

Solutions for Chapter 2: All About Motherboards

Lab Manual for A+ Guide to IT Technical Support (Comprehensive, 10th Edition), ISBN xxx-xxxxxxxxxx

[A HD] Lab 2.1 Use the HWiNFO Hardware Information Utility

[B HD] *Activity*

Follow these steps to download and run the Windows HWiNFO utility:

1. Go to the HWiNFO website at *hwinfo.com*. Be careful not to click links to ads or to other downloads. Read more about HWiNFO. Click **Download for FREE**.
2. In the Installer column, highlight **Download for Free** and click **Local (U.S.)**. The executable file downloads to your Downloads folder. Open the folder and double-click the downloaded file to start the installation.
3. If the UAC dialog box opens, click **Run** or **Yes** to start setup. Follow the directions on the screen to install the software. Retain all the default settings. The utility launches a Welcome dialog box after the installation completes.
4. To view and change HWiNFO settings, click **Settings**. Notice that the utility is set to display system summary information when it first launches. Click **OK** to close the Settings box.
5. To run HWiNFO, click **Run** in the Welcome dialog box. When the utility runs, it examines your system, and then the HWiNFO boxes shown in Figure 2-1 open.

Often, you are not given step-by-step directions when using utility software but must learn how to use it by exploring menus and using the software's help functions. The following steps give Chapter 2, Lab Manual for A+ Guide to IT Tech Support (ISBN xxx-xxxxxxxxxx)

you practice in doing that.

1. Use the HWiNFO utility to find the following information about your system:

- Motherboard or laptop model and manufacturer:

Answers may vary. For example, Lenono IdeaPad N580 laptop by Lenono

- Motherboard chipset:

Answers may vary. For example, Intel HM76 (Panther Point)

- Motherboard slots (desktop system):

Answers may vary. For example, 6×PCI Express ×1, 2× PCI Express ×16

- BIOS/UEFI manufacturer:

Answers may vary. For example, LENOVO

- BIOS/UEFI version:

Answers may vary. For example, 5ECN91WW (V8.03)

- BIOS/UEFI (release) date:

Answers may vary. For example, 09/04/2012

- CPU brand name:

Answers may vary. For example, Intel Pentium CPU B960 2.20 GHz

- Processor socket (platform):

Answers may vary. For example, Socket G2 (rPGA988B)

- Original processor frequency:

Answers may vary. For example, 2200.0 MHz

- Number of CPU cores:

Answers may vary. For example, 2

- Amount of L1 cache:

Answers may vary. For example, 2 x 32 KBytes

- Amount of L2 cache:

Answers may vary. For example, 2 x 256 KBytes

- Amount of L3 cache:

Answers may vary. For example, 2 MBytes

- Bus type of the video adapter, as reported by the adapter:

Answers may vary. For example, Intel Sandy Bridge-MB GT1 – Integrated Graphics

Controller [D2/J1/Q0] [Lenovo]

- Video chipset:

Answers may vary. For example, Intel HD Graphics 2000

- Amount of video memory (RAM):

Answers may vary. For example, 1,830,796 KBytes

2. For a desktop system, you can identify your motherboard's serial number by expanding **Motherboard**, **SMBIOS DMI**, and then clicking **Mainboard**. What is your motherboard's serial number?

Answers may vary. For example, CB18665347

3. Exit the utility.

[B HD] *Review Questions*

1. List three reasons you might use HWiNFO when troubleshooting or upgrading a computer:

Answer: Answers will vary; here are some possibilities:

- *You might use HWiNFO when you need to update video drivers and need to identify the video card in use.*
- *When you are having a problem with an onboard device and need to update BIOS/UEFI, you might turn to HWiNFO for information about the current version of the firmware.*
- *You might use HWiNFO when you need to download drivers for a laptop and need the model and serial numbers of the laptop.*

2. You are considering upgrading memory on a laptop. What are three attributes of currently installed memory that HWiNFO can give to help you with this decision?

Answer: Amount, speed, and type of RAM installed

3. You suspect a hard drive in a system might be failing. What type of data about the hard drive can HWiNFO give you to help you diagnose the problem? Which button on the main menu do you select to get this data?

