

SUM409W: XenServer technical deep dive and troubleshooting

Learning Lab Exercises

October 2011

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Overview

Hands-on Training Module

This training module has the following details:

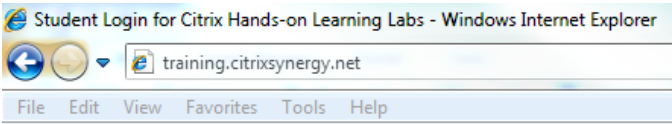

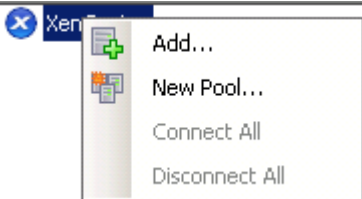
Objective	<ul style="list-style-type: none"> • Provide hands on experience with common tasks in XenServer • Provide hands on experience with common tools in XenServer used by Citrix Support
Audience	<ul style="list-style-type: none"> • Citrix Partners and XenServer Administrators/SMEs


How to log into the lab environment

The student lab environment is hosted on a Citrix XenServer. Follow the directions below to access the server.

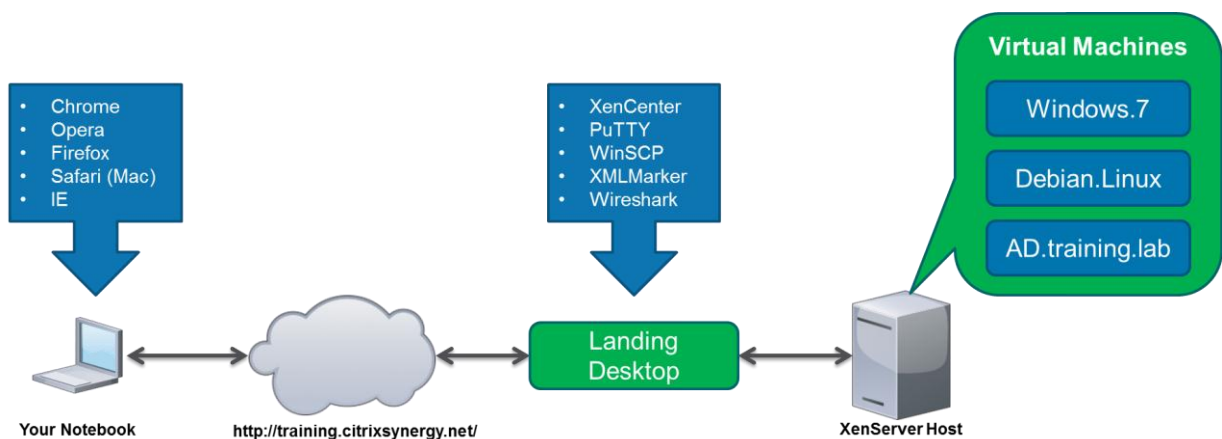
Note: Browser support: IE, Firefox, Chrome, Opera, Safari (on MAC).

Step-by-step login instructions

Step	Action
1.	<p>Launch your web browser and go to http://training.citrixsynergy.net</p> 
2.	<p>On the website, type in the session code provided by your instructor and your business email address and click Get Started.</p> <p>Please enter your session code and email address to access your training environment:</p> <p>Session code: <input type="text"/></p> <p>Business email address: <input type="text"/></p> <p><input type="button" value="Get started"/></p>
3.	<p>Once you've logged in, click the Start Lab button. This will launch your lab session.</p>  <p>Note: Please wait for the application to launch.</p>
4.	<p>Right-click XenCenter and select Add.</p> 

Step	Action
5.	<p>On the Add New Server screen enter the XenServer IP address provided on the website and in the Password field enter the password provided on the site.</p> 

Lab Architecture



Lab Environment Credentials

Below are the login credentials required to connect to the workshop systems and complete the lab exercises.

Machine/VM	Username	Password	Description
XenServer	root	*As per Student Portal	XenServer host
Debian.Linux	root	citrix	Debian 4.1.1 virtual machine
Windows.7	TRAINING\administrator	Citrix123	Windows 7 virtual machine
AD.training.lab	TRAINING\administrator	Citrix123	W2k8 R2 virtual machine

Lab Environment Details

This section is used to describe the lab environment and the virtual machines that are used.

VM Name	IP Address	Description
Windows.7	192.168.10.13	Virtual Machine
AD.training.lab	192.168.10.11	Virtual Machine
Debian.Linux	N/A	Virtual Machine
Landing Desktop	N/A	XenApp Published Desktop

Exercise 1: Connecting to Administrative Consoles

Overview

In this exercise we will connect to the administrative consoles used during this Learning Lab session.


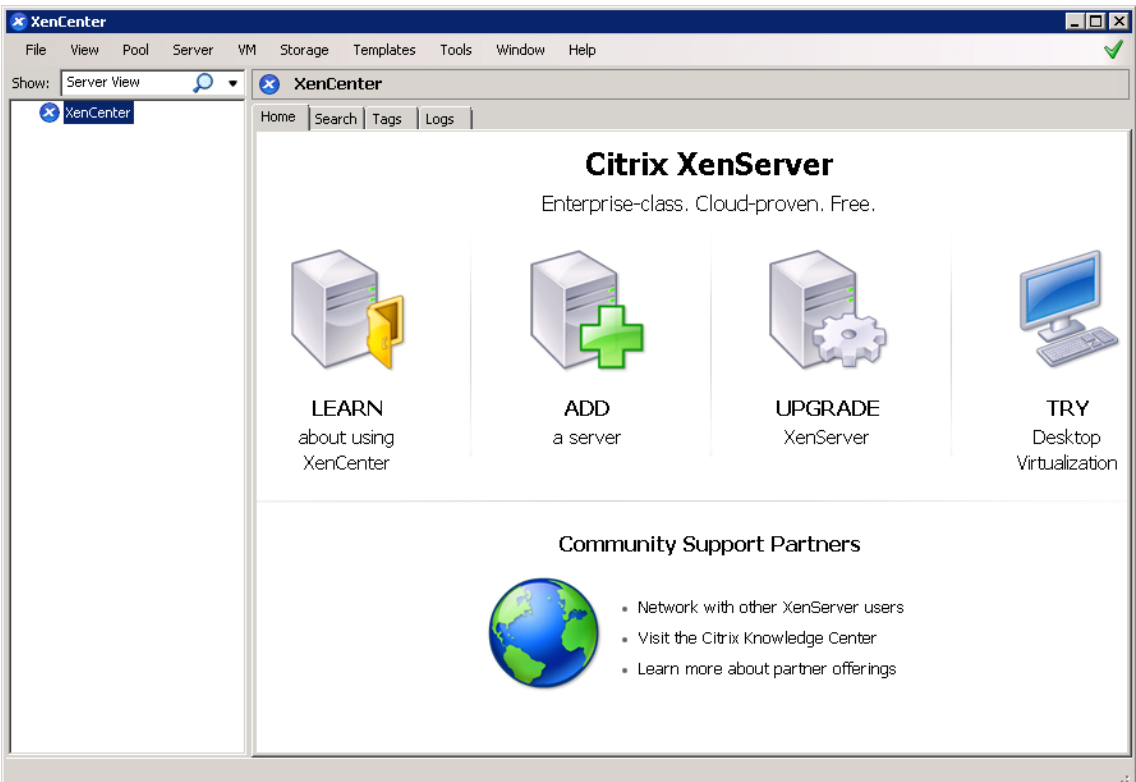
Throughout the hands-on sections of this Learning lab we will be using different consoles for certain actions. Feel free to use the console you are more familiar with to complete a desired task unless the console to be used is specifically mentioned in the lab documentation.

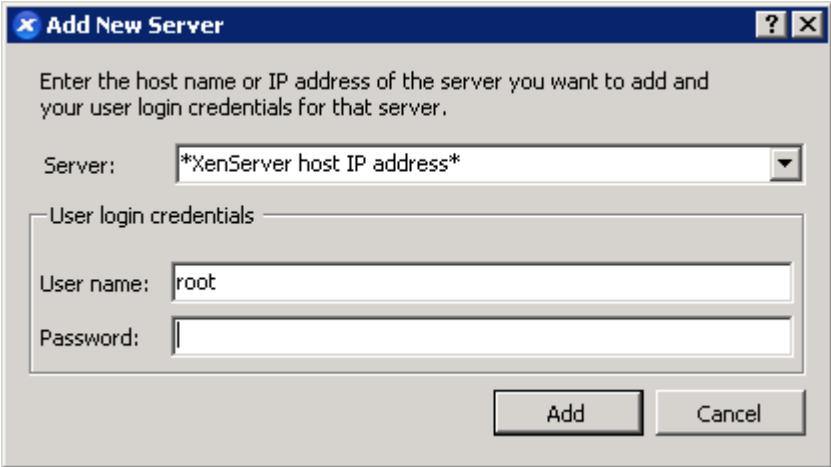
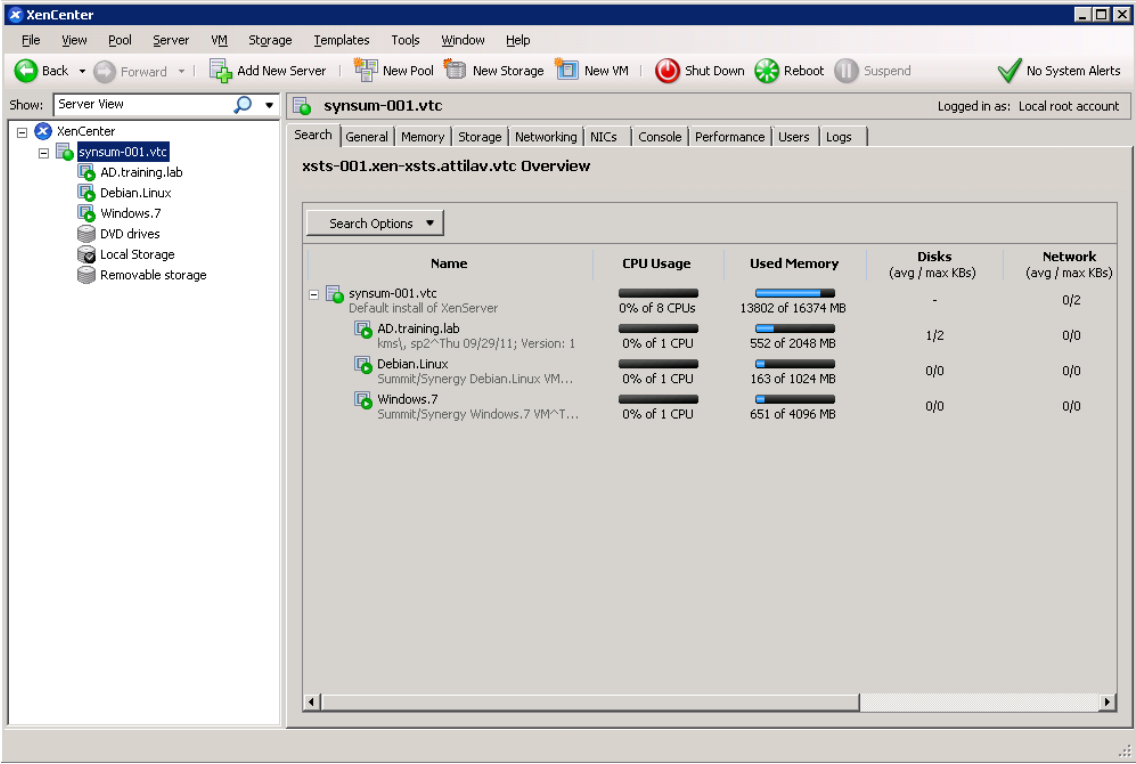
To complete this exercise, you must have the following:

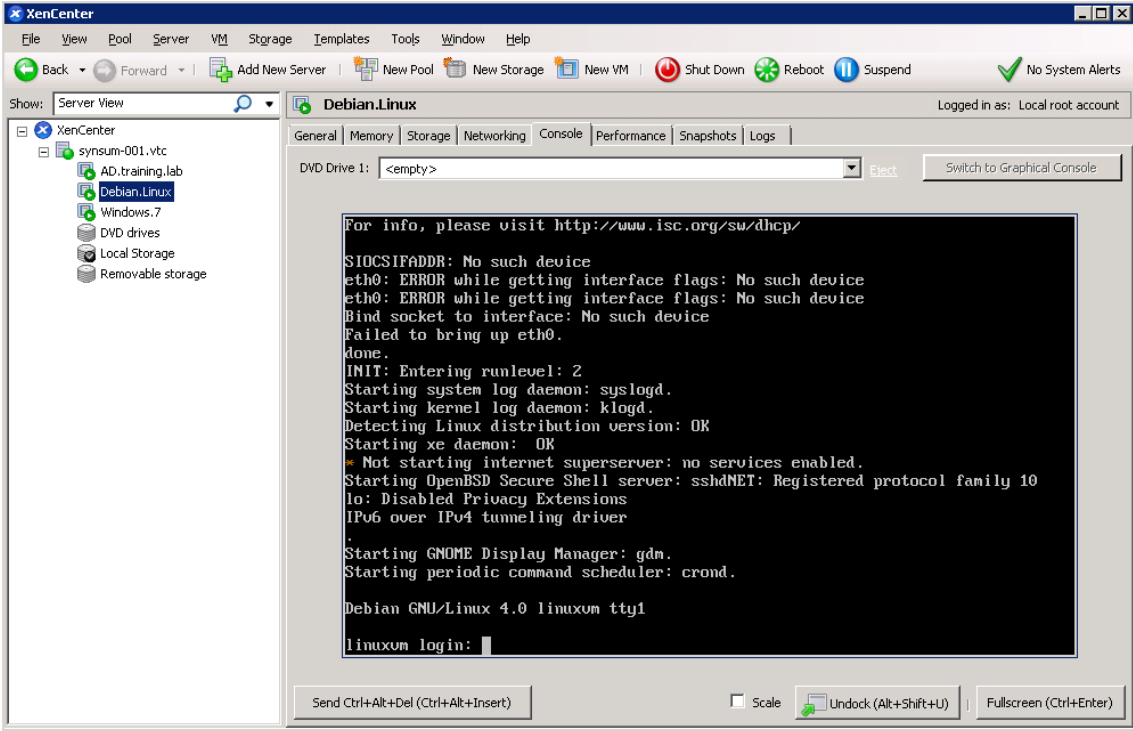
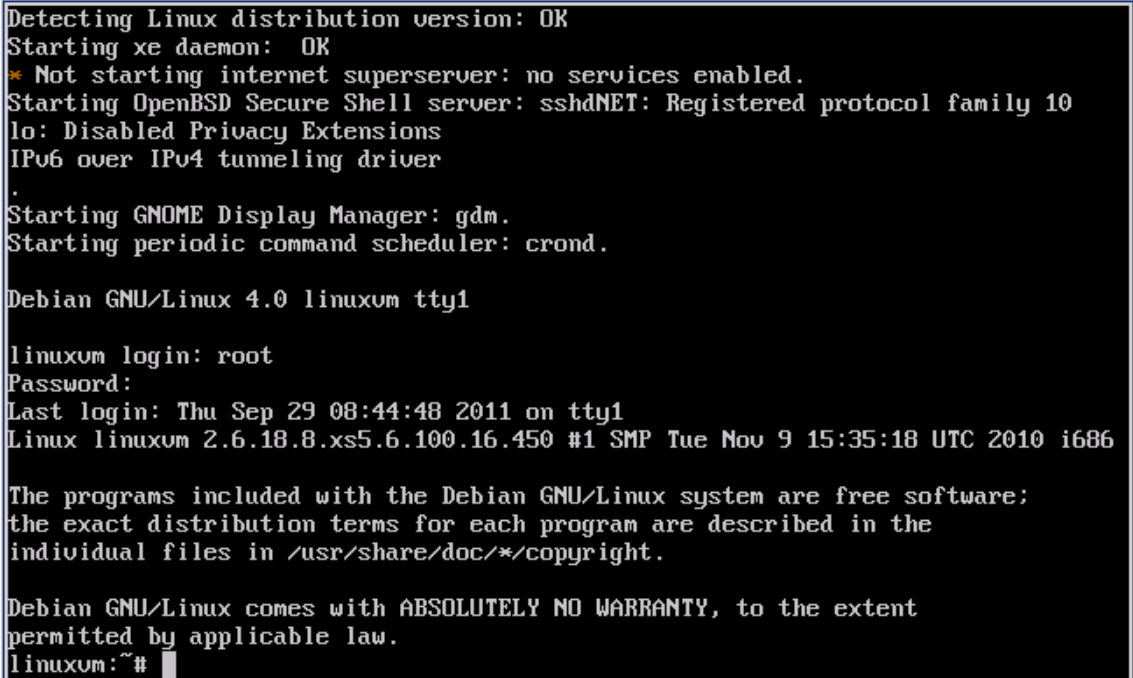

- SSH client (PuTTY)
- XenCenter

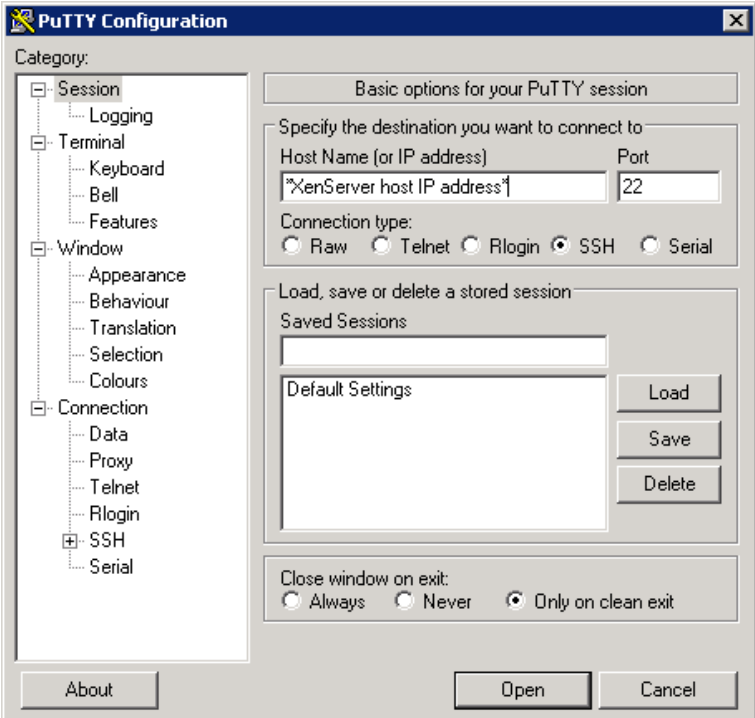
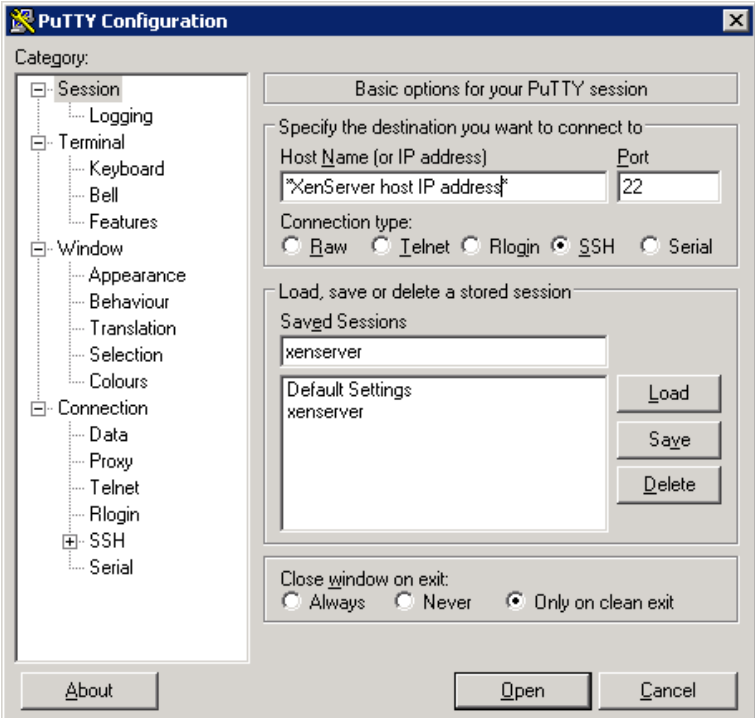
Step-by-step guidance

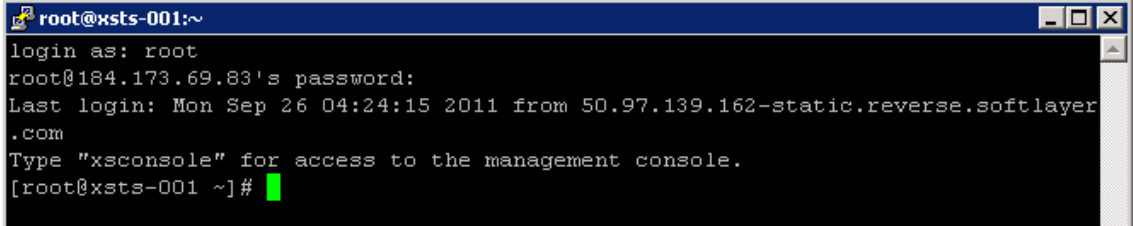



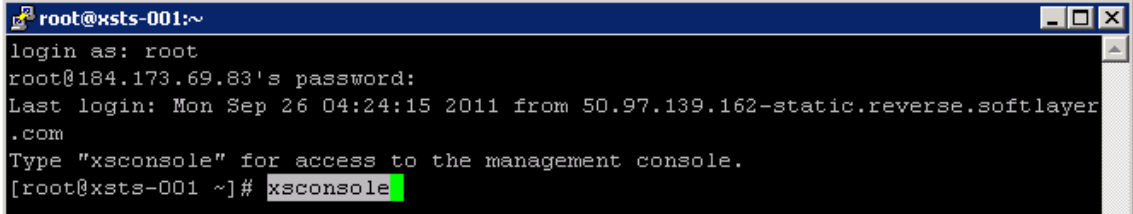
Estimated time to complete this lab: **10 minutes**.

Step	Action
	 Connect to your Landing Desktop and designated XenServer host:
1.	<p>XenCenter should launch automatically after logging in. If not, launch it from the Landing Desktop.</p> 

Step	Action
2.	<p>Click ADD a server and enter the connection information as per the Student Portal</p> 
3.	<p>After a successful synchronization the XenServer host details are displayed.</p>  <p>Note: All virtual machines should be in a started state</p>

Step	Action
4.	<p>Click the Console tab for the Debian.Linux VM</p> 
5.	<p>Login (username=root, password=citrix)</p> 
	<p> Connect to XenServer via an SSH client (PuTTY):</p>

Step	Action
6.	<p>Launch PuTTY from the Landing Desktop and enter your XenServer host IP address.</p> 
7.	<p>Enter “xenserver” in the “Saved Sessions” field and click “Save”. This will speed things up when we need to open multiple SSH connections.</p> <p>Note: Next time you need to launch an SSH connection via PuTTY simply click “Load” and then “Open”</p> 
8.	Click Open

Step	Action
9.	Accept any key exchange message
10.	<p>Enter the credentials to login to XenServer.</p> <p>Note: You can copy and paste the credentials from the Synergy/Summit portal page. To paste the credentials right click when prompted for the password (no text will appear) and press ENTER.</p>  <pre> root@xsts-001:~ login as: root root@184.173.69.83's password: Last login: Mon Sep 26 04:24:15 2011 from 50.97.139.162-static.reverse.softlayer.com Type "xsconsole" for access to the management console. [root@xsts-001 ~]# </pre>
	 Launch the xsconsole via our SSH connection:
11.	<p>Type xsconsole in the console window.</p> <p> Remember to use tab completion when working at the shell e.g. xsc . It makes entering commands and long strings of text much easier.</p>  <pre> root@xsts-001:~ login as: root root@184.173.69.83's password: Last login: Mon Sep 26 04:24:15 2011 from 50.97.139.162-static.reverse.softlayer.com Type "xsconsole" for access to the management console. [root@xsts-001 ~]# xsconsole </pre>

Step	Action
12.	<p>We should now have access to the xsconsole. The xsconsole is launched by default at the local server console after a successful boot of XenServer i.e. the first console you see after booting XenServer.</p> 
13.	<p>The xsconsole is used for initial configuration of the XenServer host and many general administrative tasks can be also completed via this console.</p>
END OF EXERCISE	

Summary

<p>Key Takeaways</p>	<p>The key takeaways for this exercise are:</p> <ul style="list-style-type: none"> You will be able to connect to the administrative consoles used during this Learning Lab. You will be familiar with all the XenServer administrative consoles available.
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Exercise 2: Navigate to and Review Common Logs

Overview

In this exercise we will navigate to common log locations and review those logs.


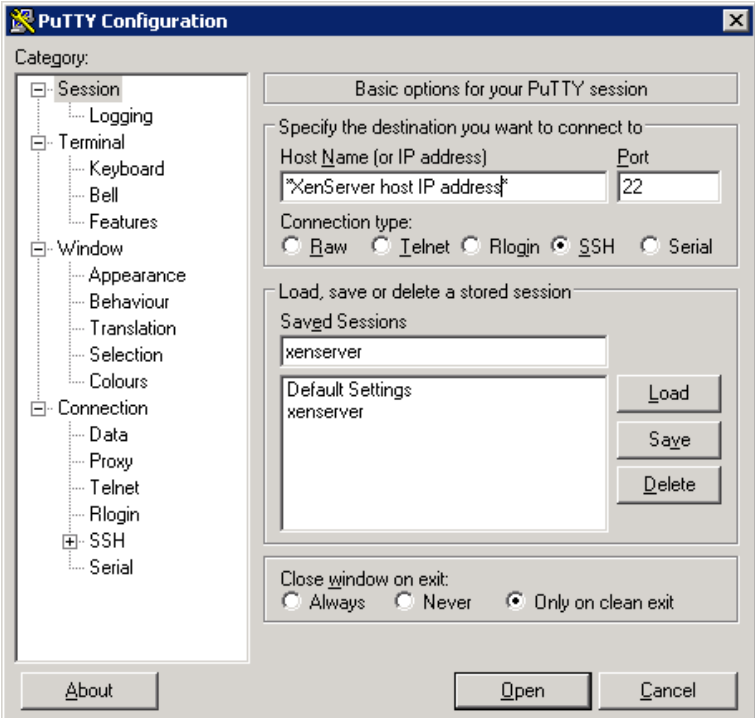
Log information can be useful when troubleshooting an issue and/or understanding how actions are performed e.g. following a log file when making a change to a XenServer host or virtual machine.

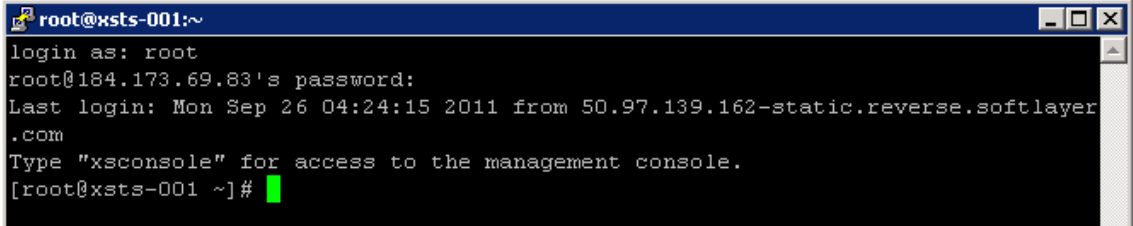
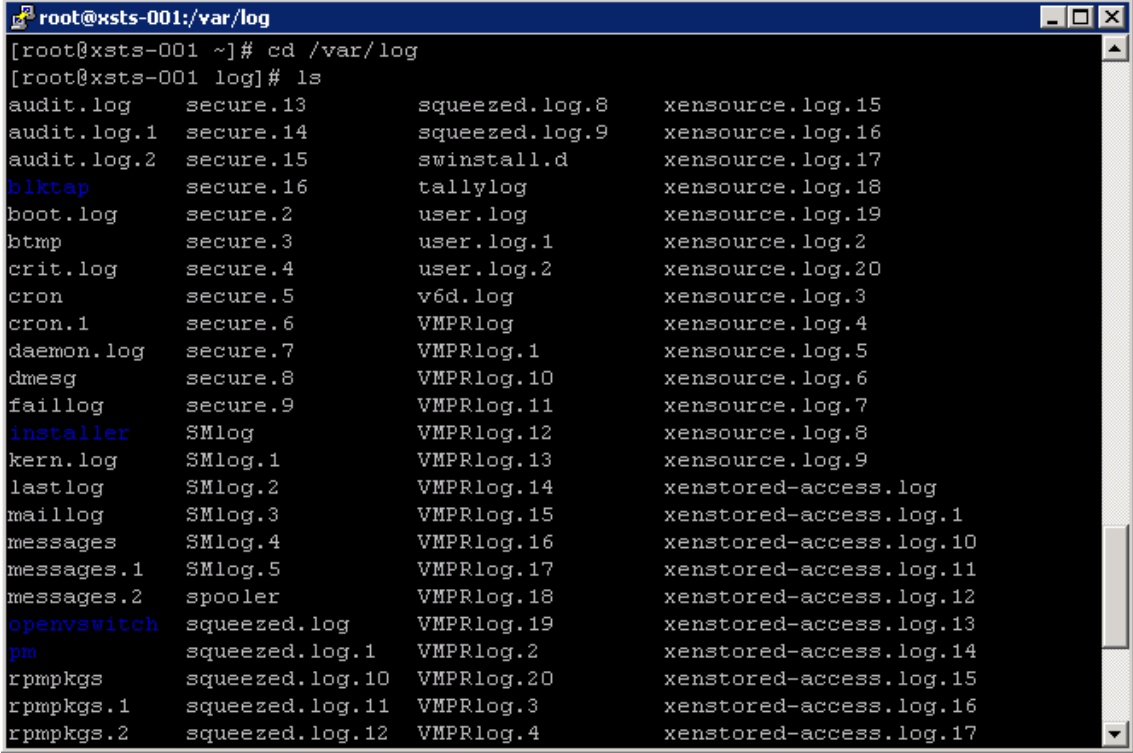
To complete this exercise, you must have the following:

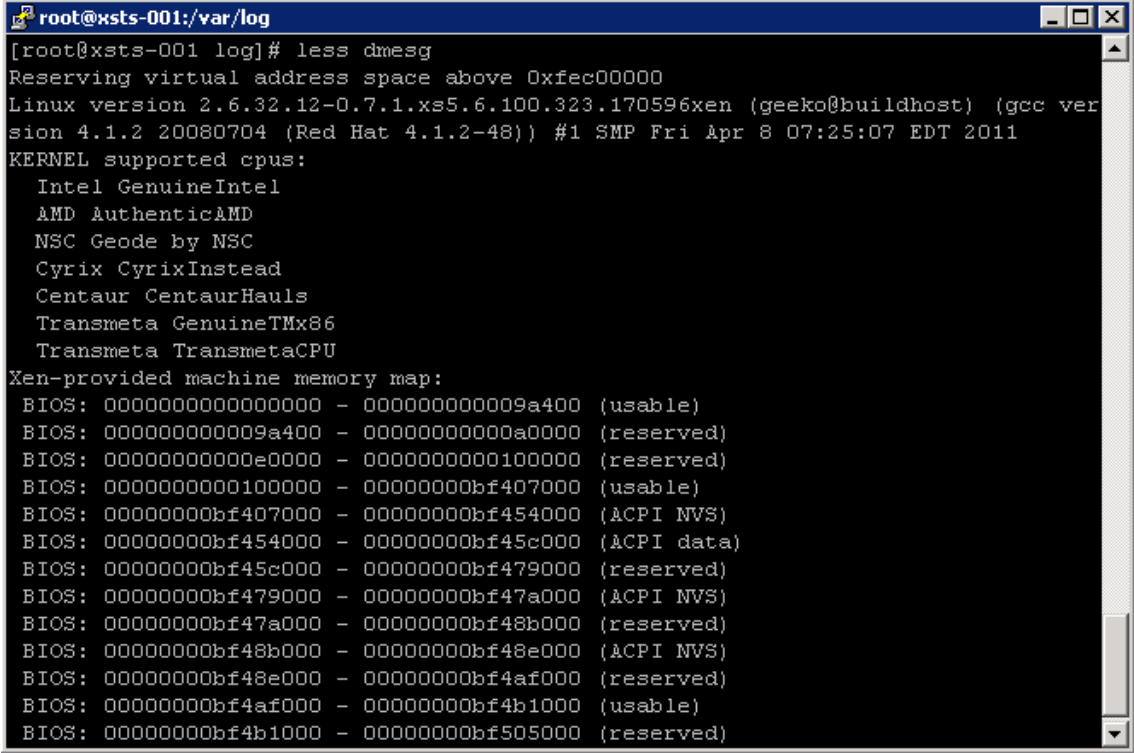
- XenCenter
- SSH client (PuTTY)

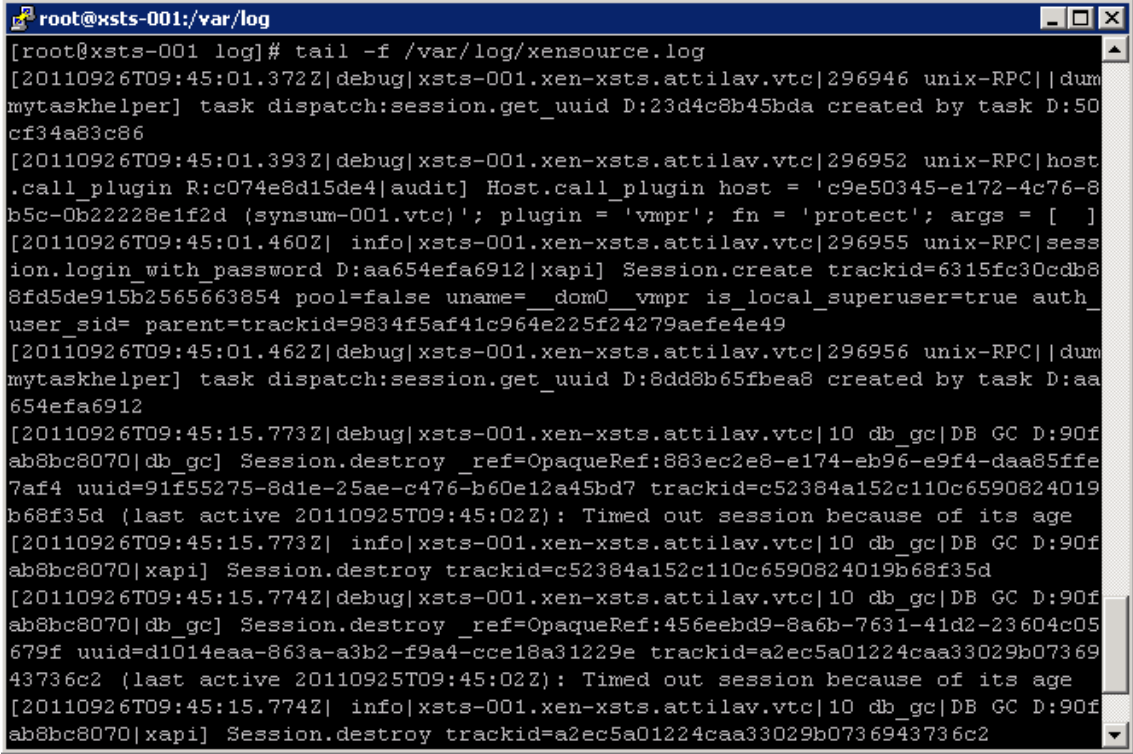



Step-by-step guidance

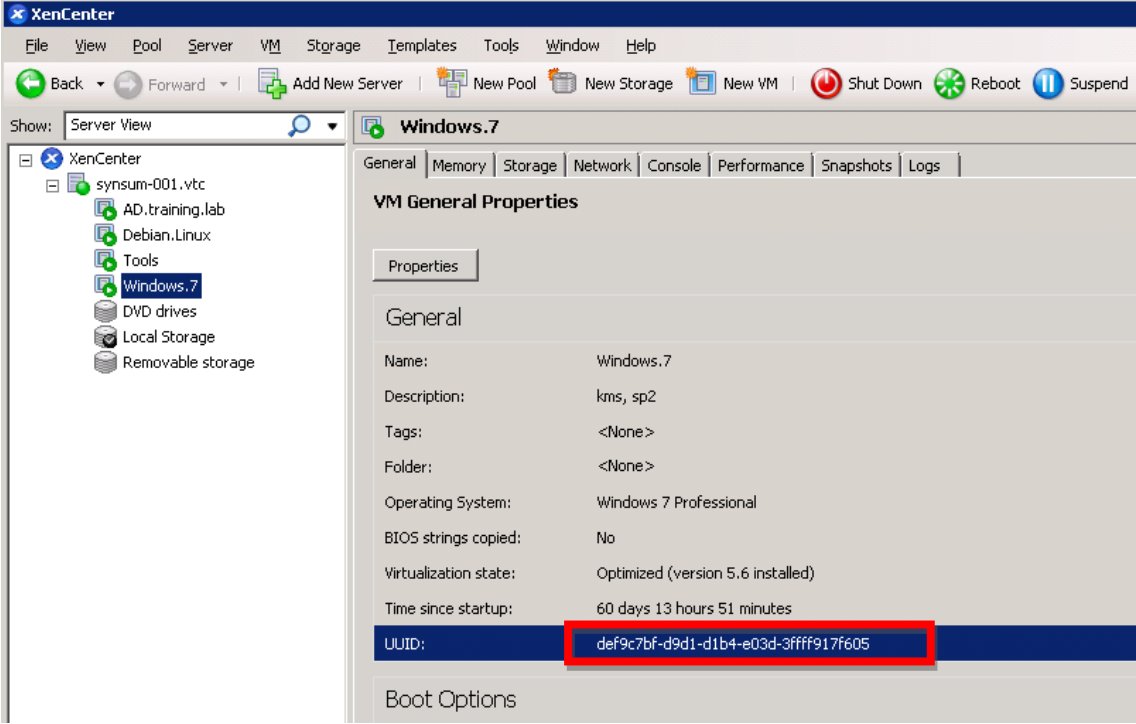
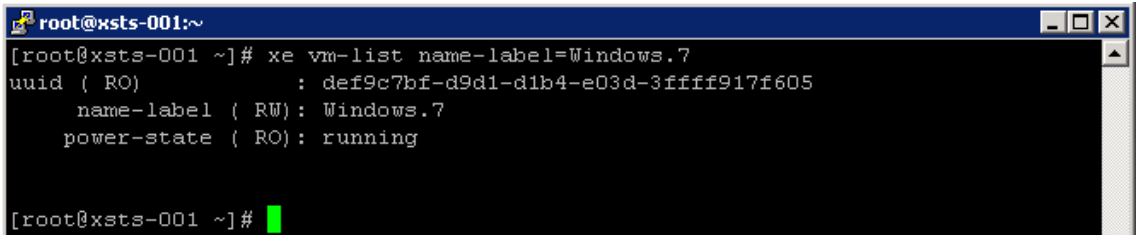
Estimated time to complete this lab: **15 minutes**.

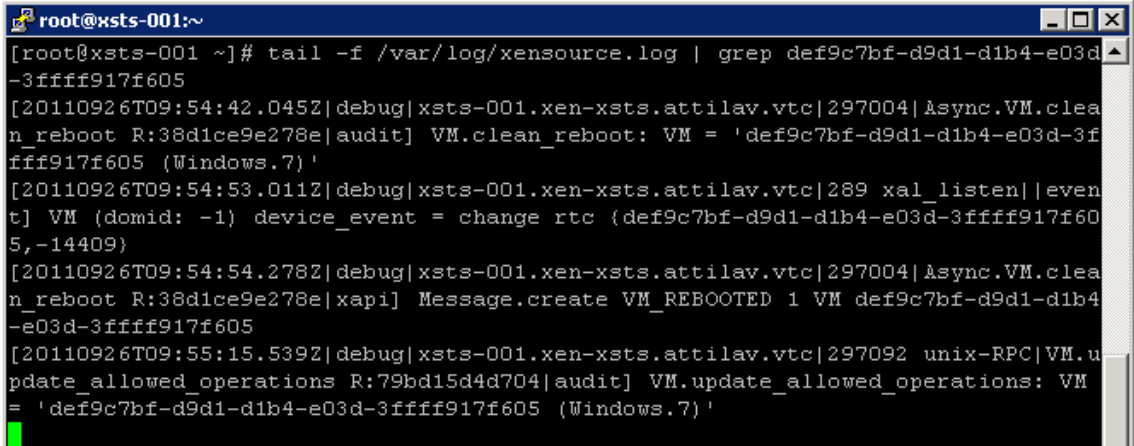
Step	Action
	 Open a new SSH connection to your XenServer host using PuTTY:
1.	<p>Launch PuTTY from the Landing Desktop by loading the saved session information (xenserver) and click Open.</p> 

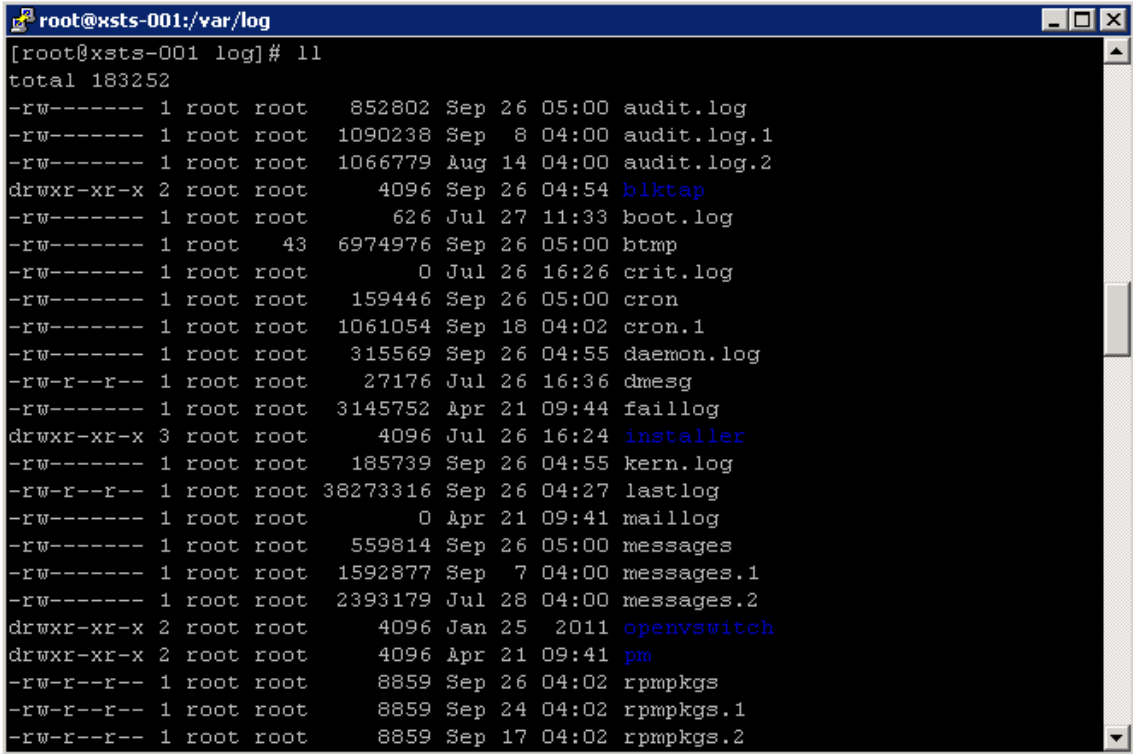
Step	Action
2.	<p>Login with the default credentials</p>  <pre> root@xsts-001:~ login as: root root@184.173.69.83's password: Last login: Mon Sep 26 04:24:15 2011 from 50.97.139.162-static.reverse.softlayer.com Type "xsconsole" for access to the management console. [root@xsts-001 ~]# </pre>
3.	<p>Change into the /var/log directory and list the contents of the directory</p> <p>e.g. <code>cd /var/log</code></p> <p>e.g. <code>ls</code></p>  <pre> root@xsts-001:/var/log [root@xsts-001 ~]# cd /var/log [root@xsts-001 log]# ls audit.log secure.13 squeezed.log.8 xensource.log.15 audit.log.1 secure.14 squeezed.log.9 xensource.log.16 audit.log.2 secure.15 swinstall.d xensource.log.17 blktap secure.16 tallylog xensource.log.18 boot.log secure.2 user.log xensource.log.19 btmptmp secure.3 user.log.1 xensource.log.20 crit.log secure.4 user.log.2 xensource.log.20 cron secure.5 v6d.log xensource.log.3 cron.1 secure.6 VMPRlog xensource.log.4 daemon.log secure.7 VMPRlog.1 xensource.log.5 dmesg secure.8 VMPRlog.10 xensource.log.6 faillog secure.9 VMPRlog.11 xensource.log.7 installer SMlog VMPRlog.12 xensource.log.8 kern.log SMlog.1 VMPRlog.13 xensource.log.9 lastlog SMlog.2 VMPRlog.14 xenstored-access.log maillog SMlog.3 VMPRlog.15 xenstored-access.log.1 messages SMlog.4 VMPRlog.16 xenstored-access.log.10 messages.1 SMlog.5 VMPRlog.17 xenstored-access.log.11 messages.2 spooler VMPRlog.18 xenstored-access.log.12 openvswitch squeezed.log VMPRlog.19 xenstored-access.log.13 pm squeezed.log.1 VMPRlog.2 xenstored-access.log.14 rpmpkgs squeezed.log.10 VMPRlog.20 xenstored-access.log.15 rpmpkgs.1 squeezed.log.11 VMPRlog.3 xenstored-access.log.16 rpmpkgs.2 squeezed.log.12 VMPRlog.4 xenstored-access.log.17 </pre> <p>Note: Other commands to list the contents of a directory include <code>ls -l</code> and <code>ll</code>. Experiment with some of these commands to see how they display the contents of the directory differently. For more information on the <code>ls</code> command type <code>man ls</code>. To exit out of a <code>man</code> page press <code>q</code>.</p>

