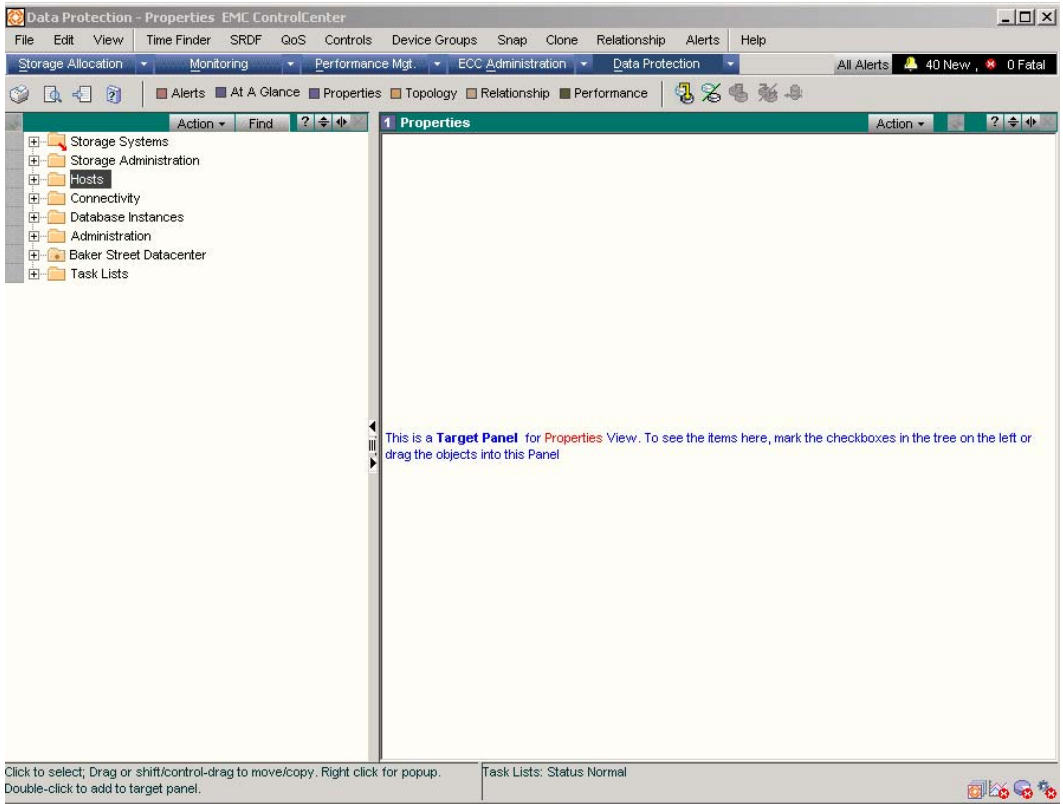
Step	Action
1	The Console has two main panes. The left-hand pane shows the Object Tree, or Tree Panel, as folders. Some of the folders are <i>Storage Systems</i>, <i>Storage Administration</i>, <i>Hosts</i>, <i>Connectivity</i>, <i>Database Instances</i>, and <i>Administration</i>. The Storage, Hosts and Connectivity folders contain the managed objects. The right hand pane is the Target Panel where different <i>Views</i> of the <i>Managed Objects</i> can be seen. The Views are <i>Properties</i>, <i>Topology</i>, <i>Relationship</i>, <i>Performance</i>, <i>At-A-Glance</i> and <i>Alerts</i>. 

Step	Action
2	Let us begin by examining the different views provided by ControlCenter. Click on the Storage Allocation task and note the options on the Menu Bar. Move your mouse over the icons on the Tool Bar and read each description. 

Step	Action
3	As you move across the Task Bar, the important thing to note is that the options on the Menu Bar and the Tool Bar change. Click on the Monitoring task and note the options on the Menu Bar. Notice that there are no task icons on right side of the Tool Bar. 

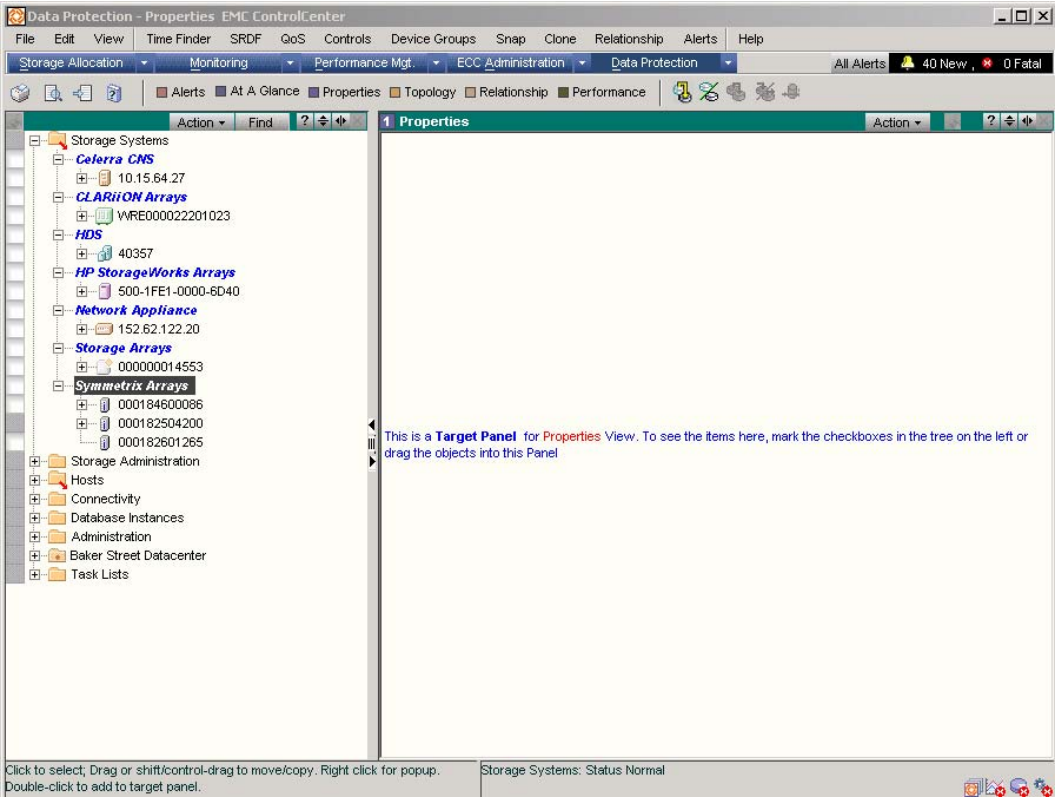
Step	Action
4	Click on the Performance Management task and note the options on the Menu. Move your mouse over the icon on the Tool Bar and read the description. 

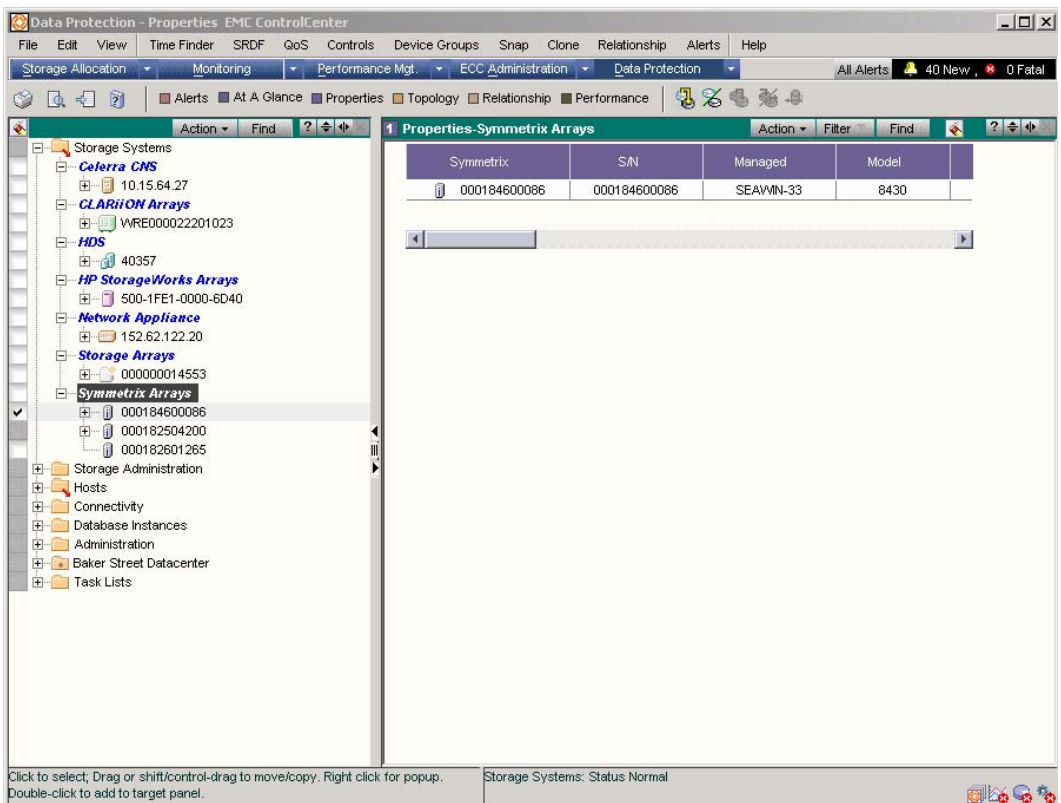
Step	Action
5	Click on the ECC Administration task and note the options on the Menu.  Click to select; Drag or shift/control-drag to move/copy. Right click for popup. Double-click to add to target panel. Administration: Status Normal

