Introduction to Network Systems

Virtualization II

Weight: 6% **Marks: /18**

Student Name:

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Virtualization II

Introduction

PC hardware is tested rigorously before it is packaged and shipped from the manufacturer. However, errors may still occur as the result of damage or malfunction taking place during the shipping and handling stages. For this reason, it is important for IT professionals to test for, diagnose, and correct a wide variety of hardware issues.

In this lab, you will use the Ultimate Boot CD (UBCD), a collection of freeware containing diagnostic routines as well as various operating systems and utilities. Some of the diagnostics run under FreeDOS and Linux. The collection includes a variety of stress tests that help you determine the functionality of devices under full-load conditions.

This lab procedure will help you become familiar with some tools that an IT professional might use to test for the incorrect operation of computer components like the central processing unit (CPU), system memory (RAM) and the floating-point unit (FPU). You will also use disk diagnostic programs to verify the functionality of file systems, as well as examine the contents of the master boot record. You will track your completion of specific parts of the lab with three screen captures that will be part of the lab deliverables.

In summary, thorough testing is a vital part of making sure a computer system is safe, secure and functional. This applies to old and new computers alike. A trained IT professional is an expert in performing diagnostic tests on computer equipment.

Equipment and Materials

- 1 Laptop/Desktop computer with VMWare Workstation 16 Pro
- Ultimate Boot CD (UBCD) Image, Ver 5.2.4 or later
- Download the software from the internet. You can use the site https://www.ultimatebootcd.com/download.html and follow the mirror sites to download the iso image. (Click the icon, not the link.)

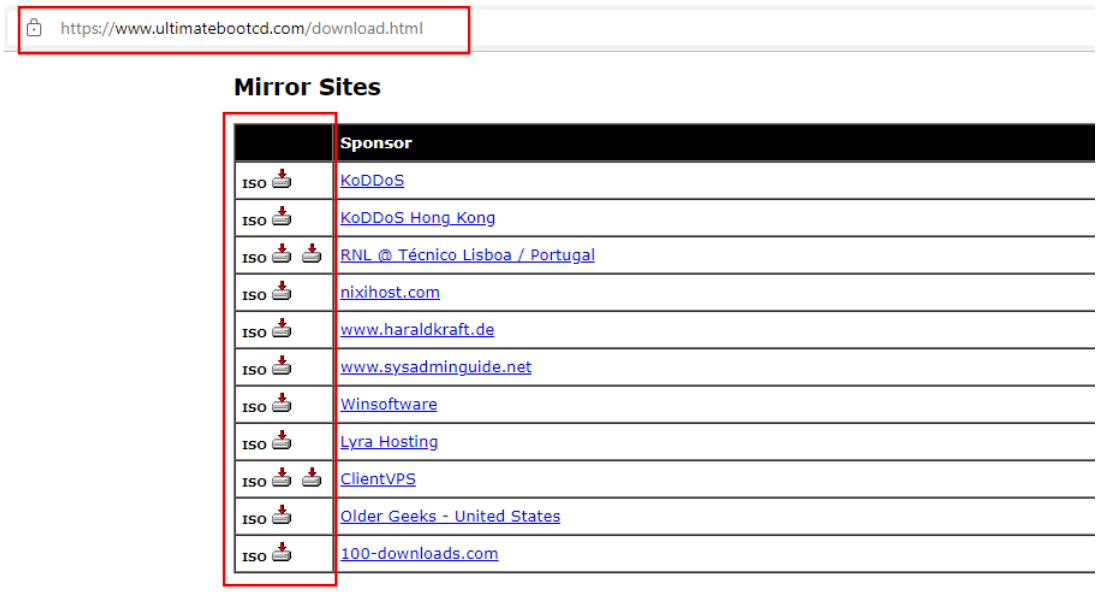

Figure 1: Screen Capture of Mirror Sites List

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Submitting your work

Do not save your screen captures or other information to this lab document. Save them in a separate Word document. Submit this separate document to Brightspace along with your lab assignment. Refer to the lab guide for how to take a screenshot.

Note: Be prepared to answer questions from the instructor at signoff time.

Procedure

1. Create an empty Virtual Machine using VMWare Workstation hypervisor. (Use BIOS instead of UEFI when creating the VM.) Watch the demo provided by the instructor during class.
2. Insert the UBCD CD/DVD or the ISO image to boot the system. If you do not get the screen as shown in the screenshot below, verify the BIOS boot sequence (boot from CD first).