Step	Action
4.	<p>View the contents of the dmesg log file.</p> <p>*Remember to use tab completion when working at the shell.</p> <p>e.g. less dmesg</p>  <pre> root@xsts-001:/var/log [root@xsts-001 log]# less dmesg Reserving virtual address space above 0xfec00000 Linux version 2.6.32.12-0.7.1.x85.6.100.323.170596xen (geeko@buildhost) (gcc ver sion 4.1.2 20080704 (Red Hat 4.1.2-48)) #1 SMP Fri Apr 8 07:25:07 EDT 2011 KERNEL supported cpus: Intel GenuineIntel AMD AuthenticAMD NSC Geode by NSC Cyrix CyrixInstead Centaur CentaurHauls Transmeta GenuineTMx86 Transmeta TransmetaCPU Xen-provided machine memory map: BIOS: 0000000000000000 - 000000000009a400 (usable) BIOS: 000000000009a400 - 00000000000a0000 (reserved) BIOS: 00000000000e0000 - 0000000000100000 (reserved) BIOS: 0000000000100000 - 00000000bf407000 (usable) BIOS: 00000000bf407000 - 00000000bf454000 (ACPI NVS) BIOS: 00000000bf454000 - 00000000bf45c000 (ACPI data) BIOS: 00000000bf45c000 - 00000000bf479000 (reserved) BIOS: 00000000bf479000 - 00000000bf47a000 (ACPI NVS) BIOS: 00000000bf47a000 - 00000000bf48b000 (reserved) BIOS: 00000000bf48b000 - 00000000bf48e000 (ACPI NVS) BIOS: 00000000bf48e000 - 00000000bf4af000 (reserved) BIOS: 00000000bf4af000 - 00000000bf4b1000 (usable) BIOS: 00000000bf4b1000 - 00000000bf505000 (reserved) </pre> <p>Press q to quit</p> <p>Note: There are many tools/commands that can be used to view the contents of a file. In the above example we use the less command so that we are able to scroll through the file using the arrow keys. Use the spacebar to page down. Other commands include cat, more, etc.</p> <p>Note: The dmesg (“display messages”) log file contains information related to dom0 boot.</p> <p>Note: To list the boot messages of the Xen hypervisor use the xe host-dmesg command.</p>

Step	Action
<p>5.</p>	<p>Follow a log file to view the latest entry updates within the file</p> <p>e.g. <code>tail -f /var/log/xensource.log</code></p>  <pre> root@xsts-001:/var/log [root@xsts-001 log]# tail -f /var/log/xensource.log [20110926T09:45:01.372Z debug xsts-001.xen-xsts.attilav.vtc 296946 unix-RPC dum mytaskhelper] task dispatch:session.get_uuid D:23d4c8b45bda created by task D:50 cf34a83c86 [20110926T09:45:01.393Z debug xsts-001.xen-xsts.attilav.vtc 296952 unix-RPC host .call_plugin R:c074e8d15de4 audit] Host.call_plugin host = 'c9e50345-e172-4c76-8 b5c-0b22228e1f2d (synsum-001.vtc)'; plugin = 'vmpr'; fn = 'protect'; args = [] [20110926T09:45:01.460Z info xsts-001.xen-xsts.attilav.vtc 296955 unix-RPC sess ion.login_with_password D:aa654efa6912 xapi] Session.create trackid=6315fc30cdb8 8fd5de915b2565663854 pool=false uname=__dom0__ vmpr is_local_superuser=true auth_ user_sid= parent=trackid=9834f5af41c964e225f24279aefe4e49 [20110926T09:45:01.462Z debug xsts-001.xen-xsts.attilav.vtc 296956 unix-RPC dum mytaskhelper] task dispatch:session.get_uuid D:8dd8b65fbea8 created by task D:aa 654efa6912 [20110926T09:45:15.773Z debug xsts-001.xen-xsts.attilav.vtc 10 db_gc DB GC D:90f ab8bc8070 db_gc] Session.destroy_ref=OpaqueRef:883ec2e8-e174-eb96-e9f4-daa85ffe 7af4 uuid=91f55275-8d1e-25ae-c476-b60e12a45bd7 trackid=c52384a152c110c6590824019 b68f35d (last active 20110925T09:45:02Z): Timed out session because of its age [20110926T09:45:15.773Z info xsts-001.xen-xsts.attilav.vtc 10 db_gc DB GC D:90f ab8bc8070 xapi] Session.destroy trackid=c52384a152c110c6590824019b68f35d [20110926T09:45:15.774Z debug xsts-001.xen-xsts.attilav.vtc 10 db_gc DB GC D:90f ab8bc8070 db_gc] Session.destroy_ref=OpaqueRef:456eed9-8a6b-7631-41d2-23604c05 679f uuid=d1014eaa-863a-a3b2-f9a4-cce18a31229e trackid=a2ec5a01224caa33029b07369 43736c2 (last active 20110925T09:45:02Z): Timed out session because of its age [20110926T09:45:15.774Z info xsts-001.xen-xsts.attilav.vtc 10 db_gc DB GC D:90f ab8bc8070 xapi] Session.destroy trackid=a2ec5a01224caa33029b0736943736c2 </pre> <p>Press CTRL+C to quit</p> <p>Note: The <code>tail</code> command lists the last 10 lines of a file. With the <code>-f</code> parameter we are able to follow the file and view the last 10 lines of the file as it is updated.</p> <ul style="list-style-type: none"> Remember to use tab/auto completion when working at the shell e.g. <code>xens</code> . Auto completion is also able to provide you with a list of available command or parameters by using double .
	<p>Follow log file entries for a specific virtual machine:</p>

Step	Action
6.	<p>Find the UUID of a VM via XenCenter</p>  <p>Note: You can copy the UUID from XenCenter by right-clicking and selecting “copy”.</p>
7.	<p>Find the UUID of a VM via CLI.</p> <p>e.g. <code>xe vm-list name-label=Windows.7</code></p> 

Step	Action
<p>8.</p>	<p>Use the UUID of the VM as the search pattern for the grep command</p> <p>e.g. <code>tail -f /var/log/xensource.log grep [UUID of the VM]</code></p>  <p>Note: You can copy and paste the complete UUID to be used by the grep command or provide enough unique information for the parameter to function i.e. def9 (in the above example). In most cases the first 4 characters of a UUID are unique.</p> <p>Note: The tail command lists the last 10 lines of a file. The -f parameter “follows” the file and automatically updates the last 10 lines displayed with any updates occurring in the file.</p> <p>Note: You will not see any updates until you move onto the step no. 12.</p>
<p>9.</p>	<p>Reboot the Windows.7 virtual machine and follow the log updates relating to that VMs UUID</p>
<p>10.</p>	<p>Press CTRL+C to quit after the virtual machine has rebooted</p>
<p>11.</p>	<p>This type of information can also be sent to a file</p> <p>e.g. <code>tail -f [log filename] > [target filename]</code></p>

Step	Action
12.	<p>Long List the contents of the <code>/var/log</code> directory to see more detailed information about the log files such as dates stamps and size.</p> <p>e.g. <code>ll /var/log</code></p>
	 <pre> root@xsts-001:/var/log [root@xsts-001 log]# ll total 183252 -rw----- 1 root root 852802 Sep 26 05:00 audit.log -rw----- 1 root root 1090238 Sep 8 04:00 audit.log.1 -rw----- 1 root root 1066779 Aug 14 04:00 audit.log.2 drwxr-xr-x 2 root root 4096 Sep 26 04:54 blktap -rw----- 1 root root 626 Jul 27 11:33 boot.log -rw----- 1 root 43 6974976 Sep 26 05:00 btmp -rw----- 1 root root 0 Jul 26 16:26 crit.log -rw----- 1 root root 159446 Sep 26 05:00 cron -rw----- 1 root root 1061054 Sep 18 04:02 cron.1 -rw----- 1 root root 315569 Sep 26 04:55 daemon.log -rw-r--r-- 1 root root 27176 Jul 26 16:36 dmesg -rw----- 1 root root 3145752 Apr 21 09:44 faillog drwxr-xr-x 3 root root 4096 Jul 26 16:24 installer -rw----- 1 root root 185739 Sep 26 04:55 kern.log -rw-r--r-- 1 root root 38273316 Sep 26 04:27 lastlog -rw----- 1 root root 0 Apr 21 09:41 maillog -rw----- 1 root root 559814 Sep 26 05:00 messages -rw----- 1 root root 1592877 Sep 7 04:00 messages.1 -rw----- 1 root root 2393179 Jul 28 04:00 messages.2 drwxr-xr-x 2 root root 4096 Jan 25 2011 openvswitch drwxr-xr-x 2 root root 4096 Apr 21 09:41 pm -rw-r--r-- 1 root root 8859 Sep 26 04:02 rpmpkgs -rw-r--r-- 1 root root 8859 Sep 24 04:02 rpmpkgs.1 -rw-r--r-- 1 root root 8859 Sep 17 04:02 rpmpkgs.2 </pre>
	<p>Note: Commands to list the contents of a directory include <code>ls -l</code> and <code>ll</code>. Experiment with some of these commands to see how they display the contents of the directory differently. For more information on the <code>ls</code> command type <code>man ls</code>. Press <code>q</code> to quit out of the man/manual page.</p>

Step	Action
<p>13.</p>	<p>Review XenServer information via CLI: related version, build number, hypervisor version, etc. located in the <code>xensource-inventory</code> file.</p> <p>e.g. <code>less /etc/xensource-inventory</code></p>  <pre> root@xsts-001:/var/log [root@xsts-001 log]# less /etc/xensource-inventory BUILD_NUMBER='47101p' CURRENT_INTERFACES='xapi2 xapi1' PRODUCT_BRAND='XenServer' DOMO_MEM='752' MANAGEMENT_INTERFACE='xapi2' INSTALLATION_UUID='c9e50345-e172-4c76-8b5c-0b22228e1f2d' KERNEL_VERSION='2.6.32.12-0.7.1.xs5.6.100.323.170596xen' DEFAULT_SR_PHYSDEVS='/dev/sda3' #PUBLIC_MANAGEMENT_INTERFACE='xenbr1' XEN_VERSION='3.4.2' PRIMARY_DISK='/dev/disk/by-id/scsi-SATA_WDC_WD1003FBYX-_WD-WCAW32034030' CONTROL_DOMAIN_UUID='11bf5e72-e173-403b-aef7-a63c4f970f71' PRODUCT_NAME='xenenterprise' BACKUP_PARTITION='/dev/disk/by-id/scsi-SATA_WDC_WD1003FBYX-_WD-WCAW32034030-part 2' PRODUCT_VERSION='5.6.100' INSTALLATION_DATE='2011-07-26 15:21:25.801168' /etc/xensource-inventory (END) </pre> <p>Press <code>q</code> to quit</p> <p>Note: The contents of this inventory file will vary from a default inventory file as some modifications were made to facilitate this cloud-based lab environment.</p>
<p>14.</p>	<p>Alternatively you can use the <code>cat</code> command to view the contents of the file.</p> <p>e.g. <code>cat /etc/xensource-inventory</code></p>  <pre> root@xsts-001:/var/log [root@xsts-001 log]# cat /etc/xensource-inventory BUILD_NUMBER='47101p' CURRENT_INTERFACES='xapi2 xapi1' PRODUCT_BRAND='XenServer' DOMO_MEM='752' MANAGEMENT_INTERFACE='xapi2' INSTALLATION_UUID='c9e50345-e172-4c76-8b5c-0b22228e1f2d' KERNEL_VERSION='2.6.32.12-0.7.1.xs5.6.100.323.170596xen' DEFAULT_SR_PHYSDEVS='/dev/sda3' #PUBLIC_MANAGEMENT_INTERFACE='xenbr1' XEN_VERSION='3.4.2' PRIMARY_DISK='/dev/disk/by-id/scsi-SATA_WDC_WD1003FBYX-_WD-WCAW32034030' CONTROL_DOMAIN_UUID='11bf5e72-e173-403b-aef7-a63c4f970f71' PRODUCT_NAME='xenenterprise' BACKUP_PARTITION='/dev/disk/by-id/scsi-SATA_WDC_WD1003FBYX-_WD-WCAW32034030-part 2' PRODUCT_VERSION='5.6.100' INSTALLATION_DATE='2011-07-26 15:21:25.801168' [root@xsts-001 log]# </pre> <p>Note: For more information about the <code>cat</code> command type <code>man cat</code> to display the manual for the command. Press <code>q</code> to quit of a <code>man</code>/manual page.</p>

END OF EXERCISE

Summary

**Key
Takeaways**

The key takeaways for this exercise are:

- You will be able to locate, view and follow common system logs
- You will be able to locate XenServer build information via the CLI

Exercise 3: Collect a XenServer Status Report

Overview

In this exercise we will collect a system status report from a XenServer host.


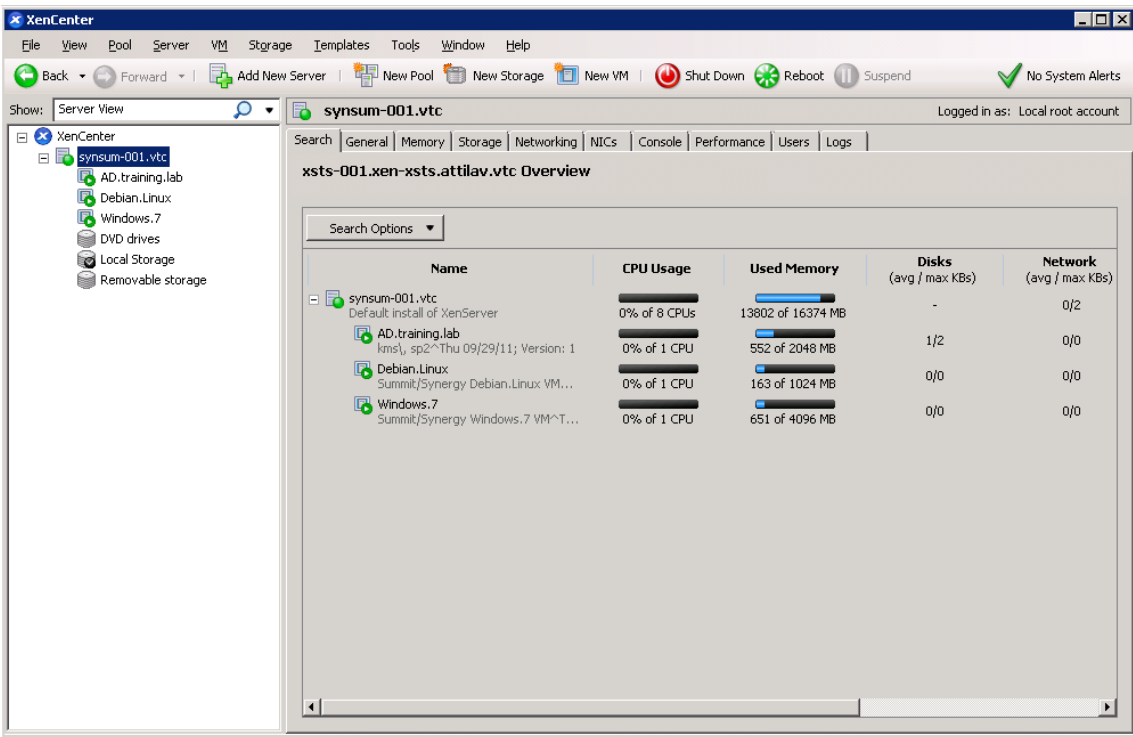
This information is valuable for your own analysis and can be forwarded to Citrix Technical Support.

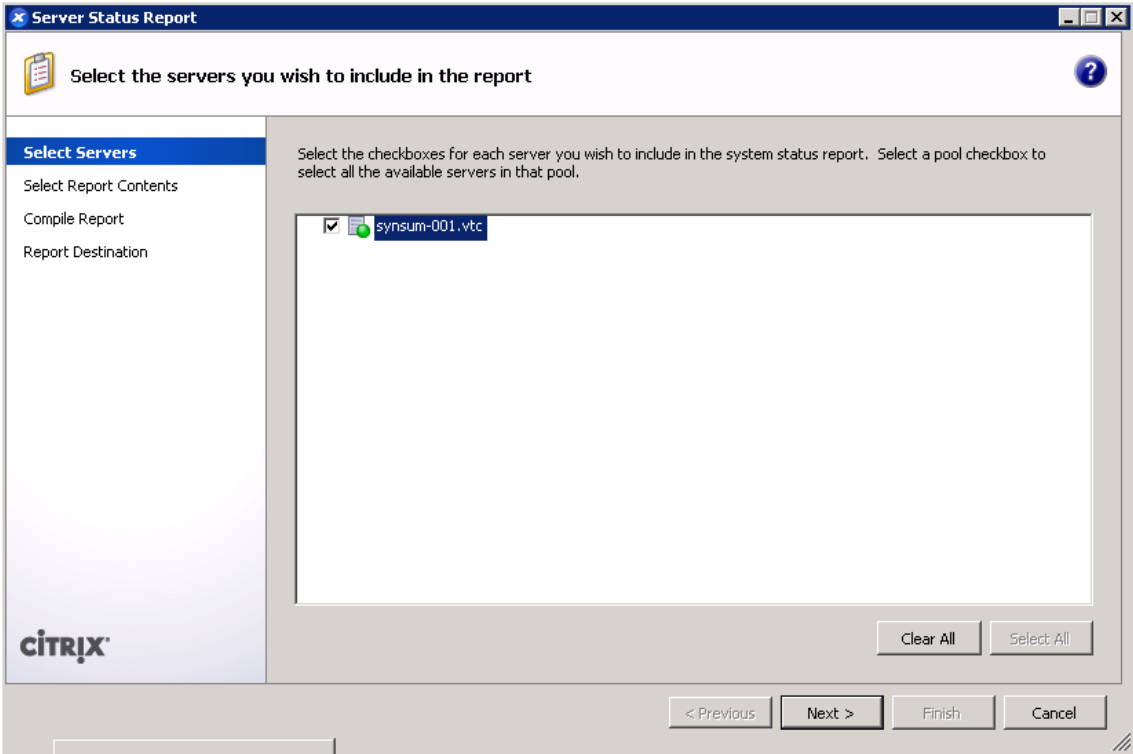
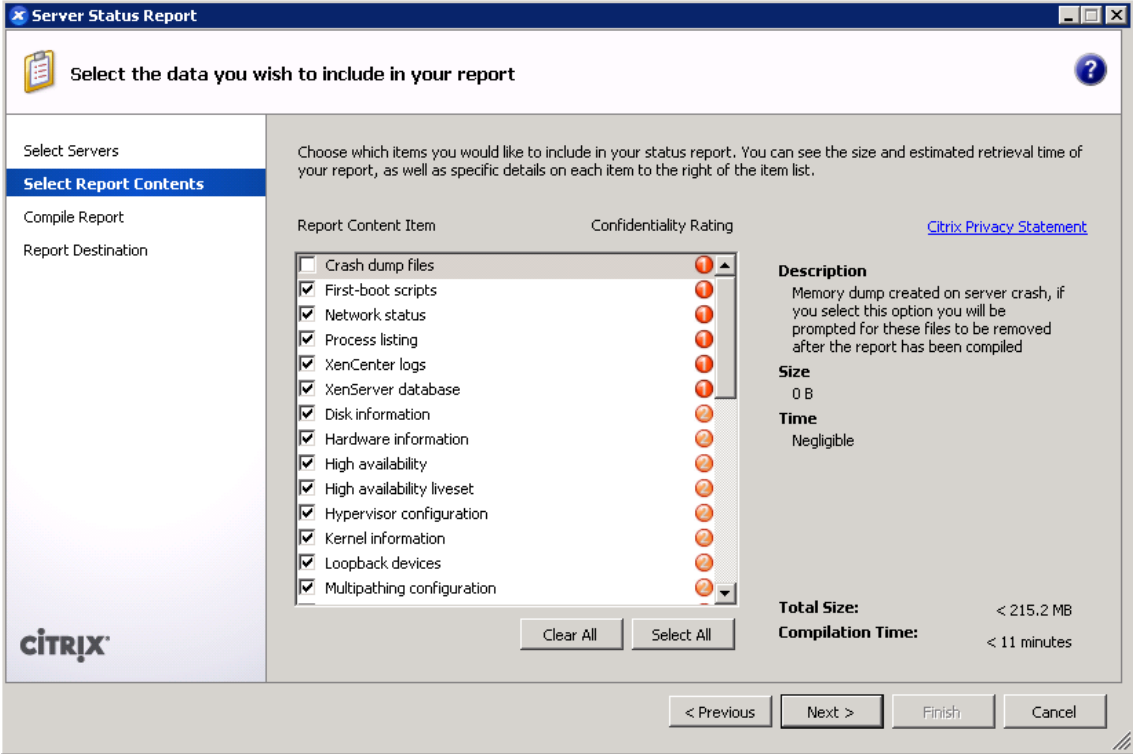
To complete this exercise, you must have the following:

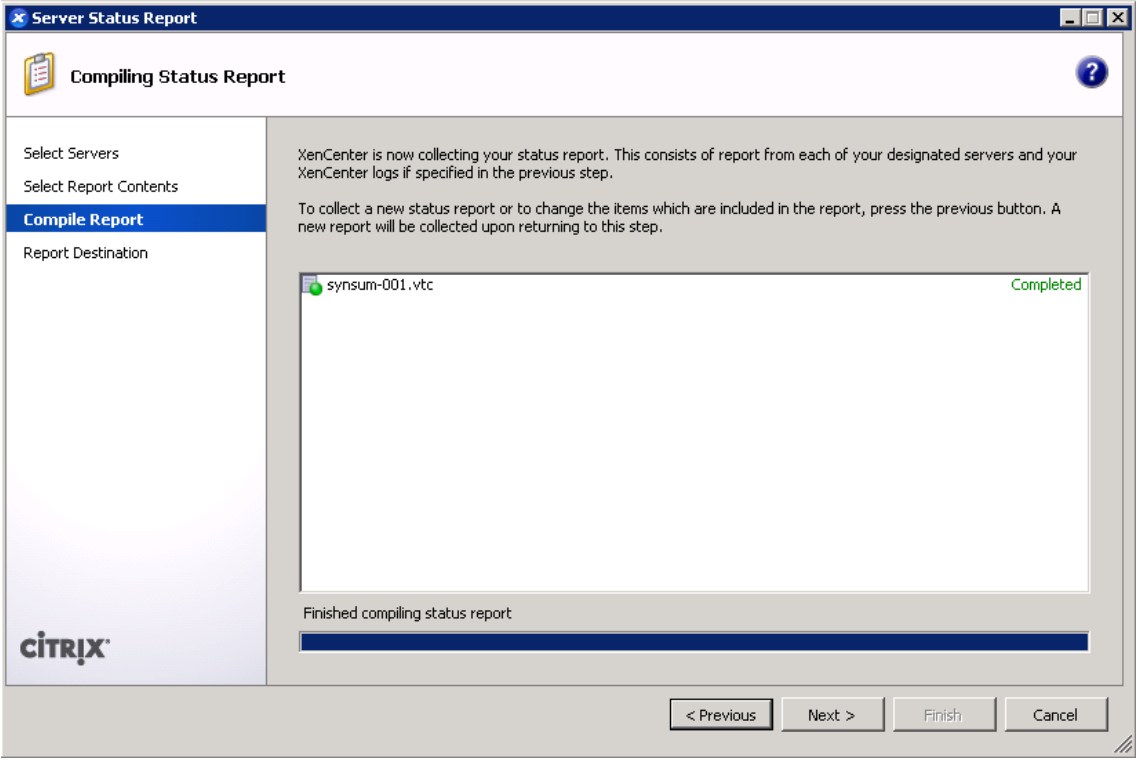
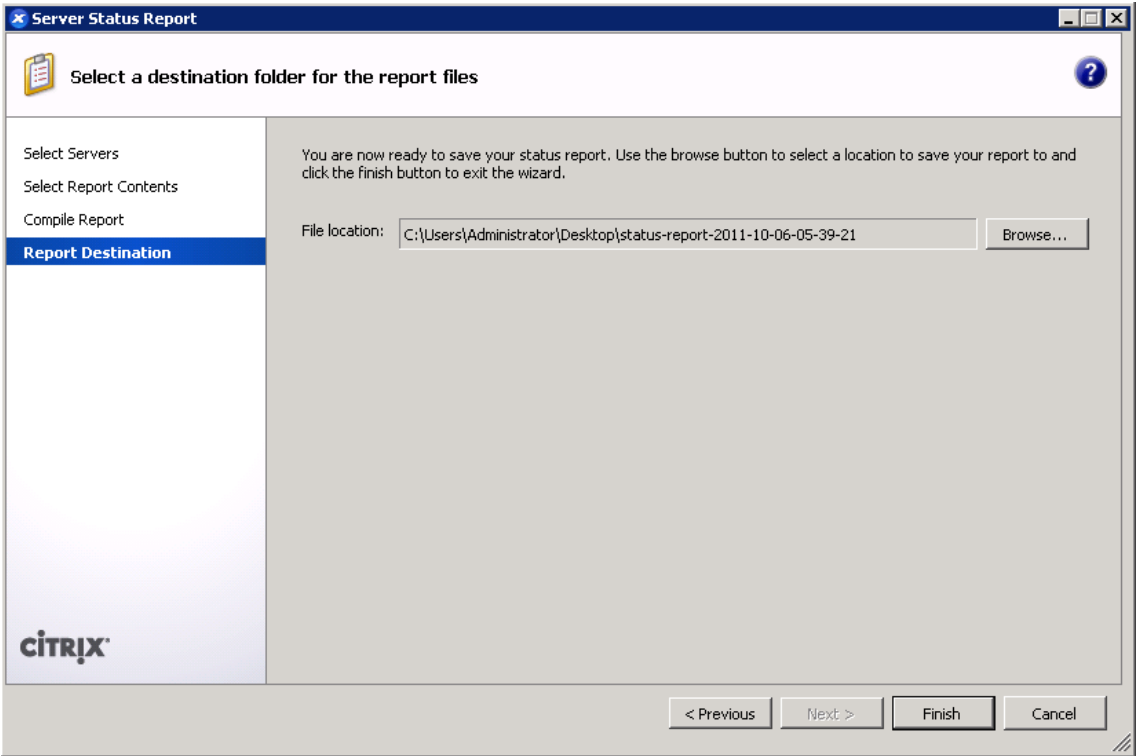
- XenCenter
- SSH client (PuTTY)
- WinSCP

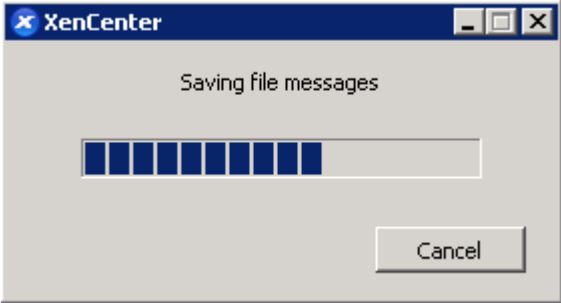

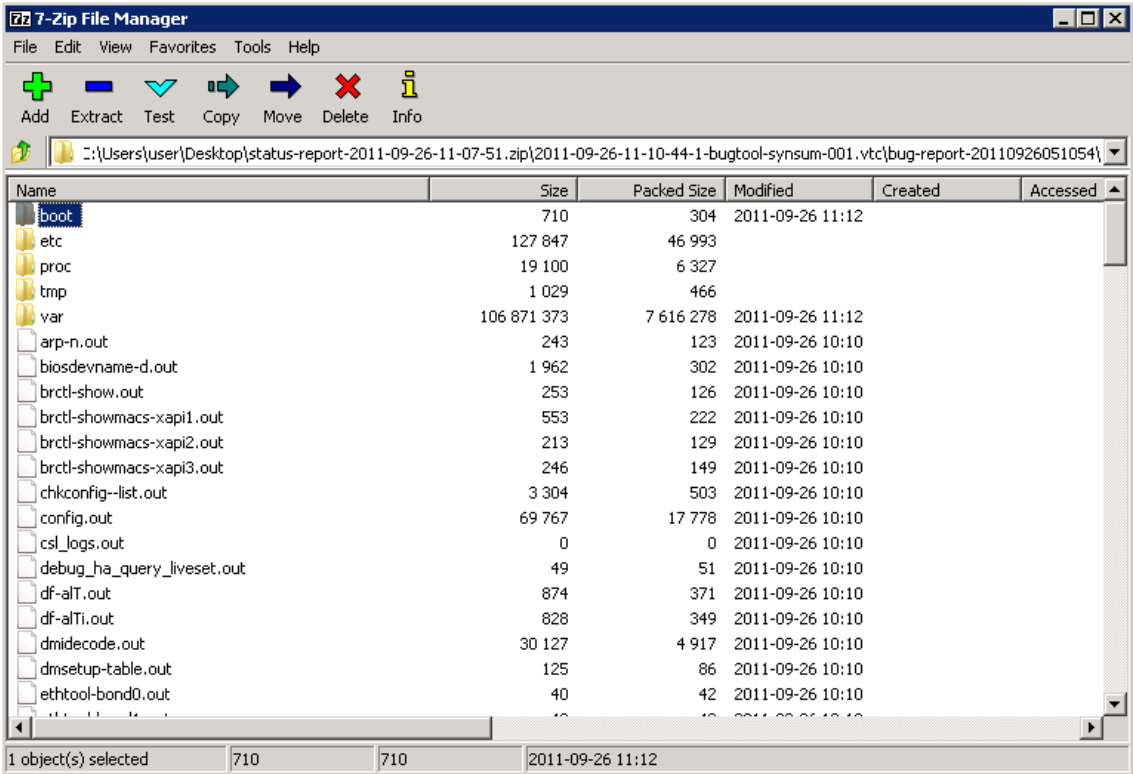
Step-by-step guidance

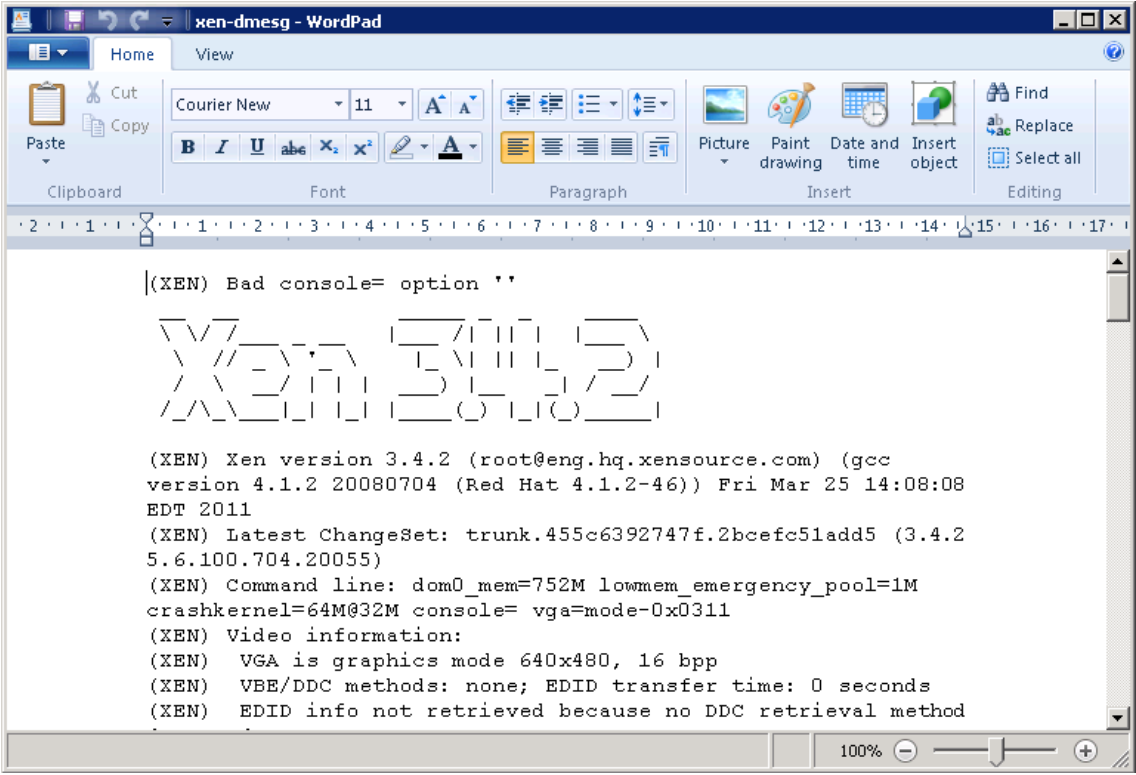

Estimated time to complete this lab: **15 minutes**.

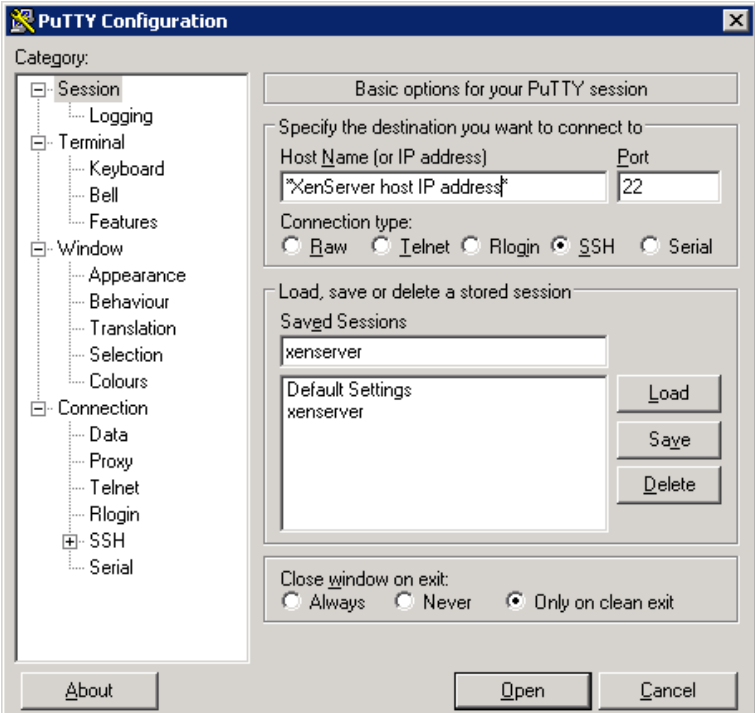
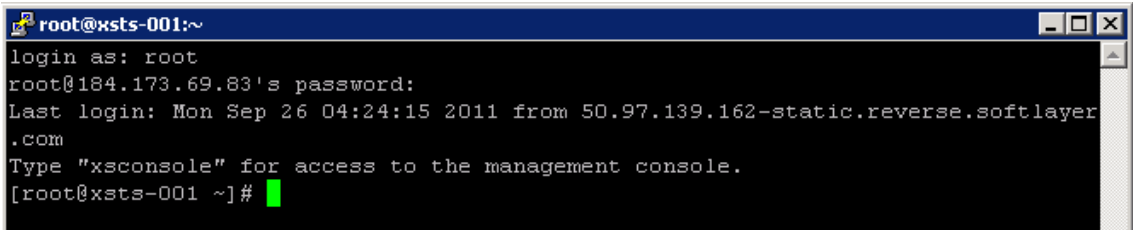
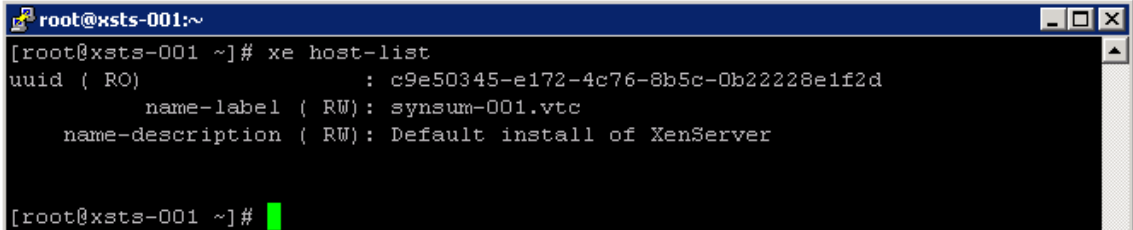
Step	Action																									
	 Collect a Server Status Report via XenCenter:																									
1.	<p>From your Landing Desktop launch XenCenter (if not already running)</p>  <table border="1"> <thead> <tr> <th>Name</th> <th>CPU Usage</th> <th>Used Memory</th> <th>Disks (avg / max KBs)</th> <th>Network (avg / max KBs)</th> </tr> </thead> <tbody> <tr> <td>synsum-001.vtc Default install of XenServer</td> <td>0% of 8 CPUs</td> <td>13802 of 16374 MB</td> <td>-</td> <td>0/2</td> </tr> <tr> <td>AD.training.lab kmsl, sp2^Thu 09/29/11; Version: 1</td> <td>0% of 1 CPU</td> <td>552 of 2048 MB</td> <td>1/2</td> <td>0/0</td> </tr> <tr> <td>Debian.Linux Summit/Synergy Debian.Linux VM...</td> <td>0% of 1 CPU</td> <td>163 of 1024 MB</td> <td>0/0</td> <td>0/0</td> </tr> <tr> <td>Windows.7 Summit/Synergy Windows.7 VM^T...</td> <td>0% of 1 CPU</td> <td>651 of 4096 MB</td> <td>0/0</td> <td>0/0</td> </tr> </tbody> </table>	Name	CPU Usage	Used Memory	Disks (avg / max KBs)	Network (avg / max KBs)	synsum-001.vtc Default install of XenServer	0% of 8 CPUs	13802 of 16374 MB	-	0/2	AD.training.lab kmsl, sp2^Thu 09/29/11; Version: 1	0% of 1 CPU	552 of 2048 MB	1/2	0/0	Debian.Linux Summit/Synergy Debian.Linux VM...	0% of 1 CPU	163 of 1024 MB	0/0	0/0	Windows.7 Summit/Synergy Windows.7 VM^T...	0% of 1 CPU	651 of 4096 MB	0/0	0/0
Name	CPU Usage	Used Memory	Disks (avg / max KBs)	Network (avg / max KBs)																						
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AD.training.lab kmsl, sp2^Thu 09/29/11; Version: 1	0% of 1 CPU	552 of 2048 MB	1/2	0/0																						
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Windows.7 Summit/Synergy Windows.7 VM^T...	0% of 1 CPU	651 of 4096 MB	0/0	0/0																						

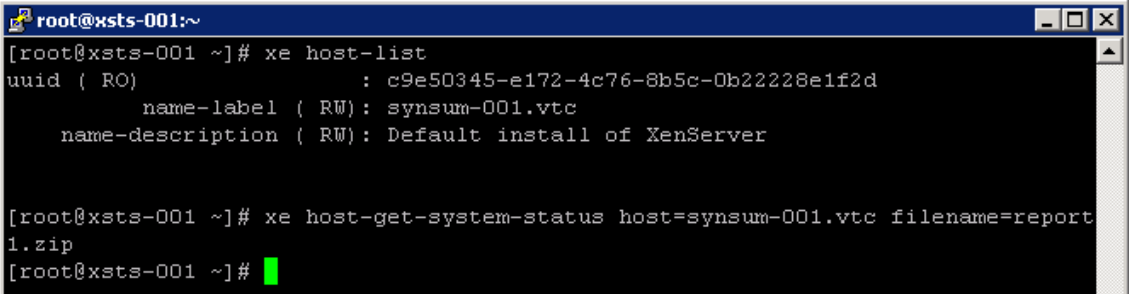
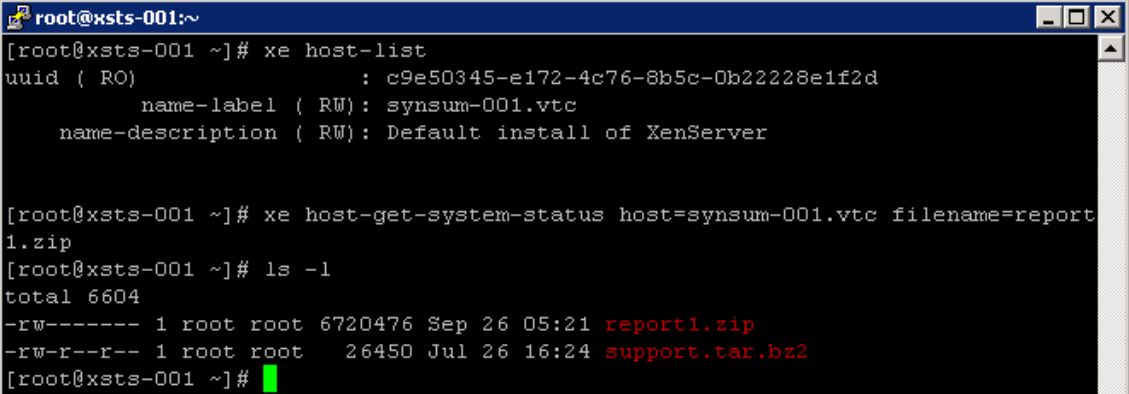

Step	Action
2.	<p>Click Tools > Server Status Report...</p> 
3.	<p>Select the server to collect the status report from and click Next</p>
4.	<p>Review the list of Report Content. Use the default selections and click Next</p> 

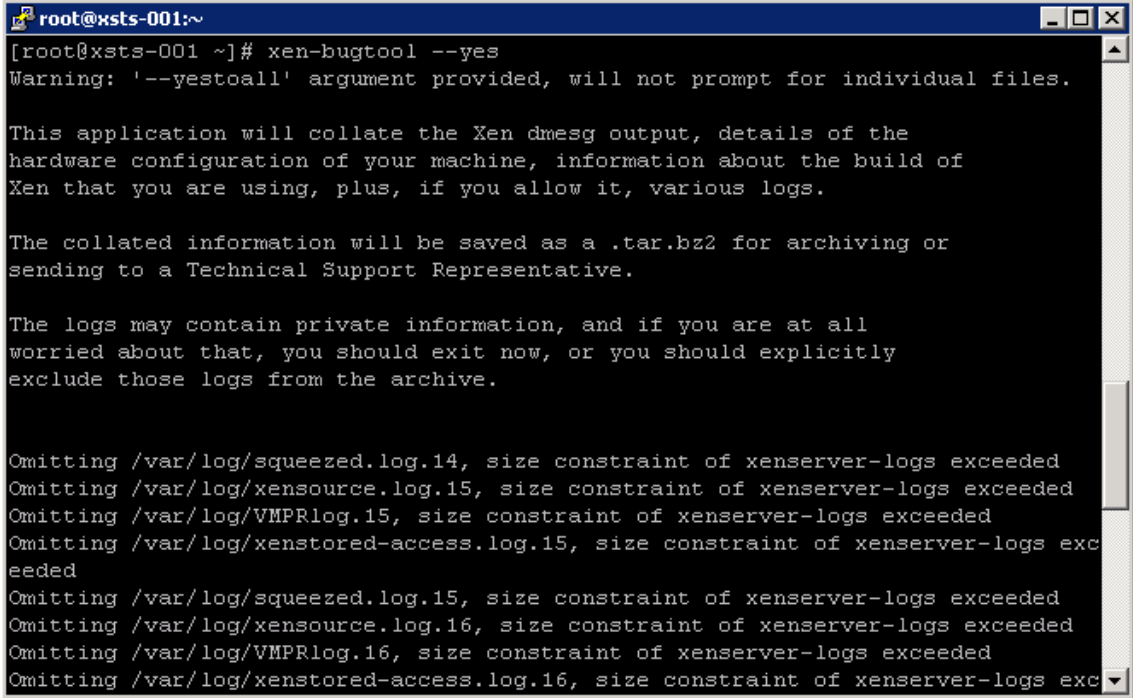
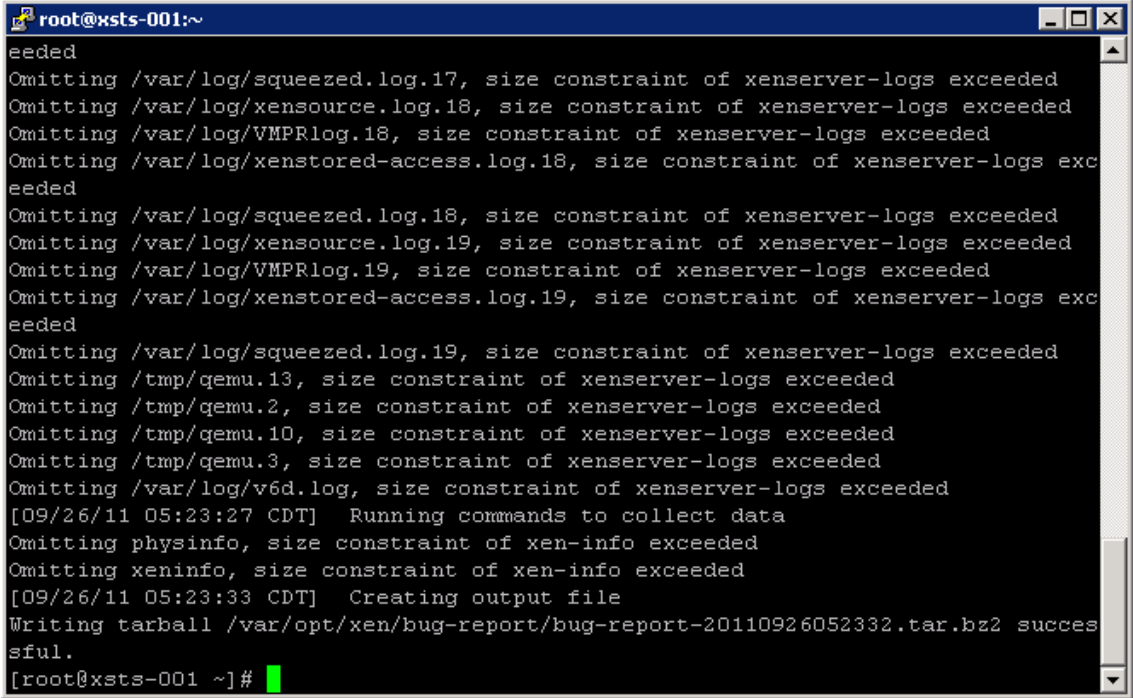

Step	Action
5.	<p>After the report has been compiled and collected successfully click Next</p> 
6.	<p>Browse to the desktop and click Finish.</p> 

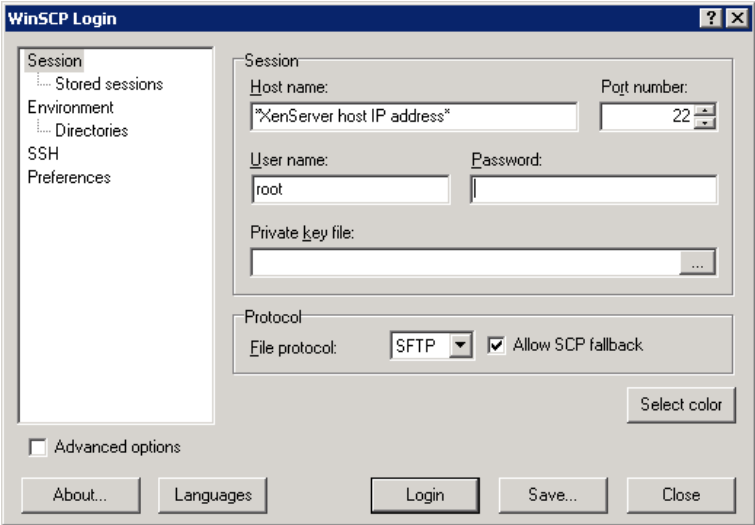
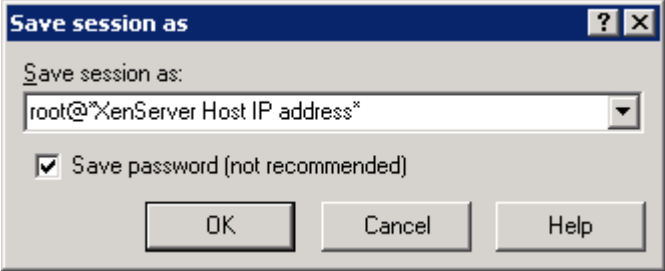
Step	Action
7.	<p>The status report will be saved to your Landing Desktop</p> 
	<p> Open and review the content of the server status report:</p>
8.	<p>Open .zip file located on your Landing Desktop and browse through the folders to the bug-report folder</p> 