Answer: HWiNFO can report S.M.A.R.T. data about the drive, including the temperature of the drive, drive failures, and drive warnings. Click the Sensors button to see this data.

4. List two precautions you should take when using free utility software available on the web.

Answers may vary; here are some possibilities:

- Be careful not to download adware or bloatware along with the utility.
- Make sure you download only from reliable websites you trust.

[A HD] Lab 2.2 Identify Motherboard Components

[A HD] Activity

Fill in the following chart for your assigned motherboards. If you have more than three motherboards, use additional paper. When the entry in the Item column is a question (such as “SCSI Controller?”), write a number or a Yes or No answer.

Answers may vary. For example:

Item	Motherboard 1	Motherboard 2	Motherboard 3
Manufacturer/model	Asus Prime Z390-A/H10	GIGABYTE B450M DS3H	BIOSTAR B450MH
BIOS/UEFI manufacturer	UEFI AMI BIOS	UEFI AMI BIOS	UEFI AMI BIOS
CPU socket	LGA 1151 (300 Series)	AM4	AM4
Chipset	Z390	AMD B450	AMD B450

RAM slot type	DDR4	DDR4	DDR4
How many RAM slots?	4	4	2
How many RAM channels?	Dual Channel	Dual Channel	Dual Channel
How many PCI slots?	None	None	None
How many PCIe ×1 slots?	3	1	2
How many PCIe ×16 slots?	3	2	1
How many M.2 slots?	2	1	1
Parallel ATA (IDE) connector?	No	No	No
How many SATA connectors?	6	4	4
How many SATA Express connectors?	None	None	None
Embedded video? How many video ports?	No, none	Yes, DVI-D x1, HDMI x1	Yes, HDMI x1, VGA x1

Embedded audio? How many audio ports?	Yes, 5	Yes, 3 analog	Yes, 3 analog
Form factor	ATX	Micro ATX	Micro ATX
Describe any unusual components	AI Overclocking	Supports CrossFire	

[B HD] *Review Questions*

1. What are the two main differences between an ATX and microATX board?

Answer: The microATX is smaller and has fewer expansion slots. The microATX has a maximum size of 9.6" × 9.6" with a maximum of four expansion slots, but usually three or fewer.

2. How can you determine the chipset if it's not written on the board?

Answer: Consult the documentation for your motherboard or research your motherboard's make and model number on the Internet.

3. Of the motherboards you examined, which do you think is the oldest? Why?

Answer: Answers will vary.

4. Which motherboard best supports old and new technology? Why?

Answer: The answer depends on available samples.

5. Which motherboard seems to provide the best possibility for expansion? Why?

Answer: The answer depends on available samples.

6. Which motherboard is most likely the easiest to configure? Why?

Answer: The answer depends on available samples.

7. Which motherboard do you think is the most expensive? Why?

Answer: The answer depends on available samples.

8. What are some considerations a motherboard manufacturer has to contend with when designing a motherboard? (For example, consider room for large CPUs and cooling fans, where the power supply is located in relationship to the power connector, new technologies, and so forth.)

Answer: Answers will vary depending on student experience and research, but might include the following:

- Locations of ports and connections off the back or front of a tower or desktop case
- Holes in the board that align with holes in different types of computer cases
- The need to accommodate different memory module technologies and amounts of RAM
- The need to accommodate more than one type of CPU and CPU manufacturer
- Room for additional components, such as modem riser cards
- Stenciled or printed information on the board to identify the manufacturer, model, components, and connections on the board

[A HD] Lab 2.3 Identify a Motherboard and Find Documentation and Drivers on the Web

[B HD] *Activity*

Follow these steps to gather information about your motherboard and processor:

1. Windows can identify a system's installed processor and might be able to identify the motherboard installed. Boot your computer to the Windows desktop. In the Windows 10/8 Run box or the Windows 7 search box, enter **msinfo32.exe**. The System Information window opens. Write down the following information:

- Processor installed:

Answers may vary. For example, Intel Core i5-2320 CPU 3.00 GHz

- System manufacturer (likely to be the motherboard manufacturer):

Answers may vary. For example, Intel

- System model (likely to be the motherboard model):

Answers may vary. For example, DH67GD

- BIOS/UEFI version/date (might help identify the motherboard):

Answers may vary. For example, Intel Corp BLH6710H

2. Shut down the system, unplug the power cord, and then press the power button for three seconds to drain residual power.
3. Following safety precautions, including using an ESD strap, remove the computer's case cover, and then remove any components obscuring your view of the motherboard. In some

cases, you might have to remove the motherboard itself, but this step usually isn't necessary. If you think it is necessary to remove the motherboard, ask your instructor for guidance.