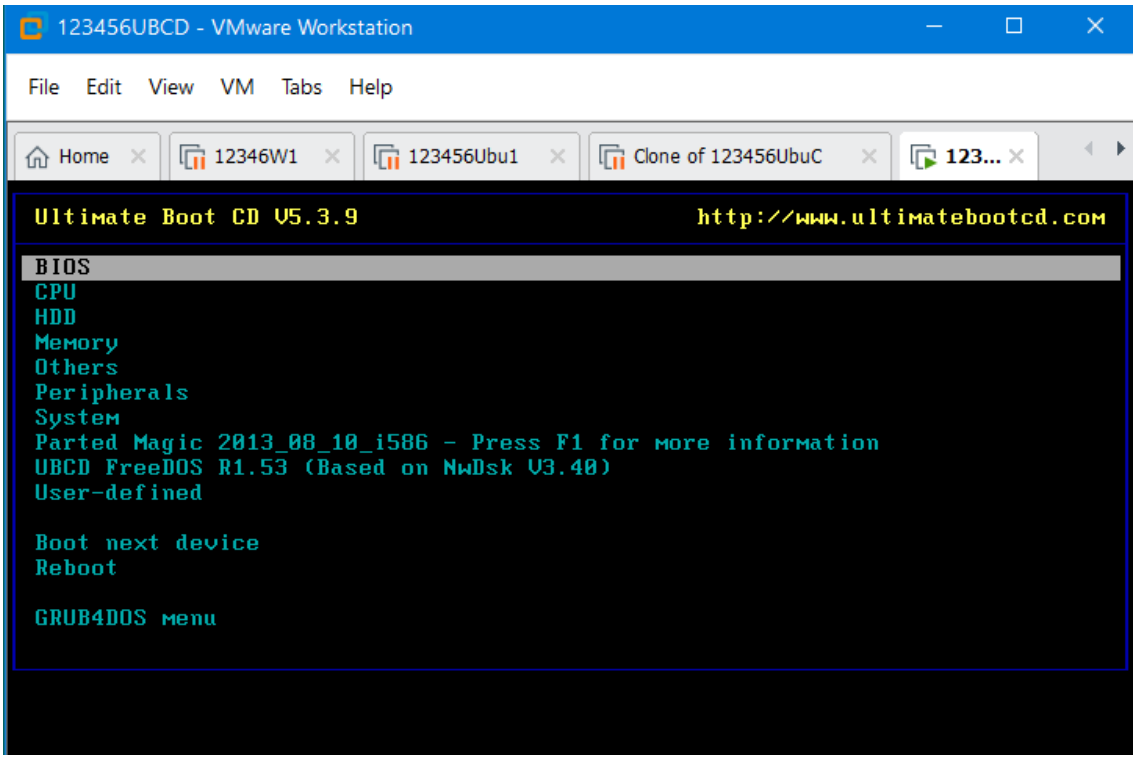

Figure 2: Screen Capture of BIOS System Boot

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Note: These programs are not accessed via a Graphical User Interface (GUI) or a mouse but by using arrow keys, function keys and other keyboard sequences.

3. Select “CPU” from the main menu by using the down arrow and hit enter.

   Let us start with an examination of each of the menu items under the CPU menu, similar to the Figure 3 screenshot below. Use the keyboard arrow keys to highlight each of the functions and view information for each test at the bottom of the screen. Do not hit enter when highlighting each item. Summarize the description of each item in your document.

   Note: If you want to return to the main menu, please either enter the command reboot, or restart the machine from VM menu – Power – Restart Guest.