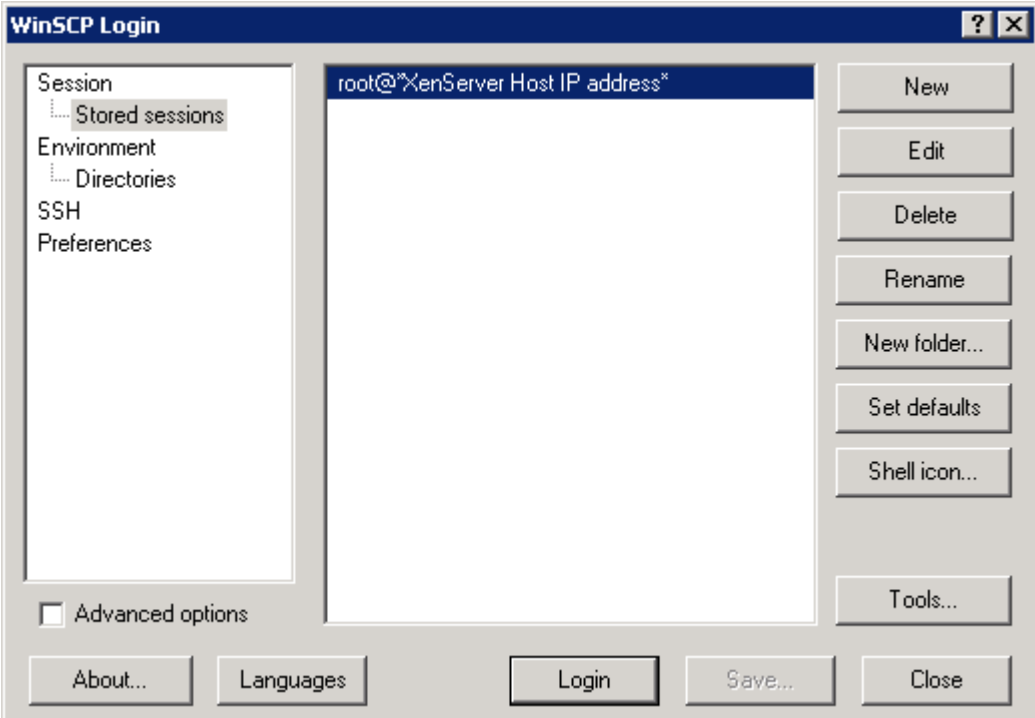
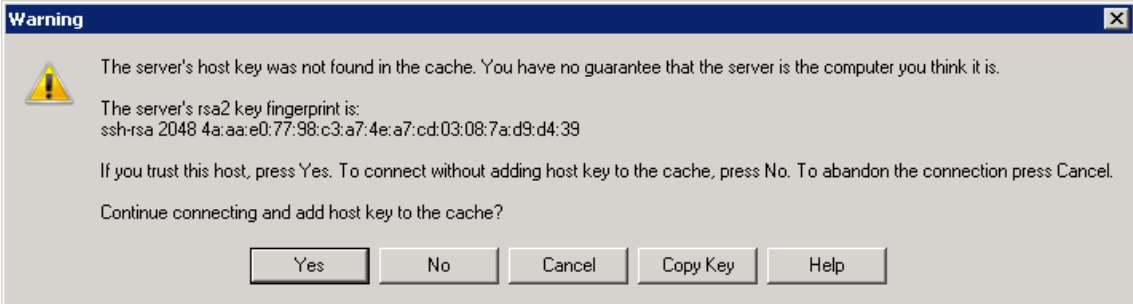
Step	Action
9.	<p>Open the xen-dmesg.out file with WordPad and review</p>  <p>Note: This file contains information about the hypervisor. From this file we can confirm the version of the hypervisor i.e. 3.4.2, the total amount of memory detected, CPU information, even the control domain's/dom0 creation parameters and much more.</p>
	<p> Collect a server status report via the CLI:</p>

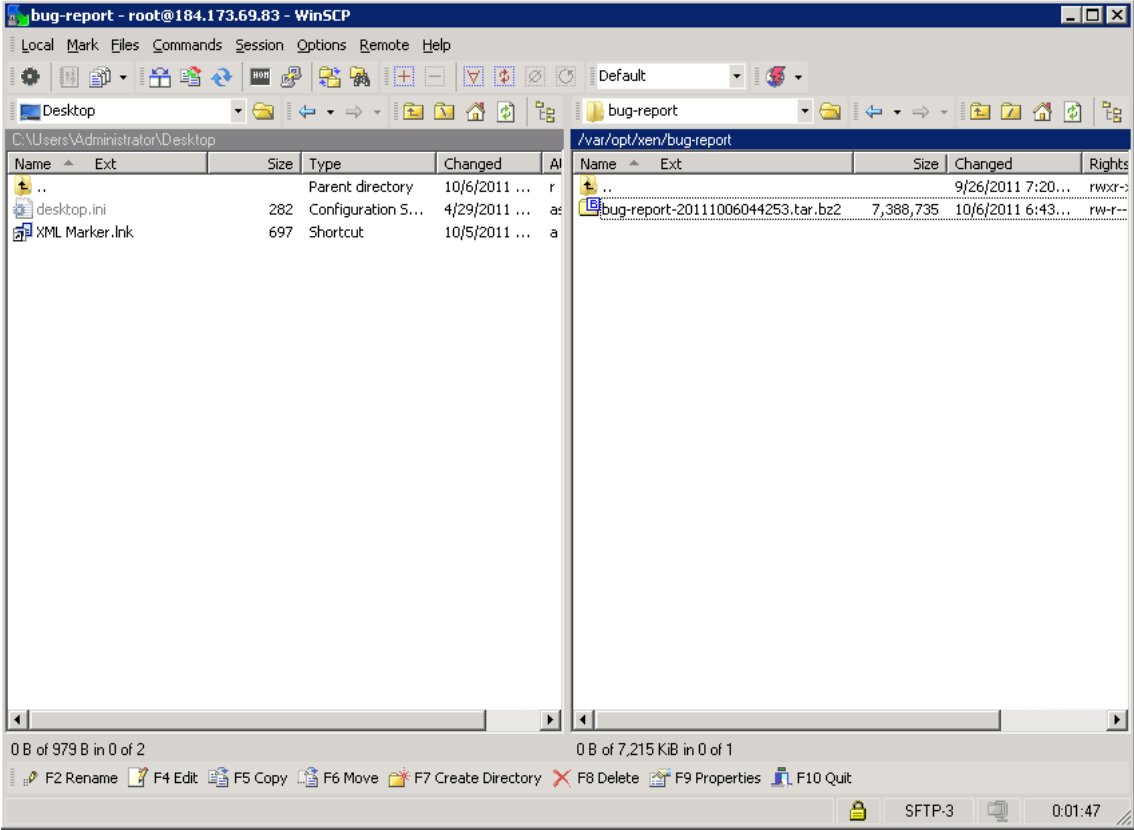
Step	Action
10.	<p>Launch PuTTY from the Landing Desktop OR use an existing SSH session.</p> 
11.	<p>Login with the required credentials available from the Student Portal page.</p> 
12.	<p>Find the XenServer host information i.e. UUID, name label, etc.</p> <p>e.g. <code>xe host-list</code></p> 

Step	Action
<p>13.</p>	<p>Collect the report using the xe command</p> <p>e.g. xe host-get-system-status host=[server name] filename=[filename]</p>  <pre> root@xsts-001:~ [root@xsts-001 ~]# xe host-list uid (RO) : c9e50345-e172-4c76-8b5c-0b22228e1f2d name-label (RW) : synsum-001.vtc name-description (RW) : Default install of XenServer [root@xsts-001 ~]# xe host-get-system-status host=synsum-001.vtc filename=report1.zip [root@xsts-001 ~]# </pre> <p>Note: If no path has been designated in the filename parameter the file will be stored in the current folder.</p> <p>Note: The xe command requires that the XAPI service is running.</p>
<p>14.</p>	<p>List the folder contents with the ls -l command to locate the status report file i.e. report1.zip.</p> <p>e.g. ls -l</p>  <pre> root@xsts-001:~ [root@xsts-001 ~]# xe host-list uid (RO) : c9e50345-e172-4c76-8b5c-0b22228e1f2d name-label (RW) : synsum-001.vtc name-description (RW) : Default install of XenServer [root@xsts-001 ~]# xe host-get-system-status host=synsum-001.vtc filename=report1.zip [root@xsts-001 ~]# ls -l total 6604 -rw----- 1 root root 6720476 Sep 26 05:21 report1.zip -rw-r--r-- 1 root root 26450 Jul 26 16:24 support.tar.bz2 [root@xsts-001 ~]# </pre>
	<p> If the xapi service is not running or unable to start you can still collect a system report using the xen-bugtool:</p>

Step	Action
15.	<p>Run the xen-bugtool command to generate a server status report package</p> <p>e.g. <code>xen-bugtool --yes</code></p>  <pre> root@xsts-001:~ [root@xsts-001 ~]# xen-bugtool --yes Warning: '--yestoall' argument provided, will not prompt for individual files. This application will collate the Xen dmesg output, details of the hardware configuration of your machine, information about the build of Xen that you are using, plus, if you allow it, various logs. The collated information will be saved as a .tar.bz2 for archiving or sending to a Technical Support Representative. The logs may contain private information, and if you are at all worried about that, you should exit now, or you should explicitly exclude those logs from the archive. Omitting /var/log/squeezed.log.14, size constraint of xenserver-logs exceeded Omitting /var/log/xensource.log.15, size constraint of xenserver-logs exceeded Omitting /var/log/VMPRlog.15, size constraint of xenserver-logs exceeded Omitting /var/log/xenstored-access.log.15, size constraint of xenserver-logs exceeded Omitting /var/log/squeezed.log.15, size constraint of xenserver-logs exceeded Omitting /var/log/xensource.log.16, size constraint of xenserver-logs exceeded Omitting /var/log/VMPRlog.16, size constraint of xenserver-logs exceeded Omitting /var/log/xenstored-access.log.16, size constraint of xenserver-logs exceeded </pre> <p>Note: The <code>--yes</code> parameter answers all prompts for confirmation with <code>yes</code>.</p>
16.	<p>When the package creation is complete the location of the package will be displayed in the console. The default location for the status reports is <code>/var/opt/xen/bug-report/</code></p>  <pre> root@xsts-001:~ eeded Omitting /var/log/squeezed.log.17, size constraint of xenserver-logs exceeded Omitting /var/log/xensource.log.18, size constraint of xenserver-logs exceeded Omitting /var/log/VMPRlog.18, size constraint of xenserver-logs exceeded Omitting /var/log/xenstored-access.log.18, size constraint of xenserver-logs exceeded Omitting /var/log/squeezed.log.18, size constraint of xenserver-logs exceeded Omitting /var/log/xensource.log.19, size constraint of xenserver-logs exceeded Omitting /var/log/VMPRlog.19, size constraint of xenserver-logs exceeded Omitting /var/log/xenstored-access.log.19, size constraint of xenserver-logs exceeded Omitting /var/log/squeezed.log.19, size constraint of xenserver-logs exceeded Omitting /tmp/qemu.13, size constraint of xenserver-logs exceeded Omitting /tmp/qemu.2, size constraint of xenserver-logs exceeded Omitting /tmp/qemu.10, size constraint of xenserver-logs exceeded Omitting /tmp/qemu.3, size constraint of xenserver-logs exceeded Omitting /var/log/v6d.log, size constraint of xenserver-logs exceeded [09/26/11 05:23:27 CDT] Running commands to collect data Omitting physinfo, size constraint of xen-info exceeded Omitting xeninfo, size constraint of xen-info exceeded [09/26/11 05:23:33 CDT] Creating output file Writing tarball /var/opt/xen/bug-report/bug-report-20110926052332.tar.bz2 successful. [root@xsts-001 ~]# </pre>
	 Collect a system report from XenServer:

Step	Action
17.	<p>Launch WinSCP from your Landing Desktop and connect to your designated XenServer by clicking New and entering the XenServer host IP address and credentials.</p>  <p>The WinSCP Login dialog box is shown with the following fields: Host name: *XenServer host IP address*, Port number: 22, User name: root, Password: (empty), Private key file: (empty). The File protocol is set to SFTP and Allow SCP fallback is checked. Buttons include About..., Languages, Login, Save..., and Close.</p> <p>Note: Enter the credentials including Username and Password and click Save</p>
18.	<p>Save the connection information</p>  <p>The Save session as dialog box is shown with the following fields: Save session as: root@*XenServer Host IP address*, and a checked checkbox for Save password (not recommended). Buttons include OK, Cancel, and Help.</p> <p>Note: Tick the “Save password” box</p>

Step	Action
19.	<p>After saving the XenServer host credentials click Login</p>  <p>The screenshot shows the WinSCP Login dialog box. On the left is a tree view with 'Session' selected, containing 'Stored sessions', 'Environment', 'Directories', 'SSH', and 'Preferences'. The main area shows a session name 'root@*XenServer Host IP address*'. On the right is a vertical stack of buttons: 'New', 'Edit', 'Delete', 'Rename', 'New folder...', 'Set defaults', 'Shell icon...', and 'Tools...'. At the bottom are buttons for 'About...', 'Languages', 'Login', 'Save...', and 'Close'. There is also an 'Advanced options' checkbox.</p>
20.	<p>Accept any key exchange message</p>  <p>The screenshot shows a 'Warning' dialog box with a yellow warning icon. The text reads: 'The server's host key was not found in the cache. You have no guarantee that the server is the computer you think it is. The server's rsa2 key fingerprint is: ssh-rsa 2048 4a:aa:e0:77:98:c3:a7:4e:a7:cd:03:08:7a:d9:d4:39. If you trust this host, press Yes. To connect without adding host key to the cache, press No. To abandon the connection press Cancel. Continue connecting and add host key to the cache?'. At the bottom are buttons for 'Yes', 'No', 'Cancel', 'Copy Key', and 'Help'.</p>

Step	Action
21.	<p>Browse to the default store location for the status report (<code>/var/opt/xen/bug-report</code>) and drag-n-drop the <code>.tar.bz2</code> file to your Landing Desktop.</p>  <p>Note: The contents of the status report is identical whether it is collected via the CLI or XenCenter</p> <p style="text-align: center;">END OF EXERCISE</p>

Summary

Key Takeaways	<p>The key takeaways for this exercise are:</p> <ul style="list-style-type: none"> • You will be able to generate a system status report via XenCenter and CLI. • You will be able to collect a system status report using WinSCP.
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Exercise 4: Collect and Review the Pool/Host Database

Overview

In this exercise we will locate the pool/host database and review the information stored within it.

In this version of XenServer the database is called state.db and is in XML format.


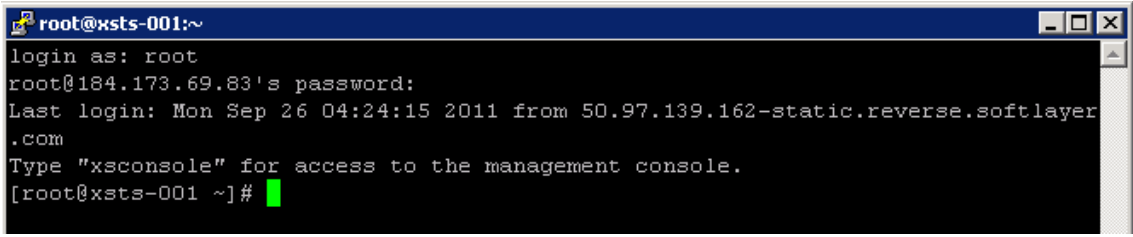

This database holds the pool/host configuration information which is critical to the functionality of the environment and should not be manually edited.

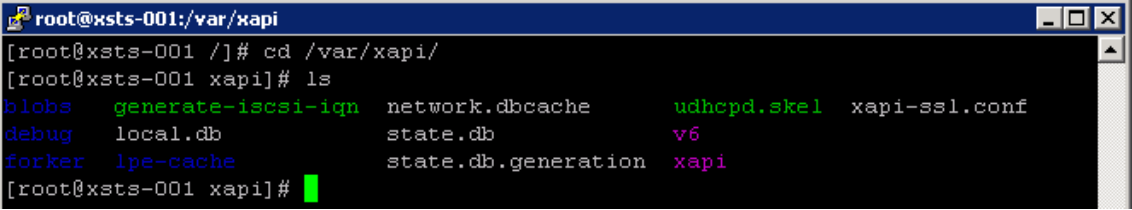

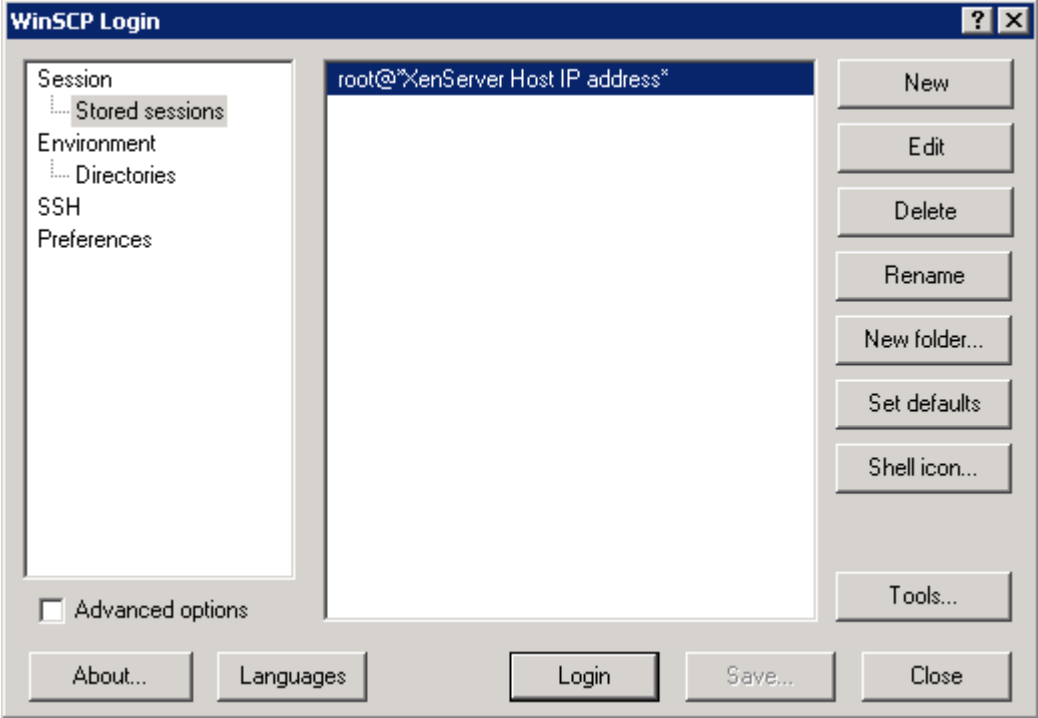
To complete this exercise, you must have the following:

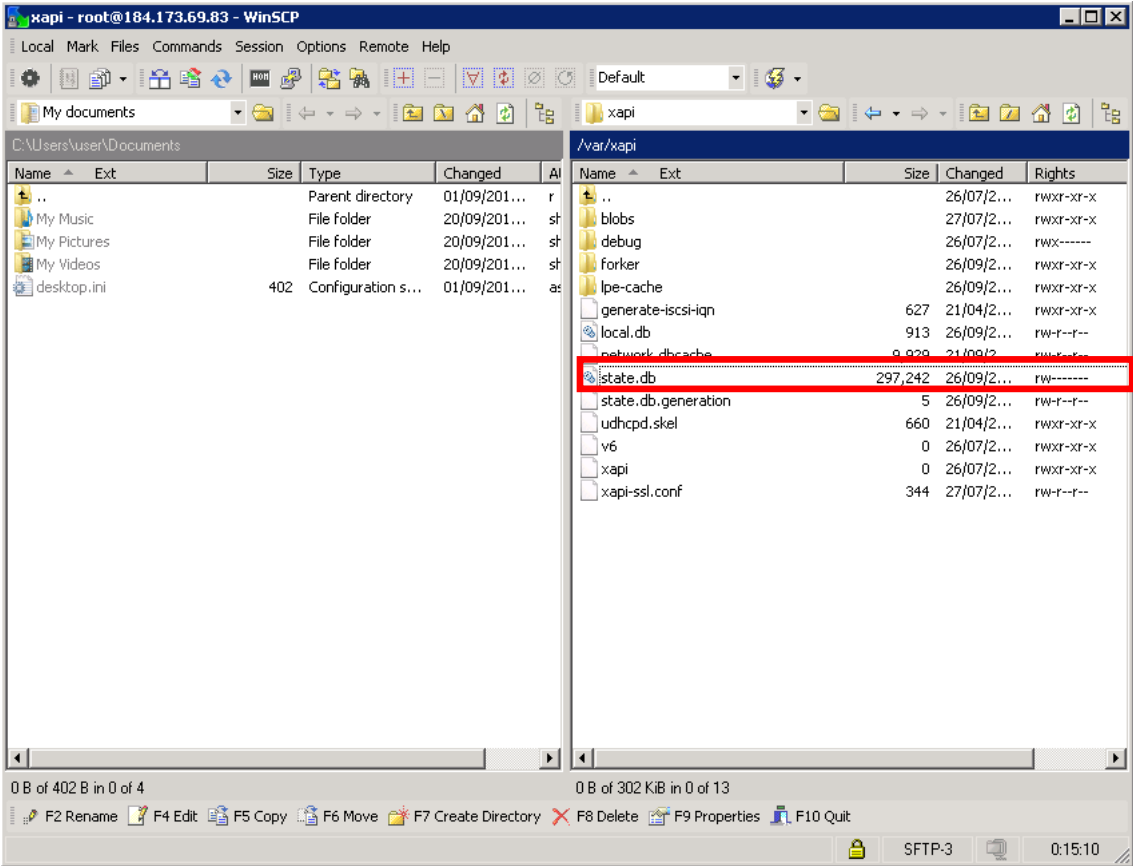
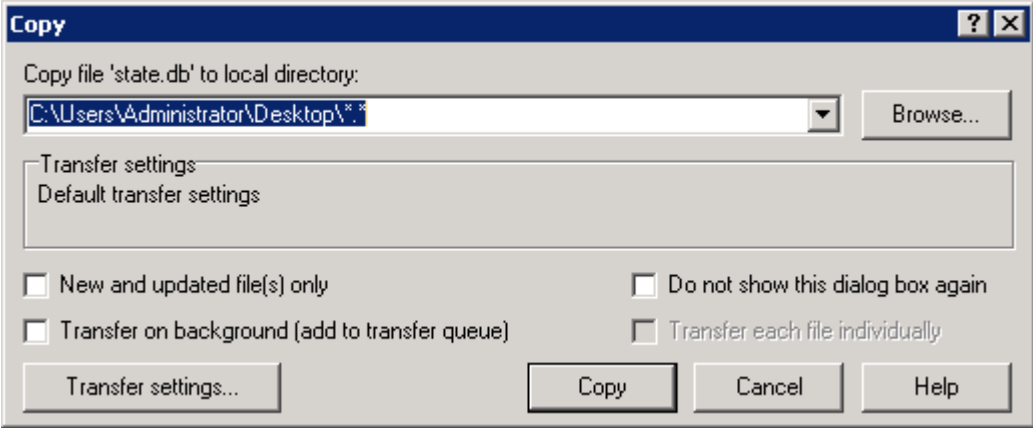

- XenCenter
- SSH client (PuTTY)
- WinSCP
- XML Marker

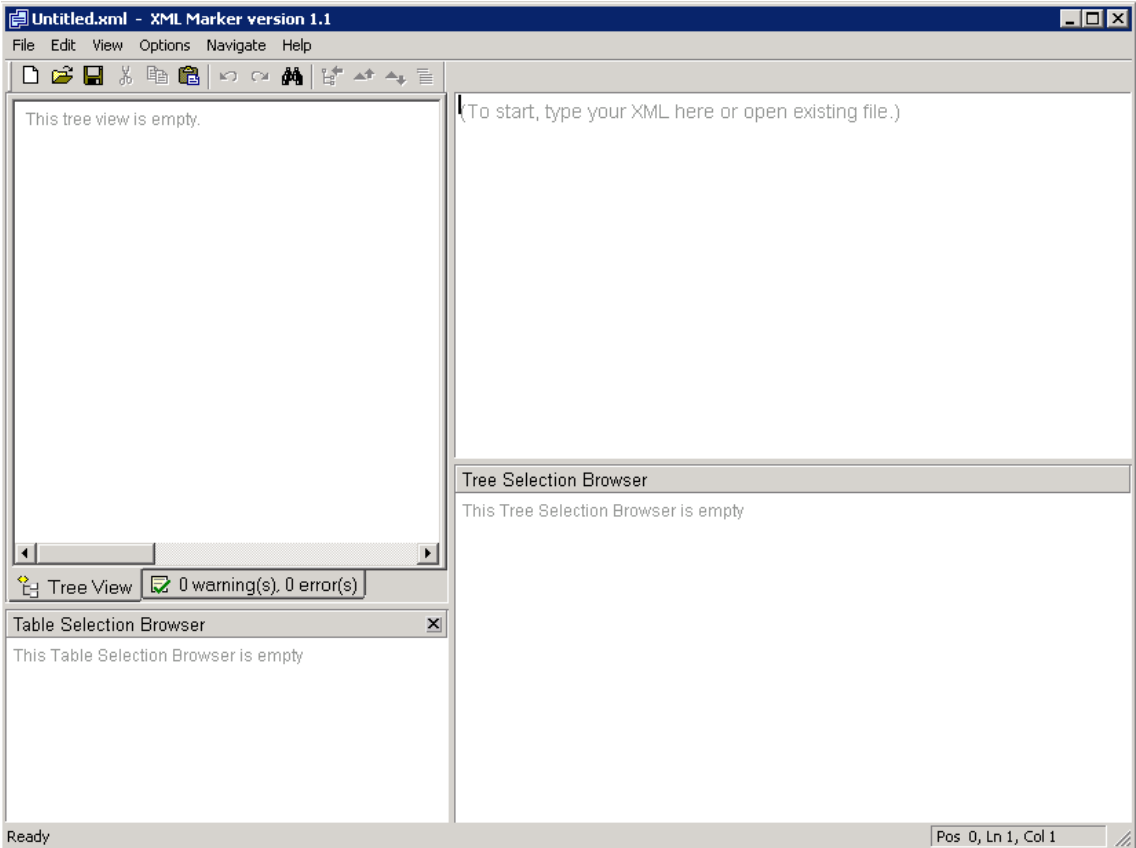
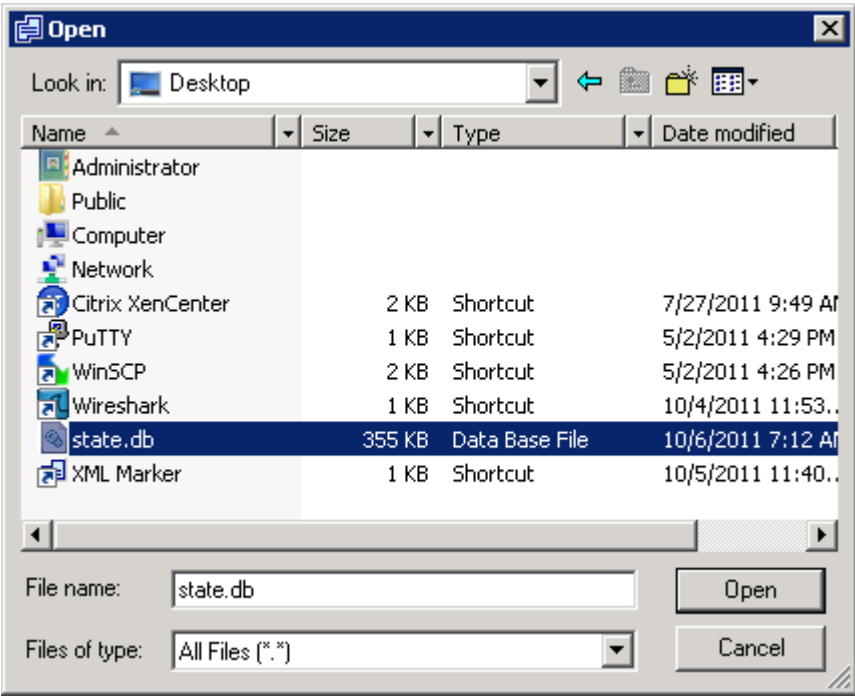
Step-by-step guidance

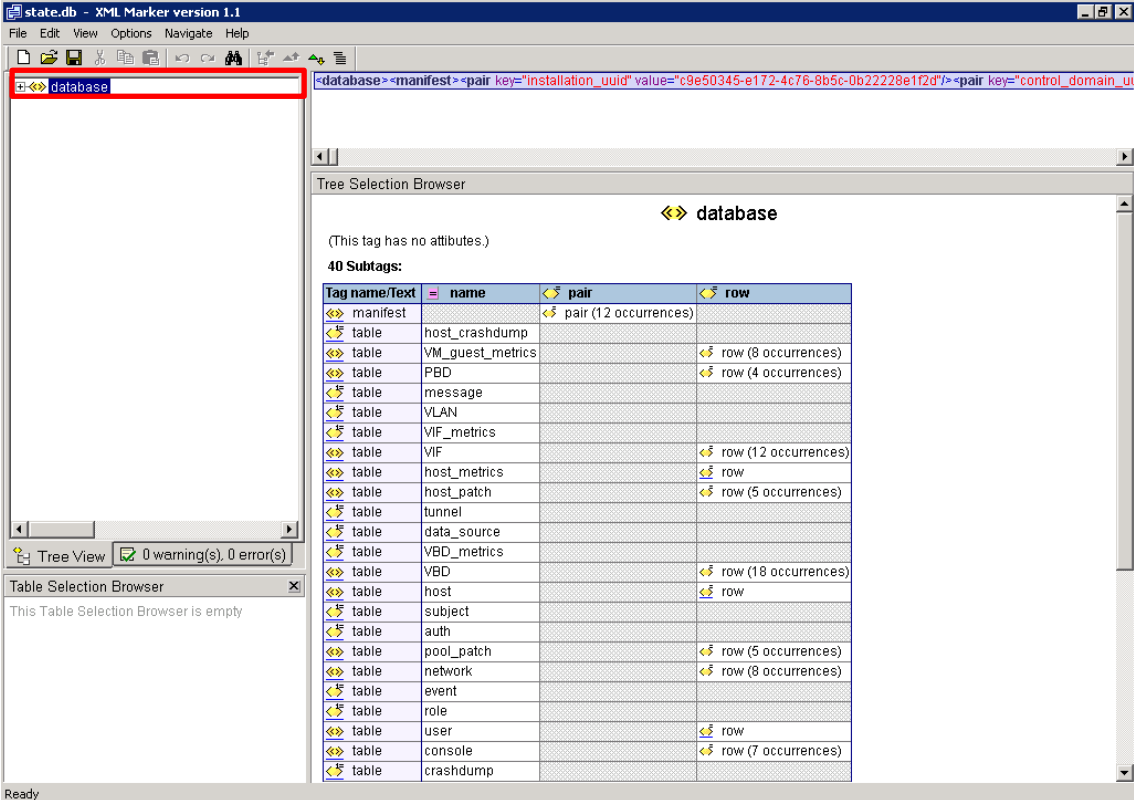
Estimated time to complete this lab: **15 minutes**.


Step	Action
	 Locate the database file via the CLI:
1.	<p>Launch a new SSH client OR duplicate an existing session of PuTTY from the Landing Desktop OR reuse an open session window.</p>  <pre> root@xsts-001:~ login as: root root@184.173.69.83's password: Last login: Mon Sep 26 04:24:15 2011 from 50.97.139.162-static.reverse.softlayer.com Type "xsconsole" for access to the management console. [root@xsts-001 ~]# </pre>
2.	<p>Navigate to the folder location containing the database</p> <p>e.g. <code>cd /var/xapi</code></p>  <pre> root@xsts-001:/var/xapi [root@xsts-001 /]# cd /var/xapi/ [root@xsts-001 xapi]# </pre>

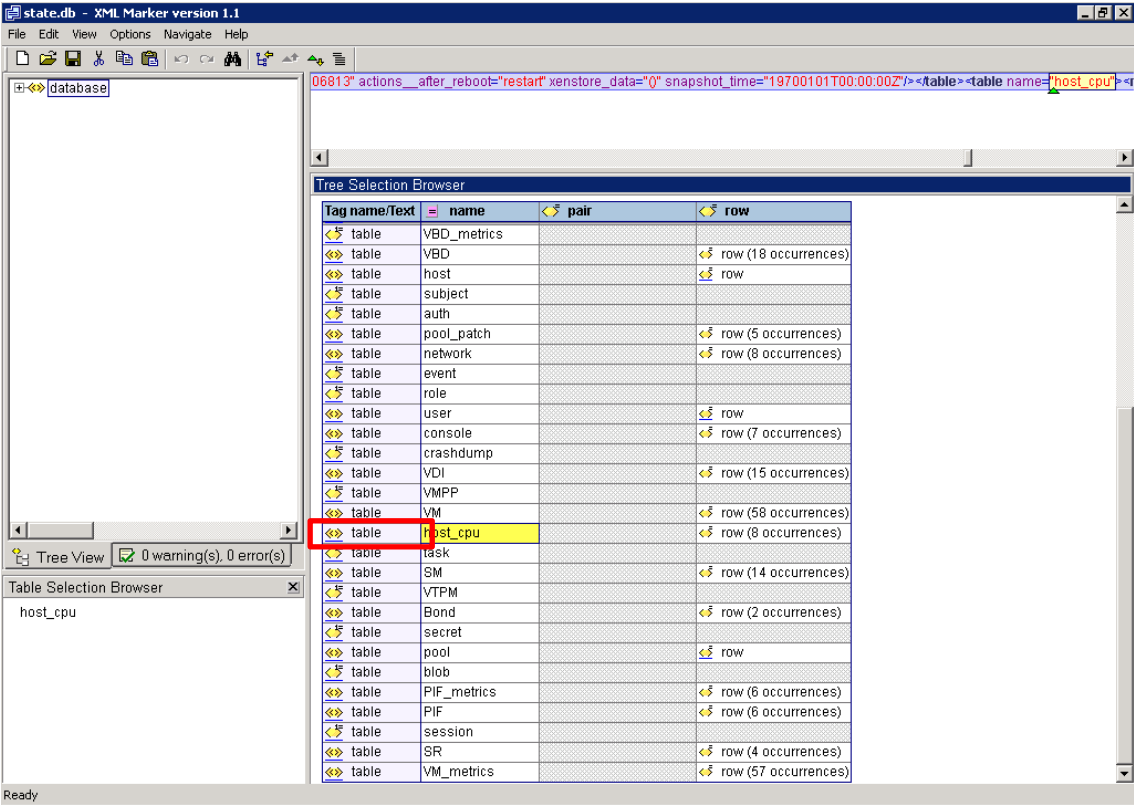
Step	Action
3.	<p>List the contents of the /var/xapi folder</p> <p>e.g. <code>ls</code></p>  <pre> root@xsts-001:/var/xapi [root@xsts-001 /]# cd /var/xapi/ [root@xsts-001 xapi]# ls blobs generate-iscsi-ign network.dbcache udhcpd.skel xapi-ssl.conf debug local.db state.db v6 forker lpe-cache state.db.generation xapi [root@xsts-001 xapi]# </pre>
4.	<p>Confirm the presence of the state.db file</p> <p>Note: Running <code>xe pool-dump-database</code> command is the same as copying the state.db to another location. This command is covered in Exercise 5.</p>
	<p> Use WinSCP to collect a copy of this file:</p>
5.	<p>Use an existing WinSCP session or re-launch WinSCP from your Landing Desktop by selecting your saved session information and click Login.</p> 

Step	Action																																																																											
6.	<p>Navigate to the <code>/var/xapi</code> folder location using WinSCP</p>  <p>The screenshot shows the WinSCP interface with the local pane on the left showing 'C:\Users\user\Documents' and the remote pane on the right showing '/var/xapi'. The remote pane contains a table of files:</p> <table border="1" data-bbox="842 510 1401 853"> <thead> <tr> <th>Name</th> <th>Ext</th> <th>Size</th> <th>Changed</th> <th>Rights</th> </tr> </thead> <tbody> <tr><td>..</td><td></td><td></td><td>26/07/2...</td><td>rw-r--r-x</td></tr> <tr><td>blobs</td><td></td><td></td><td>27/07/2...</td><td>rw-r--r-x</td></tr> <tr><td>debug</td><td></td><td></td><td>26/07/2...</td><td>rw-r-----</td></tr> <tr><td>forker</td><td></td><td></td><td>26/09/2...</td><td>rw-r--r-x</td></tr> <tr><td>lpe-cache</td><td></td><td></td><td>26/09/2...</td><td>rw-r--r-x</td></tr> <tr><td>generate-iscsi-ign</td><td></td><td>627</td><td>21/04/2...</td><td>rw-r--r-x</td></tr> <tr><td>local.db</td><td></td><td>913</td><td>26/09/2...</td><td>rw-r--r--</td></tr> <tr><td>network_dbcache</td><td></td><td>9,929</td><td>21/09/2...</td><td>rw-r--r--</td></tr> <tr style="border: 2px solid red;"><td>state.db</td><td></td><td>297,242</td><td>26/09/2...</td><td>rw-r-----</td></tr> <tr><td>state.db.generation</td><td></td><td>5</td><td>26/09/2...</td><td>rw-r--r--</td></tr> <tr><td>udhcpd.skel</td><td></td><td>660</td><td>21/04/2...</td><td>rw-r--r-x</td></tr> <tr><td>v6</td><td></td><td>0</td><td>26/07/2...</td><td>rw-r--r-x</td></tr> <tr><td>xapi</td><td></td><td>0</td><td>26/07/2...</td><td>rw-r--r-x</td></tr> <tr><td>xapi-ssl.conf</td><td></td><td>344</td><td>27/07/2...</td><td>rw-r--r--</td></tr> </tbody> </table>	Name	Ext	Size	Changed	Rights	..			26/07/2...	rw-r--r-x	blobs			27/07/2...	rw-r--r-x	debug			26/07/2...	rw-r-----	forker			26/09/2...	rw-r--r-x	lpe-cache			26/09/2...	rw-r--r-x	generate-iscsi-ign		627	21/04/2...	rw-r--r-x	local.db		913	26/09/2...	rw-r--r--	network_dbcache		9,929	21/09/2...	rw-r--r--	state.db		297,242	26/09/2...	rw-r-----	state.db.generation		5	26/09/2...	rw-r--r--	udhcpd.skel		660	21/04/2...	rw-r--r-x	v6		0	26/07/2...	rw-r--r-x	xapi		0	26/07/2...	rw-r--r-x	xapi-ssl.conf		344	27/07/2...	rw-r--r--
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7.	<p>Drag and drop a copy of the <code>state.db</code> file to the Landing Desktop</p>  <p>The screenshot shows the 'Copy' dialog box in WinSCP. The destination field is set to <code>C:\Users\Administrator\Desktop*</code>. The dialog includes options for transfer settings and buttons for 'Copy', 'Cancel', and 'Help'.</p>																																																																											
	<p> Review the contents of the <code>state.db</code> file:</p>																																																																											

Step	Action
8.	<p>Launch XML Marker from the Landing Desktop</p> 
9.	<p>Open the state.db file located on your Landing Desktop with XML Marker</p>  <p>Note: Ensure you select All Files from the Files of Type dropdown menu.</p>

Step	Action
10.	<p>Single click the Database object in the left column.</p>  <p>Note: Double clicking a database object in the bottom right panel (Tree Selection) will display the table/object rows and their description.</p>

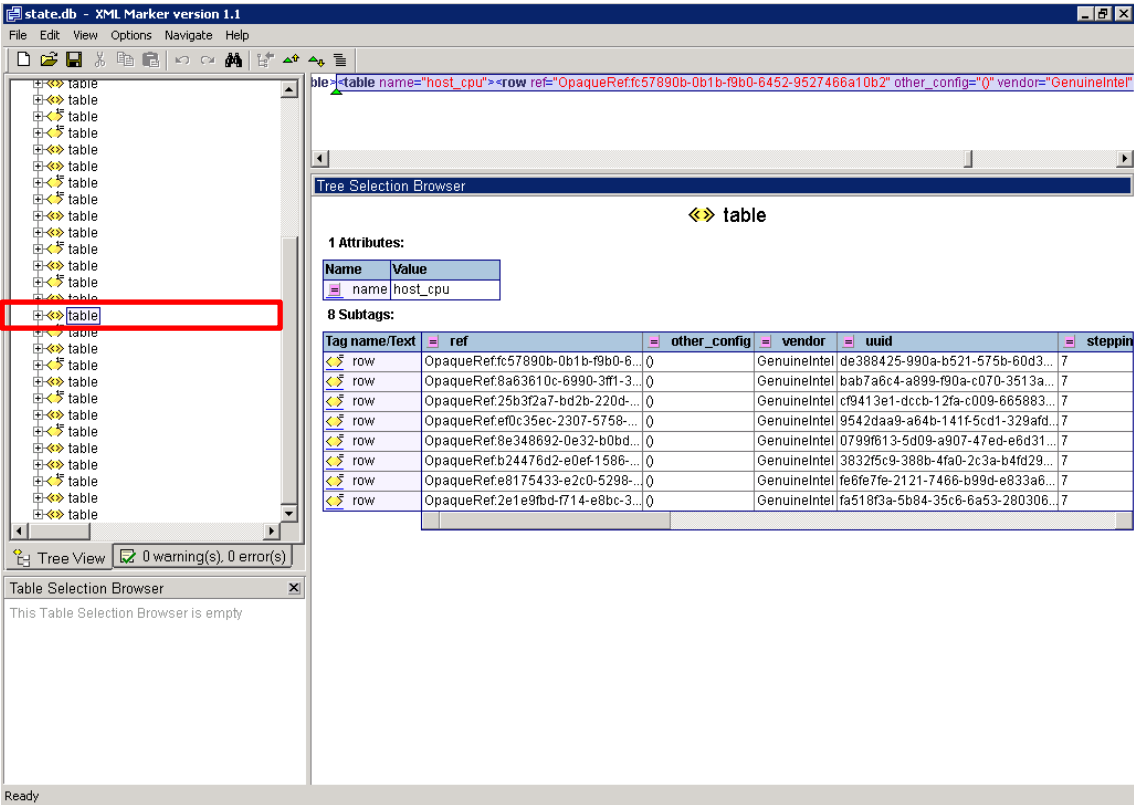
Step 11. In the right **Tree Selection Browser** pane click the table icon  associated with the **host_cpu** entry.



The screenshot shows the XML Marker interface. The 'Tree Selection Browser' pane on the right lists various table objects. The 'host_cpu' entry is highlighted in yellow. A red box highlights the table icon next to 'host_cpu'. The 'Table Selection Browser' pane at the bottom left shows 'host_cpu' selected.

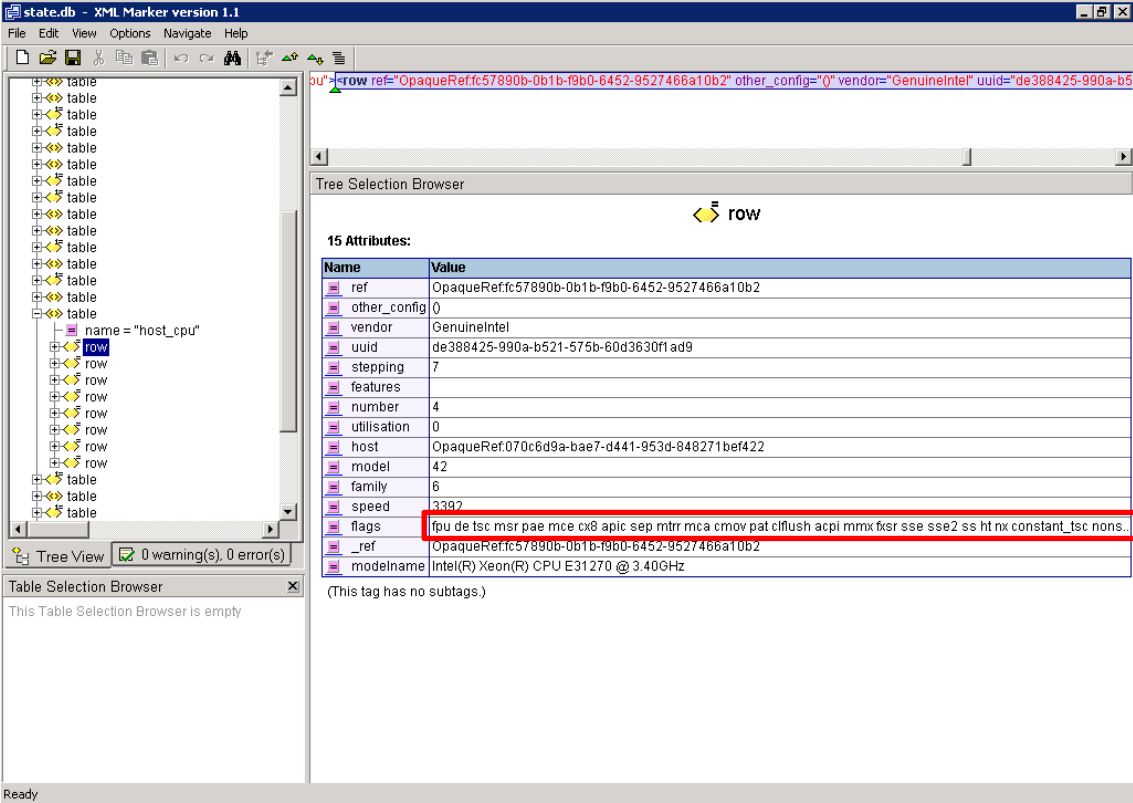


Tag name/Text	name	pair	row
table	VBD_metrics		
table	VBD		row (18 occurrences)
table	host		row
table	subject		
table	auth		
table	pool_patch		row (5 occurrences)
table	network		row (8 occurrences)
table	event		
table	role		
table	user		row
table	console		row (7 occurrences)
table	crashdump		
table	VDI		row (15 occurrences)
table	VMPP		
table	VM		row (58 occurrences)
table	host_cpu		row (8 occurrences)
table	task		
table	SM		row (14 occurrences)
table	VTPM		
table	Bond		row (2 occurrences)
table	secret		
table	pool		row
table	blob		
table	PIF_metrics		row (6 occurrences)
table	PIF		row (6 occurrences)
table	session		
table	SR		row (4 occurrences)
table	VM_metrics		row (57 occurrences)

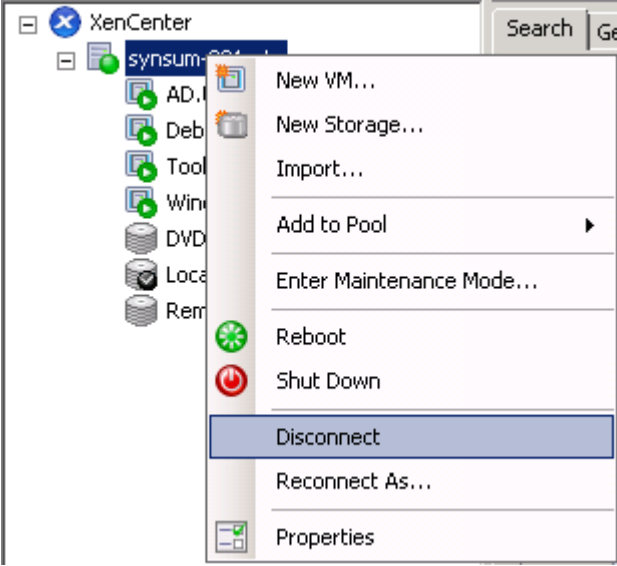
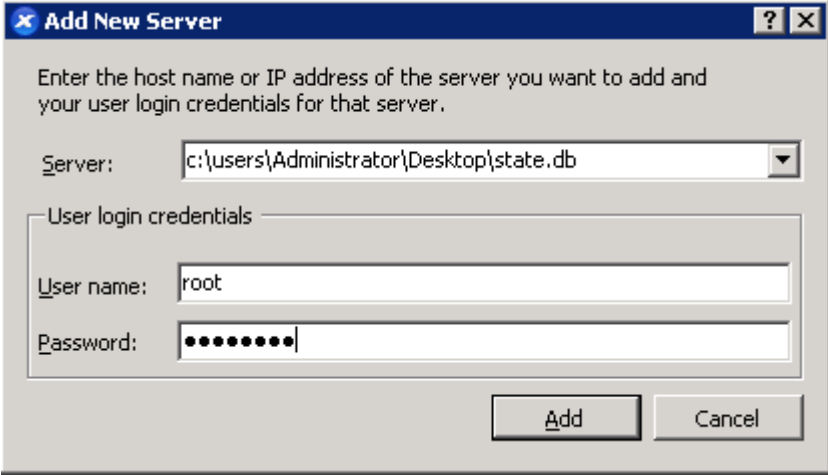
Step 12. Click the plus (+) sign for the highlighted table object and select the first row



The screenshot shows the XML Marker interface with the 'host_cpu' table expanded. The 'Tree Selection Browser' pane on the right shows the expanded table structure. The 'Table Selection Browser' pane at the bottom left shows 'This Table Selection Browser is empty'. The main XML view shows the expanded table structure with the first row selected.