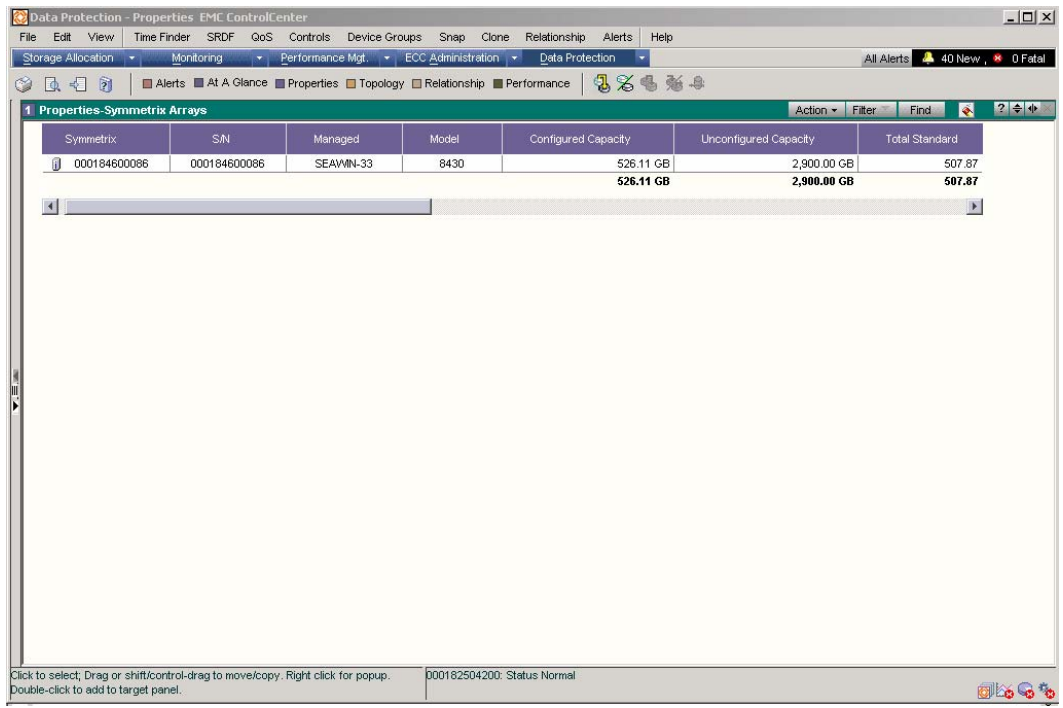
Step	Action
6	Click on the Data Protection task and note the options on the Menu. Move your mouse over the icons on the Tool Bar and read each description.  Click to select; Drag or shift/control-drag to move/copy. Right click for popup. Double-click to add to target panel. Task Lists: Status Normal