4. Look for a stenciled or silkscreened label printed on the circuit board that indicates the manufacturer and model. Note that other components sometimes have labels printed on an affixed sticker. On a motherboard, the label is usually printed directly on the circuit board.

Common motherboard manufacturers include ASUS, Intel, and ASRock.

5. Record the information on the motherboard label:

Answers may vary. For example, ASRock Killer E2200 Fatal1ty Z97KILLER

6. Take your information to a computer with Internet access and open a web browser.
7. If you know the manufacturer's URL, go directly to the manufacturer's website. (Table 2-1 lists the URLs for some motherboard manufacturers.) If you don't know the manufacturer's URL, search using the manufacturer or model, as shown in Figure 2-3. In the search results, click a link associated with the manufacturer. If this link doesn't take you directly to the documentation, it usually gets you within two or three links. Continue until you find the manufacturer's website.

Table 2-1 URLs for major motherboard manufacturers

Manufacturer	Web Address
ASRock	<i>asrock.com</i>
ASUS	<i>asus.com</i>

BIOSTAR	<i>biostar-usa.com</i>
EVGA	<i>evga.com</i>
Gigabyte Technology Co., Ltd.	<i>gigabyte.com</i>
Intel Corporation	<i>intel.com</i>
Micro-Star International (MSI)	<i>us.msi.com</i>

8. When you have found the site of your motherboard’s manufacturer, look for a link for service or support. Click this link, and, if necessary, select a product category and model number. Sometimes, knowing the type of processor the board supports can be useful in finding the right motherboard.

9. Continue working your way through the site until you find the motherboard documentation. The documentation might include a variety of documents covering technical specifications and installation instructions. Often the documentation includes a basic manual, which is usually a combination of technical and installation specifications.

10. When you find the documentation, you might also find a link to updated drivers. If you see this link, click it and note the release date of the drivers. If they are newer than your system’s current drivers, it’s often advisable to update the drivers as well. If available, record the release dates for updated drivers:

Answers may vary. For example, 2015/8/12

11. Return to the main documentation page and select the manual if it’s available. If it isn’t,

select the installation instructions.

12. The manual is probably in PDF format, so you may need to have Adobe Acrobat Reader installed. If you have the Adobe browser plug-in, you can open the document from the source location; if not, you can download the manual to your computer and then open it. Using your preferred method, open the document. Either save or print the document because you will need it in Lab 2.4.

[B HD] *Review Questions*

1. How is the label usually applied to or written on a motherboard? How is it most often applied to other components?

Answer: It is stenciled or printed directly on the board. Other components might use a paper sticker or have no label at all.

2. What type of link on a manufacturer's website usually leads you to manuals and other documentation?

Answer: Service or Support

3. What other downloads about your motherboard might you want to find on the manufacturer's website?

Answer: Driver updates and BIOS/UEFI updates

4. In what format is documentation most often available for download?

Answer: PDF (.pdf)

5. When supporting motherboards, what helpful information besides downloads can be found

on the manufacturer's website?

Answer: The answer depends on the website. Examples include troubleshooting videos, guidelines, and forums.