Tag name/Text	ref	other_config	vendor	uuid	steppin
row	OpaqueRef:c57890b-0b1b-f9b0-6...	0	GenuineIntel	de388425-990a-b521-575b-60d3...	7
row	OpaqueRef:8a63610c-6990-3ff1-3...	0	GenuineIntel	bab7a6c4-a899-f90a-c070-3513a...	7
row	OpaqueRef:25b3f2a7-bd2b-220d-...	0	GenuineIntel	cf9413e1-dccb-12fa-c009-665883...	7
row	OpaqueRef:ef0c35ec-2307-5758-...	0	GenuineIntel	9542daa9-a64b-141f-5cd1-329afd...	7
row	OpaqueRef:8e348692-0e32-b0bd-...	0	GenuineIntel	0799f613-5d09-a907-47ed-e6d31...	7
row	OpaqueRef:b24476d2-e0ef-1586-...	0	GenuineIntel	3832f5c9-388b-4fa0-2c3a-b4fd29...	7
row	OpaqueRef:e8175433-e2c0-5298-...	0	GenuineIntel	fe6fe7fe-2121-7466-b99d-e833a6...	7
row	OpaqueRef:2e1e9fbd-714-e8bc-3...	0	GenuineIntel	fa518f3a-5b84-35c6-6a53-280306...	7

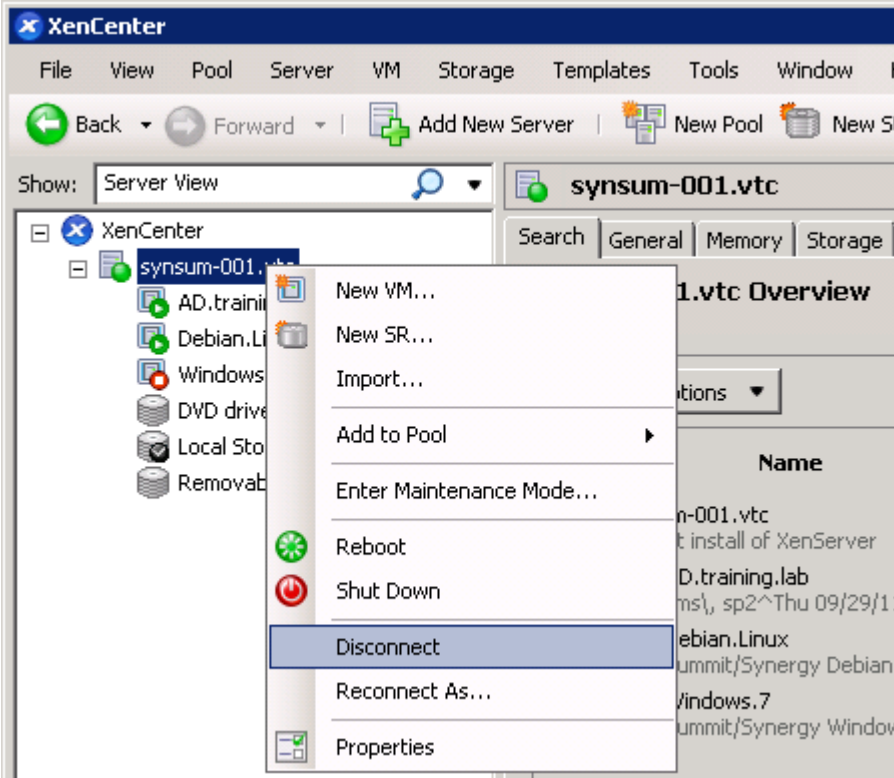
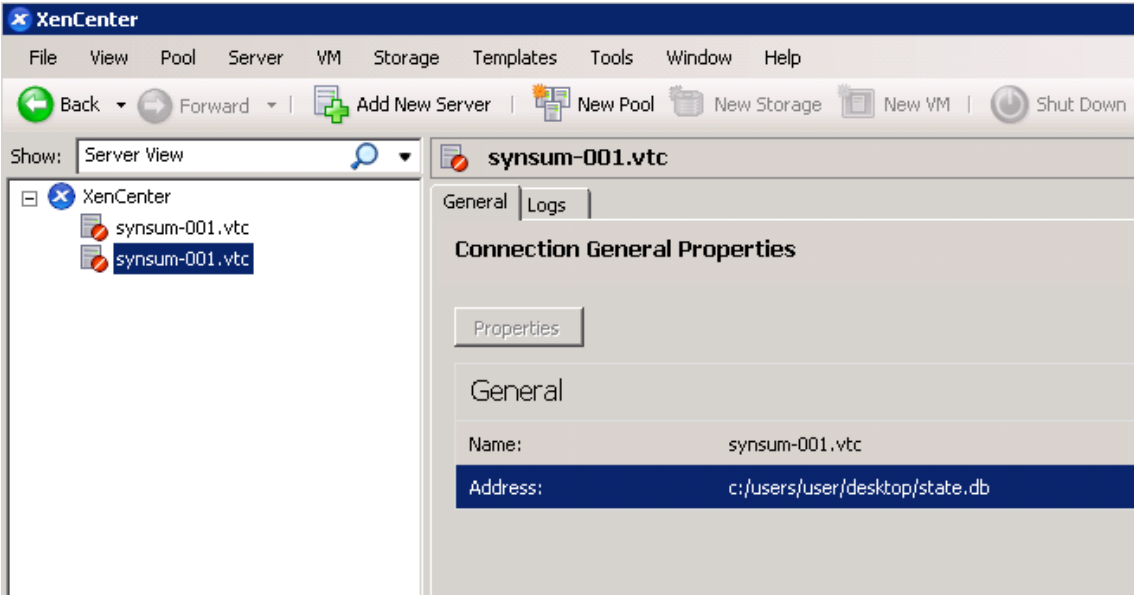
Step	Action
13.	<p>Review the CPU flag information contained in the database</p>  <p>Note: This table contains the CPU information detected by the Control Domain (dom0). The flags section contains the CPU features/functions detected.</p> <p>Warning: Do not edit a live database as this can corrupt the configuration and affect your environment.</p>
14.	Feel free to explore the database further to view the content contained within it
15.	 Close the XMLMarker application
	 Use XenCenter to open a copied database to display basic information about a pool/host configuration:

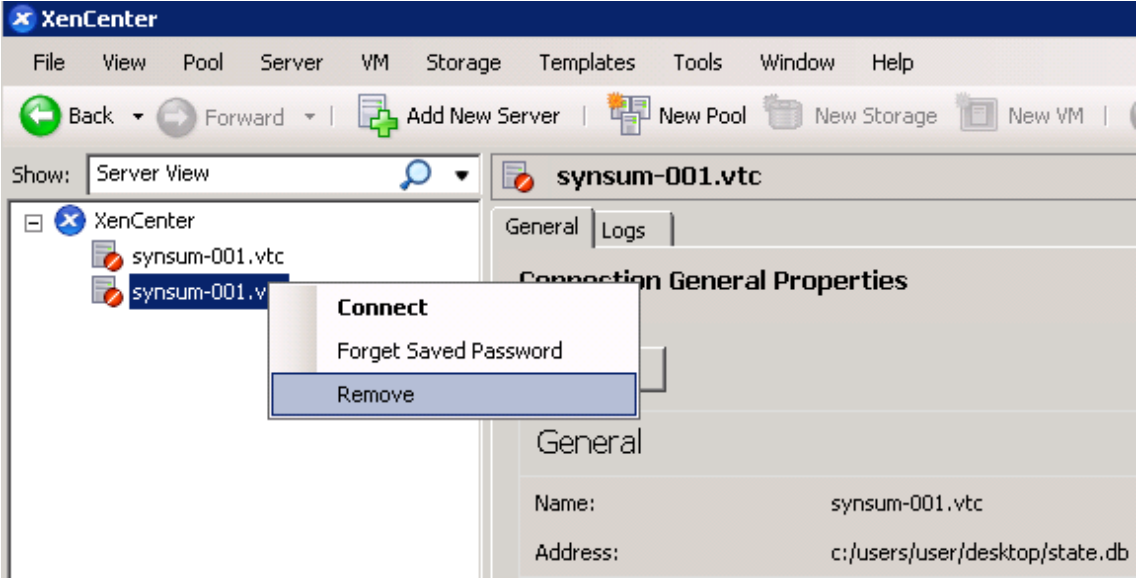
Step	Action
16.	<p>Right click on your XenServer host and select Disconnect</p> 
17.	<p>In XenCenter click ADD a Server and enter the location of the copied state.db (<code>c:\users\Administrator\Desktop\state.db</code>) file instead of the IP address.</p> 

Step	Action
18.	Navigate through the settings to review the host configuration

Name	CPU Usage	Used Memory	Disks (avg / max KBs)	Network (avg / max KBs)
synsum-001.vtc Default install of XenServer	1% of 8 CPUs	10705 of 16374 MB	-	1/2
AD.training.lab lms\, sp2~Thu 09/29/11; Version: 1	0% of 1 CPU	553 of 2048 MB	0/0	0/0
Debian.Linux Summit/Synergy Debian.Linux VM...	0% of 1 CPU	140 of 2048 MB	7/22	0/0
Windows.7 Summit/Synergy Windows.7 VM^T...	-	-	-	-

Note: The information displayed is static and represents the state of the pool/host when the state.db was copied.

Step	Action
19.	<p>Disconnect from the “New Server” we added in the previous step.</p>  <p>The screenshot shows the XenCenter interface with a context menu open over a server connection. The menu items include: New VM..., New SR..., Import..., Add to Pool, Enter Maintenance Mode..., Reboot, Shut Down, Disconnect (highlighted), Reconnect As..., and Properties.</p>
20.	<p>Remove the newly added server connection information. Ensure that the correct entry is removed by verifying the Address parameter on the General tab in XenCenter.</p>  <p>The screenshot shows the XenCenter interface with the 'Connection General Properties' dialog box open. The 'Address' field is highlighted, showing the path c:/users/user/desktop/state.db. The 'Name' field shows synsum-001.vtc.</p>

Step	Action
21.	<p>Right click and select Remove</p> 
END OF EXERCISE	

Summary

<p>Key Takeaways</p>	<p>The key takeaways for this exercise are:</p> <ul style="list-style-type: none"> • You will be able to locate, collect the pool/host database. • You will be able to view database information using 3rd party tools (XML Marker) or XenCenter.
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Exercise 5: Backing up XenServer

Overview

In this exercise we will review possible backup options in XenServer. To mitigate the increased risks of failures in a virtual environment it is critical that a properly designed backup and recovery plan is in place.


XenServer allows for the backup of three types of data i.e. Control Domain, VM and Pool/VM Metadata which we will review in this exercise.

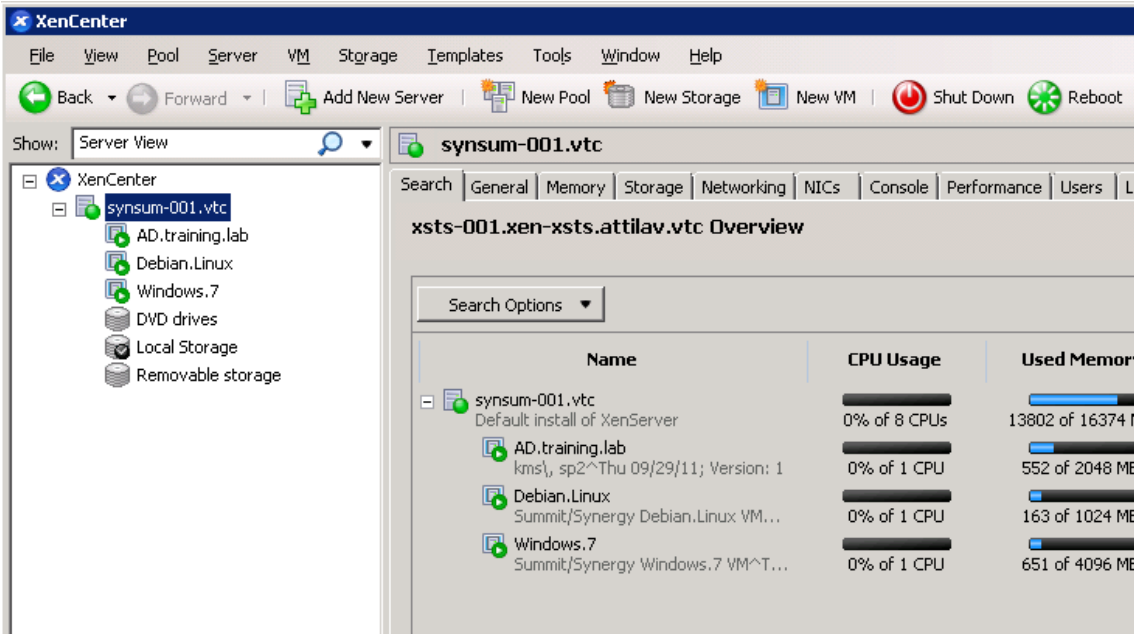
To complete this exercise, you must have the following:

- XenCenter
- SSH Client (PuTTY)

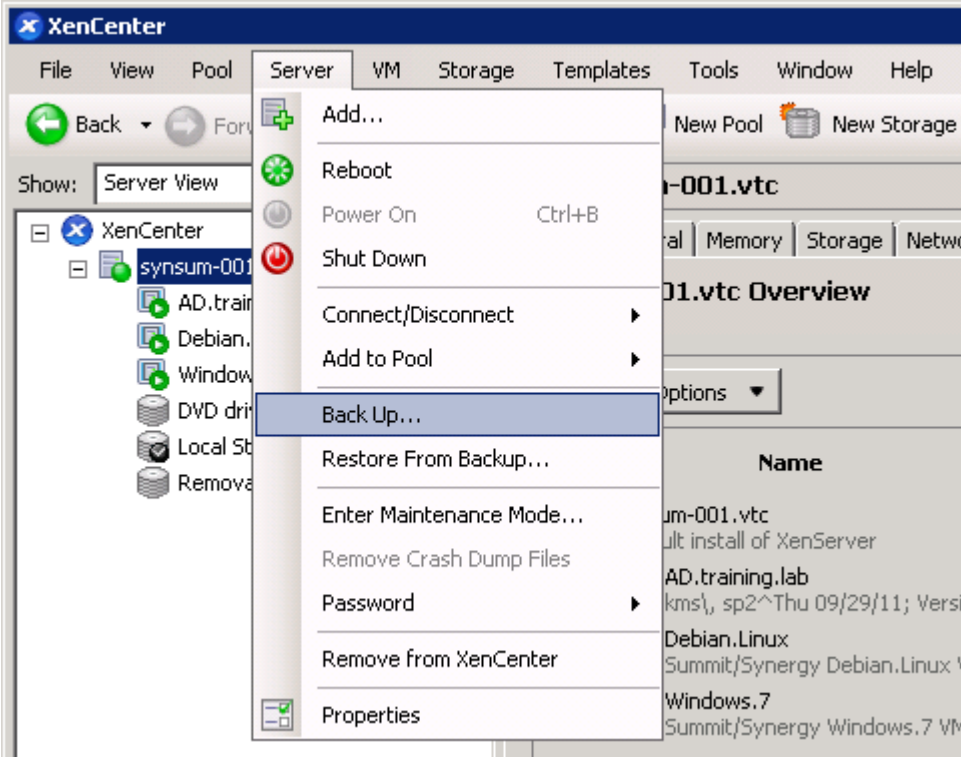
Step-by-step guidance

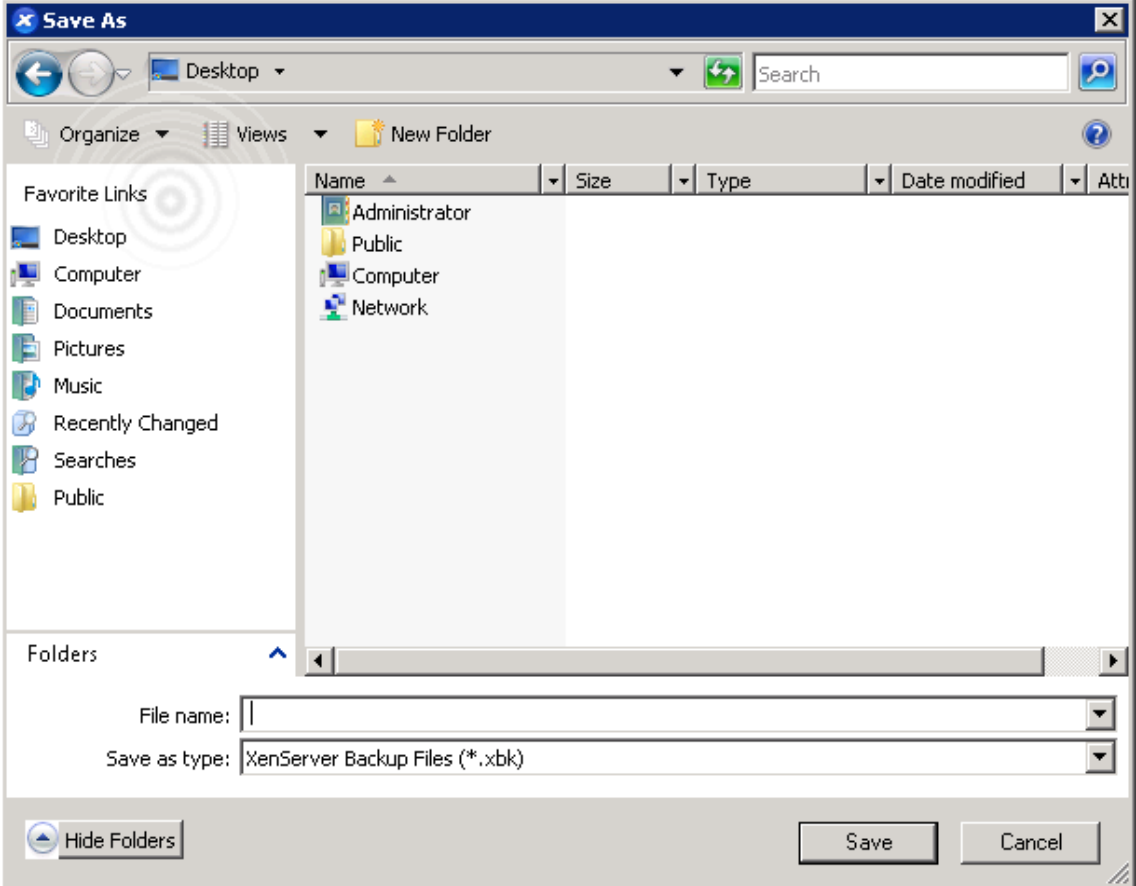
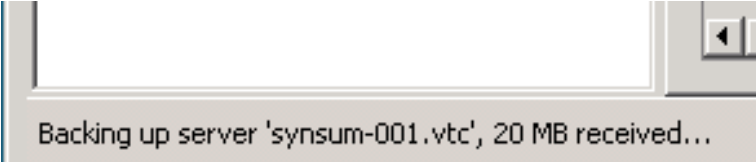



Estimated time to complete this lab: **15 minutes.**

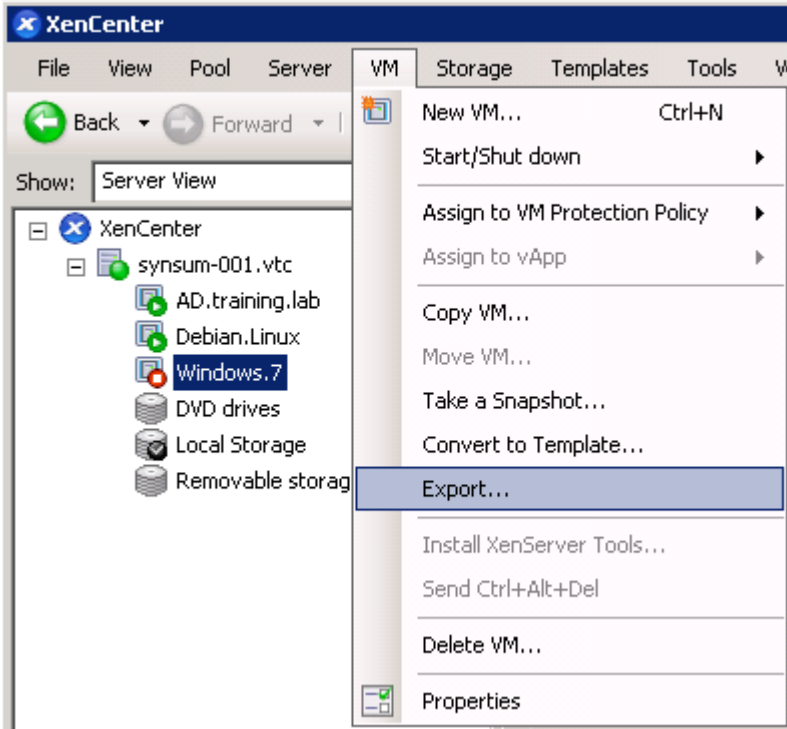
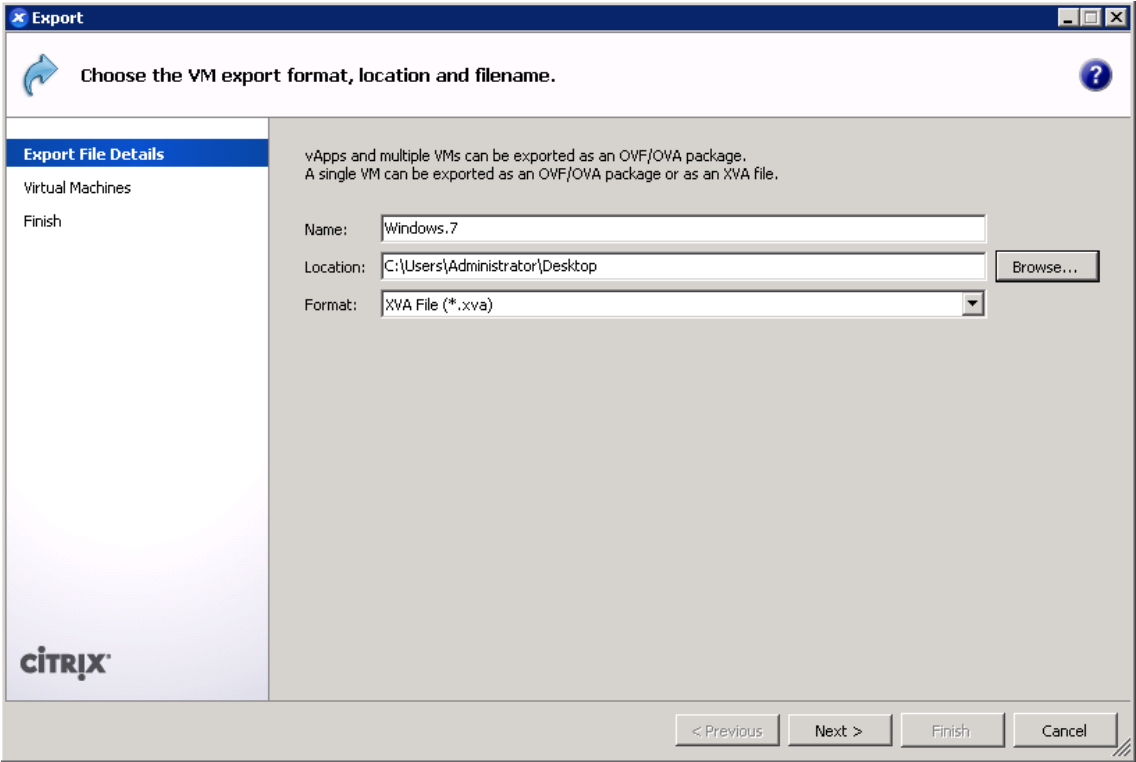
Step	Action
	 Backup a XenServer Host via XenCenter:
1.	Launch XenCenter and connect to your designated XenServer (if required)
2.	Highlight the XenServer host which we want to backup. In your environment a single host will be available.

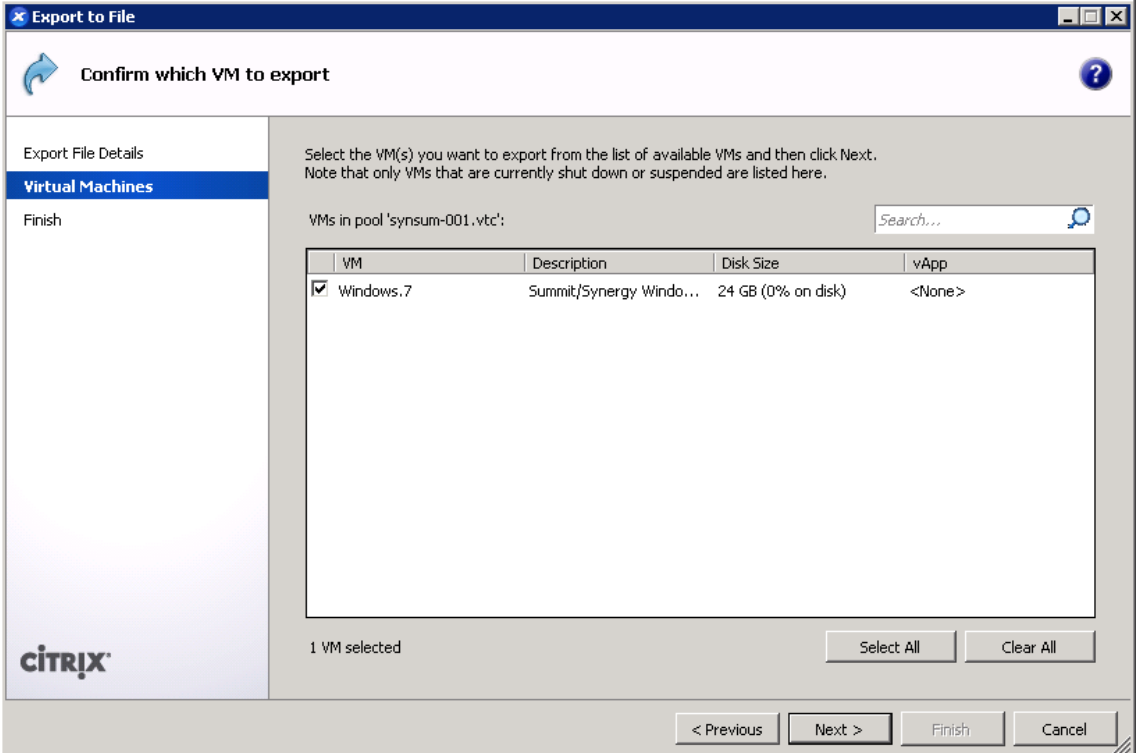
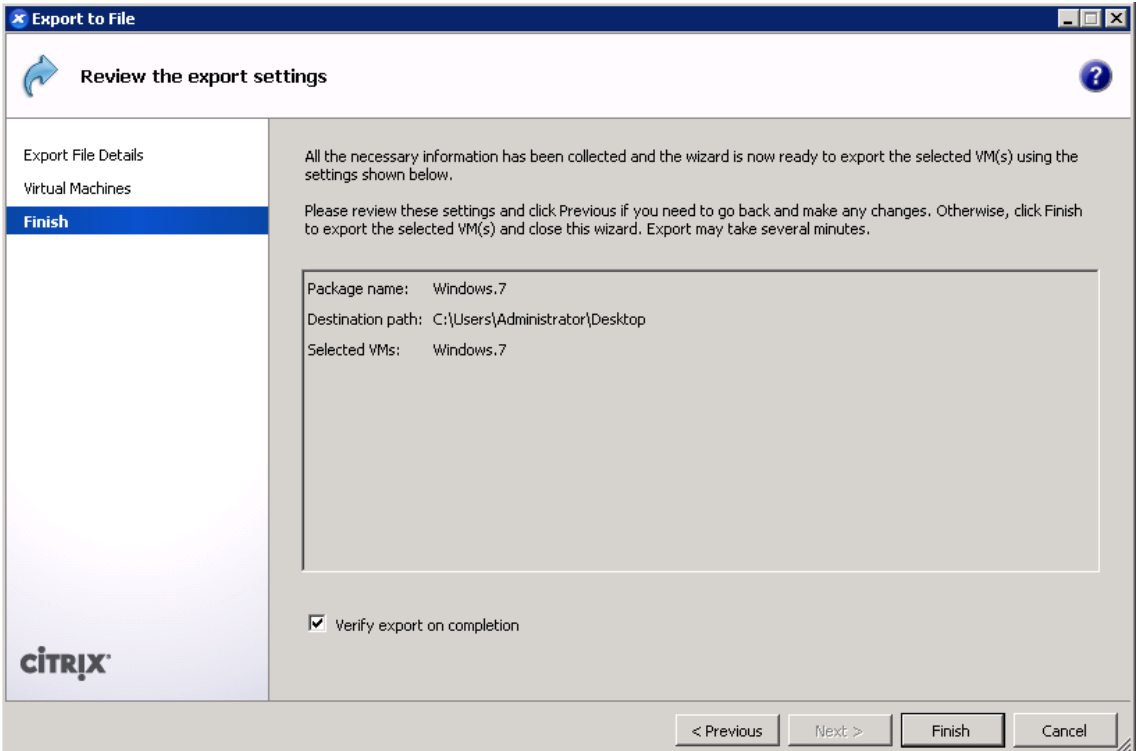


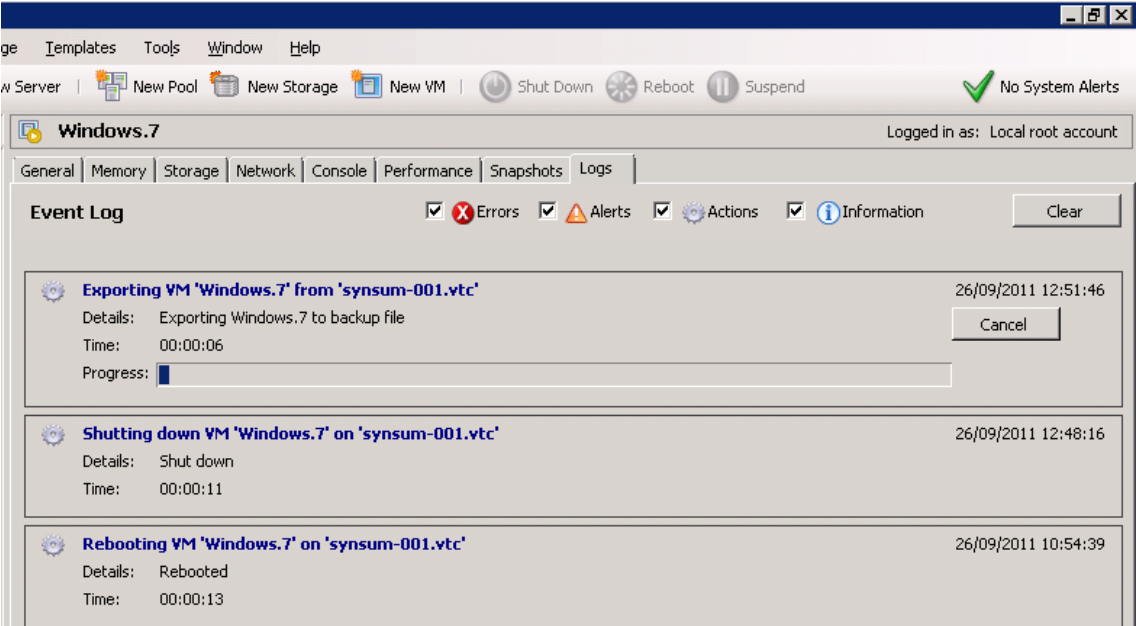

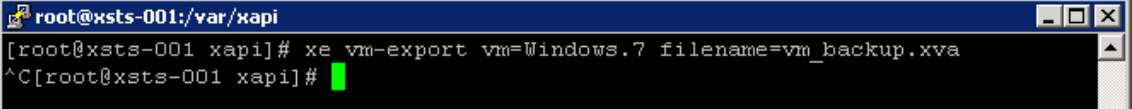

Name	CPU Usage	Used Memory
synsum-001.vtc Default install of XenServer	0% of 8 CPUs	13802 of 16374 M
AD.training.lab kms\, sp2^Thu 09/29/11; Version: 1	0% of 1 CPU	552 of 2048 ME
Debian.Linux Summit/Synergy Debian.Linux VM...	0% of 1 CPU	163 of 1024 ME
Windows.7 Summit/Synergy Windows.7 VM^T...	0% of 1 CPU	651 of 4096 ME

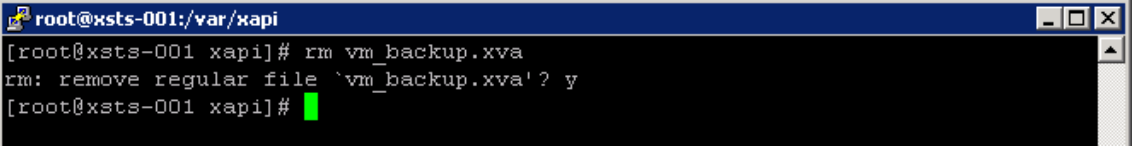

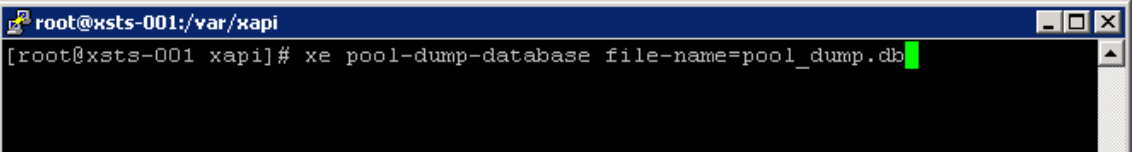
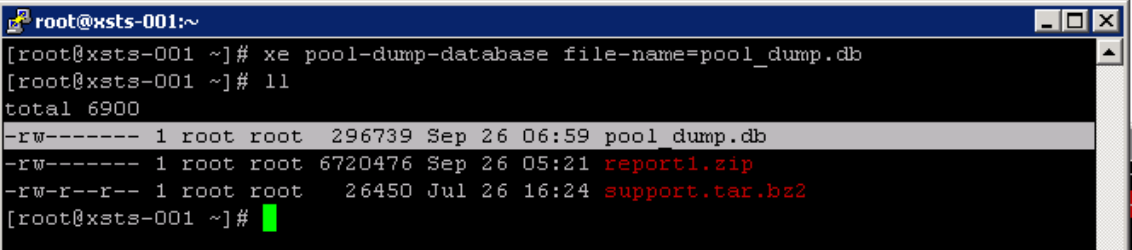
Step	Action
3.	<p>Click Server > Back Up...</p>  <p>The screenshot shows the XenCenter application window. The 'Server' menu is open, and the 'Back Up...' option is highlighted. The background shows a tree view with 'synsum-001' selected and a list of VMs including 'AD.training.lab', 'Debian.Linux', and 'Windows.7'.</p>

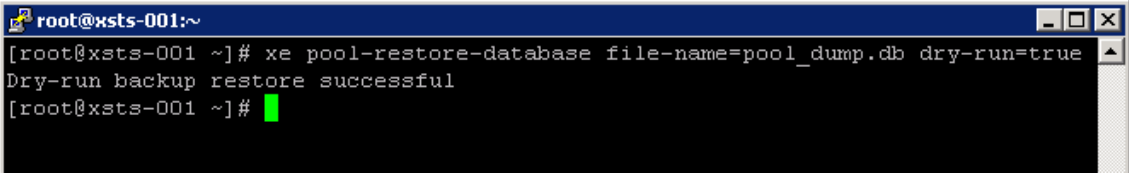

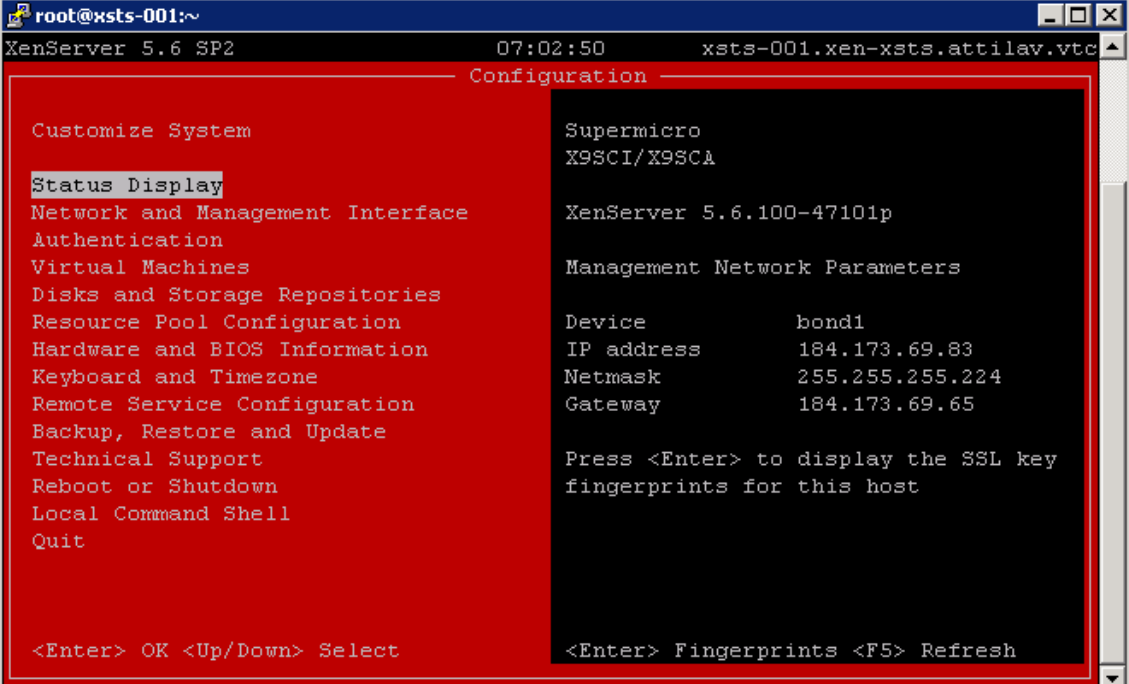
Step	Action
4.	<p>Provide a filename for the backup file e.g. host_backup.xbk and save the file to your Landing Desktop.</p>  <p>Note: The backup should take a couple of minutes to complete</p>
5.	<p>Verify the backup process is running by reviewing the status bar at the bottom of the XenCenter console</p> 
6.	<p>The .xbk file will appear on the Landing Desktop when the backup is complete</p>  <p>Note: The backup file is generally about 500MB in size</p>
7.	<p> Delete the host_backup.xbk file from the Landing Desktop</p>
	<p> Backup a virtual machine:</p>

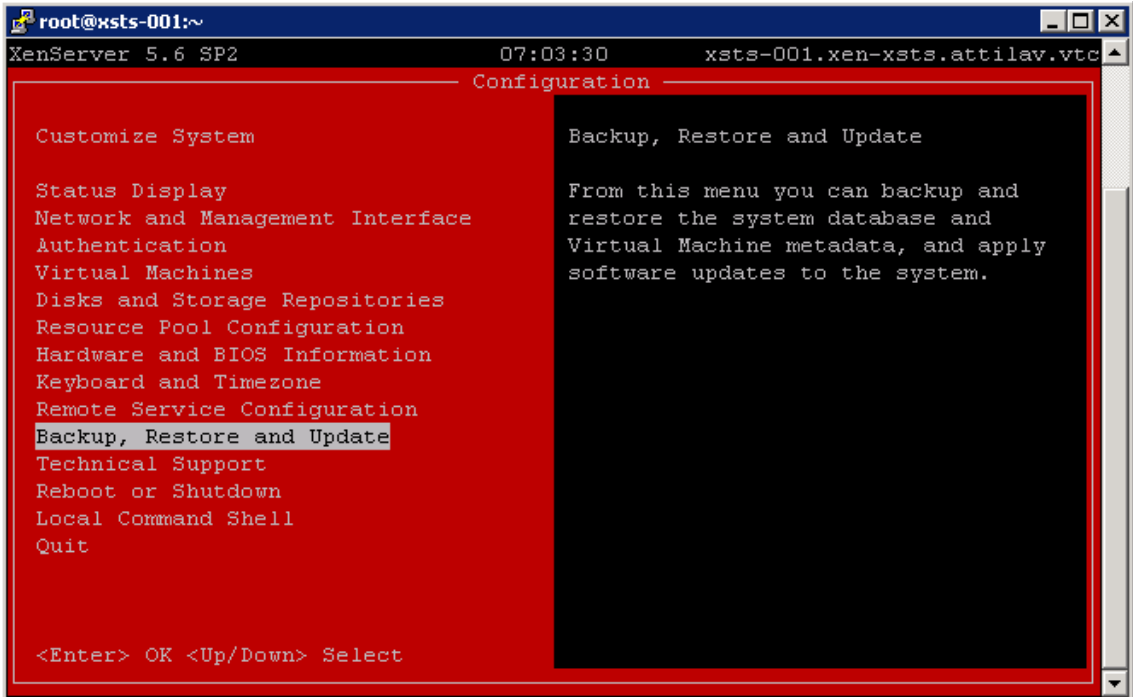
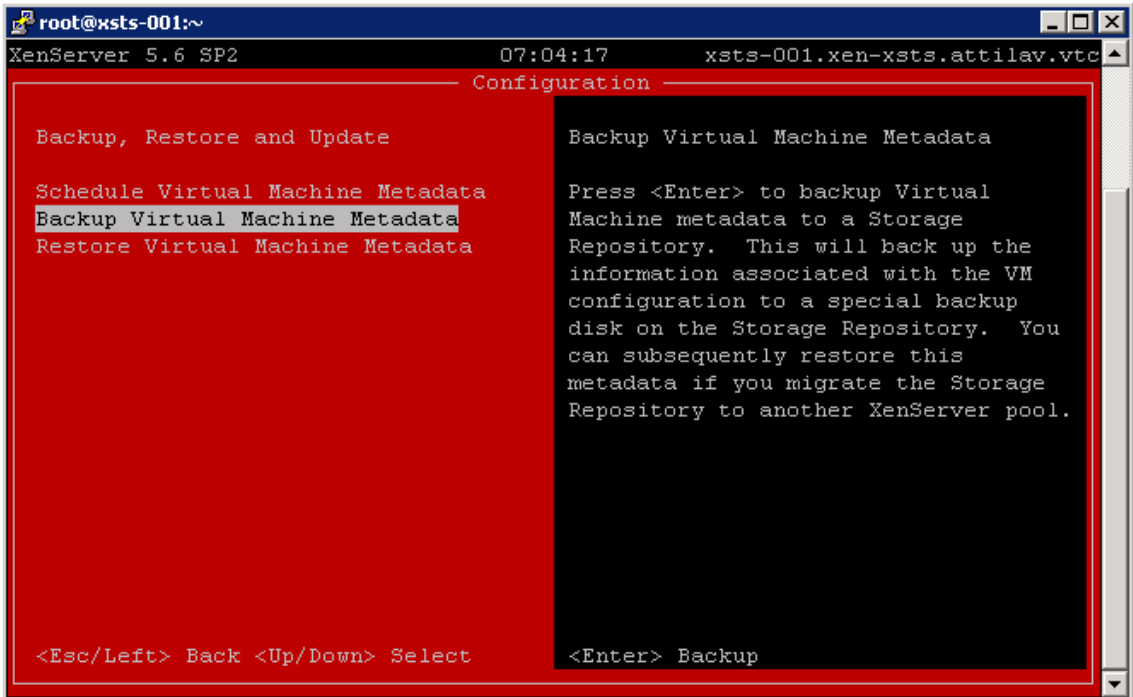
Step	Action
8.	<p>Ensure the Windows.7 virtual machine is in a stopped state before exporting. Highlight the Windows.7 virtual machine and click VM > Export...</p>  <p>The screenshot shows the XenCenter application window. The 'VM' menu is open, and the 'Export...' option is highlighted. The left pane shows a tree view with 'Windows.7' selected under the 'synsum-001.vtc' pool.</p>
9.	<p>Select the Landing Desktop as the save location and specify the format as XVA File (*.xva) and click Next</p>  <p>The screenshot shows the 'Export' dialog box. The 'Name' field is 'Windows.7', the 'Location' is 'C:\Users\Administrator\Desktop', and the 'Format' is 'XVA File (*.xva)'. The 'Next >' button is highlighted.</p>