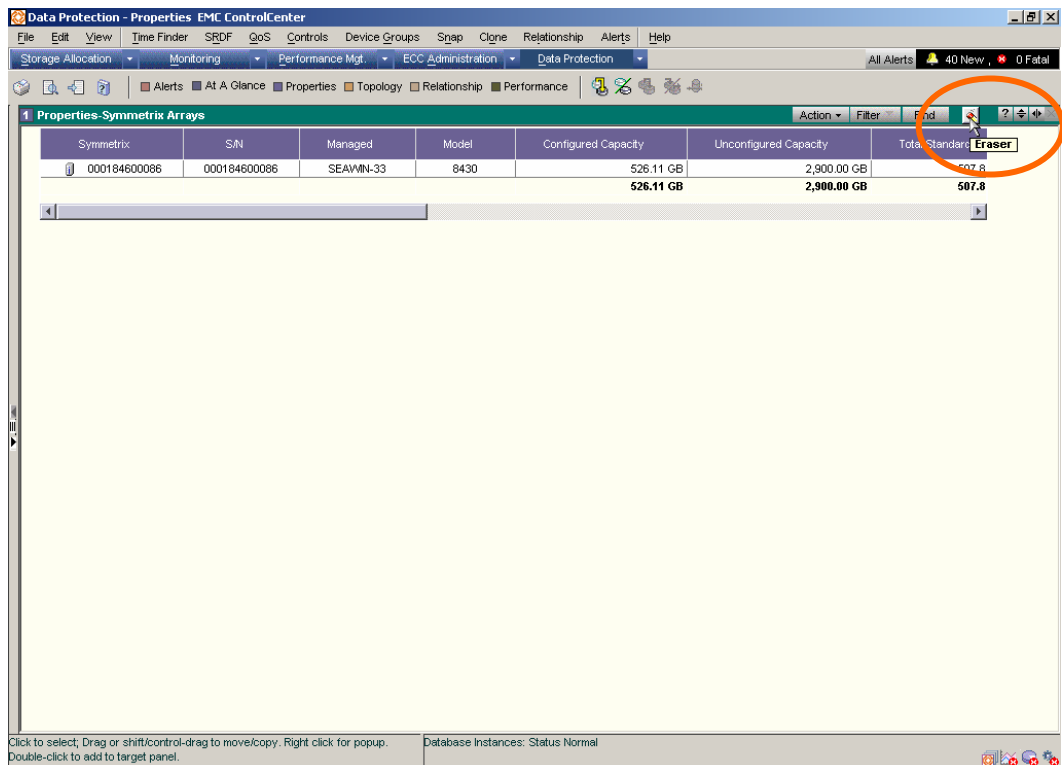
Lab Exercise 2

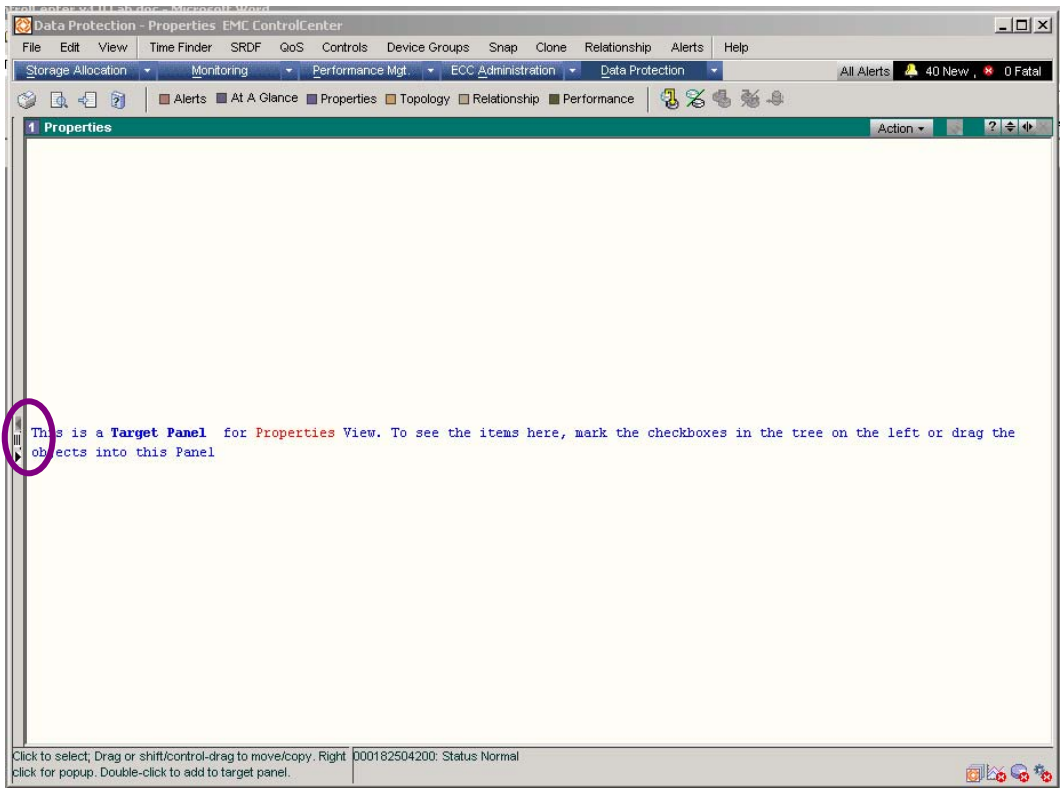
Part 2 : Examining Properties View

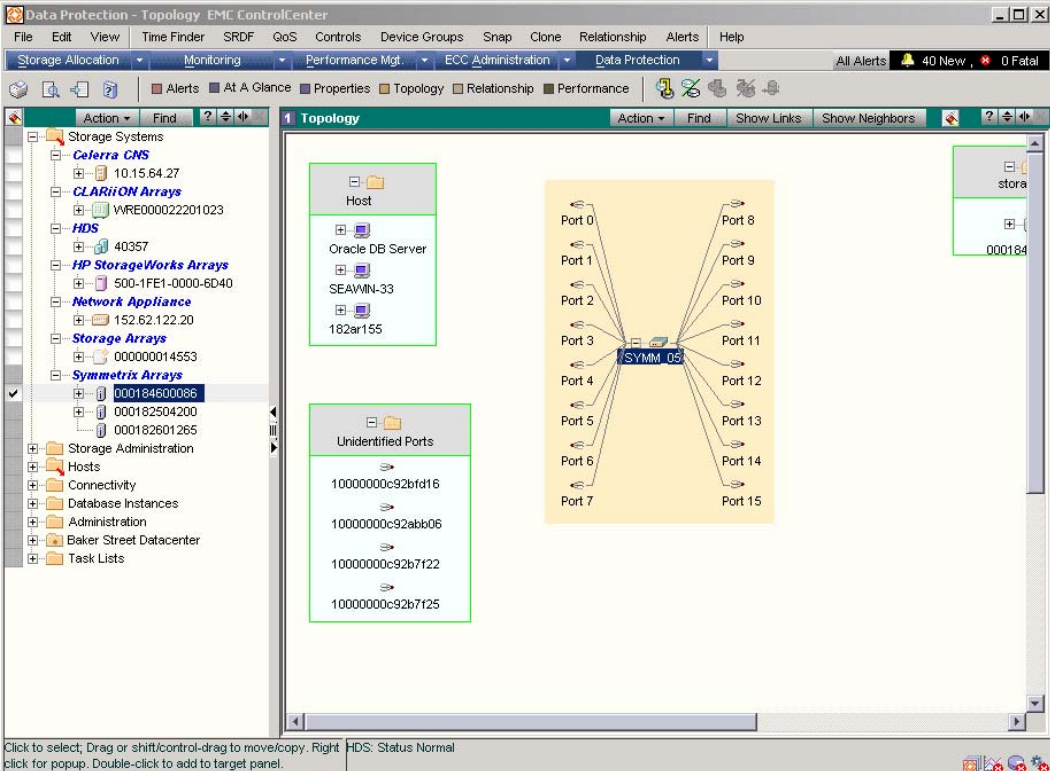
Step	Action
1	Now we will examine some of the ControlCenter views that contain Host and Array properties information. Expand the Storage Systems Folder in the Tree Panel.  How many storage arrays is ControlCenter managing? _____

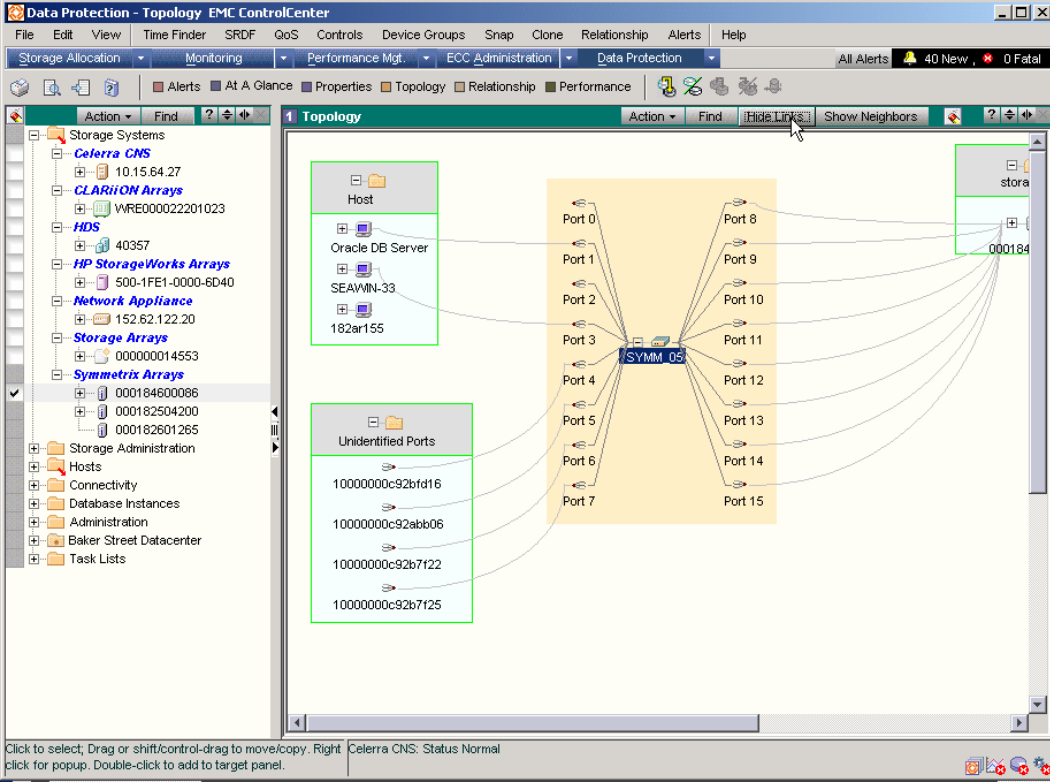
Step	Action								
2	Next we will determine the Properties of the Storage Arrays. Click on the Properties button from the Tool Bar (Short Cut bar) to display the Properties view in the Target panel. Next Click and Drag the Symmetrix number 000184600086 from the Tree Panel into the Target Panel.  The screenshot shows the EMC ControlCenter interface. On the left is a tree panel with a hierarchy: Storage Systems > Celerra CNS > CLARiON Arrays > HDS > HP StorageWorks Arrays > Network Appliance > Storage Arrays > Symmetrix Arrays. The 'Symmetrix Arrays' folder is selected, showing three sub-items: 000184600086, 000182504200, and 000182601265. On the right is the 'Properties-Symmetrix Arrays' panel, which contains a table with the following data: <table><tr><th>Symmetrix</th><th>S/N</th><th>Managed</th><th>Model</th></tr><tr><td>000184600086</td><td>000184600086</td><td>SEAWIN-33</td><td>8430</td></tr></table> At the bottom of the window, there is a status bar that reads 'Storage Systems: Status Normal'.	Symmetrix	S/N	Managed	Model	000184600086	000184600086	SEAWIN-33	8430
Symmetrix	S/N	Managed	Model						
000184600086	000184600086	SEAWIN-33	8430						

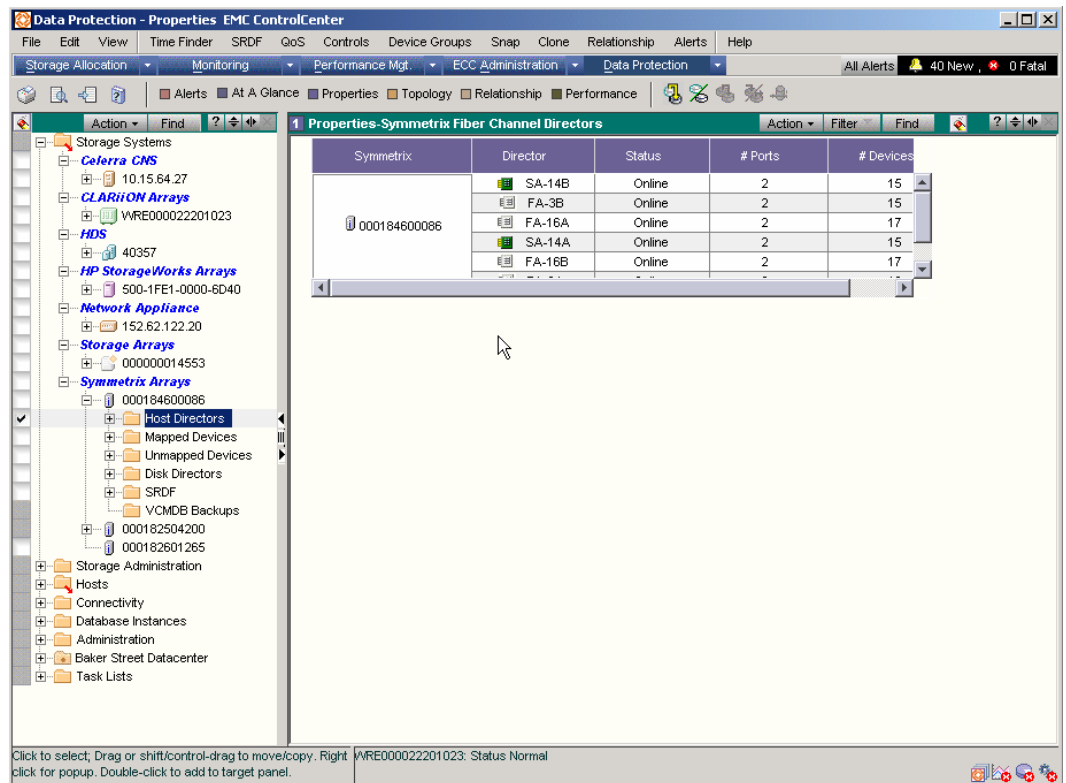
Step	Action
3	Hide the Tree Panel by clicking the left arrow on the bar that divides the Tree and Target Panels. 
4	Record the following information: Serial Number of Symmetrix: _____ Model Number of Symmetrix: _____ Configured Capacity: _____ Un-configured Capacity: _____ What is Un-configured capacity as opposed to Configured capacity? _____ _____ Cache Size: _____

Step	Action																					
5	Determine which Hosts Symmetrix number 000184600086 is attached to: Clear all objects from the Target Panel by clicking on the eraser button in the Target Panel at the top of the panel.  The screenshot shows the 'Data Protection - Properties EMC ControlCenter' window. The 'Symmetrix Arrays' section contains a table with the following data: <table><tr><th>Symmetrix</th><th>S/N</th><th>Managed</th><th>Model</th><th>Configured Capacity</th><th>Unconfigured Capacity</th><th>Total Standard</th></tr><tr><td>000184600086</td><td>000184600086</td><td>SEAWIN-33</td><td>8430</td><td>526.11 GB</td><td>2,900.00 GB</td><td>507.8</td></tr><tr><td colspan="4"></td><td>526.11 GB</td><td>2,900.00 GB</td><td>507.8</td></tr></table> The 'Eraser' button, located in the top right corner of the array list, is circled in red. Below the table, there is a large empty area for the target panel. At the bottom of the window, there is a status bar with the text 'Database Instances: Status Normal'.	Symmetrix	S/N	Managed	Model	Configured Capacity	Unconfigured Capacity	Total Standard	000184600086	000184600086	SEAWIN-33	8430	526.11 GB	2,900.00 GB	507.8					526.11 GB	2,900.00 GB	507.8
Symmetrix	S/N	Managed	Model	Configured Capacity	Unconfigured Capacity	Total Standard																
000184600086	000184600086	SEAWIN-33	8430	526.11 GB	2,900.00 GB	507.8																
				526.11 GB	2,900.00 GB	507.8																

Step	Action
6	Display both the Tree and Target panels again by clicking on the right arrow on the bar that divides the two (this should now be at the far left border of the screen). 