[A HD] Lab 2.4 Remove and Replace a Motherboard

[B HD] *Activity*

In this lab, you download and install CPU-Z, locate the motherboard manual, remove the motherboard, and install and configure a replacement motherboard. While removing the motherboard, follow the safety precautions discussed in Chapter 1 as well as those outlined in the motherboard's documentation. Be sure to use an ESD strap to protect the motherboard, as well as other devices, from ESD. Follow these steps to gather information about your motherboard:

1. Go to **cpuid.com**.
2. Be careful not to click an advertisement that has a download link. Under CPU-Z, click **for WINDOWS**. Locate the download section on the CPU-Z page and click the **SETUP * ENGLISH** link to start the download. At the time of this revision, the latest version was 1.87 and the file name was `cpu-z_1.87-en.exe`. This file contains both the 32-bit and 64-bit versions. Execute the file to install CPU-Z, following directions on the screen. Accept all default settings.
3. Run the CPU-Z program. CPU-Z results display, as shown in Figure 2-4.
4. Click the **Mainboard** tab in CPU-Z, and record information about the motherboard:
 - Manufacturer: **Answers may vary. For example, ASRock**

- Model: **Answers may vary. For example, Killer E2200 Fatal1ty Z97KILLER**
5. If this is a different motherboard than the one you used in Lab 2.3, use the motherboard information to search for the documentation on the manufacturer's website. Save or print the documentation; you will give it to the other workgroup after you remove the motherboard from your system.

Follow these steps to remove your motherboard from your computer:

1. Power down the system, unplug all cords and cables connected to the computer, press the power button for three seconds to drain any remaining power, and remove the case cover. Take all necessary precautions (including using an ESD strap) and make a sketch of cabling and component placement. Then remove the cabling and expansion cards from the motherboard.
2. Six to nine screws usually attach the motherboard to the case via spacers or standoffs. The spacers prevent the printed circuitry from shorting out on the metal case and provide space for air circulation. Also, it's important that the motherboard be securely attached to the case with enough spacers and screws so that the motherboard won't crack when expansion cards are being inserted. Remove the screws that connect the motherboard to the case, and set them aside in a cup, bag, or bowl so that you don't lose any of them.
3. Carefully lift the motherboard out of the case. You might have to tilt the board to clear the drive bays and power supply. In some cases, you might have to remove the drives to get the motherboard out.
4. Exchange the motherboard and motherboard documentation with that of another workgroup. You might also exchange the CPU and memory, depending on whether your current CPU

and memory modules are compatible with the new motherboard. Follow directions from your instructor on what to exchange. Be sure you have the new motherboard's documentation, which the other workgroup should have previously found on the Internet.

Follow these steps to install the new motherboard:

1. Install the motherboard, cabling, memory, expansion cards, and any other components you removed.
2. Have your instructor check your work before you attach the case cover and turn on the power.
3. Boot the system and enter the BIOS/UEFI setup utility. Make any adjustments in BIOS/UEFI needed for your system.
4. Save your settings and exit BIOS/UEFI setup.
5. Reboot the system and verify that the system is functioning correctly. Describe any error messages:

Answers may vary. For example, the system does not power up.

6. If an error appears, what steps do you plan to take to troubleshoot this error?

Answers may vary. For example, verify power cable is connected, open the case and verify all internal power cords are connected correctly and memory is installed correctly.

After you have the system working, follow these steps to update the motherboard drivers:

1. Go to the website of the motherboard manufacturer and search for the drivers for the board.
2. Download and run the installation program(s) to update the motherboard drivers. Which

drivers did you update?

Answers may vary. For example, audio, network and video

[B HD] *Review Questions*

1. How many screws usually attach the motherboard to the computer case?

Answer: It depends on the motherboard, but usually six to nine.

2. What is the purpose of spacers?

Answer: The purpose of spacers is to prevent the board from shorting out on the case and to provide space for air circulation.

3. When replacing a motherboard, why would you want the replacement board to use the same processor that the older board used?

Answer: To avoid having to also replace the processor

4. List three tools or methods you can use to identify a motherboard so that you can find its documentation on the web.

Answers may vary; possibilities include running CPU-Z, running System Information (msinfo32.exe) in Windows, and opening the case to look for the model and brand etched on the board.

5. A motherboard has an onboard DVI port that is currently used for a single monitor.

Sometimes the video does not come on after a Windows restart. To solve the problem, which of the following should you try first?

a. Flash BIOS/UEFI.

- b. Update the motherboard drivers.
- c. Reinstall Windows.
- d. Replace the motherboard.