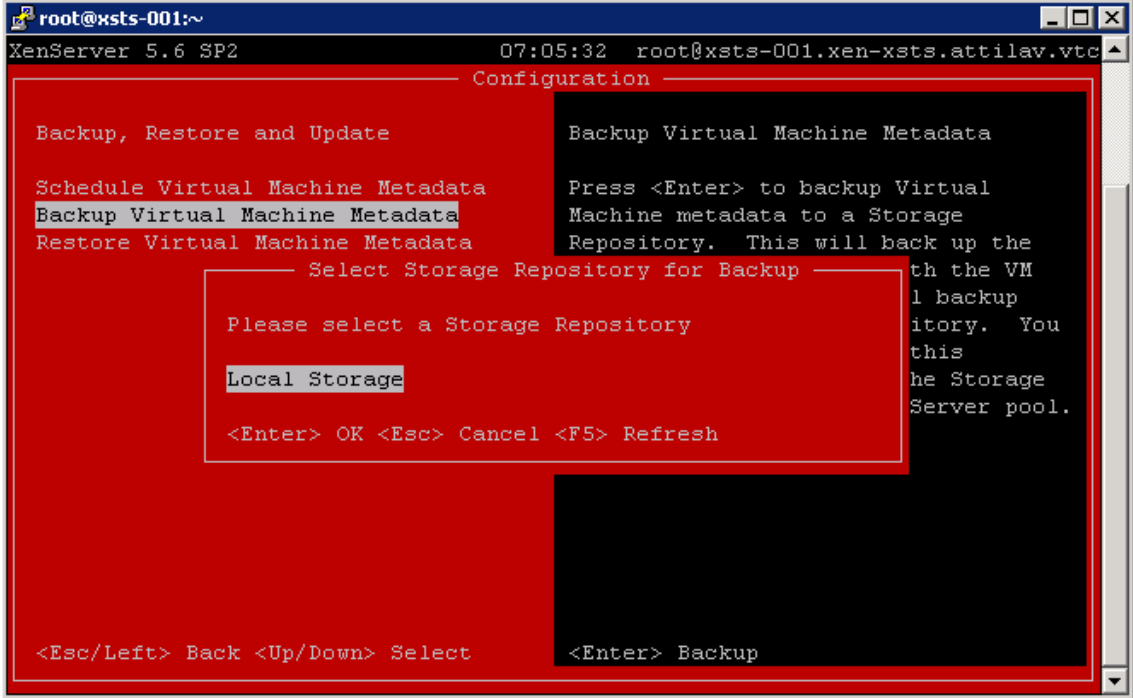
Step	Action								
10.	<p>Confirm the Windows.7 VM is selected and click Next</p>  <p>Export File Details</p> <p>Virtual Machines</p> <p>Finish</p> <p>Confirm which VM to export</p> <p>Select the VM(s) you want to export from the list of available VMs and then click Next. Note that only VMs that are currently shut down or suspended are listed here.</p> <p>VMs in pool 'synsum-001.vtc':</p> <table border="1"> <thead> <tr> <th>VM</th> <th>Description</th> <th>Disk Size</th> <th>vApp</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> Windows.7</td> <td>Summit/Synergy Windo...</td> <td>24 GB (0% on disk)</td> <td><None></td> </tr> </tbody> </table> <p>1 VM selected</p> <p>Select All Clear All</p> <p>< Previous Next > Finish Cancel</p>	VM	Description	Disk Size	vApp	<input checked="" type="checkbox"/> Windows.7	Summit/Synergy Windo...	24 GB (0% on disk)	<None>
VM	Description	Disk Size	vApp						
<input checked="" type="checkbox"/> Windows.7	Summit/Synergy Windo...	24 GB (0% on disk)	<None>						
11.	<p>Click Finish to start the export process</p>  <p>Export File Details</p> <p>Virtual Machines</p> <p>Finish</p> <p>Review the export settings</p> <p>All the necessary information has been collected and the wizard is now ready to export the selected VM(s) using the settings shown below.</p> <p>Please review these settings and click Previous if you need to go back and make any changes. Otherwise, click Finish to export the selected VM(s) and close this wizard. Export may take several minutes.</p> <p>Package name: Windows.7 Destination path: C:\Users\Administrator\Desktop Selected VMs: Windows.7</p> <p><input checked="" type="checkbox"/> Verify export on completion</p> <p>< Previous Next > Finish Cancel</p>								

Step	Action
12.	<p>Follow the backup process by clicking on Windows.7 VM and selecting the Logs tab</p> 
13.	<p> Click Cancel in the Log tab for the Windows.7 VM</p> <p>Note: For the purposes of this Learning Lab we will cancel the process as it can take some time for the process to complete.</p>
14.	<p>The above mentioned backup/export actions can also be complete via the CLI using the xe command</p> <p>e.g. xe vm-export vm=Windows.7 filename=windows7.xva</p>  <p> Press CTRL+C to cancel the process.</p> <p>Note: For the purposes of this learning lab we will cancel the process as it can take some time for the process to complete.</p> <p>Note: The export location will be the current folder unless otherwise specified</p> <p>Note: It is recommended to export VM to a share attached to the host/pool</p>

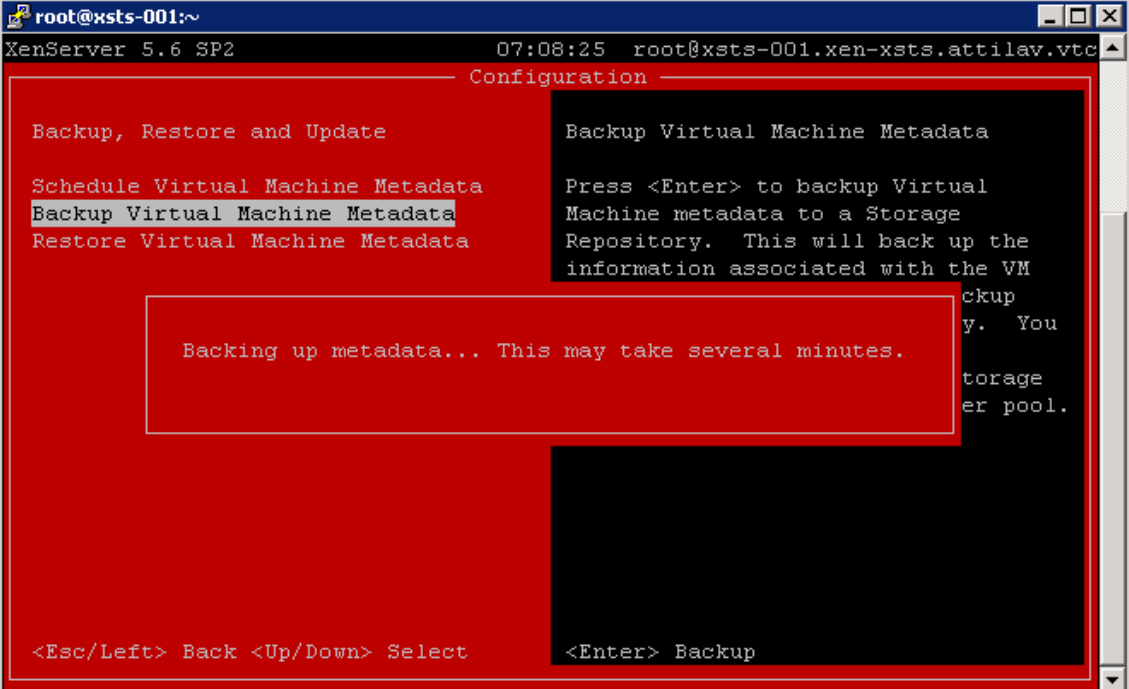
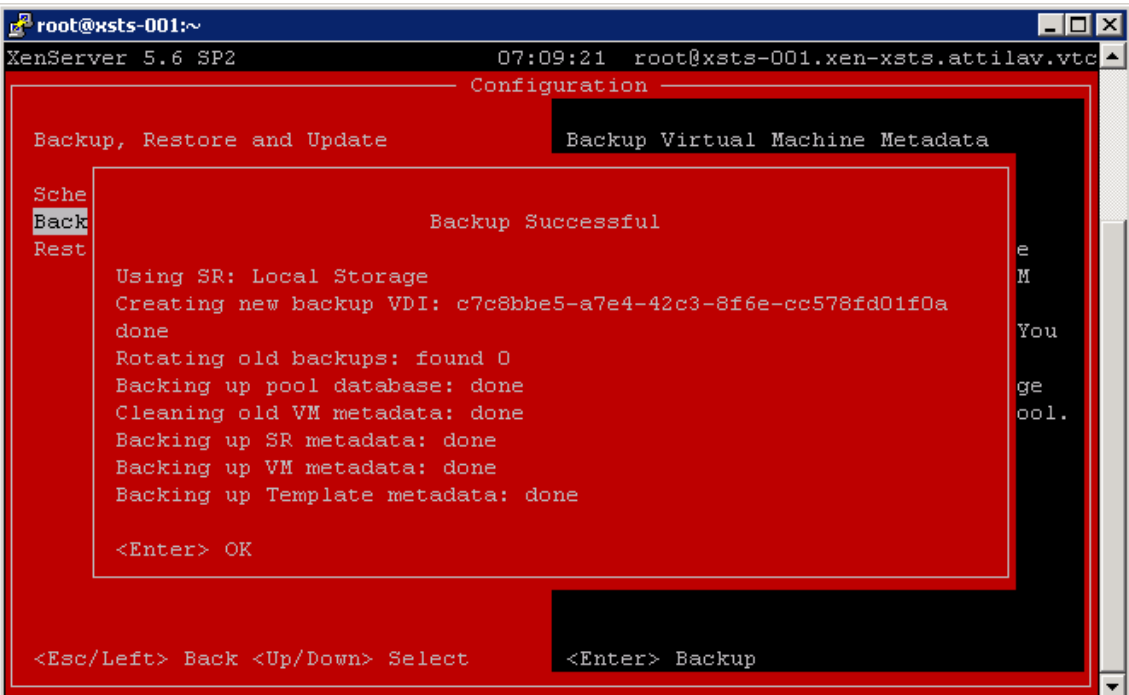
Step	Action
15.	<p>Delete the exported VM file from Dom0</p> <p>e.g. rm vm_backup.xva</p>  <p>Note: If the filesystem for dom0 is full the xapi service will be unable to start. To check the available space on dom0 (/dev/sda1) use the df -h command.</p>
	<p> Back up the host/pool configuration database:</p>
16.	<p>Launch a new SSH client OR duplicate an existing session of PuTTY from the Landing Desktop OR reuse an open session window.</p>
17.	<p>Use the xe command to generate a pool/host configuration backup</p> <p>e.g. xe pool-dump-database file-name=[filename]</p>  <p>Note: Every server in the pool will have a copy of this database however it is recommended to run this command on the master server.</p>
18.	<p>Confirm the backup has completed successfully by running ls -l and confirming the pool_dump.db file was generated.</p> 

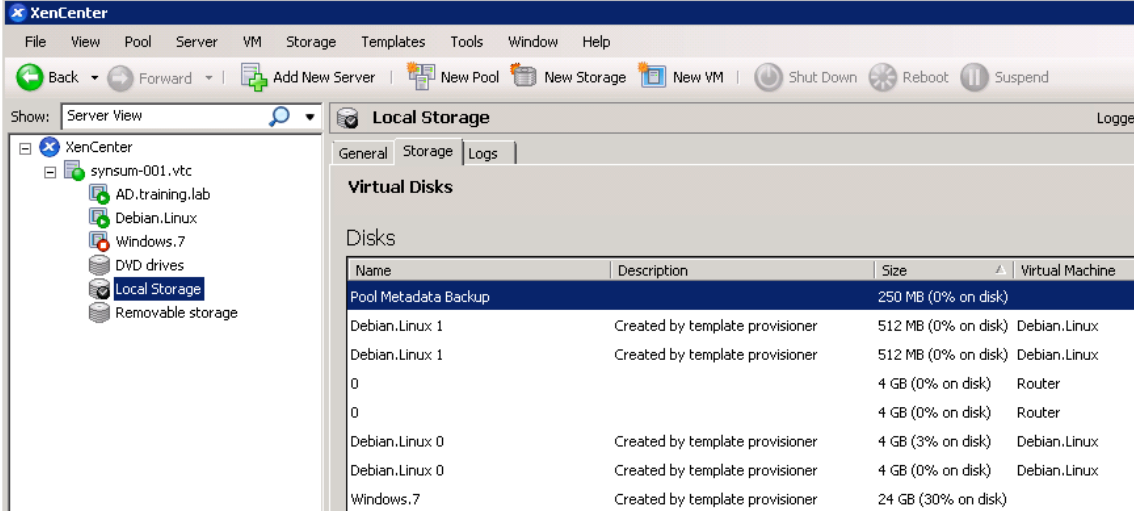

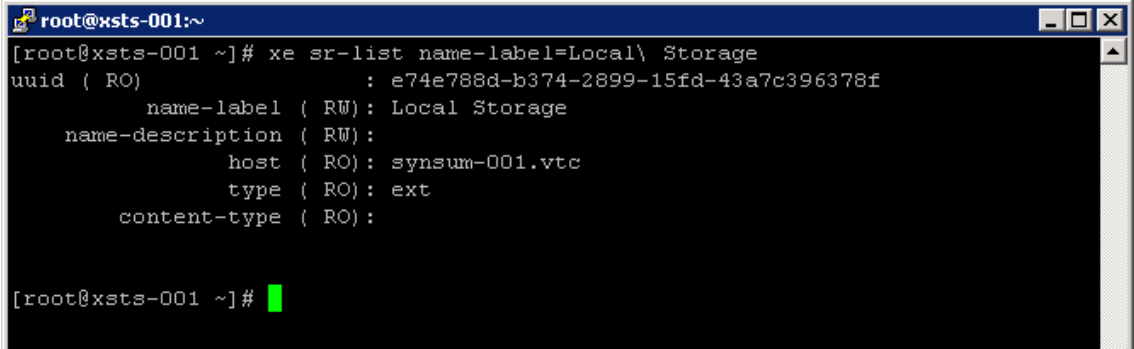
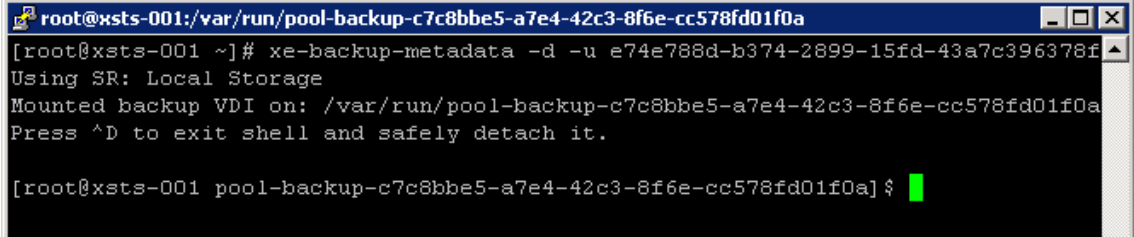
Step	Action
19.	<p>To restore from a database backup use the xe command</p> <p>e.g. xe pool-restore-database file-name=[filename] dry-run=true</p>  <pre> root@xsts-001:~ [root@xsts-001 ~]# xe pool-restore-database file-name=pool_dump.db dry-run=true Dry-run backup restore successful [root@xsts-001 ~]# </pre> <p>Note: It is <u>highly recommended</u> to do a dry-run of the restore before completing the process. This is accomplished by adding the dry-run= parameter to the restore command.</p> <p>Note: The xe toolstack needs to be restarted after a restore process is completed i.e. xe-toolstack-restart.</p>
	 Backup virtual machine metadata:
20.	<p>From the SSH console session launch the xsconsole</p> <p>e.g. xsconsole</p>  <pre> root@xsts-001:~ XenServer 5.6 SP2 07:02:50 xsts-001.xen-xsts.attilav.vtc ----- Configuration ----- Customize System Status Display Network and Management Interface Authentication Virtual Machines Disks and Storage Repositories Resource Pool Configuration Hardware and BIOS Information Keyboard and Timezone Remote Service Configuration Backup, Restore and Update Technical Support Reboot or Shutdown Local Command Shell Quit Supermicro X9SCI/X9SCA XenServer 5.6.100-47101p Management Network Parameters Device bond1 IP address 184.173.69.83 Netmask 255.255.255.224 Gateway 184.173.69.65 Press <Enter> to display the SSL key fingerprints for this host <Enter> OK <Up/Down> Select <Enter> Fingerprints <F5> Refresh </pre>

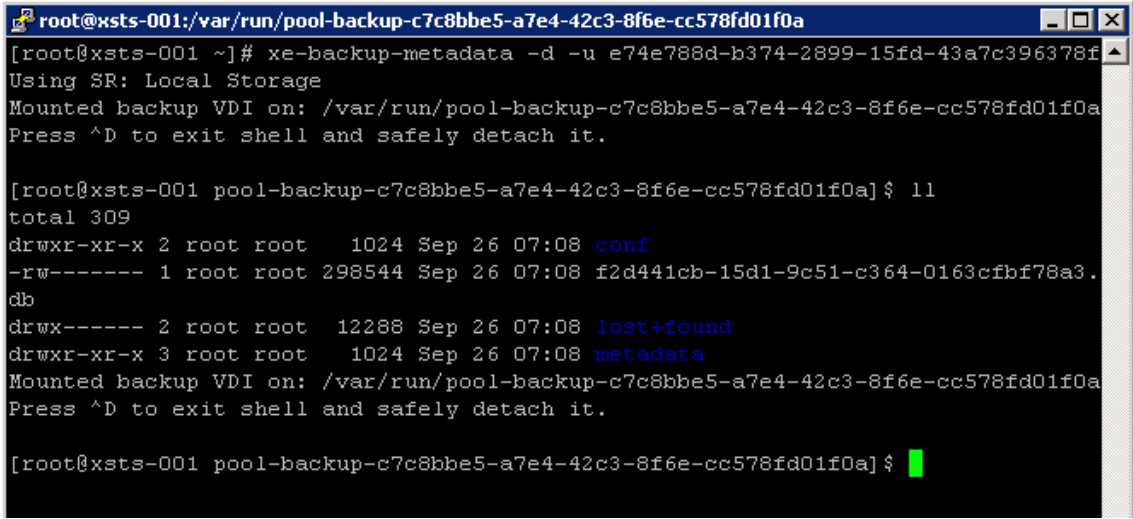
Step	Action
21.	<p>Select Backup, Restore and Update</p>  <p>The screenshot shows a terminal window titled 'root@xsts-001:~' with the XenServer 5.6 SP2 configuration menu. The menu items are: Customize System, Status Display, Network and Management Interface, Authentication, Virtual Machines, Disks and Storage Repositories, Resource Pool Configuration, Hardware and BIOS Information, Keyboard and Timezone, Remote Service Configuration, Backup, Restore and Update, Technical Support, Reboot or Shutdown, Local Command Shell, and Quit. The 'Backup, Restore and Update' option is highlighted. The right pane shows the description: 'From this menu you can backup and restore the system database and Virtual Machine metadata, and apply software updates to the system.'</p>
22.	<p>Select Backup Virtual Machine Metadata</p>  <p>The screenshot shows the same terminal window, but now the 'Backup, Restore and Update' submenu is open. The options are: Backup, Restore and Update, Schedule Virtual Machine Metadata, Backup Virtual Machine Metadata, and Restore Virtual Machine Metadata. The 'Backup Virtual Machine Metadata' option is highlighted. The right pane shows the description: 'Press <Enter> to backup Virtual Machine metadata to a Storage Repository. This will back up the information associated with the VM configuration to a special backup disk on the Storage Repository. You can subsequently restore this metadata if you migrate the Storage Repository to another XenServer pool.'</p>

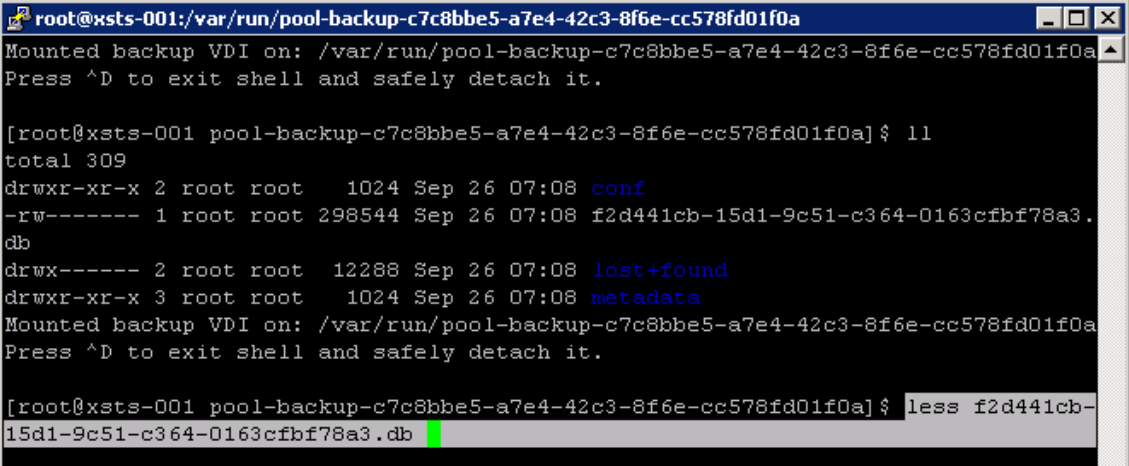
Step	Action
23.	<p>Enter the root user credentials for your XenServer</p>  <p>The screenshot shows the XenServer Configuration console. The 'Backup Virtual Machine Metadata' option is highlighted. A 'Login' dialog box is open, prompting for 'Username' (root) and 'Password' (masked with asterisks). Navigation instructions are visible at the bottom of the console.</p>
24.	<p>Specify which storage repository (SR) should contain the metadata backup virtual disk (VDI)</p>  <p>The screenshot shows the XenServer Configuration console. The 'Select Storage Repository for Backup' dialog box is open, with 'Local Storage' selected. The console background shows the same menu as in step 23, with 'Backup Virtual Machine Metadata' selected.</p>

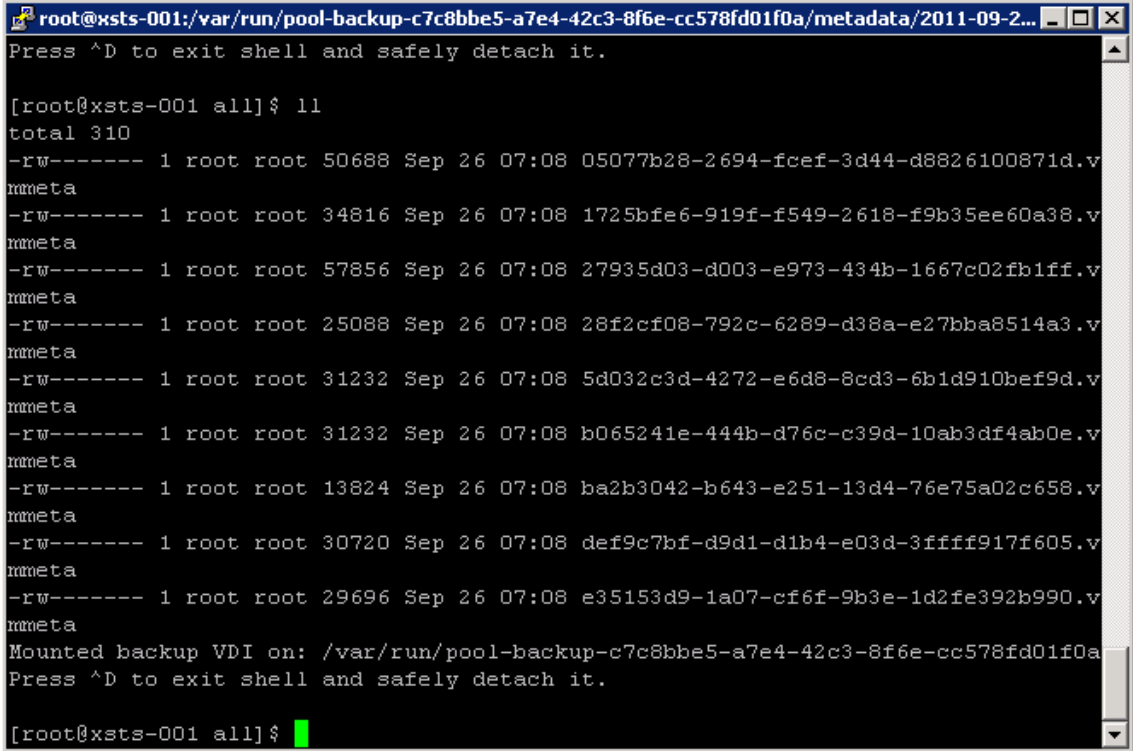
Note: In this environment only a local SR is avail for the backup. Using local storage for a backup is not recommended in production environments.

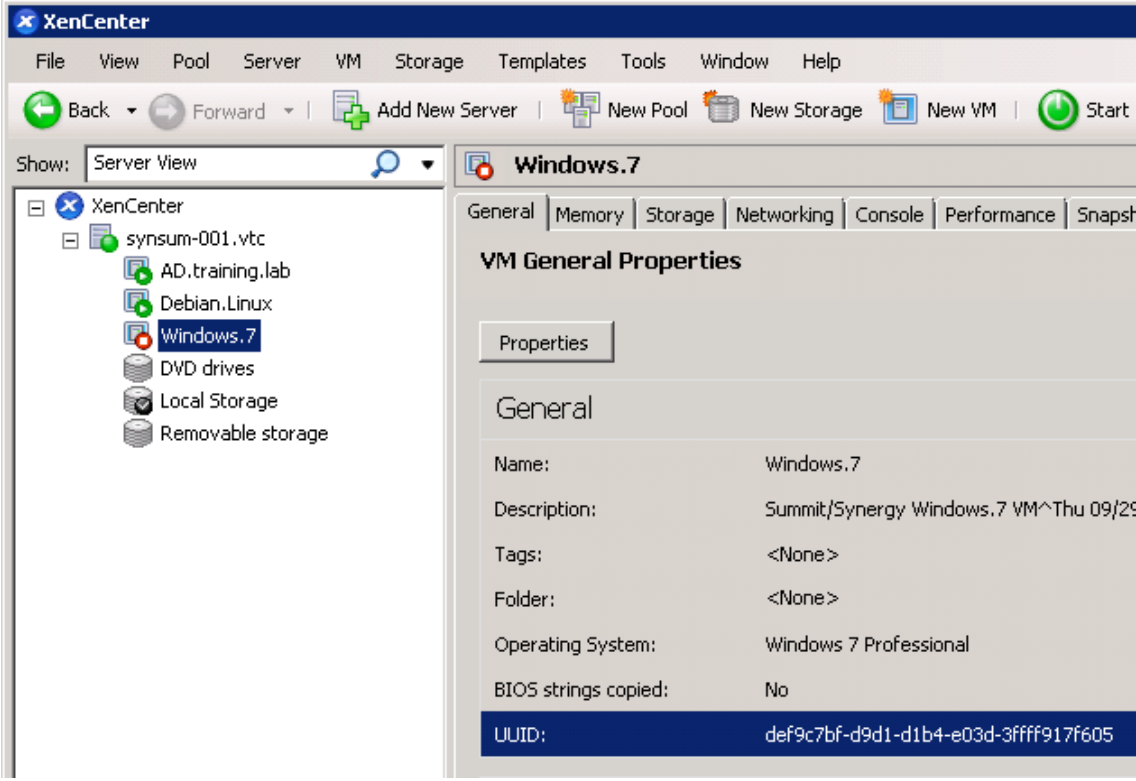
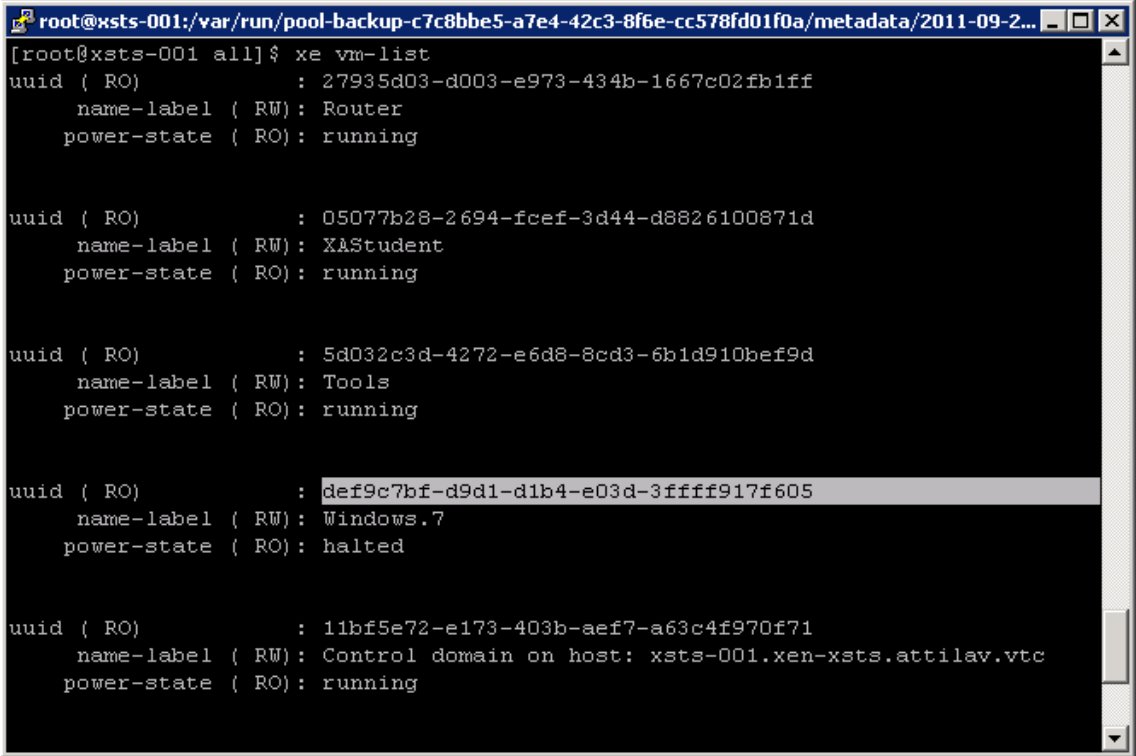
Step	Action
25.	<p>The metadata backup process will initiate</p>  <p>The screenshot shows a terminal window titled 'root@xsts-001:~' with the XenServer 5.6 SP2 configuration menu. The menu options are: 'Backup, Restore and Update', 'Schedule Virtual Machine Metadata', 'Backup Virtual Machine Metadata' (highlighted), and 'Restore Virtual Machine Metadata'. The right side of the screen shows the 'Backup Virtual Machine Metadata' dialog with instructions: 'Press <Enter> to backup Virtual Machine metadata to a Storage Repository. This will back up the information associated with the VM backup y. You storage er pool.' A red box highlights the message: 'Backing up metadata... This may take several minutes.' At the bottom, navigation instructions are shown: '<Esc/Left> Back <Up/Down> Select' and '<Enter> Backup'.</p>
26.	<p>The process should complete with information about the backup</p>  <p>The screenshot shows the same terminal window as in step 25. The menu options are: 'Backup, Restore and Update', 'Schedule Virtual Machine Metadata', 'Backup Virtual Machine Metadata' (highlighted), and 'Restore Virtual Machine Metadata'. The right side of the screen shows the 'Backup Virtual Machine Metadata' dialog with the message: 'Backup Successful'. Below this, the following information is displayed: 'Using SR: Local Storage', 'Creating new backup VDI: c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a done', 'Rotating old backups: found 0', 'Backing up pool database: done', 'Cleaning old VM metadata: done', 'Backing up SR metadata: done', 'Backing up VM metadata: done', and 'Backing up Template metadata: done'. At the bottom, the message '<Enter> OK' is shown. Navigation instructions are also present: '<Esc/Left> Back <Up/Down> Select' and '<Enter> Backup'.</p>
27.	<p>Accept the report OK and exit the xconsole by pressing ESC and selecting Quit.</p>


Step	Action
28.	<p>Verify the metadata backup virtual disk by selecting the Local Storage and clicking the Storage tab.</p>  <p>Note: The Pool Metadata Backup VDI contains a copy of the pool database (state.db)</p>
	<p> Review the backup VDI created in the previous step via the CLI:</p>
29.	<p>Locate the local SR uuid</p> <p>e.g. <code>xe sr-list name-label=[SR name i.e. Local storage]</code></p> 
30.	<p>Use the <code>xe</code> command to mount the VDI for our review</p> <p>e.g. <code>xe-backup-metadata -d -u [uuid of SR]</code></p> <p>Tip: To copy the UUID in your console drag and select the UUID with your mouse and right click.</p>  <p>Note: <code>-d</code> mounts the vdisk via a script and <code>-u</code> indicates which SR to search for the metadata VDI</p>

Step	Action
31.	<p>Use the <code>ll</code> command to list the contents of the VDI</p>  <pre> root@xsts-001:/var/run/pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a [root@xsts-001 ~]# xe-backup-metadata -d -u e74e788d-b374-2899-15fd-43a7c396378f Using SR: Local Storage Mounted backup VDI on: /var/run/pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a Press ^D to exit shell and safely detach it. [root@xsts-001 pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a]\$ ll total 309 drwxr-xr-x 2 root root 1024 Sep 26 07:08 conf -rw----- 1 root root 298544 Sep 26 07:08 f2d441cb-15d1-9c51-c364-0163cfbf78a3.db drwx----- 2 root root 12288 Sep 26 07:08 lost+found drwxr-xr-x 3 root root 1024 Sep 26 07:08 metadata Mounted backup VDI on: /var/run/pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a Press ^D to exit shell and safely detach it. [root@xsts-001 pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a]\$ █ </pre>

Step	Action
32.	<p data-bbox="268 282 933 309">Use the less command to view the contents of the .db file.</p> <p data-bbox="268 353 534 380">e.g. less [filename.db]</p> <div data-bbox="272 427 1406 891">  <pre> root@xsts-001:/var/run/pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a Mounted backup VDI on: /var/run/pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a Press ^D to exit shell and safely detach it. [root@xsts-001 pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a]\$ ll total 309 drwxr-xr-x 2 root root 1024 Sep 26 07:08 conf -rw----- 1 root root 298544 Sep 26 07:08 f2d441cb-15d1-9c51-c364-0163cfbf78a3.db drwx----- 2 root root 12288 Sep 26 07:08 lost+found drwxr-xr-x 3 root root 1024 Sep 26 07:08 metadata Mounted backup VDI on: /var/run/pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a Press ^D to exit shell and safely detach it. [root@xsts-001 pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a]\$ less f2d441cb-15d1-9c51-c364-0163cfbf78a3.db </pre> </div> <div data-bbox="272 936 1406 1686">  <pre> root@xsts-001:/var/run/pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a <database><manifest><pair key="installation_uuid" value="c9e50345-e172-4c76-8b5c-0b22228e1f2d"/><pair key="control_domain_uuid" value="11bf5e72-e173-403b-aef7-a63c4f970f71"/><pair key="pool_conf" value="master"/><pair key="pool token" value="10b8c770-0c50-6d40-0d5c-5c93bf89b947/46d62f35-f065-741d-067c-798b9d0fd317/43171f98-2dd3-0a3a-a195-a749b978b952"/><pair key="schema_major_vsn" value="5"/><pair key="schema minor_vsn" value="61"/><pair key="product version" value="5.6.100"/><pair key="product brand" value="XenServer"/><pair key="build number" value="47101p"/><pair key="xapi_major_vsn" value="1"/><pair key="xapi_minor_vsn" value="3"/><pair key="generation_count" value="20473"/></manifest><table name="VM_guest_metrics"><row ref="OpaqueRef:91b0c076-6c90-77cc-fdfc-0f7015f3d6bb" last_updated="20110504T01:38:53Z" disks="()" other_config="()" uuid="778216c2-7c0c-9083-1de8-b54da494c558" other="({'platform-feature-multiprocessor-suspend' '1'})" PV_drivers_up_to_date="false" PV_drivers_version="({'major' '5'} {'minor' '5'} {'micro' '0'}) {'build' '25727'})" os_version="({'name' 'Debian 5.0.4'} {'uname' '2.6.32-1-586-vyatta-virt'}) {'distro' 'debian'} {'major' '5'} {'minor' '0'})" networks="({'2/ip' '192.168.10.1'} {'1/ip' '20.0.0.2'} {'0/ip' '10.0.0.2'})" memory="()" live="true" _ref="OpaqueRef:91b0c076-6c90-77cc-fdfc-0f7015f3d6bb"/><row ref="OpaqueRef:313c8bbd-04ac-7ba5-bc02-ac43f635142e" last_updated="20110727T17:03:30Z" disks="()" other_config="()" uuid="e0d125fc-da29-849a-9c47-3fe9ac0c3426" other="({'platform-feature-multiprocessor-suspend' '1'})" PV_drivers_up_to_date="false" PV_drivers_version="({'major' '5'} {'minor' '5'} {'micro' '0'}) {'build' '25727'})" os_version="({'name' 'Debian 5.0.4'} {'uname' '2.6.32-1-586-vyatta-virt'}) {'distro' 'debian'} {'major' '5'} {'minor' '0'})" networks="({'2/ip' '192.168.10.1'} {'1/ip' '50.97.139.162'} {'0/ip' '10.61.5.234'})" memory="()" live="true" _ref="OpaqueRef:313c8bbd-04ac-7ba5-bc02-ac43f635142e"/><row ref="OpaqueRef:86c23496-a0f2d441cb-15d1-9c51-c364-0163cfbf78a3.db </pre> </div> <p data-bbox="268 1697 438 1724">Press q to exit</p>

Step	Action
33.	<p>To review the specific VM metadata navigate to <code>cd metadata/[date folder]/all/</code> and list the contents using the <code>ll</code> command.</p>  <pre> root@xsts-001:/var/run/pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a/metadata/2011-09-2... Press ^D to exit shell and safely detach it. [root@xsts-001 all]\$ ll total 310 -rw----- 1 root root 50688 Sep 26 07:08 05077b28-2694-fcef-3d44-d8826100871d.v mmeta -rw----- 1 root root 34816 Sep 26 07:08 1725bfe6-919f-f549-2618-f9b35ee60a38.v mmeta -rw----- 1 root root 57856 Sep 26 07:08 27935d03-d003-e973-434b-1667c02fb1ff.v mmeta -rw----- 1 root root 25088 Sep 26 07:08 28f2cf08-792c-6289-d38a-e27bba8514a3.v mmeta -rw----- 1 root root 31232 Sep 26 07:08 5d032c3d-4272-e6d8-8cd3-6b1d910bef9d.v mmeta -rw----- 1 root root 31232 Sep 26 07:08 b065241e-444b-d76c-c39d-10ab3df4ab0e.v mmeta -rw----- 1 root root 13824 Sep 26 07:08 ba2b3042-b643-e251-13d4-76e75a02c658.v mmeta -rw----- 1 root root 30720 Sep 26 07:08 def9c7bf-d9d1-d1b4-e03d-3ffff917f605.v mmeta -rw----- 1 root root 29696 Sep 26 07:08 e35153d9-1a07-cf6f-9b3e-1d2fe392b990.v mmeta Mounted backup VDI on: /var/run/pool-backup-c7c8bbe5-a7e4-42c3-8f6e-cc578fd01f0a Press ^D to exit shell and safely detach it. [root@xsts-001 all]\$ </pre> <p>Note: Each file represents a virtual machine’s meta/configuration data. The file names also correspond to the UUID of the VM.</p>

Step	Action
34.	<p>Match the UUID listed in this folder with a UUID of a virtual machine. This can be done in XenCenter or the CLI</p> <p>XenCenter:</p>  <p>CLI:</p> <p>e.g. <code>xe vm-list</code></p>  <pre> [root@xsts-001 all]\$ xe vm-list uuid (RO) : 27935d03-d003-e973-434b-1667c02fb1ff name-label (RW) : Router power-state (RO) : running uuid (RO) : 05077b28-2694-fcef-3d44-d8826100871d name-label (RW) : XAStudent power-state (RO) : running uuid (RO) : 5d032c3d-4272-e6d8-8cd3-6b1d910bef9d name-label (RW) : Tools power-state (RO) : running uuid (RO) : def9c7bf-d9d1-d1b4-e03d-3ffff917f605 name-label (RW) : Windows.7 power-state (RO) : halted uuid (RO) : 11bf5e72-e173-403b-aef7-a63c4f970f71 name-label (RW) : Control domain on host: xsts-001.xen-xsts.attilav.vtc power-state (RO) : running </pre>

Step	Action
35.	 Press CTRL+D to exit the mount location and un-mount the backup VDI
END OF EXERCISE	

Summary

Key Takeaways	<p>The key takeaways for this exercise are:</p> <ul style="list-style-type: none">• You will be able to create backups of pool configuration, virtual machine metadata and a XenServer host.• You will be able to view the contents of a backup VDI using the CLI.
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Exercise 6: Capturing a Network Trace in XenServer

Overview

In this exercise we will capture a network trace on different network interfaces associated with a XenServer host and the virtual machines running on XenServer.


The first step is to identify the interface that you would like to trace on. Questions to ask would be if the issue is isolated to a virtual machine, a group of virtual machines or a specific XenServer. The answer will determine if you will collect a trace on a PIF, VIF or Bridge.

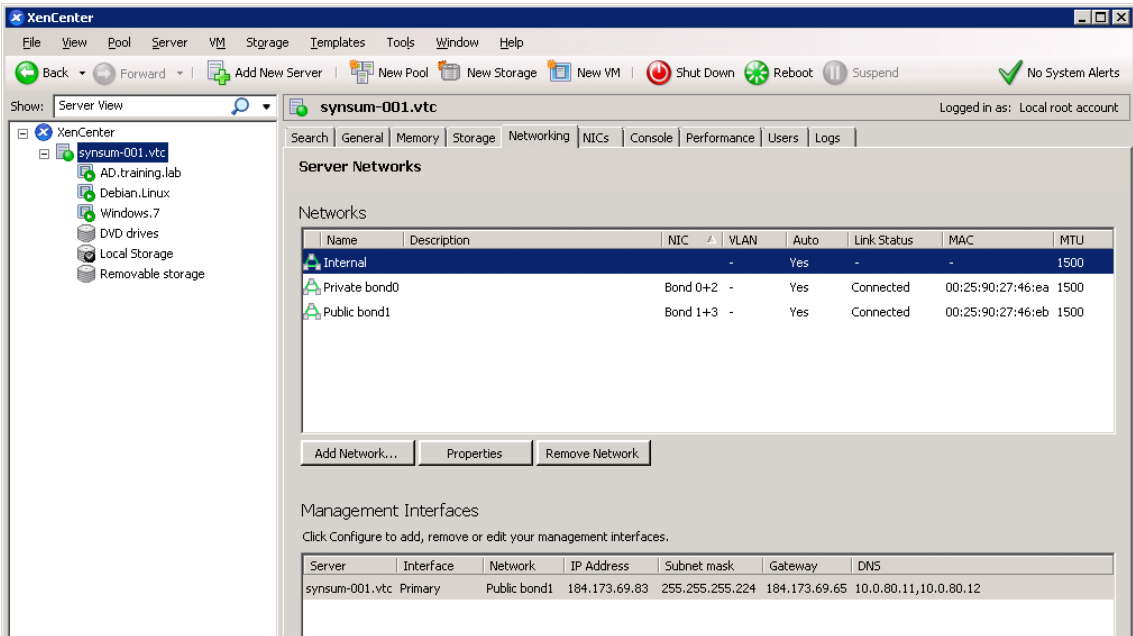
To complete this exercise, you must have the following:

- SSH Client (PuTTY)
- WinSCP
- Network trace analysis tool (Wireshark)

Step-by-step guidance

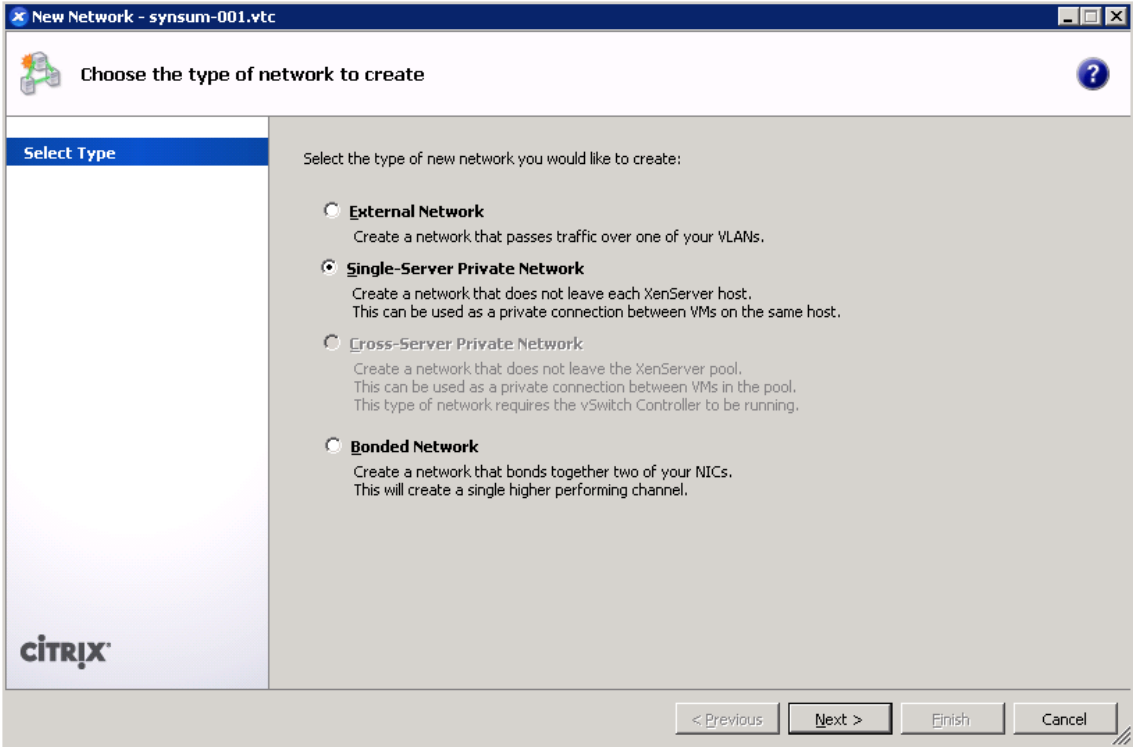
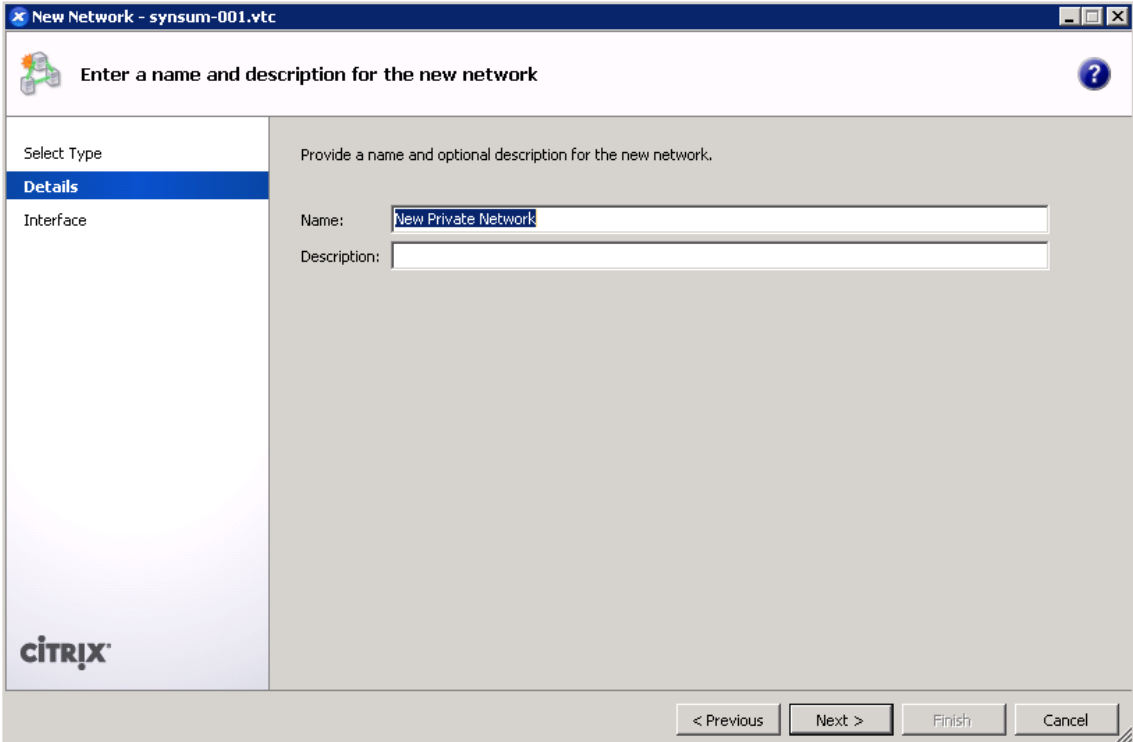
Estimated time to complete this lab: **15 minutes**.