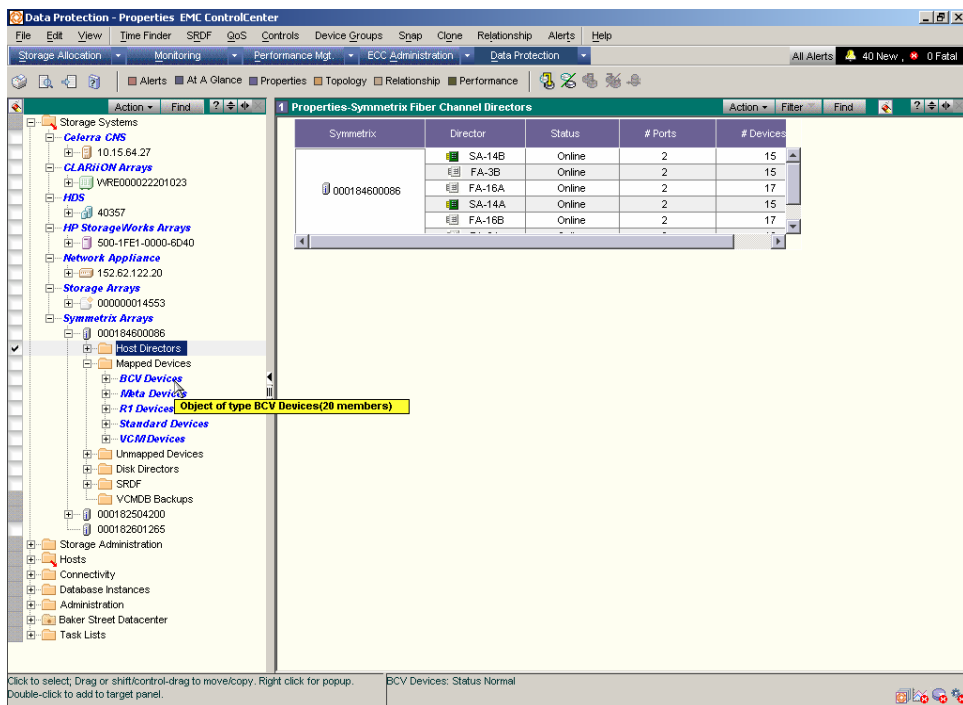
Step	Action
7	Click on the Topology button from the Tool bar. Then click and drag Symmetrix 000184600086 from the Tree Panel to the Target Panel. The Target Panel shows you a Topology view of Symmetrix 000184600086. The hosts are listed to the left, with the Symmetrix on the right. Folders with the devices are available both under the hosts and the Symmetrix. 

Step	Action
8	Click the Show Links button at the top of the Target Panel to display the physical connections between Symmetrix 000184600086 and Hosts.  The screenshot shows the EMC ControlCenter interface with the 'Topology' view selected. On the left, a tree view lists storage systems, including 'Symmetrix Arrays' with ID 000184600086. The main panel displays a central Symmetrix node (SYM 05) with 16 ports (Port 0 to Port 15). Lines connect these ports to various hosts: Oracle DB Server, SEAVIN-33, 182ar155, and several 'Unidentified Ports' with MAC addresses. The 'Show Links' button is highlighted in the top toolbar. Use the image above to complete the questions in steps 9 and 10.
9	List the Hosts to which the Symmetrix is connected and the number of Host connections: Symmetrix S/N_____ Connected Host Name_____ No. of Host Connections_____ Connected Host Name_____ No. of Host Connections_____

Step	Action																										
10	Based on the number of connections displayed for each host, what EMC software product might be installed on each host? _____ _____ _____																										
11	Next let's look at the configuration of the Symmetrix 000184600086. Click on the erase icon at the top of the Tree Panel. Click on the Properties button on the Tool bar. Expand the Symmetrix 000184600086 icon in the Tree Panel. Locate the Host Directors icon. Click and drag the Host Directors folder into the Target Panel.  The screenshot shows the 'Data Protection - Properties EMC ControlCenter' window. The left pane displays a tree view of storage systems. Under 'Symmetrix Arrays', the '000184600086' icon is expanded, showing a sub-folder 'Host Directors'. The right pane, titled 'Properties-Symmetrix Fiber Channel Directors', contains a table with the following data: <table><thead><tr><th>Symmetrix</th><th>Director</th><th>Status</th><th># Ports</th><th># Devices</th></tr></thead><tbody><tr><td rowspan="5">000184600086</td><td>SA-14B</td><td>Online</td><td>2</td><td>15</td></tr><tr><td>FA-3B</td><td>Online</td><td>2</td><td>15</td></tr><tr><td>FA-16A</td><td>Online</td><td>2</td><td>17</td></tr><tr><td>SA-14A</td><td>Online</td><td>2</td><td>15</td></tr><tr><td>FA-16B</td><td>Online</td><td>2</td><td>17</td></tr></tbody></table>	Symmetrix	Director	Status	# Ports	# Devices	000184600086	SA-14B	Online	2	15	FA-3B	Online	2	15	FA-16A	Online	2	17	SA-14A	Online	2	15	FA-16B	Online	2	17
Symmetrix	Director	Status	# Ports	# Devices																							
000184600086	SA-14B	Online	2	15																							
	FA-3B	Online	2	15																							
	FA-16A	Online	2	17																							
	SA-14A	Online	2	15																							
	FA-16B	Online	2	17																							

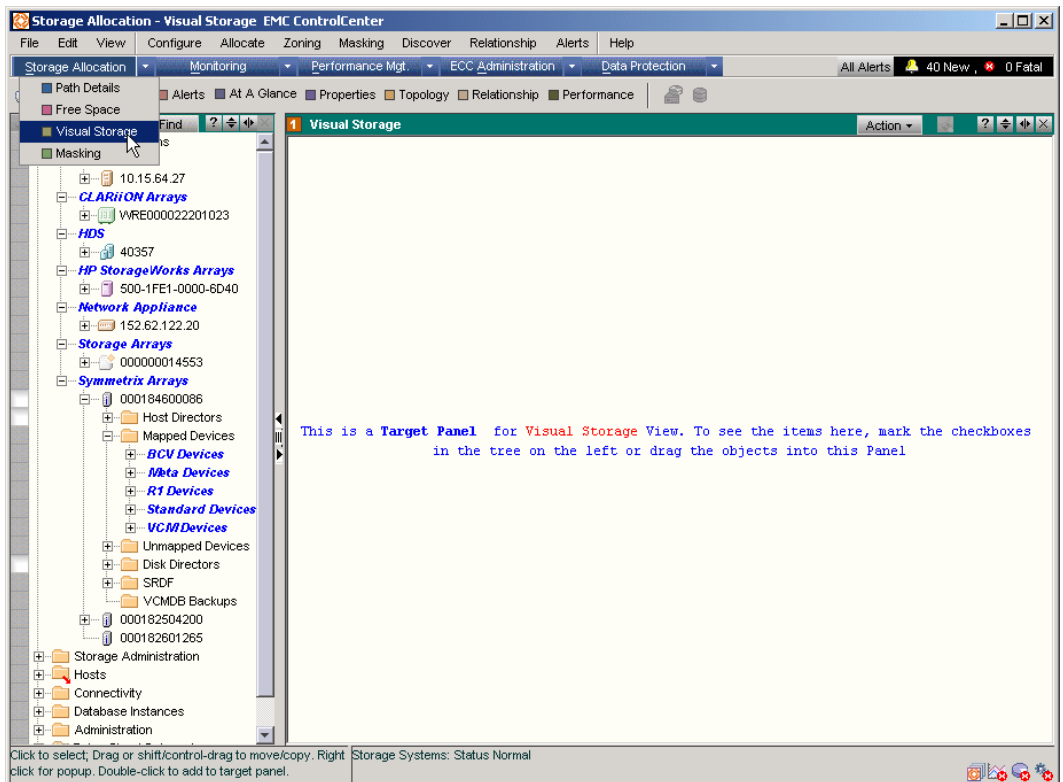
Use the image above to answer the questions in step 12.