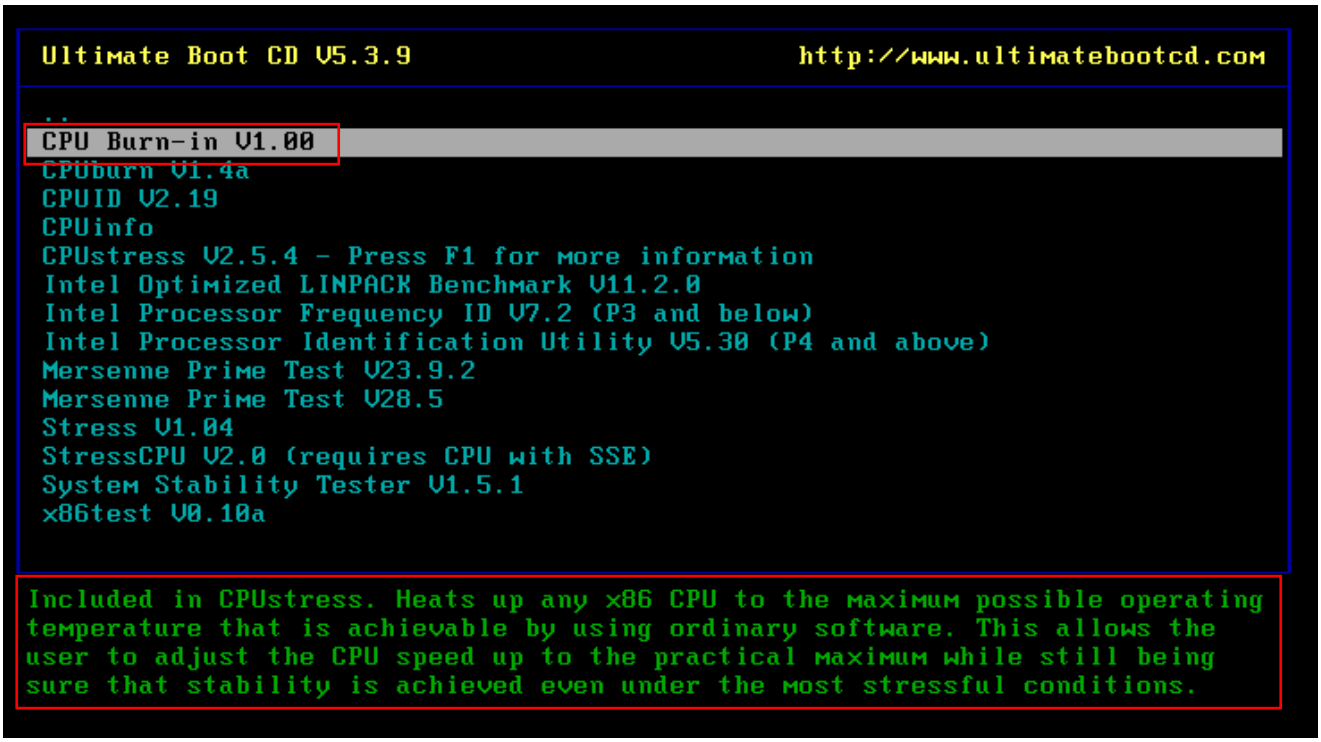

Figure 3: Screen Capture of CPU Burn-In

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After examining each of the selections, select “CPUinfo” and use this utility to document the brand, model, number of cores, cache size and frequency values of the computer in the following table. Take a screen capture showing output of the command (**SC1**). Student ID must be visible in the screen capture or no marks.

Number of CPUs:	
CPU manufacturer:	
CPU model number:	
CPU speed in MHz:	
Cache size:	
Number of cores:	

Reboot the system to return to the main menu.

CPU Stress Testing

1. Select “StressCPU V2.0” and start this test. Let this test run for at least one minute then press “CTL-C” to stop the test.

   a. Document your finds in the following table:

Architecture:	
Who owns the copyright?	
Enter at least one tested value:	

Reboot and return to the main menu, CPU menu.

2. Select “Mersenne Prime V28.5”.

   Run for at least 2 iterations. Each iteration may take a couple of minutes. Document the result from one iteration.

   Use CTL-C to stop the test and return to the main menu.

   Note: It is important to do more than one type of stress test.

Memory Information and Testing

1. Select MEMORY from the main menu. Then select “Memtest86+ V5.01” and press F1 to run in Fail-Safe mode. Take a screen capture showing output of the command (**SC2**). Student ID must be visible in the screen capture or no marks.
2. Document your findings in the following table:

Size of L1 Cache and transfer rate:	
Size of L2 Cache and transfer rate:	
Size of L3 Cache and transfer rate:	
Total amount of RAM installed:	

3. If necessary, browse the internet and write an explanation of why transfer rates vary between different caches (L1, L2 and L3)

   During the test, alpha-numeric characters are applied to the memory. What do these represent?

Hardware Information Tools

1. Find and execute the Hardware Detection Tool under the SYSTEM menu.
2. Explore some of the information available within the main menu.
3. Document your findings in the following table. As you are running the tests in a virtual environment, you may not receive all the correct answers:

Motherboard Manufacturer (vendor)	
Product	
BIOS version (BIOS Rev.)	
Integrated Video module (VESA)	
VESA Version	
Vendor	
Product Rev	
Memory:	

Hard Drive Information and Tests

The MBR is the Master Boot Record, located in the first sector of the hard drive. It has several important functions including holding the partition table of the drive and pointing to the location of the operating system.

This information is displayed in hexadecimal values. Make note of the partition information on the bottom of the screen. You may not get any values if the hard drive is new and has never been partitioned.

1. Find and execute the “MBRtool V2.3.200” under the hard drive (HDD) “Boot Management” tools. Wait for a minute to get into the next menu.
2. From the menu:
   a. Select “4”; work with a MBR (backup, restore, display etc.)
   b. then select “4” to display

c. enter “0” (zero) to select the first disk

d. then enter “o” (not zero) to view the Original MBR.

3. Take a screen capture showing output of the command (**SC3**). Student ID must be visible in the screen capture or no marks.
4. Write down how many entries you can find under “Partition Table Information”
5. There should be four entries under the Partition Table Information.

Optional challenge (not for marks)

1. Create a bootable USB memory stick with Ultimate Boot CD with PC diagnostic tools.
2. Describe in written detail how you can create a USB memory stick with Ultimate Boot CD. You may need to browse the internet to answer this question.

Marking Criteria

- Three correctly taken screen captures (6 marks)
- Four tables properly completed (8 marks)
- Questions in lab (4 marks)

Note: Marks will not be provided for incorrect screen captures or answers, or not identifiable by your student ID