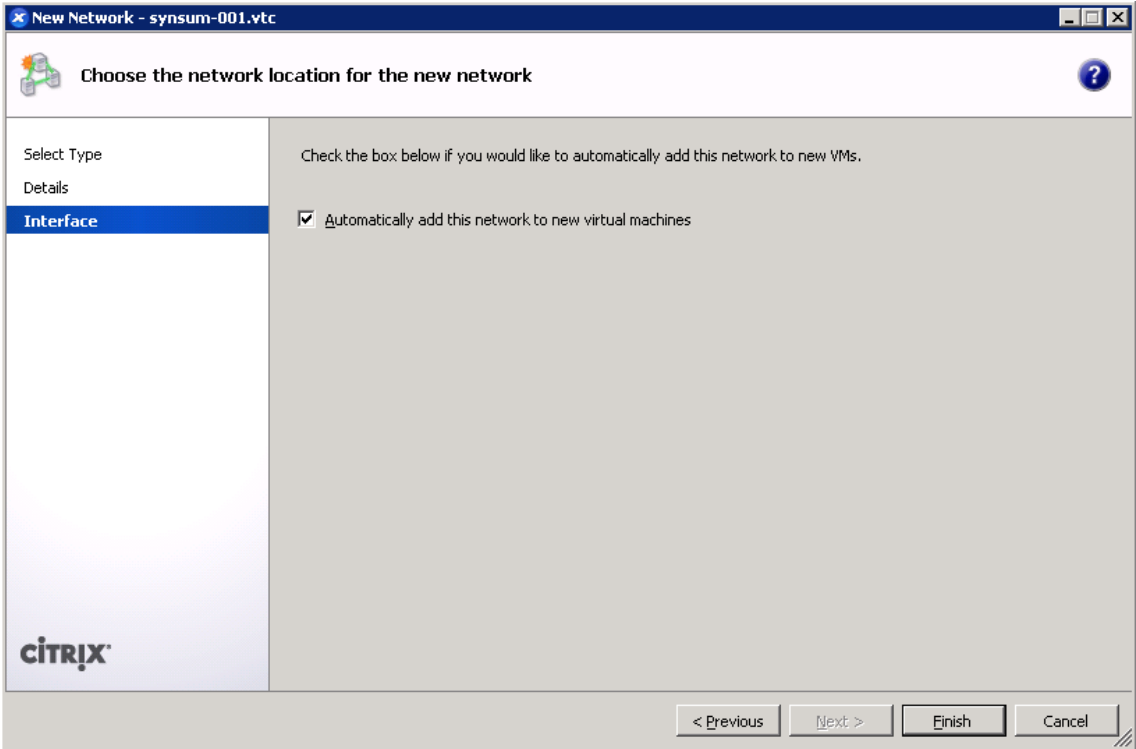
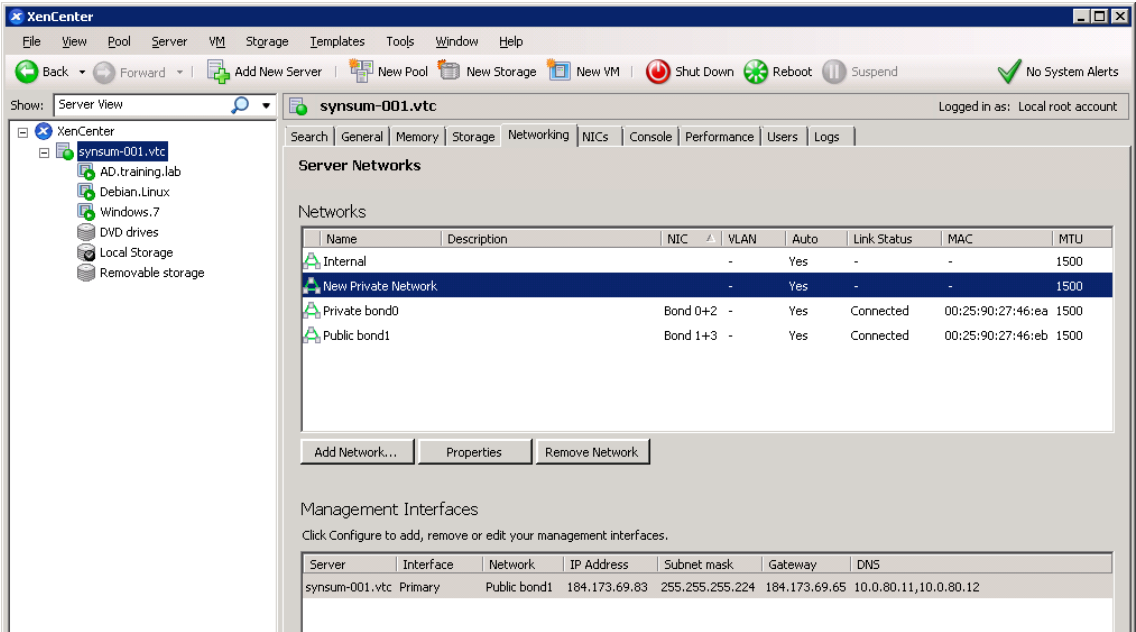
Step	Action
	 Create an isolated network and a VLAN using XenCenter:
1.	Start the Windows.7 virtual machine
2.	Highlight the host and select the Network tab

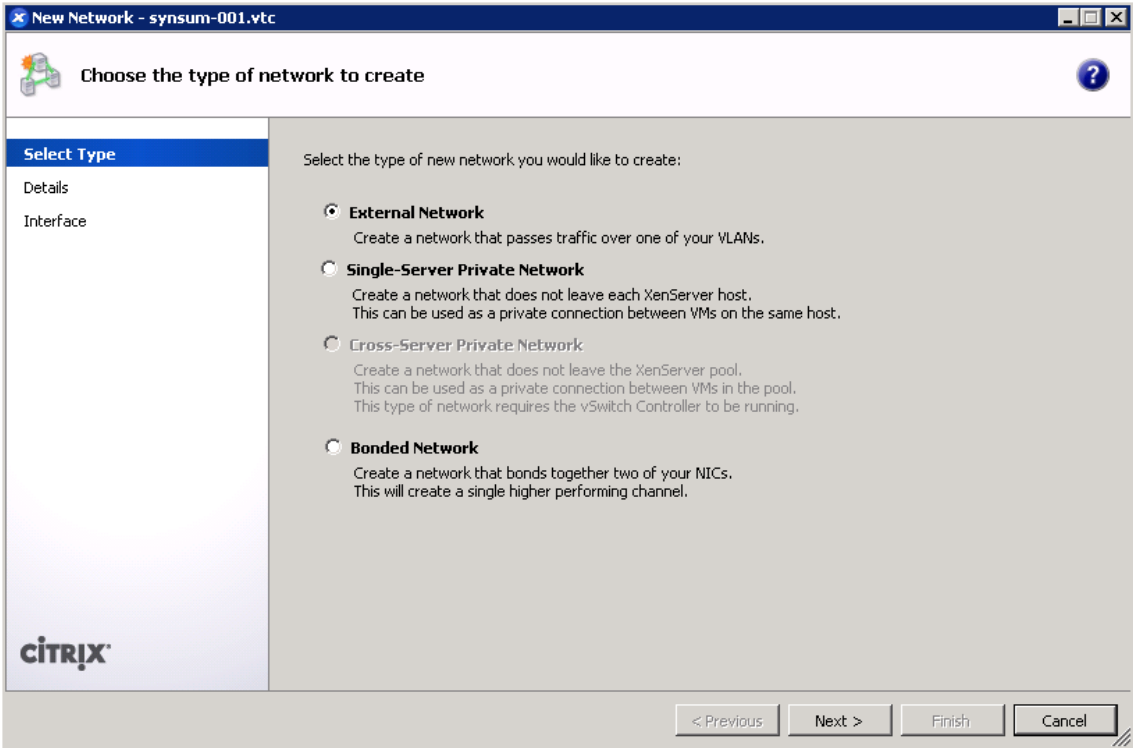
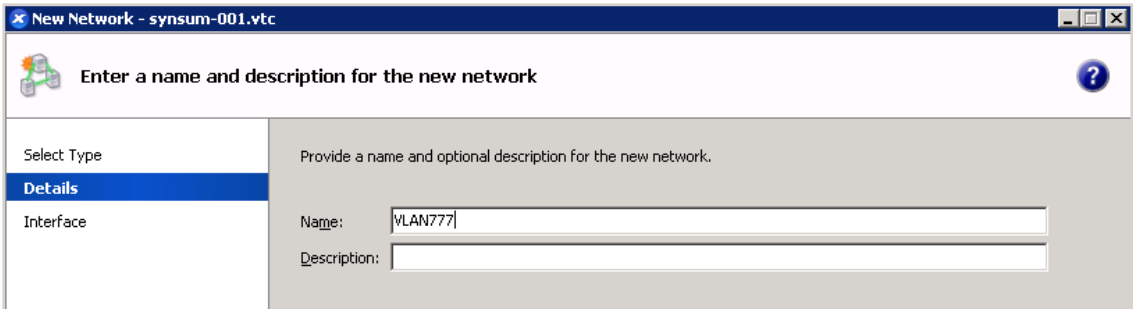
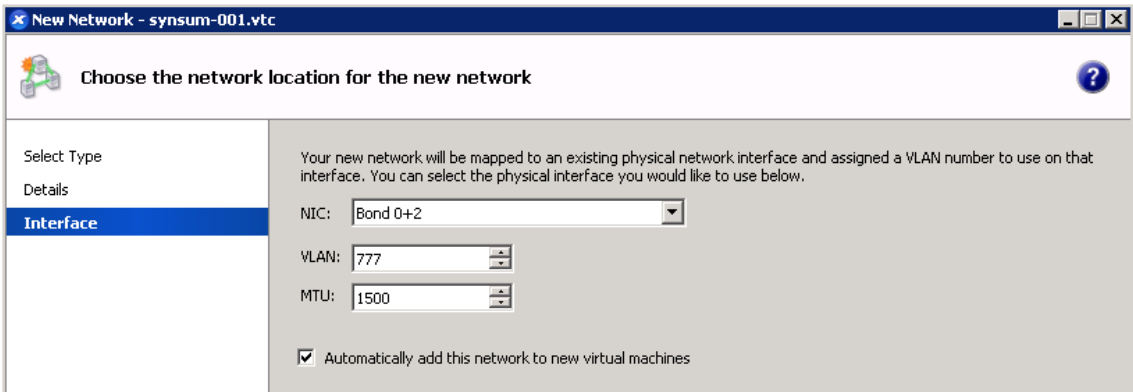


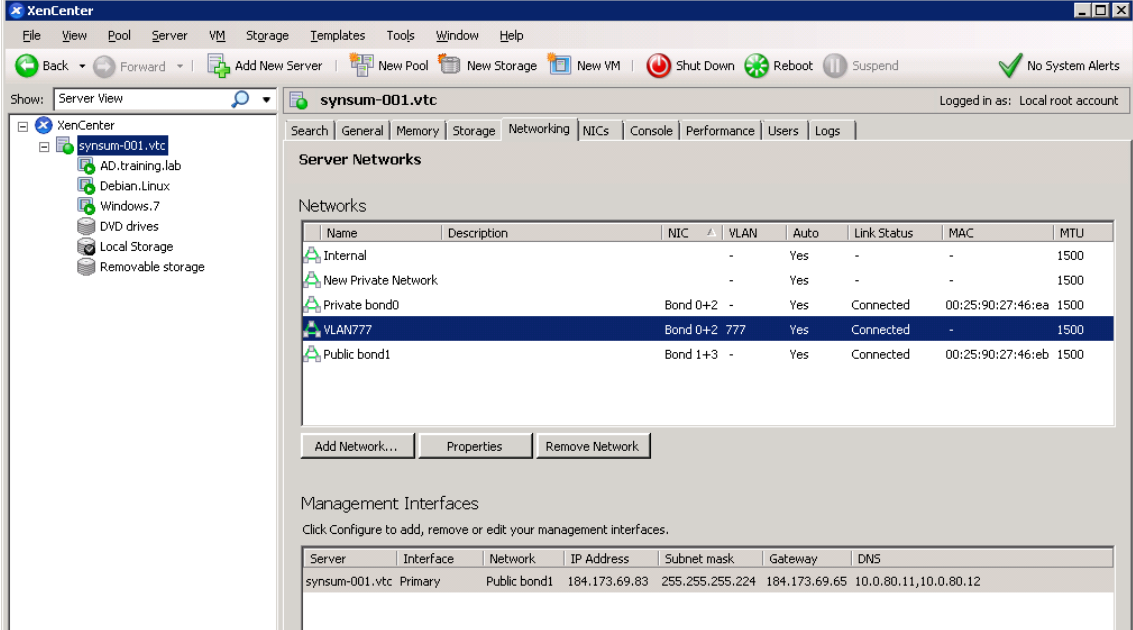

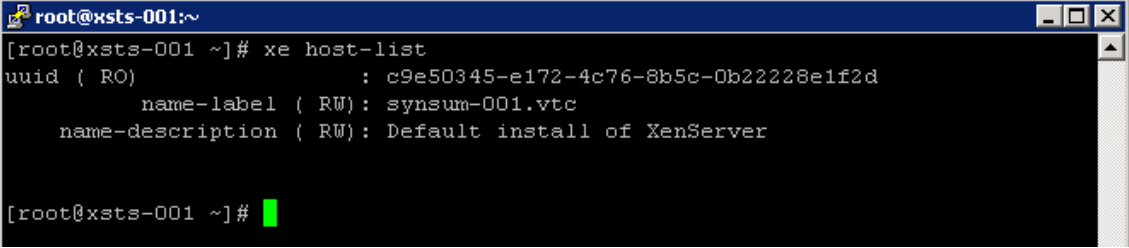
Name	Description	NIC	VLAN	Auto	Link Status	MAC	MTU
Internal			-	Yes	-	-	1500
Private bond0		Bond 0+2	-	Yes	Connected	00:25:90:27:46:ea	1500
Public bond1		Bond 1+3	-	Yes	Connected	00:25:90:27:46:eb	1500

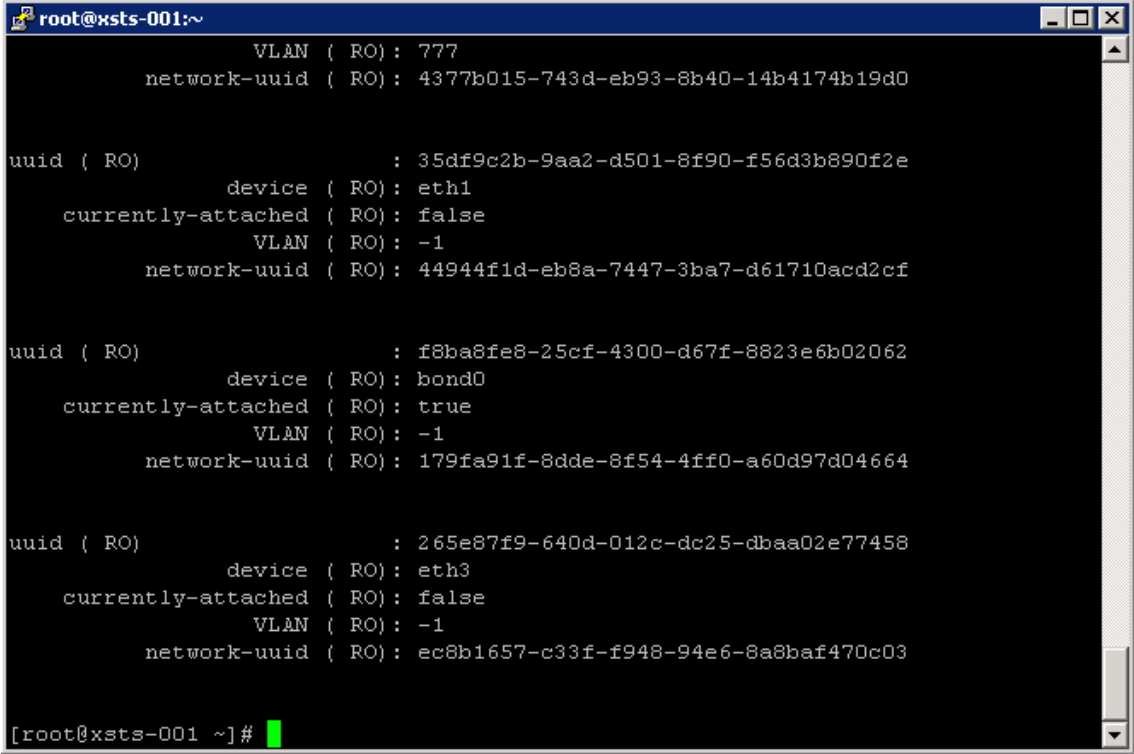
Server	Interface	Network	IP Address	Subnet mask	Gateway	DNS
synsum-001.vtc	Primary	Public bond1	184.173.69.83	255.255.255.224	184.173.69.65	10.0.80.11,10.0.80.12

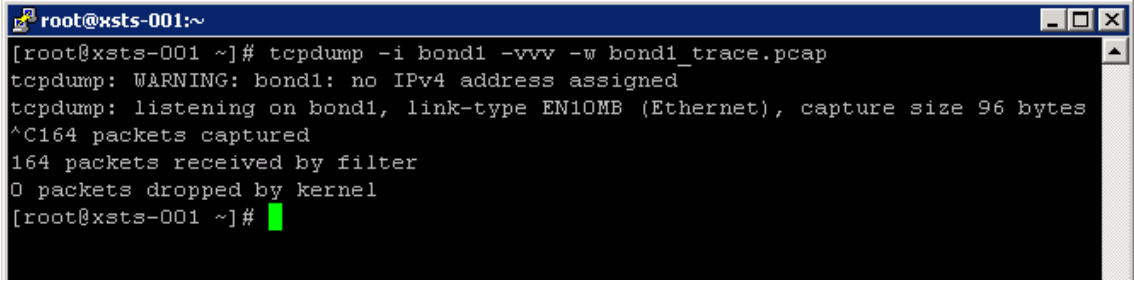

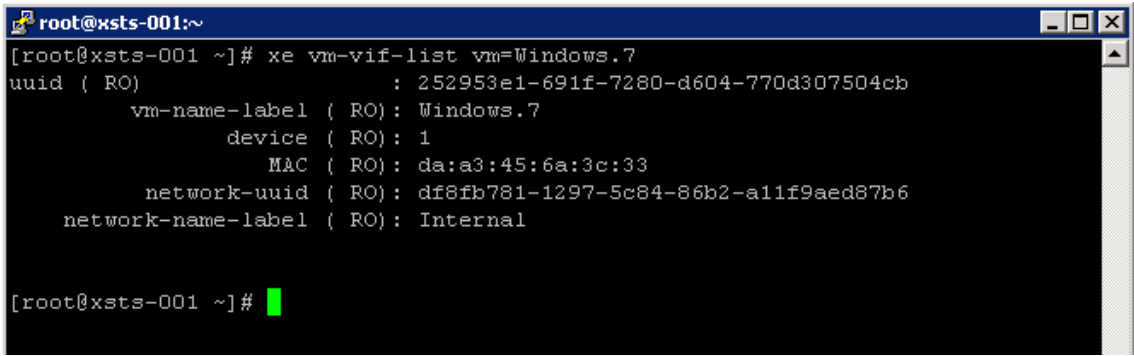
Step	Action
3.	<p>Click Add Network... and select Single-Server Private Network. Click Next.</p> 
4.	<p>Leave the network name default and click Next</p> 

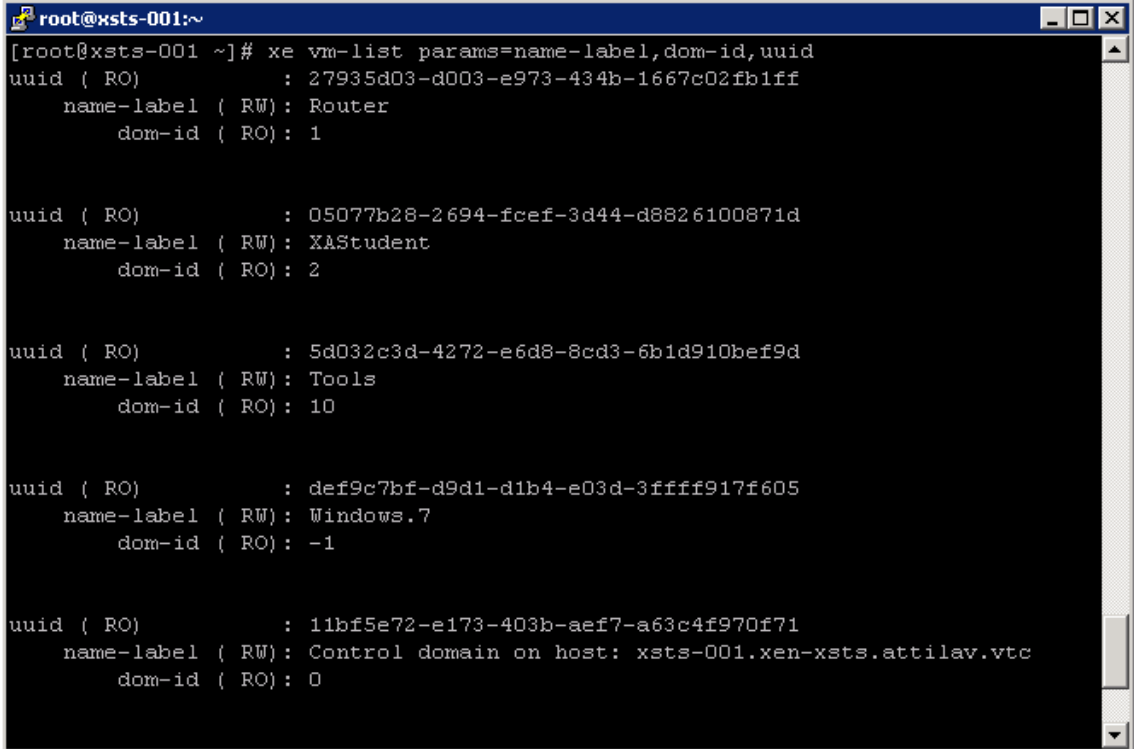
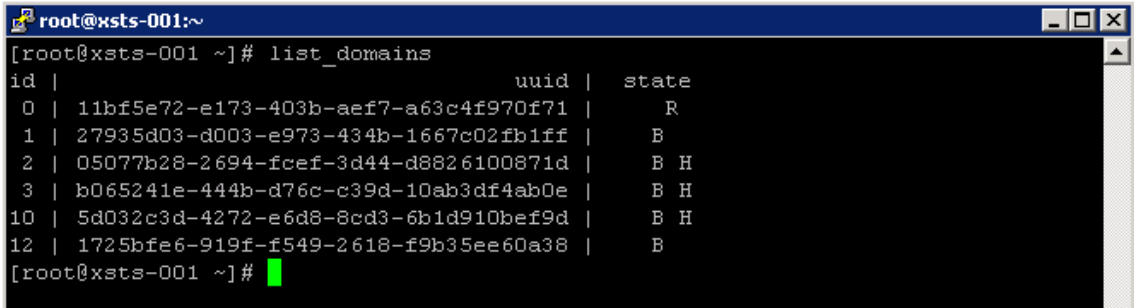
Step	Action																																																						
5.	<p>Tick the option to automatically add this network to new virtual machines and click Finish.</p> 																																																						
6.	<p>The newly created internal network should now be listed in the networks tab.</p>  <table border="1" data-bbox="568 1402 1385 1608"> <thead> <tr> <th>Name</th> <th>Description</th> <th>NIC</th> <th>VLAN</th> <th>Auto</th> <th>Link Status</th> <th>MAC</th> <th>MTU</th> </tr> </thead> <tbody> <tr> <td>Internal</td> <td></td> <td>-</td> <td>-</td> <td>Yes</td> <td>-</td> <td>-</td> <td>1500</td> </tr> <tr> <td>New Private Network</td> <td></td> <td>-</td> <td>-</td> <td>Yes</td> <td>-</td> <td>-</td> <td>1500</td> </tr> <tr> <td>Private bond0</td> <td></td> <td>Bond 0+2</td> <td>-</td> <td>Yes</td> <td>Connected</td> <td>00:25:90:27:46:ea</td> <td>1500</td> </tr> <tr> <td>Public bond1</td> <td></td> <td>Bond 1+3</td> <td>-</td> <td>Yes</td> <td>Connected</td> <td>00:25:90:27:46:eb</td> <td>1500</td> </tr> </tbody> </table> <table border="1" data-bbox="568 1727 1385 1778"> <thead> <tr> <th>Server</th> <th>Interface</th> <th>Network</th> <th>IP Address</th> <th>Subnet mask</th> <th>Gateway</th> <th>DNS</th> </tr> </thead> <tbody> <tr> <td>synsum-001.vtc</td> <td>Primary</td> <td>Public bond1</td> <td>184.173.69.83</td> <td>255.255.255.224</td> <td>184.173.69.65</td> <td>10.0.80.11,10.0.80.12</td> </tr> </tbody> </table>	Name	Description	NIC	VLAN	Auto	Link Status	MAC	MTU	Internal		-	-	Yes	-	-	1500	New Private Network		-	-	Yes	-	-	1500	Private bond0		Bond 0+2	-	Yes	Connected	00:25:90:27:46:ea	1500	Public bond1		Bond 1+3	-	Yes	Connected	00:25:90:27:46:eb	1500	Server	Interface	Network	IP Address	Subnet mask	Gateway	DNS	synsum-001.vtc	Primary	Public bond1	184.173.69.83	255.255.255.224	184.173.69.65	10.0.80.11,10.0.80.12
Name	Description	NIC	VLAN	Auto	Link Status	MAC	MTU																																																
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Server	Interface	Network	IP Address	Subnet mask	Gateway	DNS																																																	
synsum-001.vtc	Primary	Public bond1	184.173.69.83	255.255.255.224	184.173.69.65	10.0.80.11,10.0.80.12																																																	

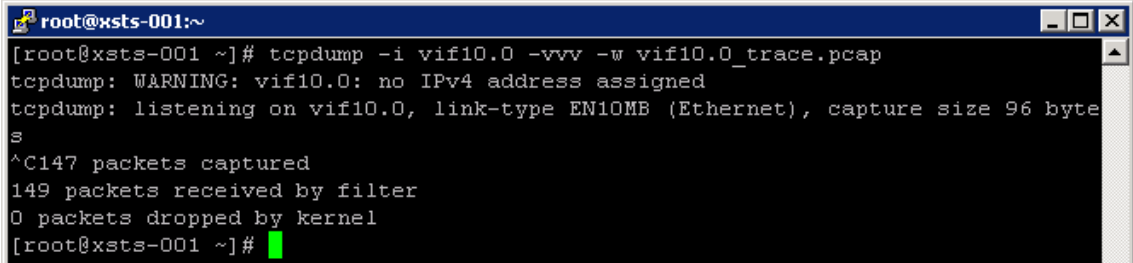
Step	Action
7.	<p>Click Add Network... and select External Network and click Next</p>  <p>The screenshot shows a window titled 'New Network - synsum-001.vtc'. The main heading is 'Choose the type of network to create'. On the left, there is a sidebar with 'Select Type' (highlighted), 'Details', and 'Interface'. The main area contains the instruction 'Select the type of new network you would like to create:' followed by four radio button options: <ul style="list-style-type: none"> External Network (selected): Create a network that passes traffic over one of your VLANs. Single-Server Private Network: Create a network that does not leave each XenServer host. This can be used as a private connection between VMs on the same host. Cross-Server Private Network: Create a network that does not leave the XenServer pool. This can be used as a private connection between VMs in the pool. This type of network requires the vSwitch Controller to be running. Bonded Network: Create a network that bonds together two of your NICs. This will create a single higher performing channel. At the bottom, there are buttons for '< Previous', 'Next >', 'Finish', and 'Cancel'. </p>
8.	<p>Change the network name to VLAN777 and click Next</p>  <p>The screenshot shows the same window, now at the 'Enter a name and description for the new network' step. The sidebar has 'Details' highlighted. The main area contains the instruction 'Provide a name and optional description for the new network.' There are two input fields: 'Name:' with 'VLAN777' entered, and 'Description:' which is empty. </p>
9.	<p>Select Bond 0+2 and enter the VLAN number 777. Tick the parameter to automatically add this network to new virtual machines. Click Finish.</p>  <p>The screenshot shows the 'Choose the network location for the new network' step. The sidebar has 'Interface' highlighted. The main area contains the instruction 'Your new network will be mapped to an existing physical network interface and assigned a VLAN number to use on that interface. You can select the physical interface you would like to use below.' There are three dropdown menus: 'NIC:' set to 'Bond 0+2', 'VLAN:' set to '777', and 'MTU:' set to '1500'. At the bottom, there is a checked checkbox labeled 'Automatically add this network to new virtual machines'. </p>


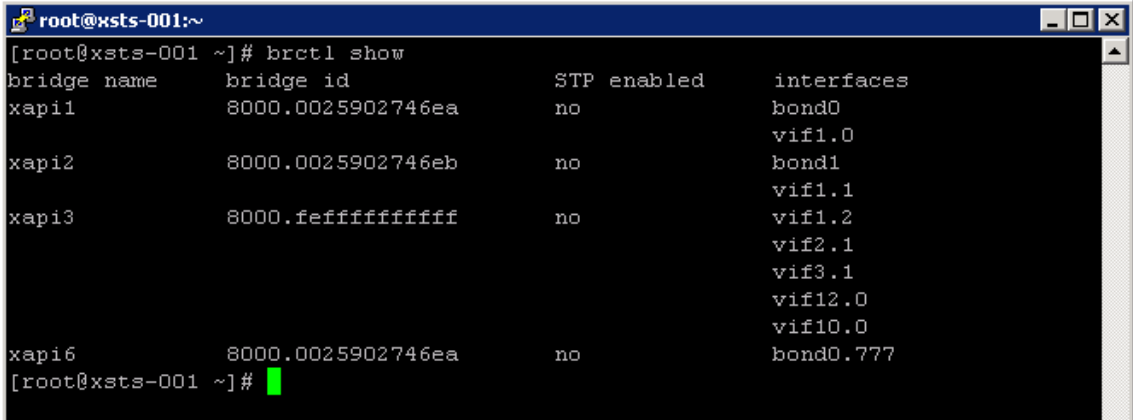
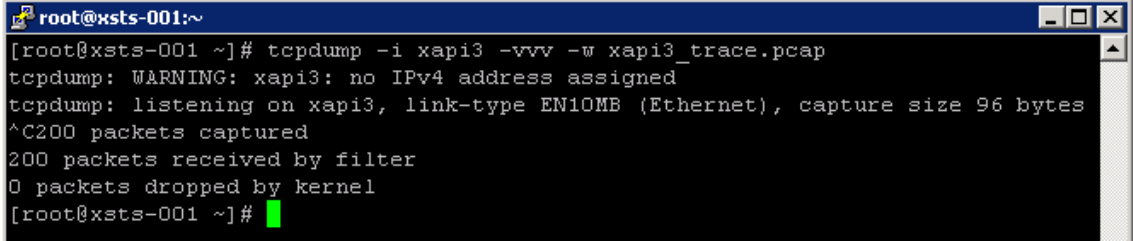

Step	Action
10.	<p>Confirm that both Internal Network and VLAN have successfully been created.</p> 
	<p> Collect a network trace on a physical interface (PIF) used by XenServer via the CLI</p>
11.	<p>Launch a new SSH client OR duplicate an existing session of PuTTY from the Landing Desktop OR reuse an open session window.</p>
12.	<p>Identify the XenServer host which we will collect the network trace from</p> <p>e.g. xe host-list</p>  <pre> root@xsts-001:~ [root@xsts-001 ~]# xe host-list uuid (RO) : c9e50345-e172-4c76-8b5c-0b22228e1f2d name-label (RW) : synsum-001.vtc name-description (RW) : Default install of XenServer [root@xsts-001 ~]# █ </pre> <p>Note: In our example only one XenServer host is available</p>

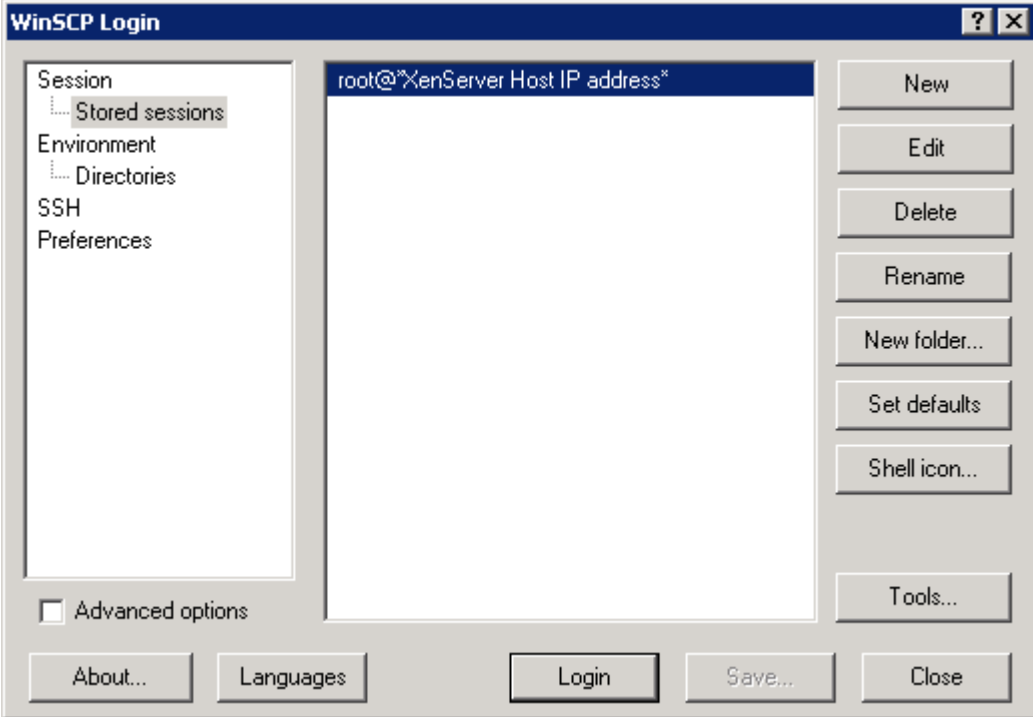
Step	Action
13.	<p>List the physical interfaces (PIF) detected by XenServer</p> <p>e.g. <code>xe pif-list host-name-label=[host name]</code> or <code>xe pif-list host-uuid=[host uuid]</code></p>  <pre> root@xsts-001:~ VLAN (RO): 777 network-uuid (RO): 4377b015-743d-eb93-8b40-14b4174b19d0 uuid (RO) : 35df9c2b-9aa2-d501-8f90-f56d3b890f2e device (RO): eth1 currently-attached (RO): false VLAN (RO): -1 network-uuid (RO): 44944f1d-eb8a-7447-3ba7-d61710acd2cf uuid (RO) : f8ba8fe8-25cf-4300-d67f-8823e6b02062 device (RO): bond0 currently-attached (RO): true VLAN (RO): -1 network-uuid (RO): 179fa91f-8dde-8f54-4ff0-a60d97d04664 uuid (RO) : 265e87f9-640d-012c-dc25-dbaa02e77458 device (RO): eth3 currently-attached (RO): false VLAN (RO): -1 network-uuid (RO): ec8b1657-c33f-f948-94e6-8a8baf470c03 [root@xsts-001 ~]# </pre> <p>Note: In the above example the host has 4 NICs (eth0, 1, 2, 3) and a VLAN 777 which is associated with bond0 and seen as a PIF.</p>

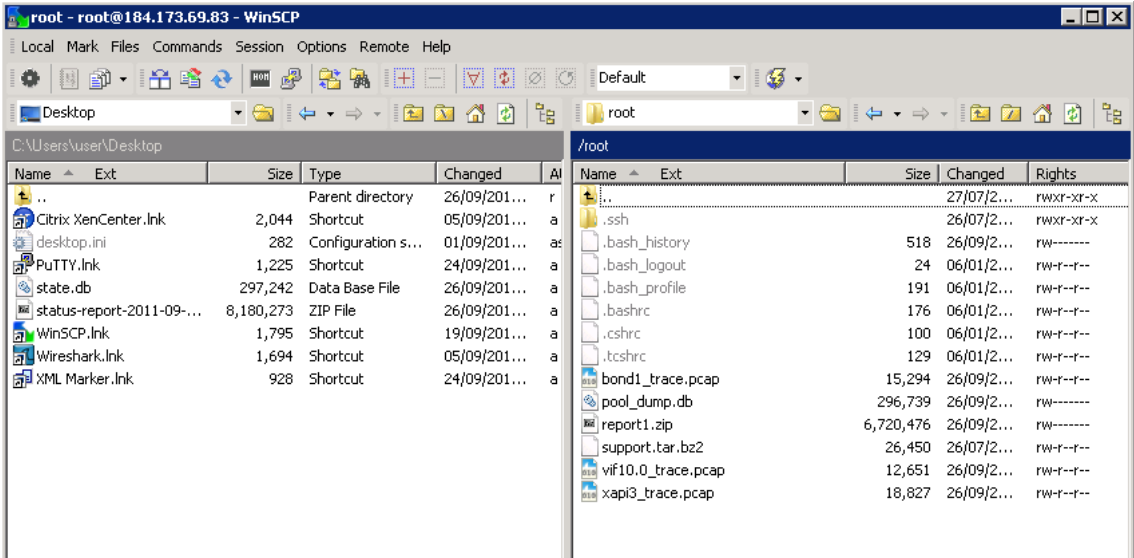


Step	Action
<p>14.</p>	<p>Use tcpdump to collect a trace from a PIF</p> <p>e.g. <code>tcpdump -i [device] -vvv -w [filename.pcap]</code></p>  <pre> root@xsts-001:~# tcpdump -i bond1 -vvv -w bond1_trace.pcap tcpdump: WARNING: bond1: no IPv4 address assigned tcpdump: listening on bond1, link-type EN10MB (Ethernet), capture size 96 bytes ^C164 packets captured 164 packets received by filter 0 packets dropped by kernel root@xsts-001 ~# </pre> <p>Note: To stop the trace press CTRL+C</p> <p>Note: In the above example we collected a network trace on bond1 and wrote the output to a file called bond1_trace.pcap.</p> <p>-i = interface -vvv = very verbose mode -w = write to file</p> <p>Note: To capture the complete packed payload use the -s 0 parameter when collecting a trace.</p> <p>Note: Use .pcap file extension to allow for file type association with network analyzing tools such as Wireshark.</p>
	<p> Collect a network trace on a virtual interface (VIF) used by a virtual machine:</p> <p>Note: VIF names are dynamically created on VM start. VIF names are constructed with the following structure; vifx.y where x is the domain id of the VM and y is the device number. The dynamic part of the name is the domain ID because it may change on VM start.</p>
<p>15.</p>	<p>List the VIFs device number associated with a VM</p> <p>e.g. <code>xe vm-vif-list vm=[vm name]</code></p>  <pre> root@xsts-001:~# xe vm-vif-list vm=Windows.7 uuid (RO) : 252953e1-691f-7280-d604-770d307504cb vm-name-label (RO): Windows.7 device (RO): 1 MAC (RO): da:a3:45:6a:3c:33 network-uuid (RO): df8fb781-1297-5c84-86b2-a11f9aed87b6 network-name-label (RO): Internal root@xsts-001 ~# </pre> <p>Note: In the above example this VM has one VIF. Device: 1 is connected to the Internal network.</p>

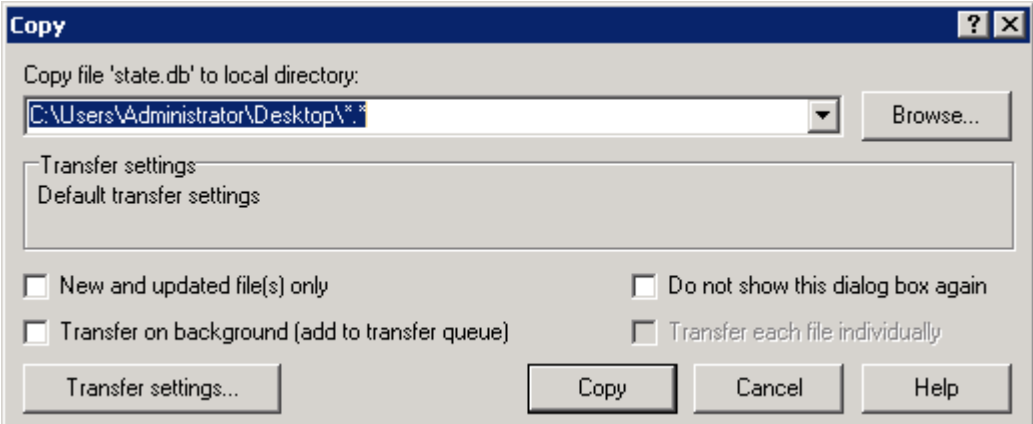

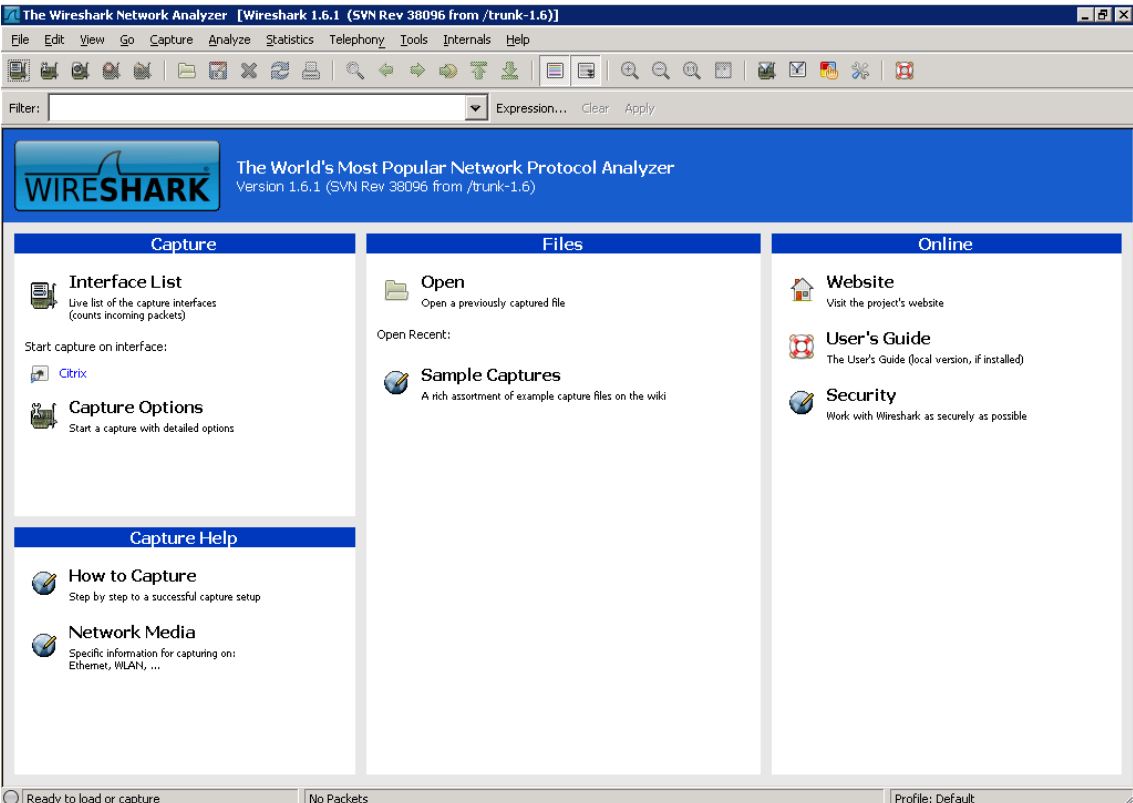
Step	Action
<p>16.</p>	<p>Locate the domain identifier (domid) for a particular virtual machine using xe</p> <p>e.g. xe vm-list params=name-label,dom-id,uuid</p>  <pre> root@xsts-001:~ [~]# xe vm-list params=name-label,dom-id,uuid uuid (RO) : 27935d03-d003-e973-434b-1667c02fb1ff name-label (RW) : Router dom-id (RO) : 1 uuid (RO) : 05077b28-2694-fcef-3d44-d8826100871d name-label (RW) : XAStudent dom-id (RO) : 2 uuid (RO) : 5d032c3d-4272-e6d8-8cd3-6b1d910bef9d name-label (RW) : Tools dom-id (RO) : 10 uuid (RO) : def9c7bf-d9d1-d1b4-e03d-3ffff917f605 name-label (RW) : Windows.7 dom-id (RO) : -1 uuid (RO) : 11bf5e72-e173-403b-aef7-a63c4f970f71 name-label (RW) : Control domain on host: xsts-001.xen-xsts.attilav.vtc dom-id (RO) : 0 </pre>
<p>17.</p>	<p>An alternative method to list the domid of the current domains running on your XenServer is using the list_domains command.</p> <p>e.g. list_domains</p>  <pre> root@xsts-001:~ [~]# list_domains id uuid state --- --- --- 0 11bf5e72-e173-403b-aef7-a63c4f970f71 R 1 27935d03-d003-e973-434b-1667c02fb1ff B 2 05077b28-2694-fcef-3d44-d8826100871d B H 3 b065241e-444b-d76c-c39d-10ab3df4ab0e B H 10 5d032c3d-4272-e6d8-8cd3-6b1d910bef9d B H 12 1725bfe6-919f-f549-2618-f9b35ee60a38 B [~]# </pre> <p>Note: This command will list all running domains and their associated domain identifiers (domid). This command is also not dependent on xapi.</p> <p>Note: The additional domains listed are hidden virtual machines running on the host which provides the remote access infrastructure for this lab environment.</p>