Step	Action																																				
12	Determine the number and type of Host (Front End) Directors on this Symmetrix: What is the total number of Front End Directors? _____ Using the table in the Target panel, fill in the following: <table border="1"><thead><tr><th>Front End Director</th><th>Type</th><th>Number of Ports</th><th># Of Devices Presented to each Director</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></tbody></table>	Front End Director	Type	Number of Ports	# Of Devices Presented to each Director																																
Front End Director	Type	Number of Ports	# Of Devices Presented to each Director																																		

Step	Action																		
13	Expand the Mapped Devices Folder in the Tree Panel for Symmetrix 00018460086.  Use the image above to answer the questions in steps 14 and 15.																		
14	List the device types (R1/R2/BCV/Standard, etc.) <table><tr><th>Mapped Devices Types</th><th>Number of Each Type (Mouse over the Device Type folder to determine number, or open folder and count)</th></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table>	Mapped Devices Types	Number of Each Type (Mouse over the Device Type folder to determine number, or open folder and count)																
Mapped Devices Types	Number of Each Type (Mouse over the Device Type folder to determine number, or open folder and count)																		
15	What is the difference between a Mapped and an Unmapped device? _____ _____ _____																		

Lab Exercise 2

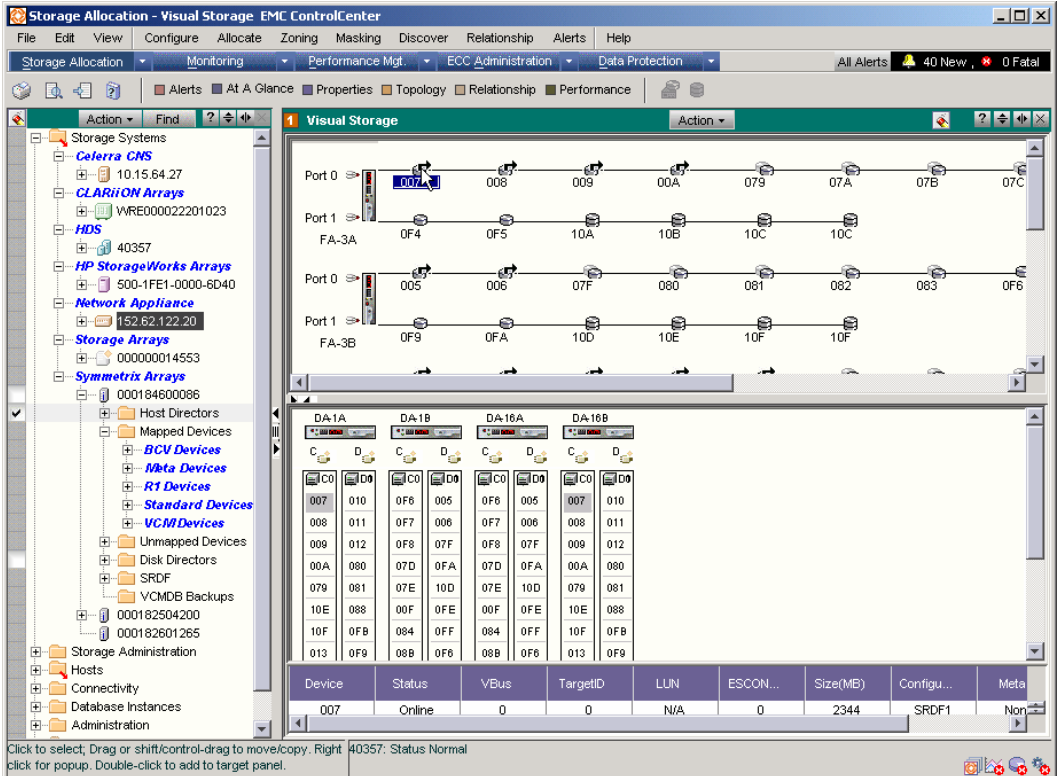
Part 3: Using Visual Storage

Step	Action
1	In the previous section we examined the Properties view. Now we will change to the Visual Storage View to display Front End Directors and Disk Directors, along with all the devices in one view. From the Storage Allocation pull down menu, choose Visual Storage. The Properties view will change to the Visual Storage view. 

Step	Action
2	In the Tree Panel, expand the Symmetrix 000184600086 folder and locate the Host Directors folder. Click and drag the Host Directors into the Target Panel. This view has three regions. The top region shows the Front End directors and the Mapped devices. The middle region shows the Disk Directors and the location of all the hyper volumes. The bottom region is an Information area. It provides the information on the current object over which the mouse is placed.

The screenshot displays the EMC ControlCenter Visual Storage interface. The left pane shows a tree view of storage systems, with 'Host Directors' expanded under 'Symmetrix Arrays'. The main pane shows a 'Visual Storage' view with a top section for Front End directors (Port 0 and Port 1 for FA-3A and FA-3B) and a middle section for Disk Directors (DA-1A, DA-1B, DA-16A, DA-16B) showing mapped devices. The bottom section is an information table for the selected director.

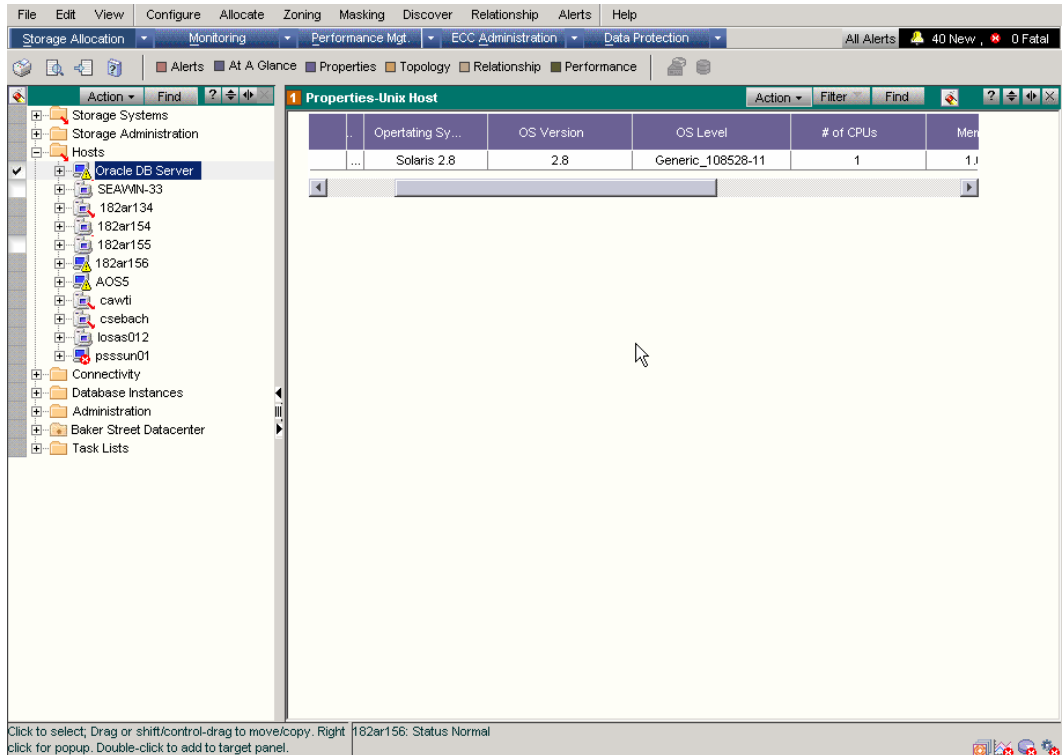
Director	Status	# Ports	# Devic...
FA-3A	Online	2	30

Step	Action																		
3	In the top region display, on Director FA-3A port 0, click on device 007, this will highlight the device in blue. The location of the device on the backend will be highlighted in gray in the middle region display.  The screenshot shows the EMC ControlCenter Visual Storage interface. The top region displays a network diagram with Director FA-3A port 0 highlighted. The middle region shows a grid of storage devices, with device 007 highlighted in blue. The bottom region shows a table of device details for device 007. <table><thead><tr><th>Device</th><th>Status</th><th>VBus</th><th>TargetID</th><th>LUN</th><th>ESCON...</th><th>Size(MB)</th><th>Configu...</th><th>Meta</th></tr></thead><tbody><tr><td>007</td><td>Online</td><td>0</td><td>0</td><td>N/A</td><td>0</td><td>2344</td><td>SRDF1</td><td>Non</td></tr></tbody></table>	Device	Status	VBus	TargetID	LUN	ESCON...	Size(MB)	Configu...	Meta	007	Online	0	0	N/A	0	2344	SRDF1	Non
Device	Status	VBus	TargetID	LUN	ESCON...	Size(MB)	Configu...	Meta											
007	Online	0	0	N/A	0	2344	SRDF1	Non											
4	While your Mouse is over device 007 in the top region display, examine the Information Area in the bottom region display, and answer the following questions. What is the status of device 007? _____ What is the size of device 007? _____																		