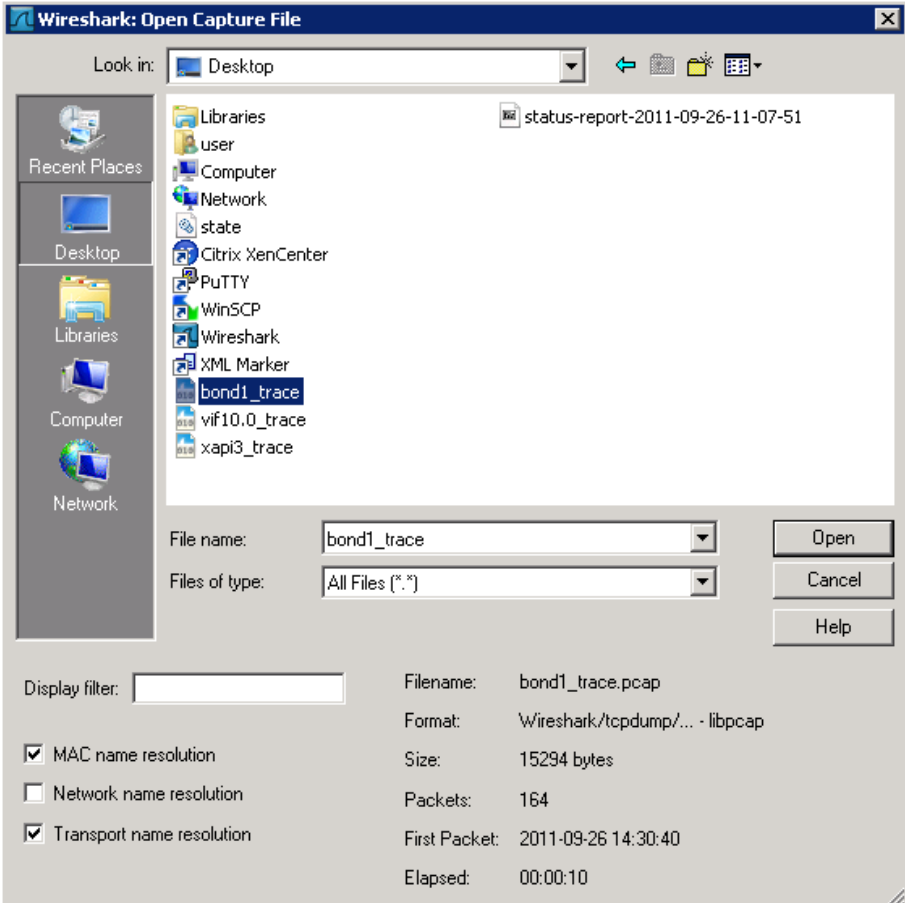
Step	Action
<p>18.</p>	<p>List the current interfaces detected/managed by dom0</p> <p>e.g. <code>ifconfig</code></p>  <pre> root@xsts-001:~# ifconfig vif1.2 Link encap:Ethernet HWaddr FE:FF:FF:FF:FF:FF UP BROADCAST RUNNING NOARP MTU:1500 Metric:1 RX packets:2837817 errors:0 dropped:0 overruns:0 frame:0 TX packets:1475691 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:32 RX bytes:2589946542 (2.4 GiB) TX bytes:390725897 (372.6 MiB) vif2.1 Link encap:Ethernet HWaddr FE:FF:FF:FF:FF:FF UP BROADCAST RUNNING NOARP MTU:1500 Metric:1 RX packets:812242 errors:0 dropped:0 overruns:0 frame:0 TX packets:1351219 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:32 RX bytes:303938569 (289.8 MiB) TX bytes:650730508 (620.5 MiB) vif3.1 Link encap:Ethernet HWaddr FE:FF:FF:FF:FF:FF UP BROADCAST RUNNING NOARP MTU:1500 Metric:1 RX packets:278408 errors:0 dropped:0 overruns:0 frame:0 TX packets:327964 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:32 RX bytes:50522628 (48.1 MiB) TX bytes:96026886 (91.5 MiB) vif10.0 Link encap:Ethernet HWaddr FE:FF:FF:FF:FF:FF UP BROADCAST RUNNING NOARP MTU:1500 Metric:1 RX packets:709019 errors:0 dropped:0 overruns:0 frame:0 TX packets:1825343 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:32 </pre> <p>Note: If you scroll through the output you should see 4 PIFs (eth0, 1, 2, 3), the VLAN 777 (bond0.777) and VIFs associated with domid 3 and 10 with device numbers 0 and 1 (vif3.1 and vif10.0)</p>
<p>19.</p>	<p>Collect a network trace from a VIF from the VM</p> <p>e.g. <code>tcpdump -i [interface] -vvv -w [filename]</code></p>  <pre> root@xsts-001:~# tcpdump -i vif10.0 -vvv -w vif10.0_trace.pcap tcpdump: WARNING: vif10.0: no IPv4 address assigned tcpdump: listening on vif10.0, link-type EN10MB (Ethernet), capture size 96 bytes ^C147 packets captured 149 packets received by filter 0 packets dropped by kernel root@xsts-001:~# </pre> <p>Note: In the above example a trace was collected from the first interface (.0) attached to the VM associated with domid 10</p> <p>i.e. <code>tcpdump -i vif10.0 -vvv -w vif10.0_trace.pcap</code></p> <p>Note: To capture the complete packed payload use the <code>-s 0</code> parameter when collecting a trace.</p>

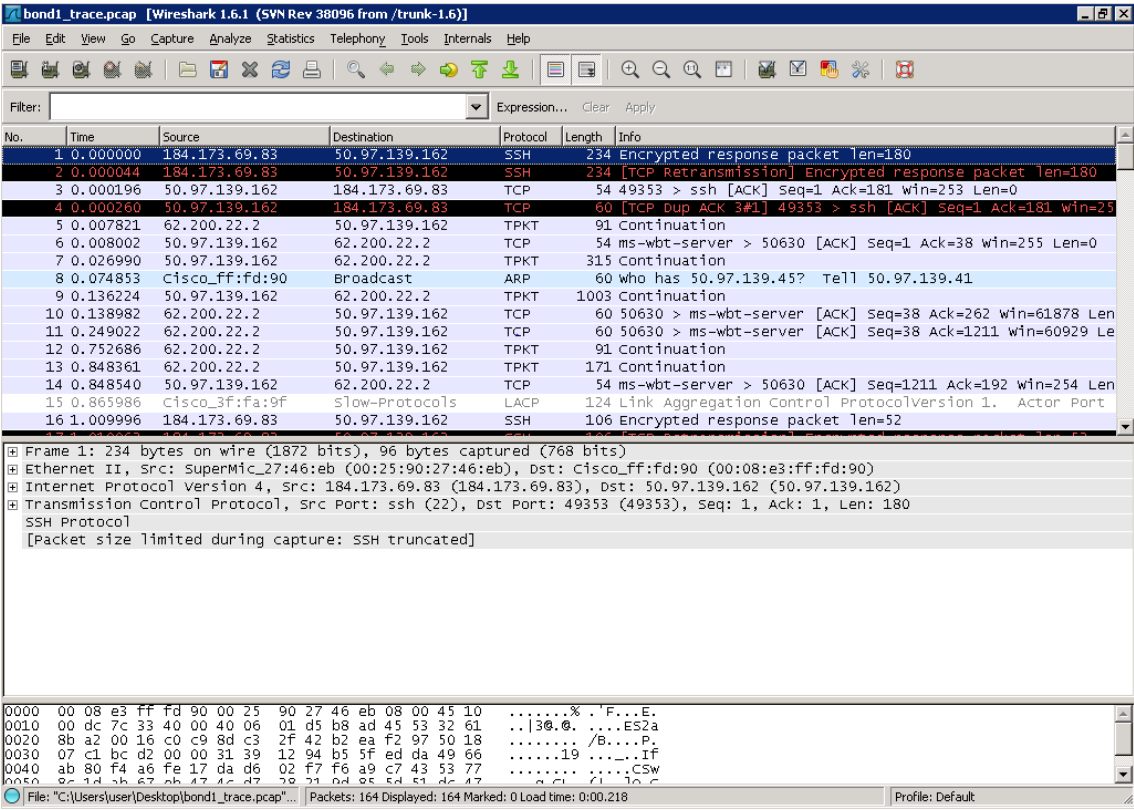
Step	Action
	<p> Collect a network trace on a virtual bridge (xapiX/xenbrX) used by a virtual machine:</p> <p>Note: This process will collect all traffic running over the bridge. Whether or not the data packet is leaving the host i.e. hitting the wire or not.</p>
20.	<p>List the current network bridge configuration</p> <p>e.g. brctl show</p>  <pre> root@xsts-001:~ [brctl show] bridge name bridge id STP enabled interfaces xapi1 8000.0025902746ea no bond0 vif1.0 xapi2 8000.0025902746eb no bond1 vif1.1 xapi3 8000.feffffffffffff no vif1.2 vif2.1 vif3.1 vif12.0 vif10.0 xapi6 8000.0025902746ea no bond0.777 </pre>
21.	<p>Trace network traffic on a bridge</p> <p>e.g. tcpdump -i [bridge name] -vvv -w [filename]</p>  <pre> root@xsts-001:~ [tcpdump -i xapi3 -vvv -w xapi3_trace.pcap] tcpdump: WARNING: xapi3: no IPv4 address assigned tcpdump: listening on xapi3, link-type EN10MB (Ethernet), capture size 96 bytes ^C200 packets captured 200 packets received by filter 0 packets dropped by kernel </pre> <p>Note: i.e. tcpdump -i xapi3 -vvv -w xapi3_trace.pcap</p> <p>Note: To capture the complete packed payload use the -s 0 parameter when collecting a trace.</p>
	<p> Collect the trace files from the XenServer for analysis:</p>
22.	<p>From the Landing Desktop connect to the XenServer host using WinSCP</p>

Step	Action
23.	<p>Use an existing WinSCP session or re-launch WinSCP from your Landing Desktop by selecting your saved session information and click Login.</p>  <p>The WinSCP Login dialog box is shown. It has a left sidebar with categories: Session, Environment, Directories, SSH, and Preferences. Under 'Session', 'Stored sessions' is selected. The main area contains a text field with 'root@*XenServer Host IP address*'. On the right, there are buttons: New, Edit, Delete, Rename, New folder..., Set defaults, Shell icon..., and Tools... At the bottom, there are buttons: About..., Languages, Login, Save..., and Close. An 'Advanced options' checkbox is at the bottom left.</p>

24.	<p>Browse to the trace files</p>  <p>The WinSCP File Explorer window is shown. The title bar reads 'root - root@184.173.69.83 - WinSCP'. The address bar shows 'root'. The left pane shows the local desktop with files like Citrix XenCenter.lnk, desktop.ini, PuTTY.lnk, state.db, status-report-2011-09-..., WinSCP.lnk, Wireshark.lnk, and XML Marker.lnk. The right pane shows the remote file system under '/root' with a table of files:</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Ext</th> <th>Size</th> <th>Changed</th> <th>Rights</th> </tr> </thead> <tbody> <tr> <td>..</td> <td></td> <td></td> <td>27/07/2...</td> <td>rwxr-xr-x</td> </tr> <tr> <td>.ssh</td> <td></td> <td></td> <td>26/07/2...</td> <td>rwxr-xr-x</td> </tr> <tr> <td>.bash_history</td> <td></td> <td>518</td> <td>26/09/2...</td> <td>rw-----</td> </tr> <tr> <td>.bash_logout</td> <td></td> <td>24</td> <td>06/01/2...</td> <td>rw-r--r--</td> </tr> <tr> <td>.bash_profile</td> <td></td> <td>191</td> <td>06/01/2...</td> <td>rw-r--r--</td> </tr> <tr> <td>.bashrc</td> <td></td> <td>176</td> <td>06/01/2...</td> <td>rw-r--r--</td> </tr> <tr> <td>.cshrc</td> <td></td> <td>100</td> <td>06/01/2...</td> <td>rw-r--r--</td> </tr> <tr> <td>.tcshrc</td> <td></td> <td>129</td> <td>06/01/2...</td> <td>rw-r--r--</td> </tr> <tr> <td>bond1_trace.pcap</td> <td></td> <td>15,294</td> <td>26/09/2...</td> <td>rw-r--r--</td> </tr> <tr> <td>pool_dump.db</td> <td></td> <td>296,739</td> <td>26/09/2...</td> <td>rw-----</td> </tr> <tr> <td>report1.zip</td> <td></td> <td>6,720,476</td> <td>26/09/2...</td> <td>rw-----</td> </tr> <tr> <td>support.tar.bz2</td> <td></td> <td>26,450</td> <td>26/07/2...</td> <td>rw-r--r--</td> </tr> <tr> <td>vif10_0_trace.pcap</td> <td></td> <td>12,651</td> <td>26/09/2...</td> <td>rw-r--r--</td> </tr> <tr> <td>xapi3_trace.pcap</td> <td></td> <td>18,827</td> <td>26/09/2...</td> <td>rw-r--r--</td> </tr> </tbody> </table> <p>Tip: To get to the root user's home folder click on the home button  in the right column.</p> <p>Note: If the trace files are not displayed click the refresh button  in the right column.</p>	Name	Ext	Size	Changed	Rights	..			27/07/2...	rwxr-xr-x	.ssh			26/07/2...	rwxr-xr-x	.bash_history		518	26/09/2...	rw-----	.bash_logout		24	06/01/2...	rw-r--r--	.bash_profile		191	06/01/2...	rw-r--r--	.bashrc		176	06/01/2...	rw-r--r--	.cshrc		100	06/01/2...	rw-r--r--	.tcshrc		129	06/01/2...	rw-r--r--	bond1_trace.pcap		15,294	26/09/2...	rw-r--r--	pool_dump.db		296,739	26/09/2...	rw-----	report1.zip		6,720,476	26/09/2...	rw-----	support.tar.bz2		26,450	26/07/2...	rw-r--r--	vif10_0_trace.pcap		12,651	26/09/2...	rw-r--r--	xapi3_trace.pcap		18,827	26/09/2...	rw-r--r--
Name	Ext	Size	Changed	Rights																																																																								
..			27/07/2...	rwxr-xr-x																																																																								
.ssh			26/07/2...	rwxr-xr-x																																																																								
.bash_history		518	26/09/2...	rw-----																																																																								
.bash_logout		24	06/01/2...	rw-r--r--																																																																								
.bash_profile		191	06/01/2...	rw-r--r--																																																																								
.bashrc		176	06/01/2...	rw-r--r--																																																																								
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xapi3_trace.pcap		18,827	26/09/2...	rw-r--r--																																																																								

Step	Action
25.	<p>Select all the trace files and drag them over to your Landing Desktop screen and click copy</p> 
	<p> Open the trace files with a trace analyzer i.e. Wireshark:</p>
26.	<p>Launch Wireshark from your client machine desktop</p> 

Step	Action
27.	<p>Click Open and browse to a trace file located on your Landing Desktop (copied earlier)</p>  <p>The screenshot shows the 'Wireshark: Open Capture File' dialog box. The 'Look in' dropdown is set to 'Desktop'. The file list contains several folders and files, with 'bond1_trace' selected. The 'File name' field is 'bond1_trace' and 'Files of type' is 'All Files (*.*)'. The 'Open' button is highlighted. Below the file list, there are checkboxes for 'MAC name resolution' (checked), 'Network name resolution' (unchecked), and 'Transport name resolution' (checked). A summary section shows: Filename: bond1_trace.pcap, Format: Wireshark/tcpdump/... - libpcap, Size: 15294 bytes, Packets: 164, First Packet: 2011-09-26 14:30:40, and Elapsed: 00:00:10.</p>

Step	Action
28.	<p>Open the trace file</p>  <p>Note: In the above example we can see the SSH traffic running between the client (PuTTY) and the XenServer Host.</p> <p style="text-align: center;">END OF EXERCISE</p>

Summary

Key Takeaways	<p>The key takeaways for this exercise are:</p> <ul style="list-style-type: none"> • You will be able to identify network interfaces to trace. • You will be able to capture and collect network traces on different network interfaces associated with a XenServer host and the virtual machines.
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Exercise 7: Monitoring in XenServer

Overview

In this exercise we will cover some common tools used to monitor performance related information about a XenServer environment.


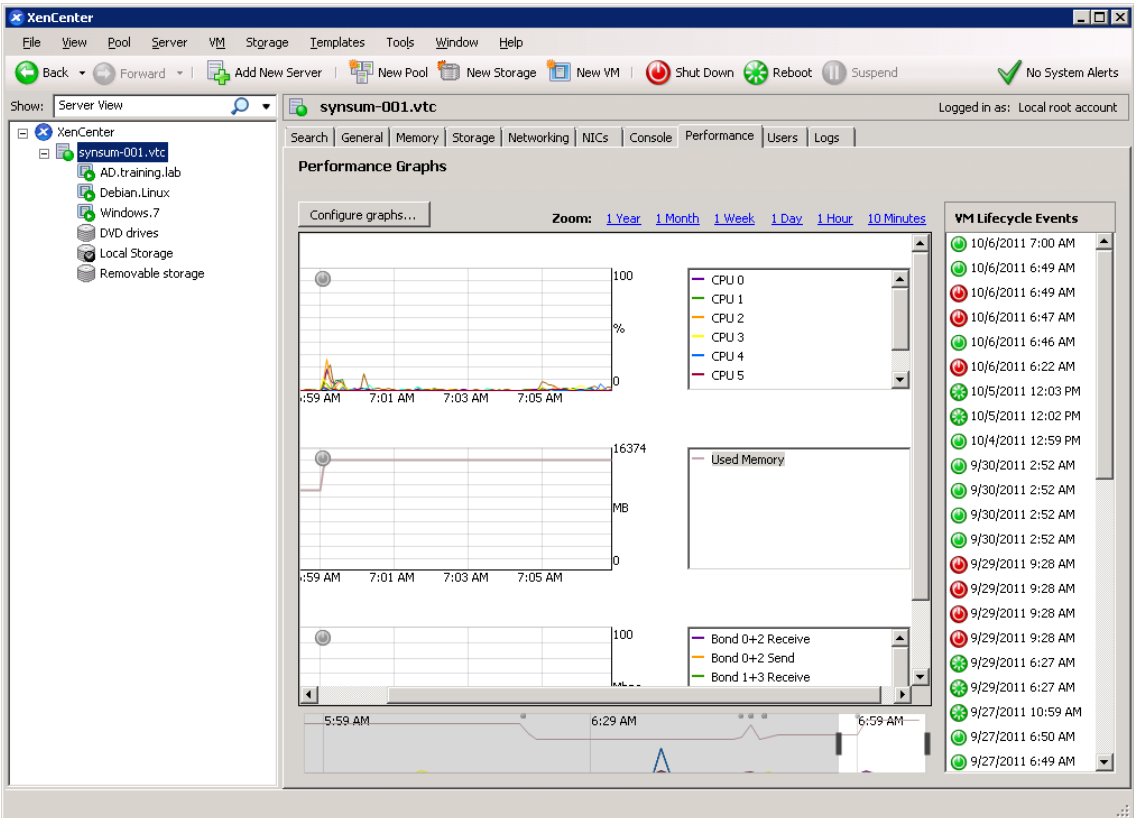
XenCenter provides a view of performance metrics for a XenServer host and virtual machine. However in some cases we use alternative tools to get another view of the performance and status of a host or VM.

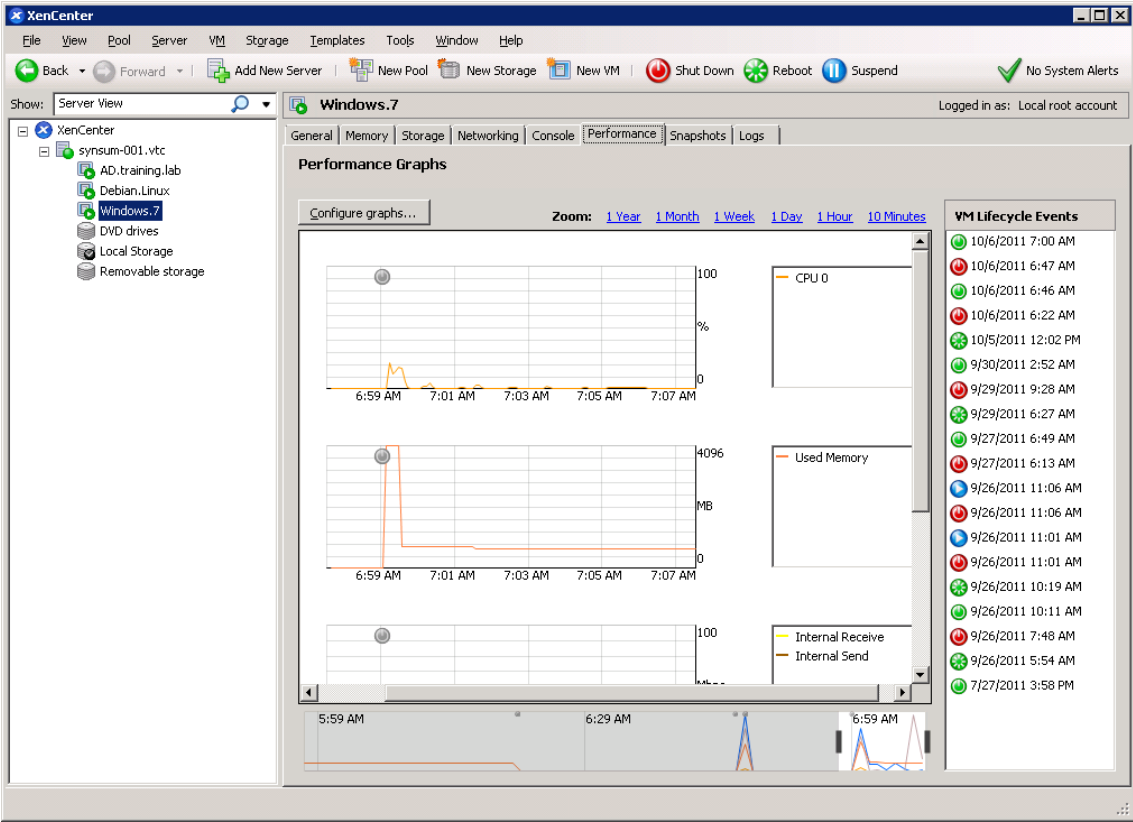

To complete this exercise, you must have the following:

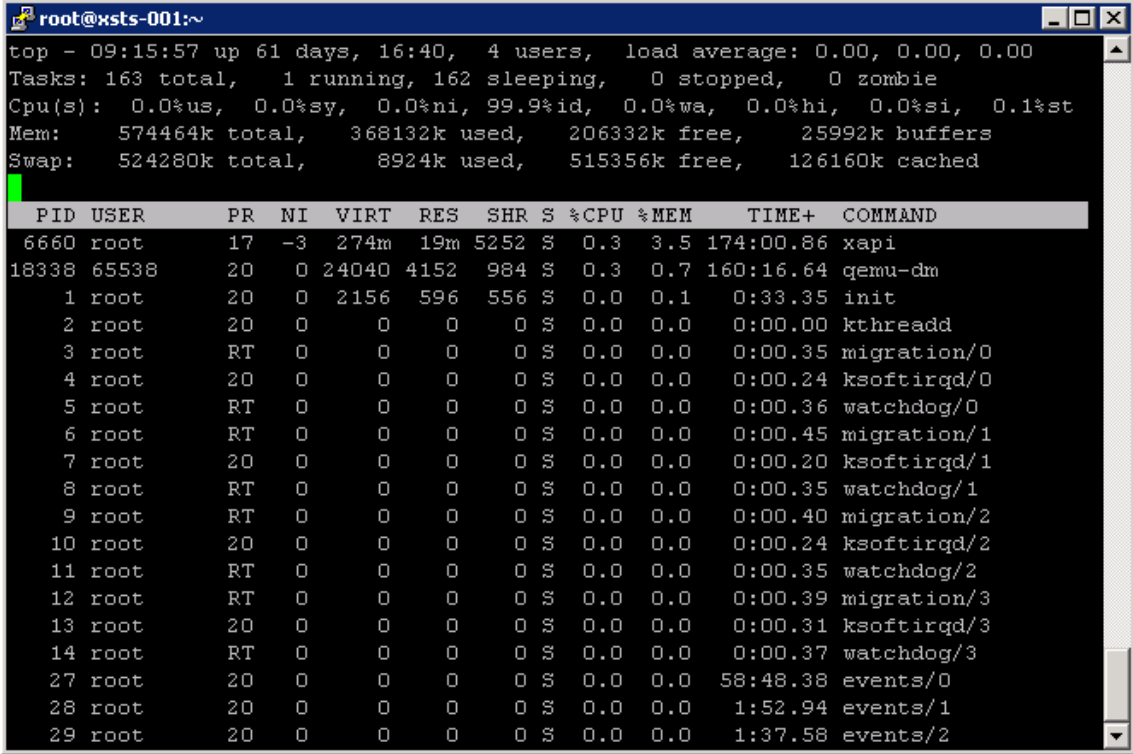
- XenCenter
- SSH client (PuTTY)

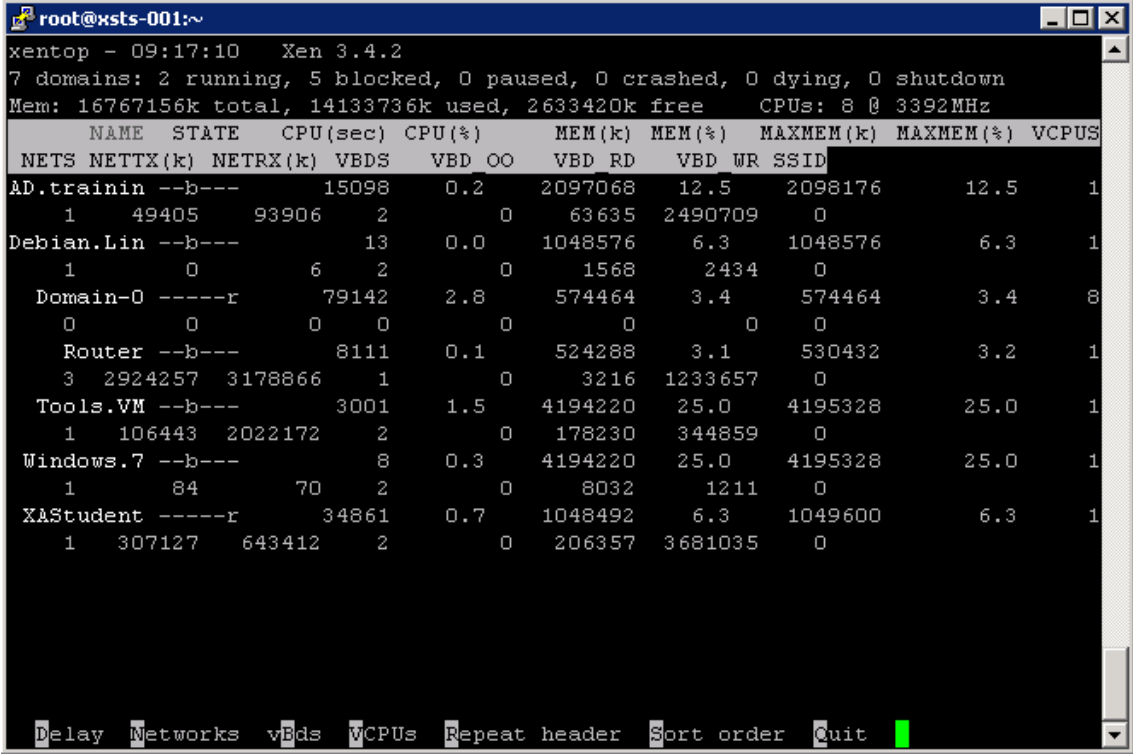
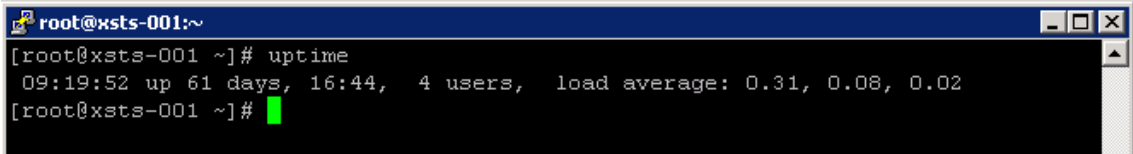
Step-by-step guidance

Estimated time to complete this lab: **15 minutes.**

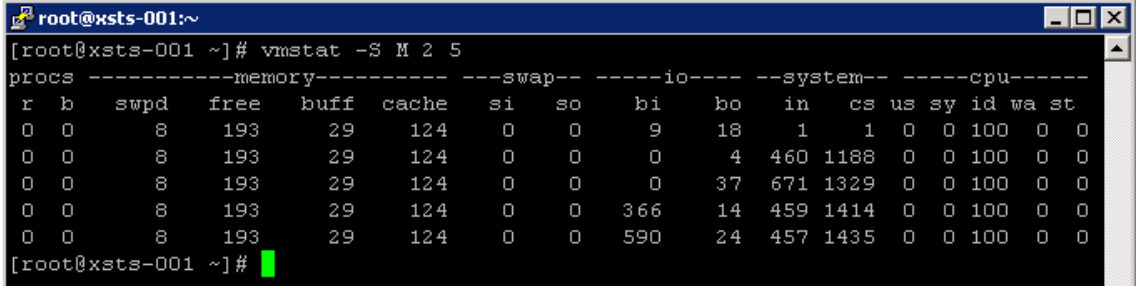
Step	Action
	 Review the performance metric information available in XenCenter:
1.	Ensure all VMs are running to generate load on the XenServer host
2.	To monitor a XenServer host performance metric highlight the host and click on the Performance tab. 

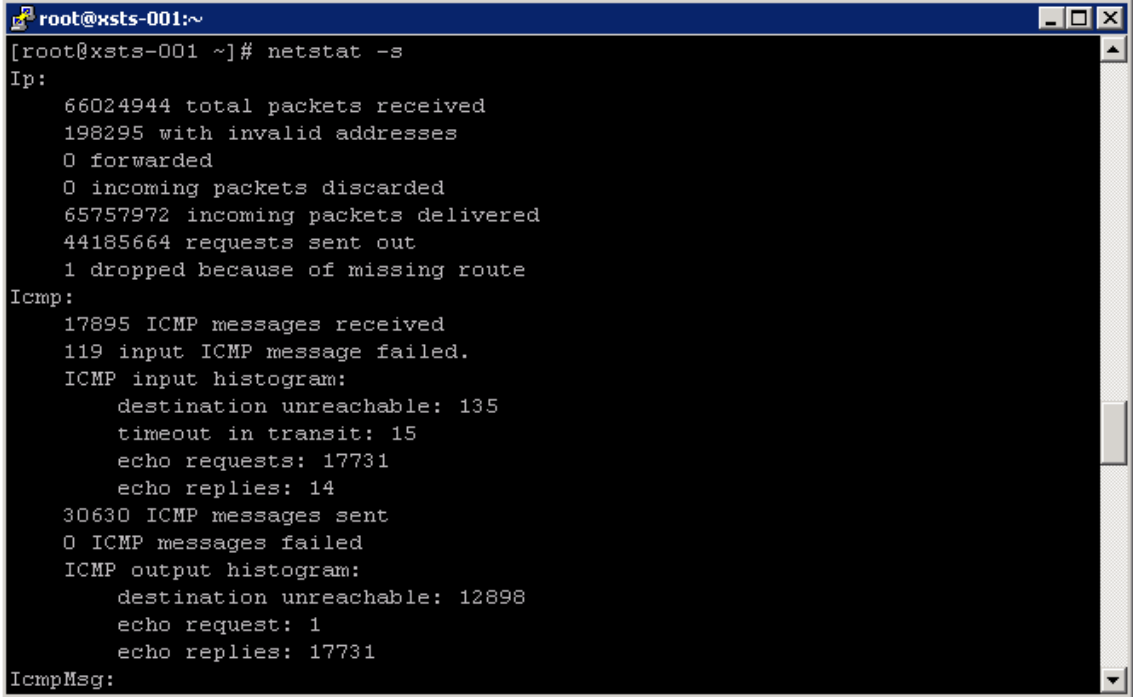
Step	Action
3.	<p>To monitor a virtual machine performance metric highlight the VM and click on the Performance tab</p> 
	<p> Use the CLI to display performance and utilization information:</p>
4.	<p>Launch a new SSH client OR duplicate an existing session of PuTTY from the Landing Desktop OR reuse an open session window.</p>

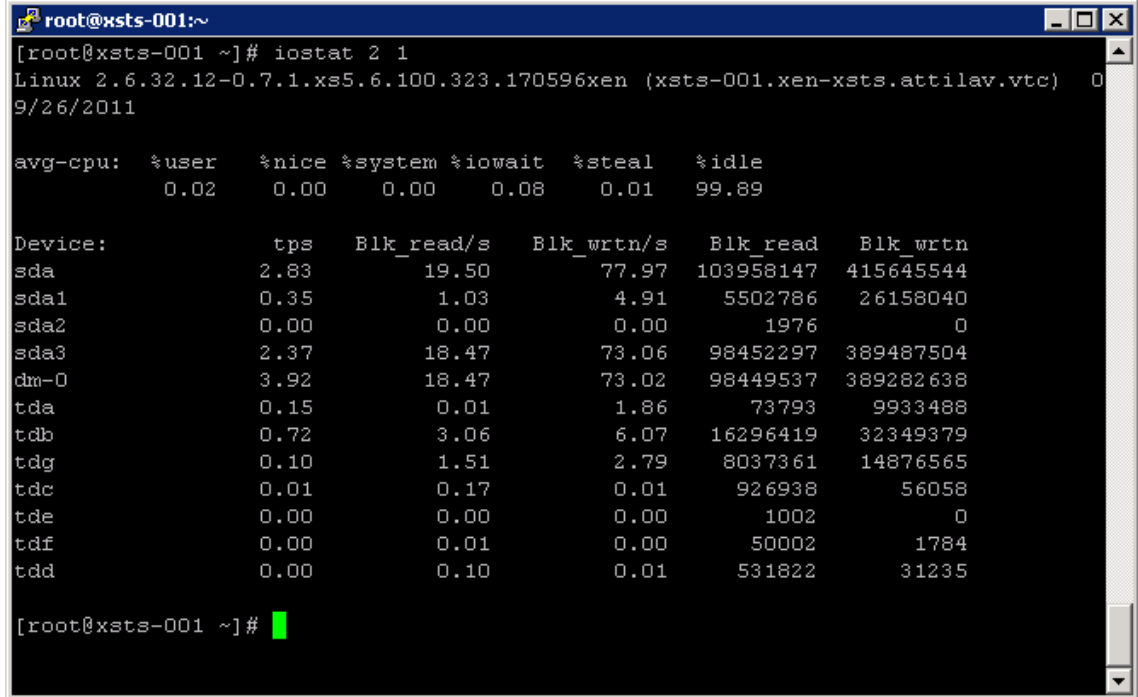
Step	Action
5.	<p>Use the top command view the current tasks on dom0</p> <p>e.g. top</p>  <pre> root@xsts-001:~ top - 09:15:57 up 61 days, 16:40, 4 users, load average: 0.00, 0.00, 0.00 Tasks: 163 total, 1 running, 162 sleeping, 0 stopped, 0 zombie Cpu(s): 0.0%us, 0.0%sy, 0.0%ni, 99.9%id, 0.0%wa, 0.0%hi, 0.0%si, 0.1%st Mem: 574464k total, 368132k used, 206332k free, 25992k buffers Swap: 524280k total, 8924k used, 515356k free, 126160k cached PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND 6660 root 17 -3 274m 19m 5252 S 0.3 3.5 174:00.86 xapi 18338 65538 20 0 24040 4152 984 S 0.3 0.7 160:16.64 qemu-dm 1 root 20 0 2156 596 556 S 0.0 0.1 0:33.35 init 2 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kthreadd 3 root 20 0 0 0 0 S 0.0 0.0 0:00.35 migration/0 4 root 20 0 0 0 0 S 0.0 0.0 0:00.24 ksoftirqd/0 5 root 20 0 0 0 0 S 0.0 0.0 0:00.36 watchdog/0 6 root 20 0 0 0 0 S 0.0 0.0 0:00.45 migration/1 7 root 20 0 0 0 0 S 0.0 0.0 0:00.20 ksoftirqd/1 8 root 20 0 0 0 0 S 0.0 0.0 0:00.35 watchdog/1 9 root 20 0 0 0 0 S 0.0 0.0 0:00.40 migration/2 10 root 20 0 0 0 0 S 0.0 0.0 0:00.24 ksoftirqd/2 11 root 20 0 0 0 0 S 0.0 0.0 0:00.35 watchdog/2 12 root 20 0 0 0 0 S 0.0 0.0 0:00.39 migration/3 13 root 20 0 0 0 0 S 0.0 0.0 0:00.31 ksoftirqd/3 14 root 20 0 0 0 0 S 0.0 0.0 0:00.37 watchdog/3 27 root 20 0 0 0 0 S 0.0 0.0 58:48.38 events/0 28 root 20 0 0 0 0 S 0.0 0.0 1:52.94 events/1 29 root 20 0 0 0 0 S 0.0 0.0 1:37.58 events/2 </pre> <p>Press q to quit</p> <p>Tip:</p> <ul style="list-style-type: none"> • Press h to display interactive command options. Press Enter to return to the main screen. • Press 1 to view individual CPU information utilized by Dom0. Note that since XenServer 5.6 FP1 Dom0 has access to a maximum of 4 vCPUs by default. • Press < and > to scroll through the task columns. • Press c to display the command line name of the task. <p>Note: For more information about the top command run man top for the manual page of this tool</p> <p>Note: top displays the information as seen from Dom0</p>

Step	Action
6.	<p>Use xentop to display the information of the hypervisor and domains.</p> <p>e.g. xentop</p>  <pre> root@xsts-001:~# xentop - 09:17:10 Xen 3.4.2 7 domains: 2 running, 5 blocked, 0 paused, 0 crashed, 0 dying, 0 shutdown Mem: 16767156k total, 14133736k used, 2633420k free CPUs: 8 @ 3392MHz NAME STATE CPU(sec) CPU(%) MEM(k) MEM(%) MAXMEM(k) MAXMEM(%) VCPUS NETS NETTX(k) NETRX(k) VBDS VBD OO VBD RD VBD WR SSID AD.trainin --b--- 15098 0.2 2097068 12.5 2098176 12.5 1 1 49405 93906 2 0 63635 2490709 0 Debian.Lin --b--- 13 0.0 1048576 6.3 1048576 6.3 1 1 0 6 2 0 1568 2434 0 Domain-0 -----r 79142 2.8 574464 3.4 574464 3.4 8 0 0 0 0 0 0 0 0 Router --b--- 8111 0.1 524288 3.1 530432 3.2 1 3 2924257 3178866 1 0 3216 1233657 0 Tools.VM --b--- 3001 1.5 4194220 25.0 4195328 25.0 1 1 106443 2022172 2 0 178230 344859 0 Windows.7 --b--- 8 0.3 4194220 25.0 4195328 25.0 1 1 84 70 2 0 8032 1211 0 XAStudent -----r 34861 0.7 1048492 6.3 1049600 6.3 1 1 307127 643412 2 0 206357 3681035 0 Delay Networks vBds vCPUs Repeat header Sort order Quit </pre> <p>Press q to quit</p> <p>Tip: Press N to display network related information. Tip: Press V to display VCPU information.</p> <p>Note: xentop displays information as seen from the hypervisor. For more information about xentop type man xentop.</p>
7.	<p>Use the uptime command to display the average load on the server</p> <p>e.g. uptime</p>  <pre> root@xsts-001:~# uptime 09:19:52 up 61 days, 16:44, 4 users, load average: 0.31, 0.08, 0.02 root@xsts-001:~# </pre> <p>Note: The uptime command shows the average sum of the number of processes waiting in the run-queue plus the number currently executing over 1, 5, and 15 minute time periods i.e. 0.31 (1 min), 0.08 (5 min), 0.02 (15min).</p> <p>Note: If a system that has a load average significantly higher than the number of CPUs it could indicate a possible bottleneck.</p>

Step	Action
8.	Use the mpstat command to display processor related information
	e.g. mpstat 2
	<pre> root@xsts-001:~ [root@xsts-001 ~]# mpstat 2 Linux 2.6.32.12-0.7.1.xs5.6.100.323.170596xen (xsts-001.xen-xsts.attilav.vtc) 09/26/2011 09:21:19 AM CPU %user %nice %sys %iowait %irq %soft %steal %idle intr/s 09:21:21 AM all 0.75 0.00 0.00 0.00 0.00 0.00 0.00 99.25 677.11 09:21:23 AM all 0.00 0.00 0.00 0.12 0.00 0.00 0.00 99.88 569.31 09:21:25 AM all 0.00 0.00 0.00 0.00 0.00 0.00 0.00 100.00 390.26 09:21:27 AM all 0.00 0.00 0.00 0.00 0.00 0.00 0.00 100.00 595.61 09:21:29 AM all 0.00 0.00 0.00 0.00 0.00 0.00 0.00 100.00 476.11 09:21:31 AM all 0.00 0.00 0.00 0.49 0.00 0.00 0.00 99.51 393.58 09:21:33 AM all 0.00 0.00 0.00 0.00 0.00 0.00 0.00 100.00 1011.76 09:21:35 AM all 0.00 0.00 0.00 0.00 0.00 0.00 0.00 100.00 332.47 09:21:37 AM all 0.00 0.00 0.00 0.12 0.00 0.00 0.00 99.88 506.28 </pre>
	Press CTRL+C to quit
	Tip: mpstat (n) will designate the interval at which metrics should be displayed i.e. mpstat 5
	Tip: mpstat -P ALL 2 5 will display five reports of statistics for all processors at two second intervals
	Note: For more information about the mpstat command run man mpstat for the manual page of this tool

Step	Action
9.	<p>Use the vmstat command to display virtual memory related information</p> <p>e.g. vmstat -S M 2 5</p>  <pre> root@xsts-001:~ [root@xsts-001 ~]# vmstat -S M 2 5 procs -----memory----- ---swap-- -----io----- --system-- -----cpu----- r b swpd free buff cache si so bi bo in cs us sy id wa st 0 0 8 193 29 124 0 0 9 18 1 1 0 0 100 0 0 0 0 8 193 29 124 0 0 0 4 460 1188 0 0 100 0 0 0 0 8 193 29 124 0 0 0 37 671 1329 0 0 100 0 0 0 0 8 193 29 124 0 0 366 14 459 1414 0 0 100 0 0 0 0 8 193 29 124 0 0 590 24 457 1435 0 0 100 0 0 [root@xsts-001 ~]# </pre> <p>Press CTRL+C to quit</p> <p>Tip: vmstat (n) will designate the intervals at which metrics are displayed i.e. vmstat 2</p> <p>Tip: vmstat (n) (n) will designate the second intervals at which metrics are displayed and the count i.e. vmstat 2 5 (every 2 seconds, 5 times).</p> <p>Tip: -S is used to specify units and M is to set the unit to Megabytes</p> <p>Columns of interest are:</p> <ul style="list-style-type: none"> • si: memory swapped in from disk /s • so: memory swapped to disk /s • us: time running non-kernel code (user time/space) • sy: time running kernel code • wa: time waiting for CPU IO <p>Note: For more information about the vmstat command run man vmstat for the manual page of this tool. This tool is generally used to highlight performance bottlenecks in a server.</p>

Step	Action
<p>10.</p>	<p>Use the netstat command to display network related information</p> <p>e.g. netstat -s</p>  <pre> root@xsts-001:~ [root@xsts-001 ~]# netstat -s Ip: 66024944 total packets received 198295 with invalid addresses 0 forwarded 0 incoming packets discarded 65757972 incoming packets delivered 44185664 requests sent out 1 dropped because of missing route Icmp: 17895 ICMP messages received 119 input ICMP message failed. ICMP input histogram: destination unreachable: 135 timeout in transit: 15 echo requests: 17731 echo replies: 14 30630 ICMP messages sent 0 ICMP messages failed ICMP output histogram: destination unreachable: 12898 echo request: 1 echo replies: 17731 IcmpMsg: </pre> <p>Press CTRL+C to quit</p> <p>Tip: netstat -s -c displays network statistics at 1 second intervals</p> <p>Note: For more information about the netstat command run man netstat for the manual page of this tool</p>

Step	Action
11.	<p>Use the iostat command to display input and output related information which could relate to CPU or devices</p> <p>e.g. iostat 2 1</p>
	 <pre> root@xsts-001:~# iostat 2 1 Linux 2.6.32.12-0.7.1.xs5.6.100.323.170596xen (xsts-001.xen-xsts.attilav.vtc) 0 9/26/2011 avg-cpu: %user %nice %system %iowait %steal %idle 0.02 0.00 0.00 0.08 0.01 99.89 Device: tps Blk_read/s Blk_wrtn/s Blk_read Blk_wrtn sda 2.83 19.50 77.97 103958147 415645544 sda1 0.35 1.03 4.91 5502786 26158040 sda2 0.00 0.00 0.00 1976 0 sda3 2.37 18.47 73.06 98452297 389487504 dm-0 3.92 18.47 73.02 98449537 389282638 tda 0.15 0.01 1.86 73793 9933488 tdb 0.72 3.06 6.07 16296419 32349379 tdg 0.10 1.51 2.79 8037361 14876565 tdc 0.01 0.17 0.01 926938 56058 tde 0.00 0.00 0.00 1002 0 tdf 0.00 0.01 0.00 50002 1784 tdd 0.00 0.10 0.01 531822 31235 root@xsts-001 ~]# </pre>
	<p>Tip: iostat 2 1 displays one report at two second intervals for all devices</p> <p>Tip: iostat -d 2 displays a continuous device report at two second intervals</p> <p>Tip: iostat -n displays NFS directory statistic if mapped</p>
	<p>Note: For more information about the iostat command run man iostat for the manual page of this tool.</p>

Step	Action
------	--------

12.	Use the sar command to display processor queue related information
-----	---

e.g. **sar -q 2 10**

```

root@xsts-001:~
[root@xsts-001 ~]# sar -q 2 10
Linux 2.6.32.12-0.7.1.xs5.6.100.323.170596xen (xsts-001.xen-xsts.attilav.vtc) 09/26/2011

09:30:10 AM   runq-sz   plist-sz   ldavg-1   ldavg-5   ldavg-15
09:30:12 AM           0         299       0.01      0.02      0.00
09:30:14 AM           0         299       0.01      0.02      0.00
09:30:16 AM           0         299       0.01      0.02      0.00
09:30:18 AM           0         299       0.01      0.02      0.00
09:30:20 AM           1         299       0.01      0.02      0.00
09:30:22 AM           0         299       0.01      0.01      0.00
09:30:24 AM           0         299       0.01      0.01      0.00
09:30:26 AM           0         299       0.01      0.01      0.00
09:30:28 AM           0         299       0.01      0.01      0.00
09:30:30 AM           0         299       0.01      0.01      0.00
Average:           0         299       0.01      0.01      0.00
[root@xsts-001 ~]#
  
```

Note: In the above example we collect 10 reports in 2 second intervals.

Also use the **sar** command

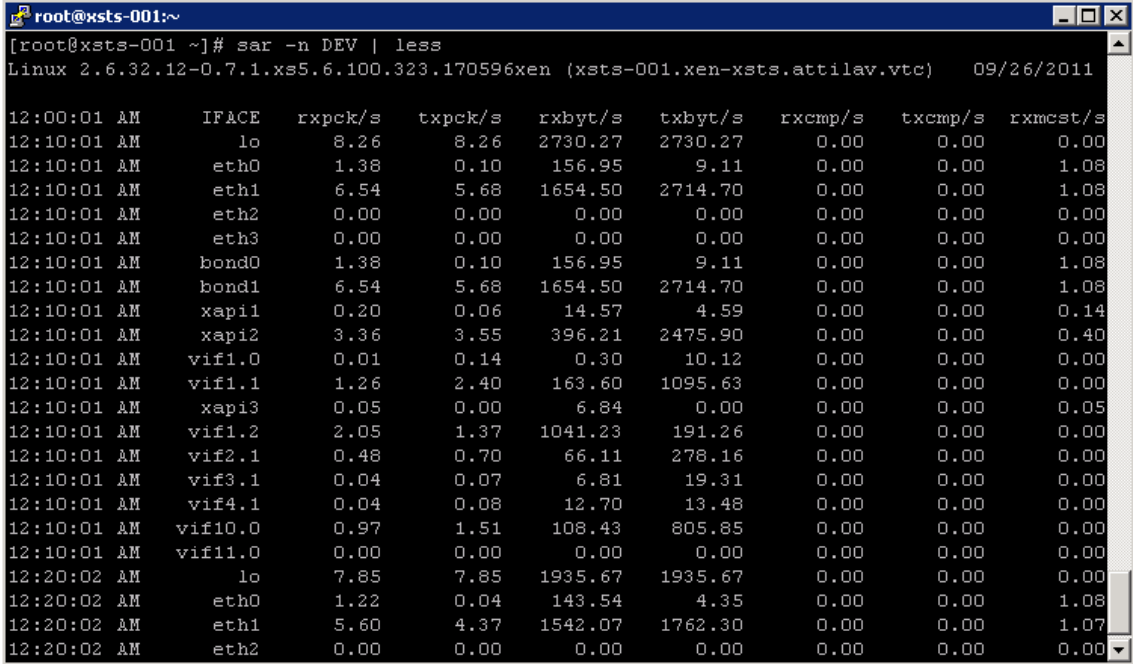
e.g. **sar -u**

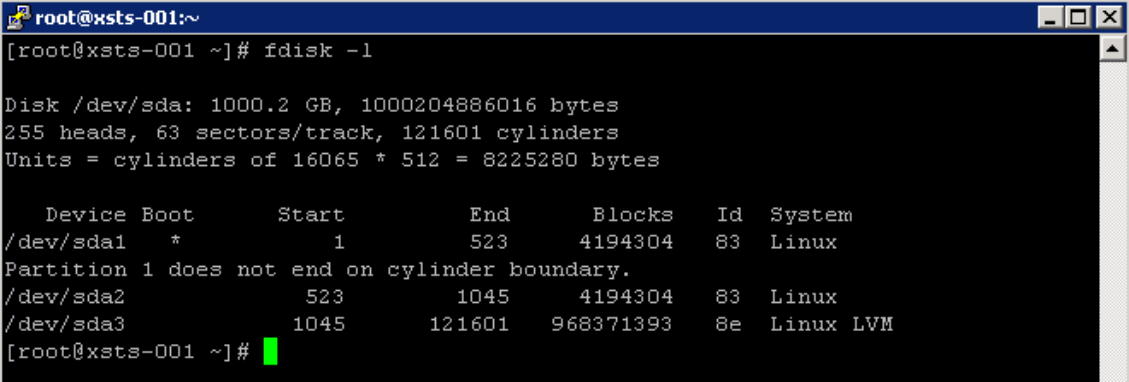
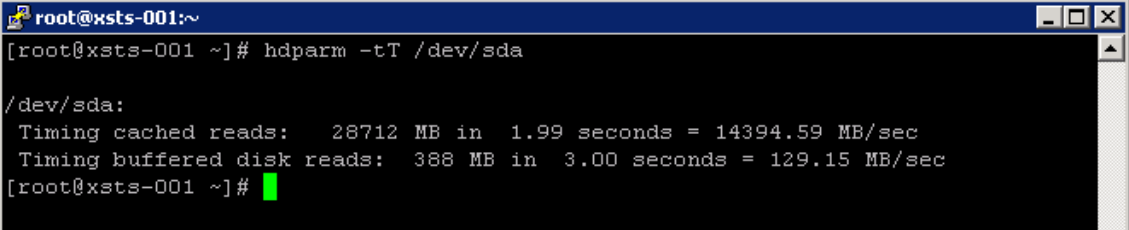
```

root@xsts-001:~
[root@xsts-001 ~]# sar -u
Linux 2.6.32.12-0.7.1.xs5.6.100.323.170596xen (xsts-001.xen-xsts.attilav.vtc) 09/26/2011

12:00:01 AM   CPU   %user   %nice   %system   %iowait   %steal   %idle
12:10:01 AM   all    0.02    0.00    0.01     0.08     0.01    99.89
12:20:02 AM   all    0.01    0.00    0.00     0.07     0.01    99.91
12:30:01 AM   all    0.01    0.00    0.00     0.07     0.01    99.90
12:40:01 AM   all    0.01    0.00    0.00     0.07     0.01    99.91
12:50:01 AM   all    0.01    0.00    0.00     0.08     0.01    99.90
01:00:01 AM   all    0.01    0.00    0.00     0.06     0.01    99.92
01:10:02 AM   all    0.02    0.00    0.00     0.07     0.01    99.91
01:20:01 AM   all    0.01    0.00    0.00     0.07     0.01    99.91
01:30:01 AM   all    0.01    0.00    0.00     0.06     0.01    99.92
01:40:01 AM   all    0.02    0.00    0.00     0.06     0.01    99.91
01:50:01 AM   all    0.01    0.00    0.00     0.06     0.01    99.92
02:00:01 AM   all    0.01    0.00    0.00     0.07     0.01    99.91
02:10:01 AM   all    0.02    0.00    0.00     0.06     0.01    99.91
02:20:01 AM   all    0.01    0.00    0.01     0.07     0.01    99.91
02:30:01 AM   all    0.01    0.00    0.00     0.08     0.01    99.91
02:40:01 AM   all    0.02    0.00    0.00     0.07     0.01    99.90
02:50:01 AM   all    0.01    0.00    0.00     0.07     0.01    99.91
03:00:01 AM   all    0.01    0.00    0.00     0.07     0.01    99.91
03:10:01 AM   all    0.02    0.00    0.00     0.06     0.01    99.91
03:20:01 AM   all    0.01    0.00    0.00     0.08     0.01    99.90
03:30:02 AM   all    0.01    0.00    0.00     0.07     0.01    99.92
  
```

Tip: These commands are useful to determine if your CPU is bound (is a bottleneck). If the **runq-sz** from **sar -q** is consistently above 2 or 3 and the **idle CPU %** from **sar -u** is consistently below 5% then the CPU could be bound.

Step	Action
13.	<p>Use the sar command to display network related information</p> <p>e.g. sar -n DEV less</p>  <pre> root@xsts-001:~ [root@xsts-001 ~]# sar -n DEV less Linux 2.6.32.12-0.7.1.xs5.6.100.323.170596xen (xsts-001.xen-xsts.attilav.vtc) 09/26/2011 12:00:01 AM IFACE rxpck/s txpck/s rxbyt/s txbyt/s rxcmp/s txcmp/s rxmcast/s 12:10:01 AM lo 8.26 8.26 2730.27 2730.27 0.00 0.00 0.00 12:10:01 AM eth0 1.38 0.10 156.95 9.11 0.00 0.00 1.08 12:10:01 AM eth1 6.54 5.68 1654.50 2714.70 0.00 0.00 1.08 12:10:01 AM eth2 0.00 0.00 0.00 0.00 0.00 0.00 0.00 12:10:01 AM eth3 0.00 0.00 0.00 0.00 0.00 0.00 0.00 12:10:01 AM bond0 1.38 0.10 156.95 9.11 0.00 0.00 1.08 12:10:01 AM bond1 6.54 5.68 1654.50 2714.70 0.00 0.00 1.08 12:10:01 AM xapi1 0.20 0.06 14.57 4.59 0.00 0.00 0.14 12:10:01 AM xapi2 3.36 3.55 396.21 2475.90 0.00 0.00 0.40 12:10:01 AM vif1.0 0.01 0.14 0.30 10.12 0.00 0.00 0.00 12:10:01 AM vif1.1 1.26 2.40 163.60 1095.63 0.00 0.00 0.00 12:10:01 AM xapi3 0.05 0.00 6.84 0.00 0.00 0.00 0.05 12:10:01 AM vif1.2 2.05 1.37 1041.23 191.26 0.00 0.00 0.00 12:10:01 AM vif2.1 0.48 0.70 66.11 278.16 0.00 0.00 0.00 12:10:01 AM vif3.1 0.04 0.07 6.81 19.31 0.00 0.00 0.00 12:10:01 AM vif4.1 0.04 0.08 12.70 13.48 0.00 0.00 0.00 12:10:01 AM vif10.0 0.97 1.51 108.43 805.85 0.00 0.00 0.00 12:10:01 AM vif11.0 0.00 0.00 0.00 0.00 0.00 0.00 0.00 12:20:02 AM lo 7.85 7.85 1935.67 1935.67 0.00 0.00 0.00 12:20:02 AM eth0 1.22 0.04 143.54 4.35 0.00 0.00 1.08 12:20:02 AM eth1 5.60 4.37 1542.07 1762.30 0.00 0.00 1.07 12:20:02 AM eth2 0.00 0.00 0.00 0.00 0.00 0.00 0.00 </pre> <p>Press q to quit</p> <ul style="list-style-type: none"> • IFACE: Name of the network interface for which statistics are reported. • rxpck/s: Total number of packets received per second. • txpck/s: Total number of packets transmitted per second. • rxbyt/s: Total number of bytes received per second. • txbyt/s: Total number of bytes transmitted per second. • rxcmp/s: Number of compressed packets received per second. • txcmp/s: Number of compressed packets transmitted per second. • rxmcast/s: Number of multicast packets received per second. <p>Note: Scroll down to the bottom of the output to see the device averages.</p>

Step	Action
14.	<p>Use the hdparm command to collect disk transfer speeds:</p> <p>First list available device using fdisk.</p> <p>e.g. fdisk -l</p>  <pre> root@xsts-001:~# fdisk -l Disk /dev/sda: 1000.2 GB, 1000204886016 bytes 255 heads, 63 sectors/track, 121601 cylinders Units = cylinders of 16065 * 512 = 8225280 bytes Device Boot Start End Blocks Id System /dev/sda1 * 1 523 4194304 83 Linux Partition 1 does not end on cylinder boundary. /dev/sda2 523 1045 4194304 83 Linux /dev/sda3 1045 121601 968371393 8e Linux LVM root@xsts-001 ~]# </pre> <p>Next display the transfer speeds of a disk device by using hdparm:</p> <p>e.g. hdparm -tT [device name]</p>  <pre> root@xsts-001:~# hdparm -tT /dev/sda /dev/sda: Timing cached reads: 28712 MB in 1.99 seconds = 14394.59 MB/sec Timing buffered disk reads: 388 MB in 3.00 seconds = 129.15 MB/sec root@xsts-001 ~]# </pre> <p>Note: -t performs device read timings -T performs cache read timings</p>
15.	<p>Note that any of the above mentioned commands can redirect their output to a file using the > [filename] parameter</p>

END OF EXERCISE

Summary

<p>Key Takeaways</p>	<p>The key takeaways for this exercise are:</p> <ul style="list-style-type: none"> You will be able to view and gather performance related data about your XenServer environment. You will be able to analyze performance related data.
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Exercise 8: Creating and Reviewing Snapshots

Overview

In this exercise we will create new virtual machine snapshots and also revert to these snapshots.

A virtual machine (VM) snapshot is a record of a running virtual machine at a point in time. When you take a snapshot of a VM, its storage information (the data on the hard drive) and metadata (configuration information) is saved.


XenServer 5.6 and above provides the functionality to save a VM's state (RAM). This can be useful if you are upgrading or patching software, or want to test a new application.

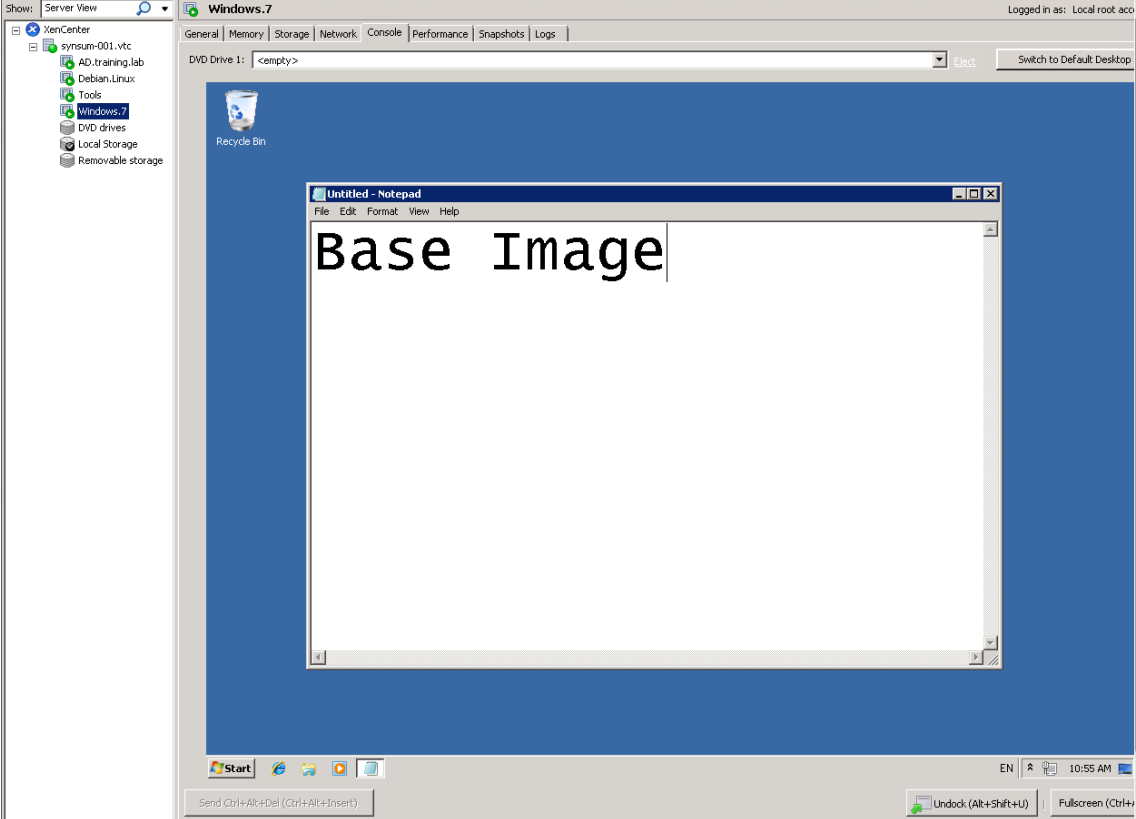
To complete this exercise, you must have the following:

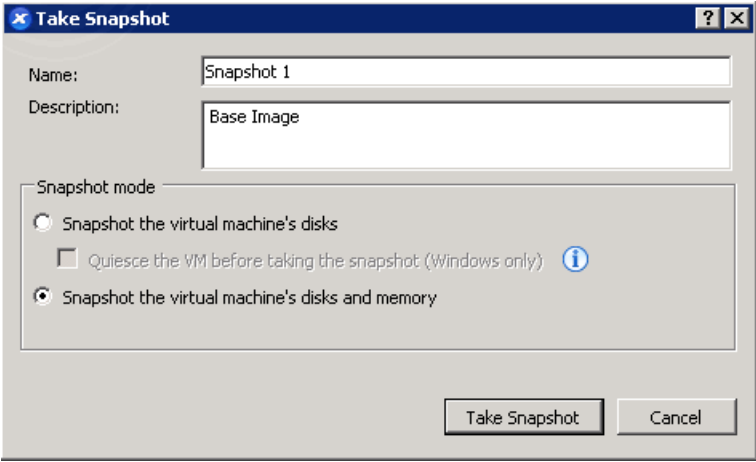
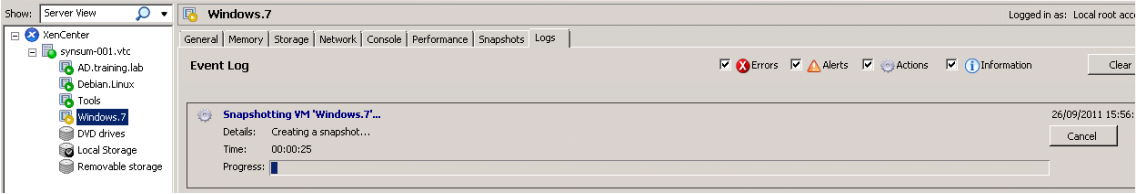
- XenServer 5.6 and above
- XenCenter
- SSH client (PuTTY)

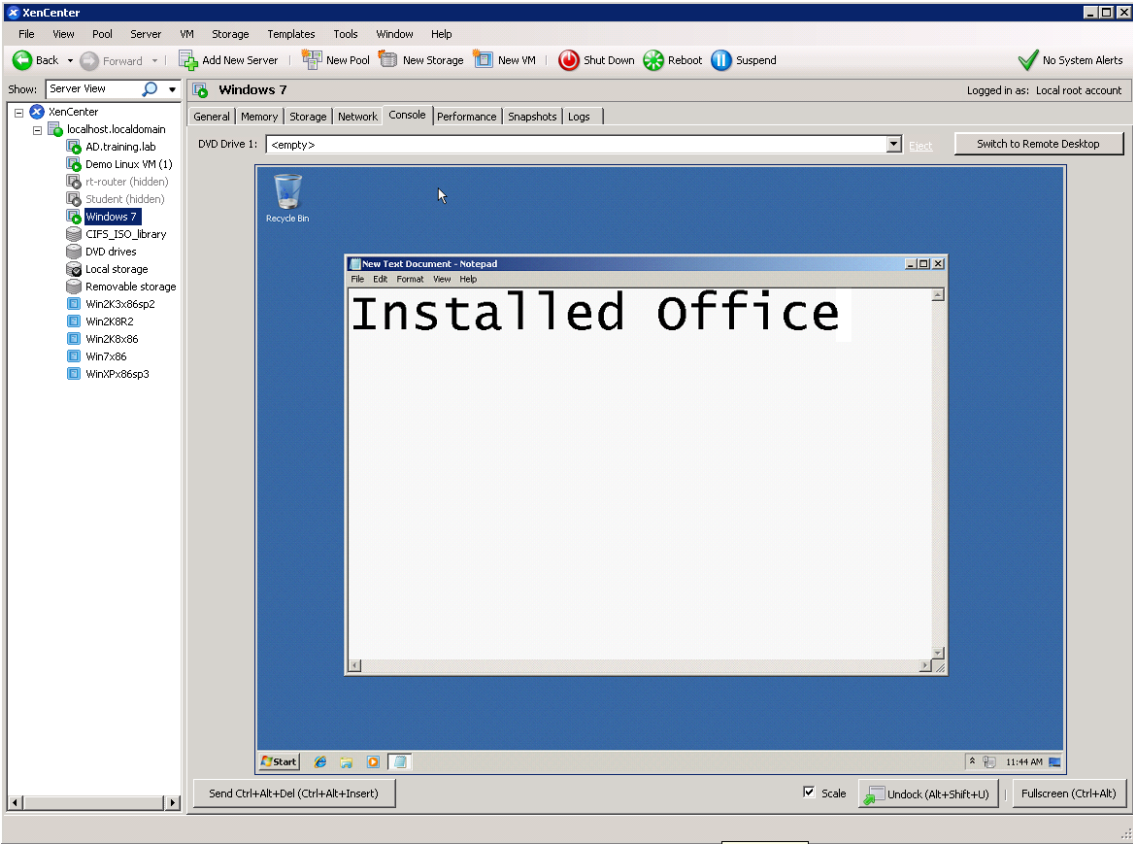
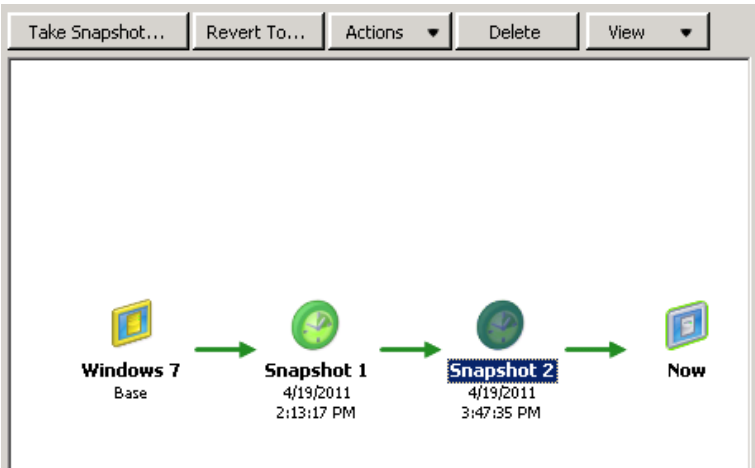
Step-by-step guidance

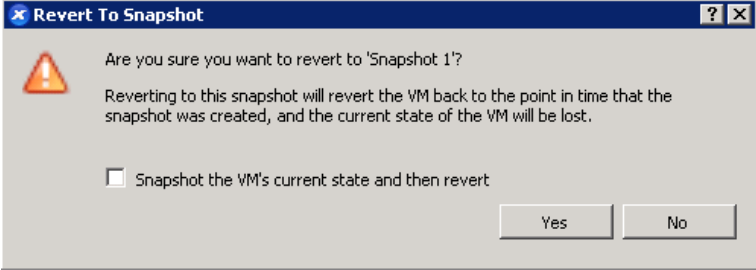
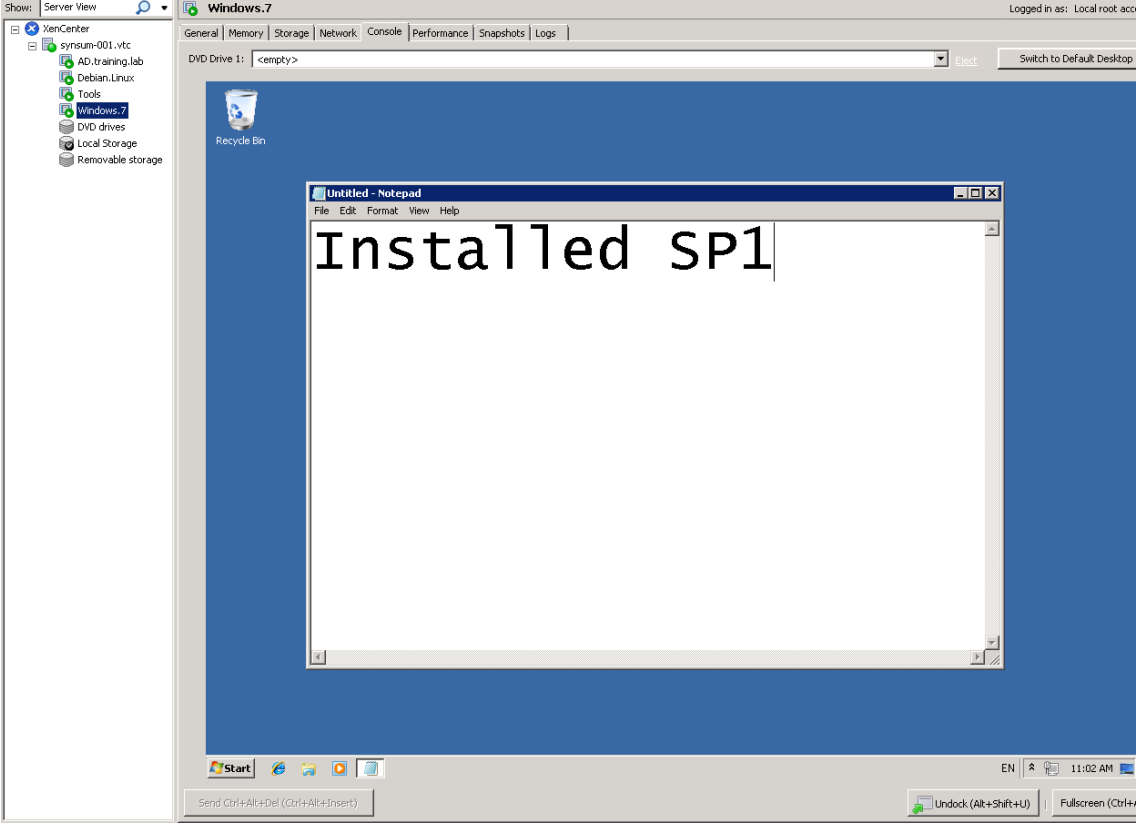
Estimated time to complete this lab: **15 minutes**.

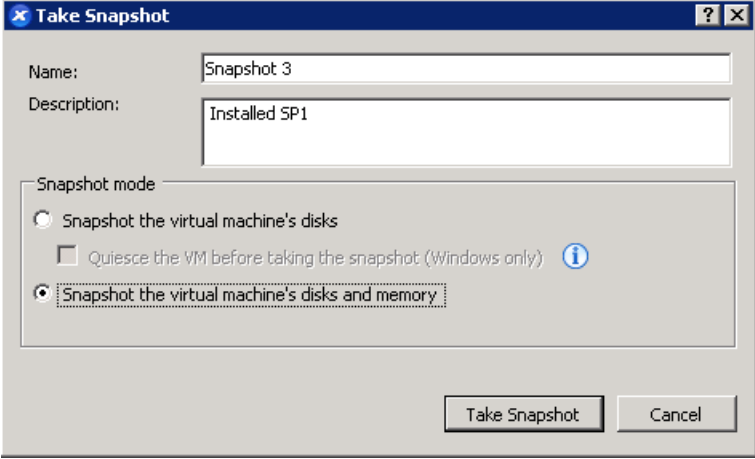
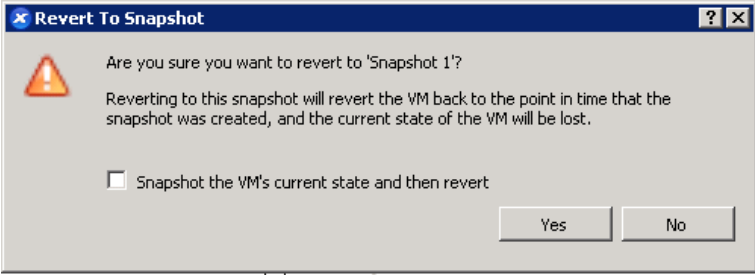
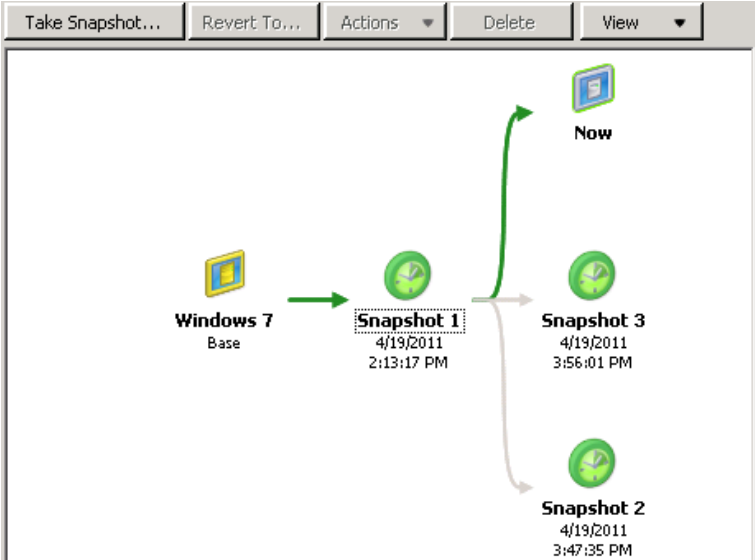
Step	Action
	 Creating and Reverting VM Snapshots:
1.	Launch XenCenter and connect to your assigned XenServer if required
2.	Start or select the running Windows.7 VM and click the Console tab



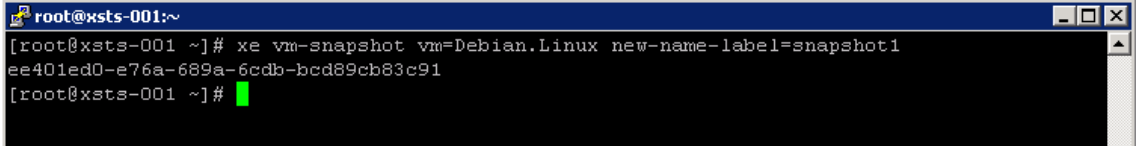

Step	Action
<p>3.</p>	<p>Create a .txt file on the desktop and write “Base Image” in the file (leave file open).</p> <ul style="list-style-type: none"> - The text will simulate the installation of software within the VM - We will be using this text to follow the snapshot state <p>Note: Increase the font size to 48 if required.</p>  <p>The screenshot shows a Citrix Hypervisor interface. On the left, a tree view shows the hierarchy: XenCenter > synsum-001.vtc > AD.training.lab > Windows.7. The main window displays the Windows 7 desktop environment. A Recycle Bin icon is on the desktop. A Notepad window titled 'Untitled - Notepad' is open, showing the text 'Base Image' in a large font. The taskbar at the bottom includes the Start button, several application icons, and the system tray showing the time as 10:55 AM. The console title bar includes tabs for General, Memory, Storage, Network, Console, Performance, Snapshots, and Logs. The 'Snapshots' tab is currently selected.</p>
<p>4.</p>	<p>Select the Snapshots tab</p>

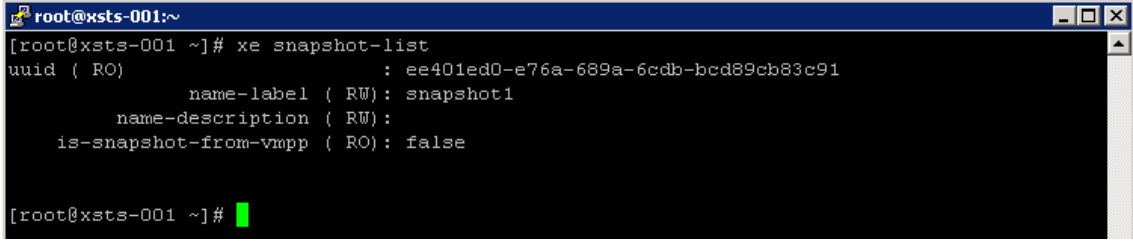
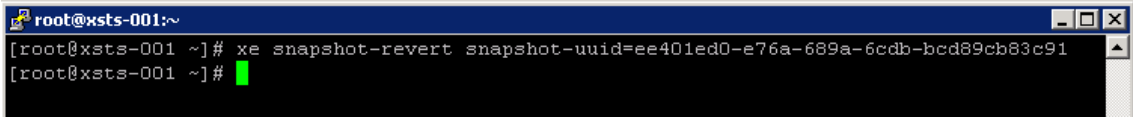

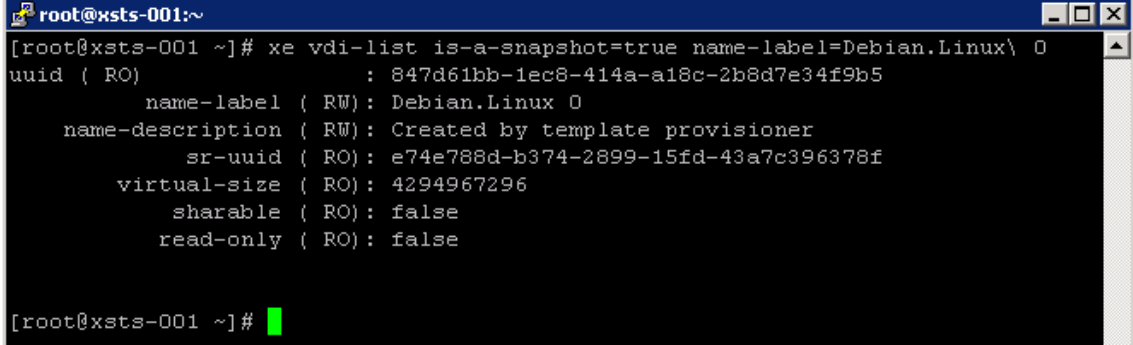
Step	Action
5.	<p>Take disk and memory snapshot with a description of “Base Image”</p>  <p>Note: The running VM is temporarily suspended during the live snapshot process</p> <p>Note: Quiesce snapshots are only available for Windows VMs (Windows Server 2003 and Windows Server 2008 for both 32-bit and 64-bit variants) which utilizes the VSS service. The VSS plug-in needs to be installed within the virtual machine. For more information please refer to XenServer VM Installation Guide.</p>
6.	<p>Follow the snapshot process in the Logs tab.</p> 

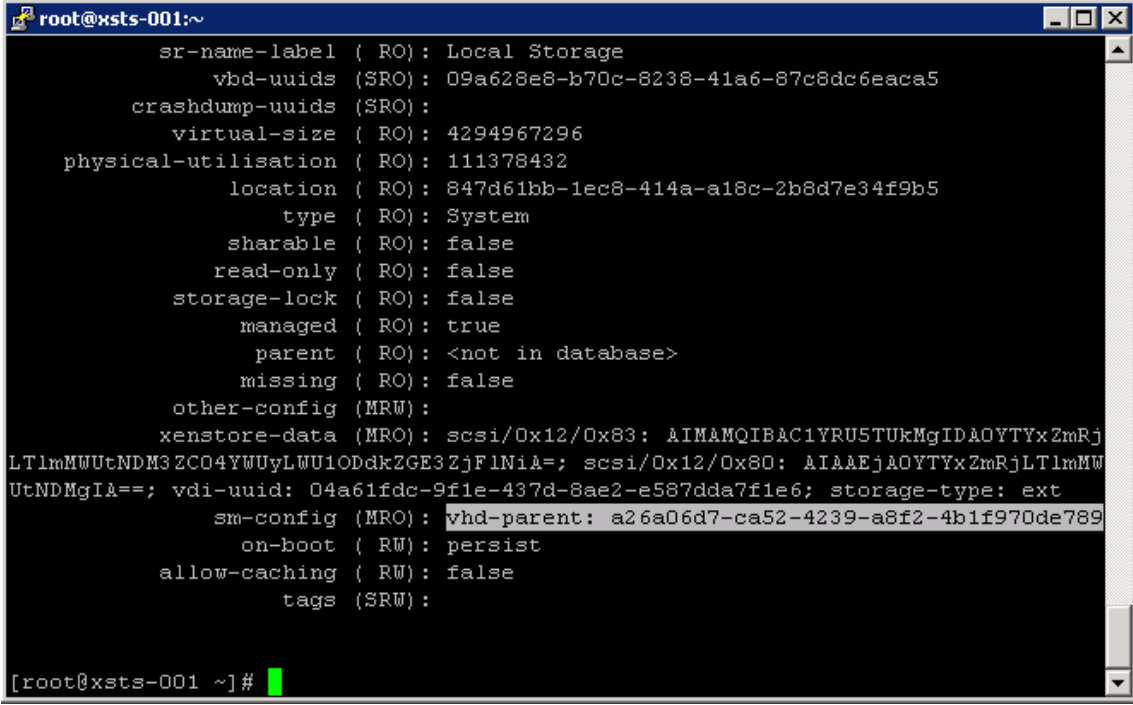
Step	Action
7.	<p>Select the Console tab and change the text in the .txt file to read “Installed Office”</p>  <p>The screenshot shows the XenCenter interface with the console tab selected for a Windows 7 VM. A Notepad window is open on the desktop, displaying the text "Installed office". The XenCenter interface includes a menu bar, a toolbar with actions like "Add New Server", "New Pool", "New Storage", "New VM", "Shut Down", "Reboot", and "Suspend", and a left-hand tree view showing the server hierarchy.</p>
8.	<p>Create a second disk and memory snapshot with a description of “installed office”</p>  <p>The screenshot shows the snapshot management interface in XenCenter. It features a toolbar with buttons for "Take Snapshot...", "Revert To...", "Actions", "Delete", and "View". Below the toolbar is a timeline of snapshots: "Windows 7 Base", "Snapshot 1" (dated 4/19/2011 2:13:17 PM), "Snapshot 2" (dated 4/19/2011 3:47:35 PM), and "Now". Arrows indicate the sequence from the base to the first snapshot, then to the second snapshot, and finally to the current state.</p>

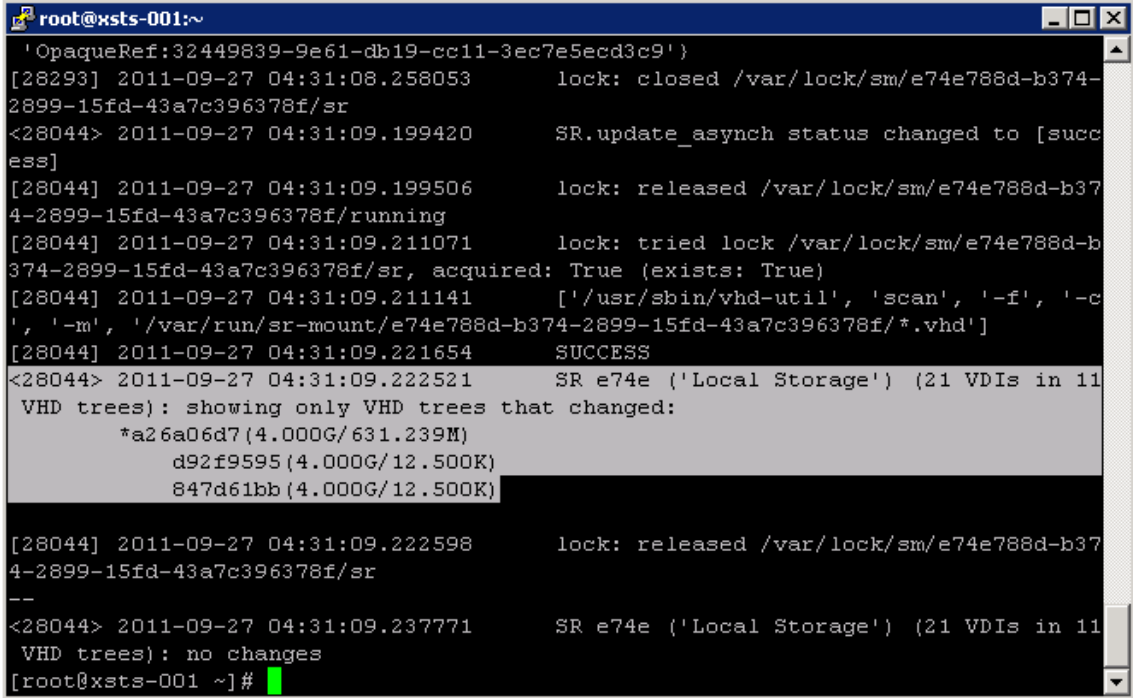
Step	Action
<p>9.</p>	<p>Select Snapshot 1 and click Revert To...</p> <ul style="list-style-type: none"> - Unselect Snapshot the VMs current state - Click Yes 
<p>10.</p>	<p>Click the Console tab and edit the .txt file to say “Installed SP1”</p> 

Step	Action
11.	<p>Select a disk and memory snapshot with a description of “Installed SP1” and take disk and memory snapshot</p> 
12.	<p>Select Snapshot 1 from the Snapshot tab and click Revert To...</p> <ul style="list-style-type: none"> - Unselect Snapshot the VMs current state - Click Yes 
13.	<p>Review VM Life Tree</p> 

Step	Action
14.	<p>Select a snapshot and click on the screen icon in the Details pane to review the “state” of the VM based on the text file</p> 
15.	<p>Highlight all snapshots of the Windows.7 VM by dragging your mouse over them and click Delete</p>
	<p> Connect to your XenServer host via an SSH client (PuTTY) and login to the console:</p>
16.	<p>Launch a new SSH client OR duplicate an existing session of PuTTY from the Landing Desktop OR reuse an open session window.</p>
17.	<p>Create a snapshot of your Debian.Linux VM by running following command:</p> <p>e.g. <code>xe vm-snapshot vm=Debian.Linux new-name-label=snapshot1</code></p>  <p>Tip: Remember to use tab completion in the CLI</p>
18.	<p>Confirm snapshot has been taken correctly in XenCenter</p> 

Step	Action
19.	<p>List snapshots via CLI by running the following command:</p> <p>i.e. xe snapshot-list</p>  <pre> root@xsts-001:~ [root@xsts-001 ~]# xe snapshot-list uuid (RO) : ee401ed0-e76a-689a-6cdb-bcd89cb83c91 name-label (RW): snapshot1 name-description (RW): is-snapshot-from-vmpp (RO): false [root@xsts-001 ~]# </pre> <p>Note: This command will list all snapshots within a pool.</p>
20.	<p>Revert to a snap of your Debian.Linux VM by running following command:</p> <p>e.g. xe snapshot-revert snapshot-uuid=[UUID of snapshot1]</p>  <pre> root@xsts-001:~ [root@xsts-001 ~]# xe snapshot-revert snapshot-uuid=ee401ed0-e76a-689a-6cdb-bcd89cb83c91 [root@xsts-001 ~]# </pre> <p>Note: Due to the disk-only snapshot taken previously the Debian.Linux VM will revert to a halted (crash consistent) state.</p>
	<p> Review VHD chain dependencies of a VM using the CLI:</p>
21.	<p>Find the VDI which you want to review by running following command:</p> <p>e.g. xe vdi-list is-a-snapshot=true name-label=Debian.Linux\ 0</p>  <pre> root@xsts-001:~ [root@xsts-001 ~]# xe vdi-list is-a-snapshot=true name-label=Debian.Linux\ 0 uuid (RO) : 847d61bb-1ec8-414a-a18c-2b8d7e34f9b5 name-label (RW): Debian.Linux 0 name-description (RW): Created by template provisioner sr-uuid (RO): e74e788d-b374-2899-15fd-43a7c396378f virtual-size (RO): 4294967296 sharable (RO): false read-only (RO): false [root@xsts-001 ~]# </pre>

Step	Action
22.	<p>Find out which VDI/VHD file is the parent of the VDI we want to review by running the following command:</p> <p>e.g. <code>xe vdi-param-list uuid=[UUID of snapshot VDI]</code></p>  <pre> root@xsts-001:~ sr-name-label (RO): Local Storage vbd-uuids (SRO): 09a628e8-b70c-8238-41a6-87c8dc6eaca5 crashdump-uuids (SRO): virtual-size (RO): 4294967296 physical-utilisation (RO): 111378432 location (RO): 847d61bb-1ec8-414a-a18c-2b8d7e34f9b5 type (RO): System sharable (RO): false read-only (RO): false storage-lock (RO): false managed (RO): true parent (RO): <not in database> missing (RO): false other-config (MRW): xenstore-data (MRO): scsi/0x12/0x83: AIMAMQIBAC1YRU5TUKMgIDAOYTYxZmRj LTlmMWUtNDM3ZCO4YWUyLWU1ODdkZGE3ZjFlNiA=; scsi/0x12/0x80: AIAAEjAOYTYxZmRjLTlmMW UtNDMgIA==; vdi-uuid: 04a61fdc-9f1e-437d-8ae2-e587dda7f1e6; storage-type: ext sm-config (MRO): vhd-parent: a26a06d7-ca52-4239-a8f2-4b1f970de789 on-boot (RW): persist allow-caching (RW): false tags (SRW): [root@xsts-001 ~]# </pre> <p>Note: From the above command we can see which VDI/VHD file is the parent in a chain.</p>

Step	Action
23.	<p>To view the VHD tree/chain for a virtual disk we can use the <code>/var/log/SMlog</code> by running following command:</p> <p>e.g. <code>less /var/log/SMlog grep SR -A 5</code></p>  <p>Note: In the above example we use the <code>grep</code> command to output only the matching pattern “SR” and the following 5 lines.</p> <p>Note: In the above example the 3 VDIs are listed in relation to the Debian Linux VM:</p> <ul style="list-style-type: none"> • <code>*a26a06d7(4.000G/631.239M)</code> = original parent disk • <code>d92f9595(4.000G/12.500K)</code> = current in-use R/W disk • <code>847d61bb(4.000G/12.500K)</code> = snapshot taken previously
END OF EXERCISE	

Summary

Key Takeaways	<p>The key takeaways for this exercise are:</p> <ul style="list-style-type: none"> • You will be able to create new and revert to VM snapshots. • You will be able to create, revert and view snapshots via the CLI. • You will be able to review VHD chain dependencies of a VM using the CLI.
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Revision History

Revision	Change Description	Updated By	Date
1.0	Final Version	Dian Kotzé	10/2011

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