Lab Exercise 2

Part 4: Host Information

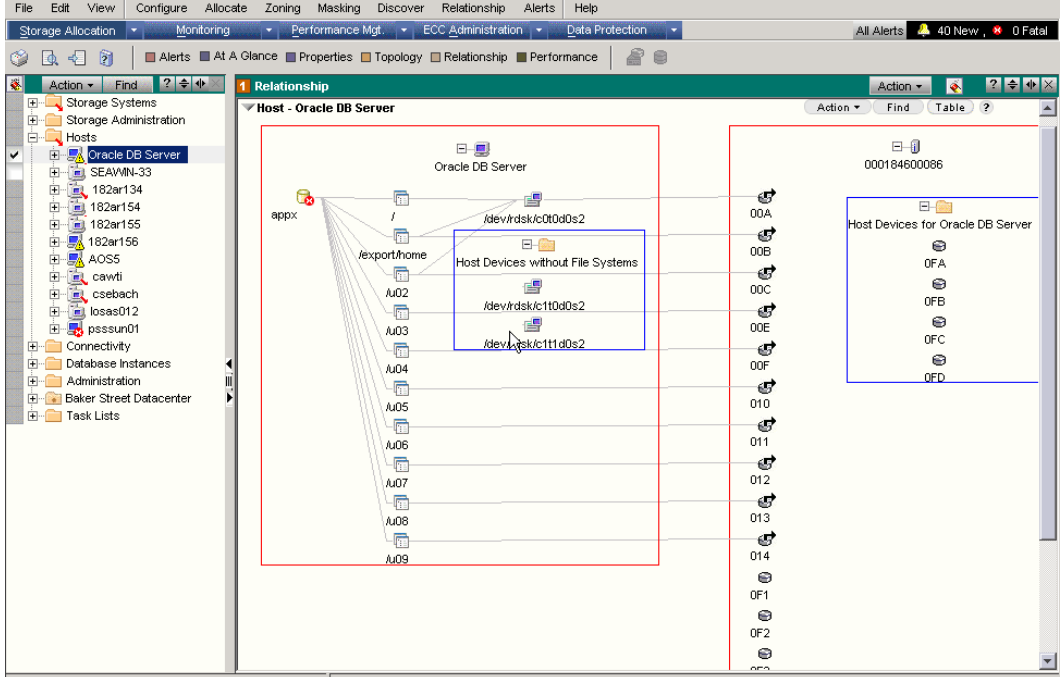
Step	Action
1	In this section we will examine the logical and physical relationship information for hosts and arrays, gathered by ControlCenter. Clear all entities from the Target Panel by clicking on the eraser button in the Tree Panel. Click on Properties button on the Tool bar to switch the Target Panel view to Properties.
2	Drill down into the Hosts folder in the Tree Panel, then click and drag host Oracle DB Server into the Target panel. The Properties of the host are shown.

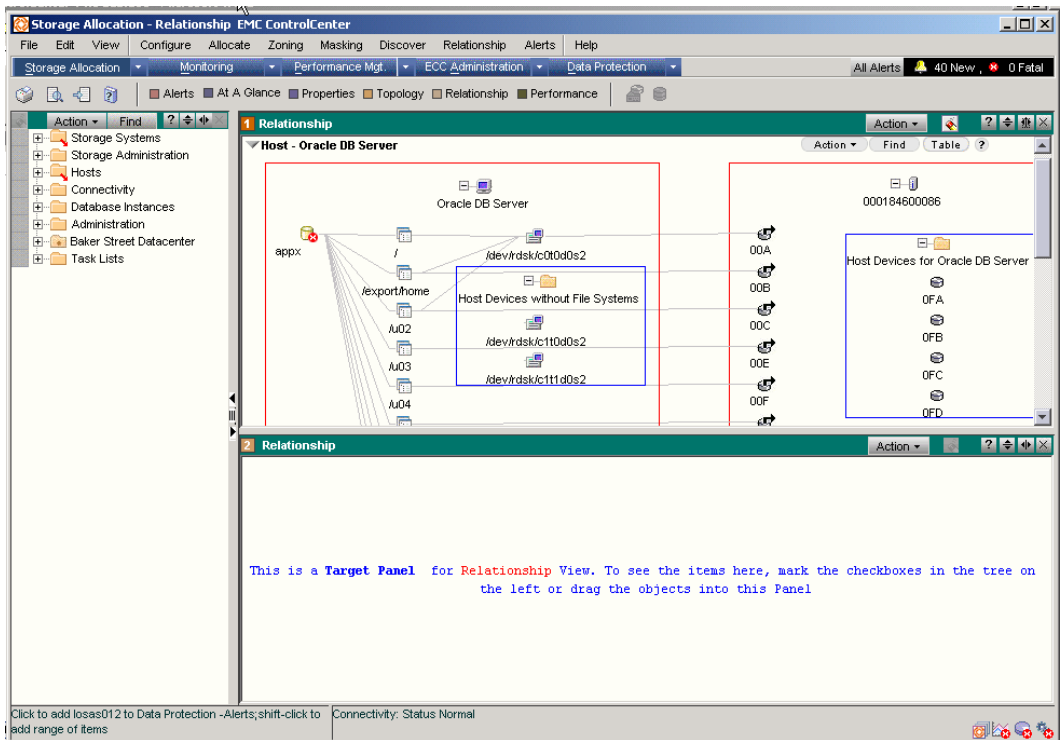


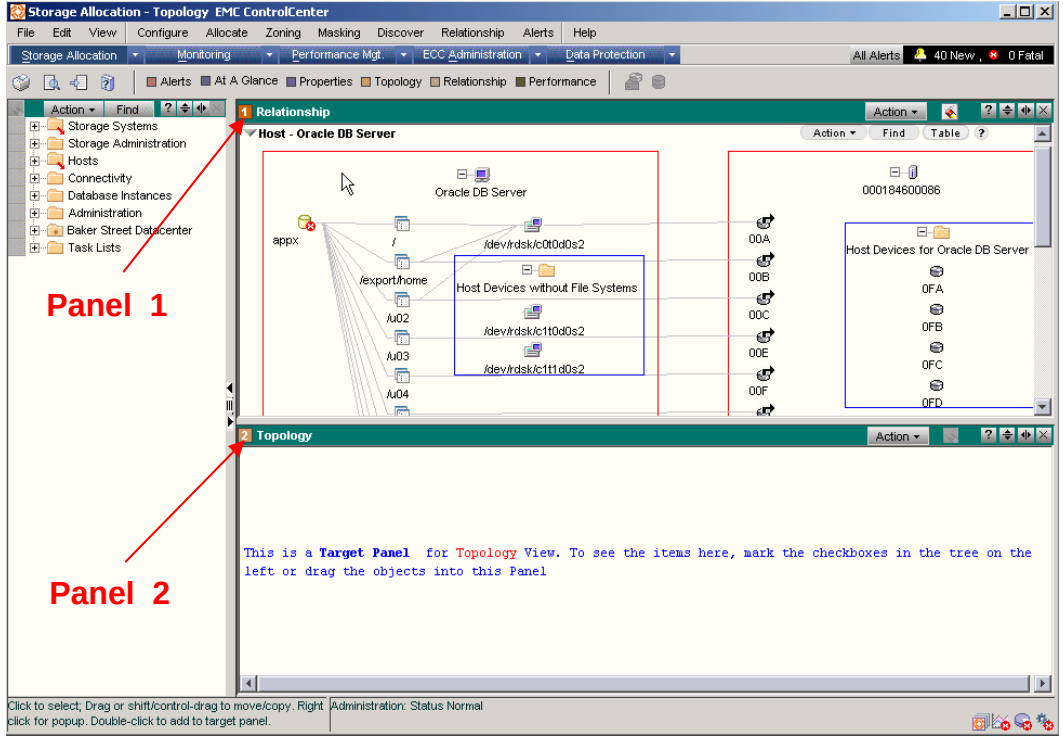
Click to select; Drag or shift/control-drag to move/copy. Right click for popup. Double-click to add to target panel.

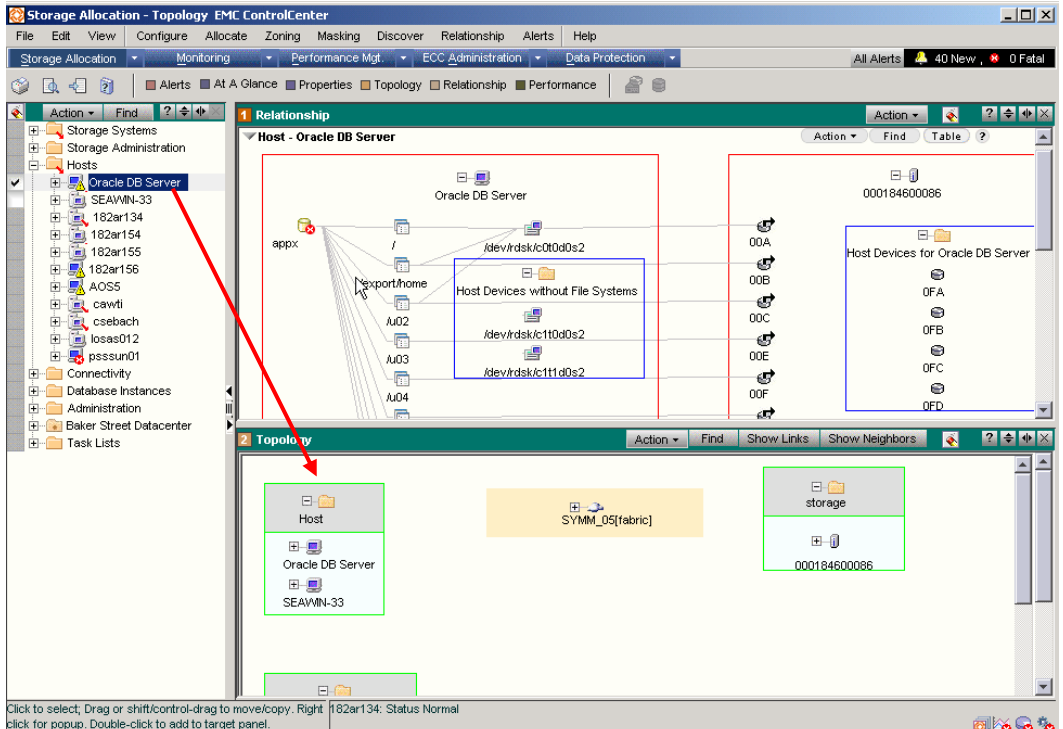
182ar156: Status Normal

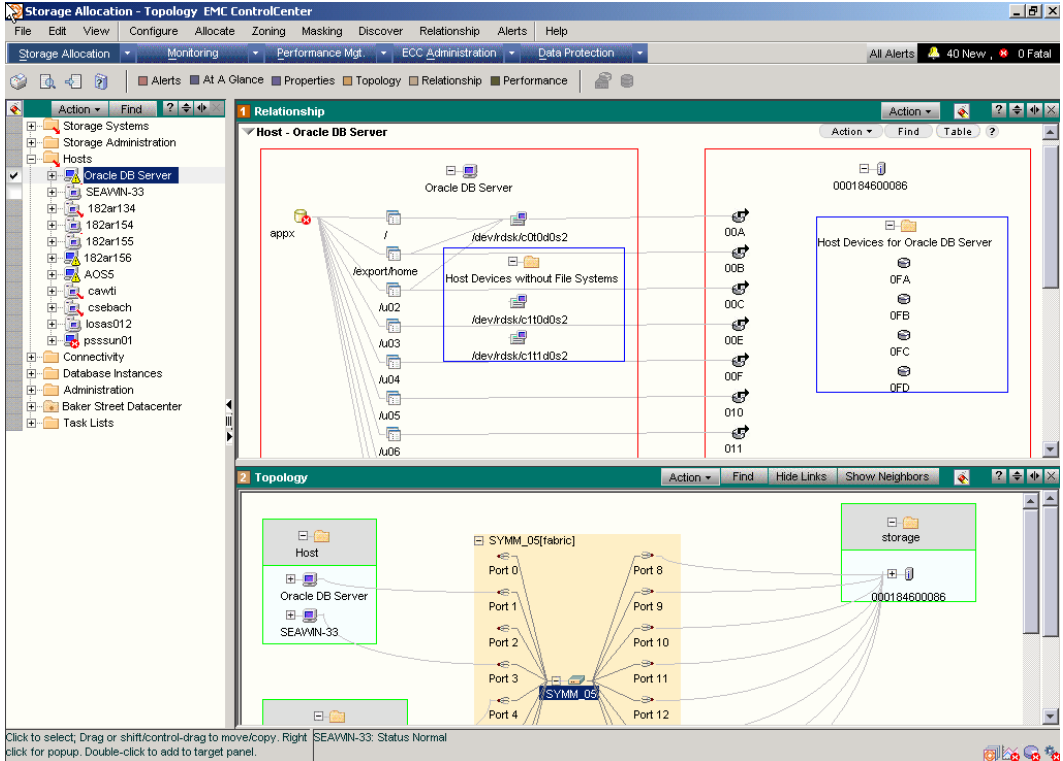
Use the image above to answer the questions in step 3.

Step	Action								
3	The Properties of the host are shown. Record the following: <table border="1"> <tr> <td>Host Name</td><td></td></tr> <tr> <td>Operating System</td><td></td></tr> <tr> <td>OS level</td><td></td></tr> <tr> <td>Number of CPUs</td><td></td></tr> </table>	Host Name		Operating System		OS level		Number of CPUs	
Host Name									
Operating System									
OS level									
Number of CPUs									
4	Switch the Properties view to Relationship view by clicking the Relationship button on the Tool bar. The Relationship view for a host is in a Map format.  Click to select; Drag or shift/control-drag to move/copy; Right click for popup; Double-click to add to target panel.								

Step	Action
5	Click on the split vertical button, located in the upper right of the Target panel. This creates a second panel, which is also in the Relationship view and is empty.  The screenshot shows the EMC ControlCenter interface in the Relationship view. The main window is titled 'Storage Allocation - Relationship EMC ControlCenter'. The left sidebar contains a tree view with categories like Storage Systems, Storage Administration, Hosts, Connectivity, Database Instances, Administration, Baker Street Datacenter, and Task Lists. The main area is divided into two panels. The top panel, titled '1 Relationship', shows a diagram of an 'Oracle DB Server' connected to various host devices. A blue box highlights a section of the diagram labeled 'Host Devices without File Systems'. The bottom panel, titled '2 Relationship', is empty and contains a message: 'This is a Target Panel for Relationship View. To see the items here, mark the checkboxes in the tree on the left or drag the objects into this Panel'. The status bar at the bottom indicates 'Connectivity: Status Normal'.

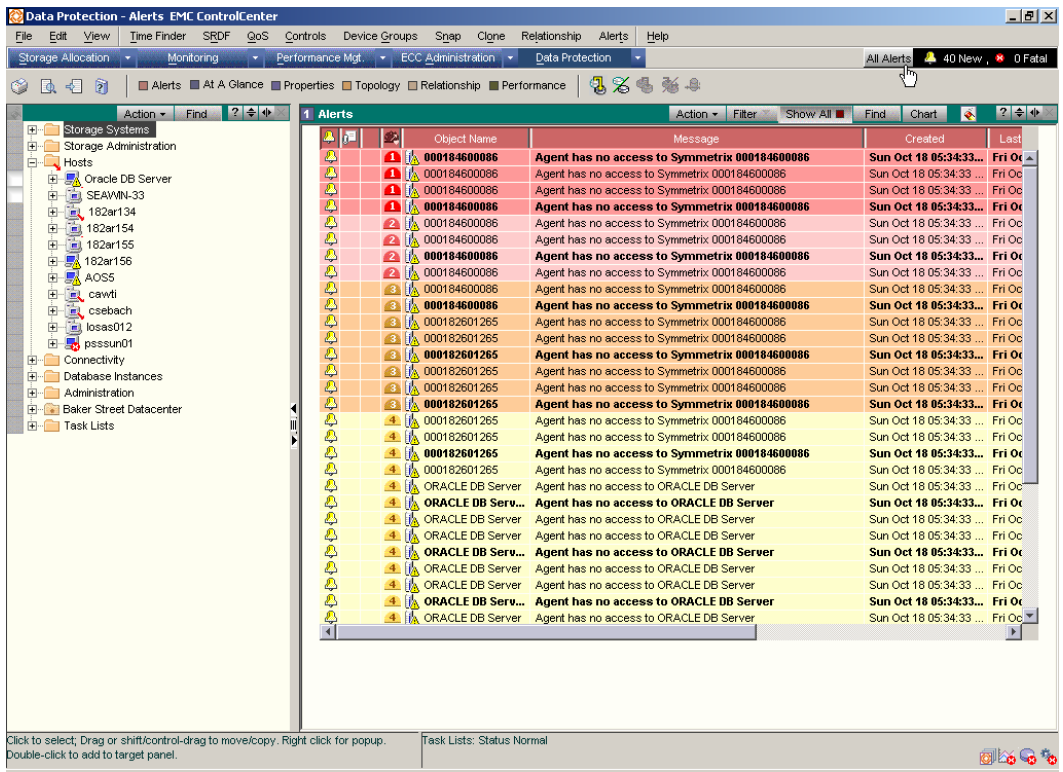
Step	Action
6	Click anywhere in the new panel to activate. Click the Topology button on the Tool bar. Notice that the top panel, now identified as panel 1, remains in the Relationship view. The bottom panel now identified as panel 2 is in the Topology view. 

Step	Action
7	In the tree panel, expand the Hosts folder, click and drag Oracle DB server into the Topology view (the bottom panel).  Click to select; Drag or shift/control-drag to move/copy; Right click for popup. Double-click to add to target panel.

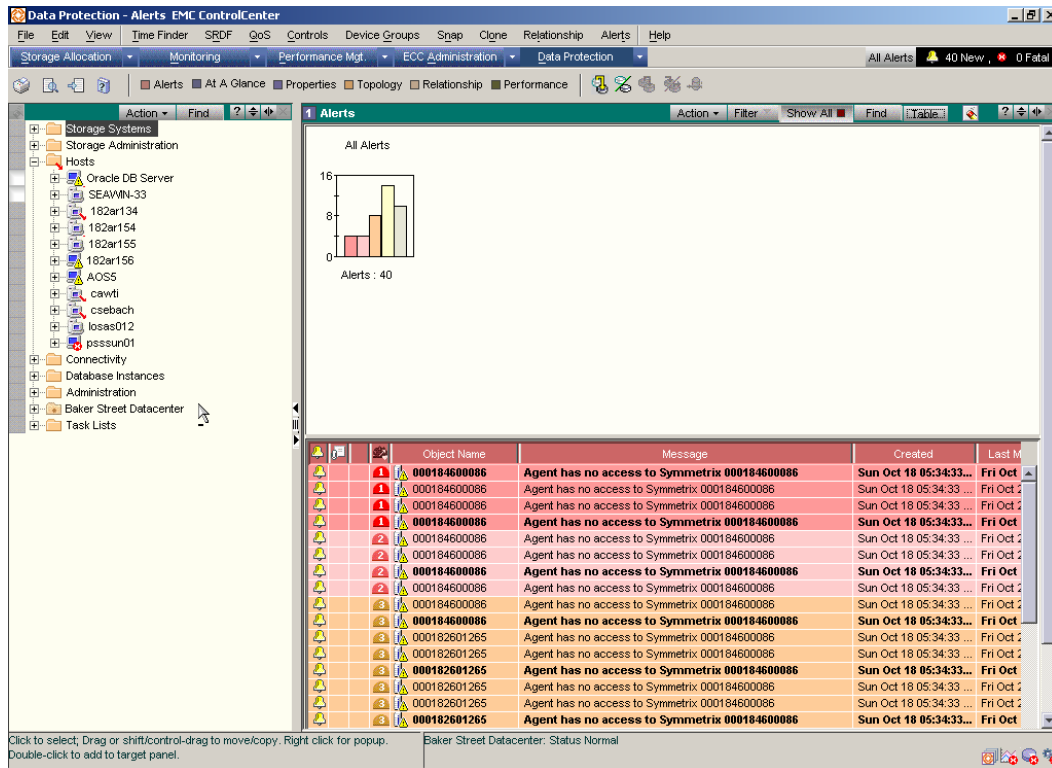
Step	Action								
8	Click on the Show Links button in panel 2 (this toggles to Hide Links).  The screenshot shows the EMC ControlCenter interface. The left pane displays a tree view with 'Hosts' expanded, showing 'Oracle DB Server' and its associated storage systems. The main pane is split into two views: 'Relationship' (top) and 'Topology' (bottom). The 'Relationship' view shows logical associations between the 'Host - Oracle DB Server' and its storage components, including 'Host Devices without File Systems' and 'Host Devices for Oracle DB Server'. The 'Topology' view shows physical associations, including the 'SYMM_05[fabric]' and 'storage' components. The 'Show Links' button is visible in the 'Topology' view toolbar. These two views show similar information from different perspectives. The Relationship view shows logical associations, while the Topology view shows physical associations. Use the image above to answer the questions in steps 9 and 10.								
9	Which panel, 1 or 2, would you use to find the following information for the Host Oracle DB Server? - <table border="1"> <tbody> <tr> <td>Filesystem</td><td></td></tr> <tr> <td>WorldWide Name</td><td></td></tr> <tr> <td>Ports</td><td></td></tr> <tr> <td>Device Symmetrical Logical Volume Numbers</td><td></td></tr> </tbody> </table>	Filesystem		WorldWide Name		Ports		Device Symmetrical Logical Volume Numbers	
Filesystem									
WorldWide Name									
Ports									
Device Symmetrical Logical Volume Numbers									
10	In panel 2, click the “X” at the top to close this panel. Clear all entities from the Target Panel by clicking on the eraser button in the Tree Panel.								

Lab Exercise 2

Part 5: Alerts

Step	Action
1	In this section, you will view the ControlCenter Alert feature. Click on All Alerts. The Target Panel should display all active alerts in table form, in order of severity.  The screenshot shows the EMC ControlCenter Alerts window. The left pane displays a tree view of storage systems, including 'Storage Systems', 'Storage Administration', 'Hosts', 'Database Instances', and 'Task Lists'. The main pane displays a table of alerts. The table has columns: Object Name, Message, Created, and Last. The alerts are sorted by severity, with critical alerts (red) at the top, followed by major (orange), and minor (yellow). The messages indicate 'Agent has no access to Symmetrix 000184600086' and 'Agent has no access to ORACLE DB Server'. The status bar at the bottom shows 'Task Lists: Status Normal'.

2 Control Center Alerts can also be reported in a Chart format. Click on Chart. (This button toggles between chart and Table.) The level 1, 2, 3, 4, and 5 Alerts are reported in the chart.



The screenshot shows the EMC ControlCenter Alerts window. The left pane displays a tree view of the storage hierarchy, including Storage Systems, Storage Administration, Hosts, and various storage devices like Oracle DB Server, SEAWIN-33, and AOS5. The main pane is titled 'Alerts' and contains a bar chart and a table. The bar chart, titled 'All Alerts', shows the count of alerts by severity level: 1 (red), 2 (orange), 3 (yellow), 4 (green), and 5 (blue). The counts are: Level 1: 1, Level 2: 1, Level 3: 1, Level 4: 1, Level 5: 1. The table below the chart lists the alerts, including the Object Name, Message, Created time, and Last Modified time. The table shows 10 alerts, all of which are 'Agent has no access to Symmetrix 000184600086'.

Object Name	Message	Created	Last Modified
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2

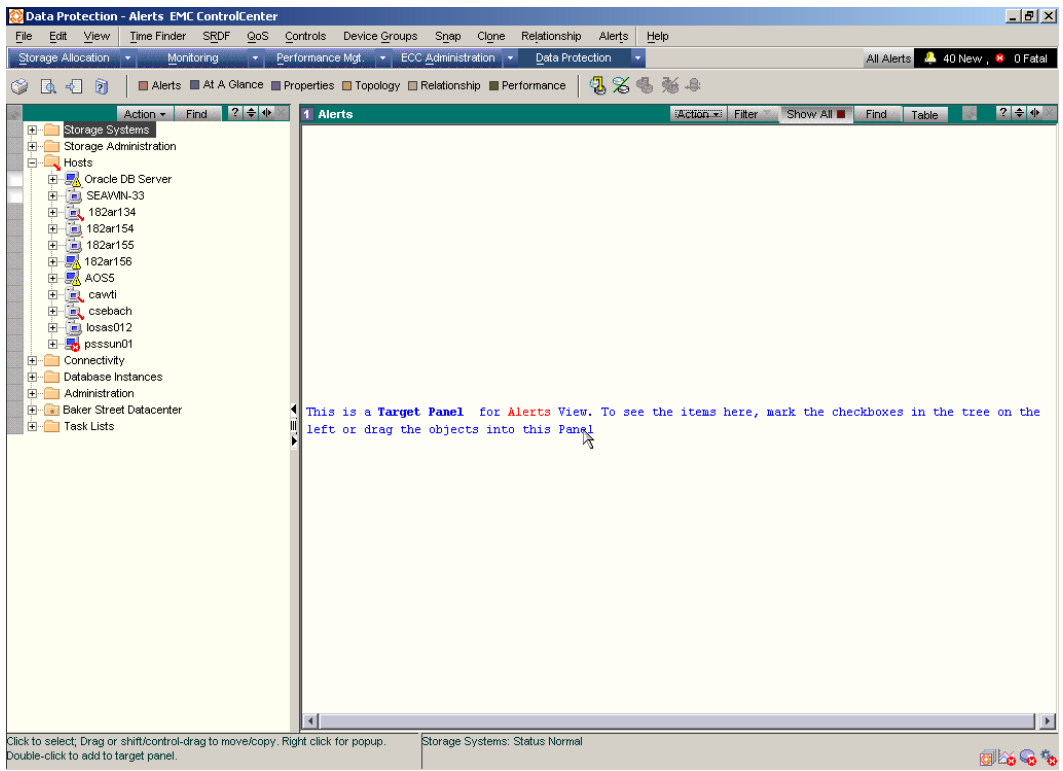
Click to select; Drag or shift/control-drag to move/copy. Right click for popup.
Double-click to add to target panel.

Baker Street Datacenter: Status Normal

Step	Action
3	Click on Action and select Clear View.

The screenshot shows the EMC ControlCenter Alerts window. On the left is a tree view of the storage hierarchy. The main area displays a bar chart titled 'All Alerts' with a value of 40. Below the chart is a table of alerts. The 'Action' menu is open, showing options like 'Find Object...', 'Clear View', 'Others', 'Customize', 'Split Horizontally', 'Split Horizontally with Data', 'Split Vertically', 'Split Vertically with Data', and 'Help'. The 'Clear View' option is highlighted.

Object Name	Message	Created	Last M
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
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000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000184600086	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000182601265	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000182601265	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000182601265	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000182601265	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000182601265	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000182601265	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000182601265	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2
000182601265	Agent has no access to Symmetrix 000184600086	Sun Oct 18 05:34:33...	Fri Oct 2

Step	Action
4	After selecting Clear View, the panel is still labeled Alerts but no information is displayed.  The screenshot shows the EMC ControlCenter interface. The main window is titled 'Data Protection - Alerts - EMC ControlCenter'. The menu bar includes File, Edit, View, Time Finder, SRDF, QoS, Controls, Device Groups, Snap, Clone, Relationship, Alerts, and Help. The toolbar has buttons for Storage Allocation, Monitoring, Performance Mgt., ECC Administration, and Data Protection. The left pane shows a tree view with categories like Storage Systems, Storage Administration, Hosts, Connectivity, Database Instances, Administration, Baker Street Datacenter, and Task Lists. The right pane is titled 'Alerts' and contains a message: 'This is a Target Panel for Alerts View. To see the items here, mark the checkboxes in the tree on the left or drag the objects into this Panel'. The status bar at the bottom indicates 'Storage Systems: Status Normal'.
5	This completes this exercise and the ControlCenter Foundations lab.