Answer: b. Update the motherboard drivers. Try the least invasive and easiest task first.

[A HD] Lab 2.5 Examine BIOS/UEFI Settings and Research

BIOS/UEFI Updates

[B HD] *Activity*

[C HD] Part 1: Access BIOS/UEFI Setup

One way to enter BIOS/UEFI setup is to press a key or key combination after you start the computer with a cold start and before Windows is launched. Follow these steps:

1. Power down your computer. Press the power button to turn it on and watch for a message on your screen, such as “Press F2 to access setup” or “Press Del to change BIOS settings.” When you press this key or key combination, the BIOS/UEFI setup main screen appears.
2. If you don’t see the key name(s) displayed on the screen, you can find the key or key combination documented in your motherboard manual. If you cannot find this information, Table 2-2 can help.

Table 2-2 Methods for entering BIOS/UEFI setup

BIOS/UEFI Brand	Method for Entering BIOS/UEFI Setup
Intel BIOS	Boot the computer, and then press the F2 key.
AMI BIOS	Boot the computer, and then press the Delete key.
Award BIOS	Boot the computer, and then press the Delete key.
Phoenix BIOS	Boot the computer, and then press the F2 or F1 key.

3. While you are in the BIOS/UEFI setup utility and you have not made any changes you want to keep, you can safely turn off your computer using the power switch on the back of a desktop or the power button on a laptop. Power down your computer now.

If you are using a Windows 10/8 computer and the motherboard firmware supports the feature, you can access BIOS/UEFI setup from Windows. Follow these steps:

1. Start your computer normally and sign in to Windows 10/8. Do one of the following:
 - For Windows 10, open the **Settings** window, click **Update & Security**, and click **Recovery**. On the Recovery page, click **Restart now** under Advanced startup.
 - For Windows 8, click **Settings** on the charms bar. Click **Change PC settings**. In the left pane, click **Update and recovery**, and then click **Recovery**. Under Advanced start-up, click **Restart now**.
2. When the system restarts, click **Troubleshoot**. On the Troubleshoot page, click **Advanced options**. On the Advanced options page, examine the various options available. Click **UEFI**

Firmware Settings, and then click **Restart** on the UEFI Firmware Settings page. The system will restart again and boot to the BIOS/UEFI user interface.

[C HD] Part 2: Examine BIOS/UEFI Settings

After you have entered BIOS/UEFI setup, follow these steps to explore the BIOS/UEFI menus and screens:

1. Examine the information and options available on the first screen. Each manufacturer's BIOS/UEFI interface has its own variations, but much of the elemental information is common to all utilities. Some manufacturers, such as ASRock, include a tutorial within the BIOS/UEFI itself. If your version provides this feature, explore it now and take notes of significant options and menus.
2. Look for some or all of the following information. Be aware that some BIOS/UEFI utilities offer an advanced mode that provides additional information. However, some BIOS/UEFI interfaces provide only limited information.
 - Date: **Answers may vary. For example, 11/23/2020**
 - Time: **Answers may vary. For example, 16:29:58**
 - BIOS/UEFI brand: **Answers may vary. For example, Lenovo IdeaPad N580**
 - BIOS/UEFI version: **Answers may vary. For example, 5ECN91WW (V8.03)**
 - Revision date: **Answers may vary. For example, not available**
 - CPU temperature: **Answers may vary. For example, not available; 67 degrees Celsius**
 - CPU voltage: **Answers may vary, but typically this information is not available.**

- Motherboard temperature: **Answers may vary. For example, not available; 47 degrees Celsius**
- Memory summary: **Answers may vary. For example, 4096 MB**
- Does the BIOS/UEFI support RAID configurations? If so, which type of RAID is supported (RAID 0, RAID 1, RAID 5, RAID 10)?

Answers may vary. For example, RAID is not supported

- For each installed SATA drive, record the drive size and SATA port:

Answers may vary. For example, drive size is not available for the one hard drive installed in a low-end laptop.

- Virtualization support:

Answers may vary. For example, virtualization is not supported.

- Boot sequence (drives or network that BIOS/UEFI searches for an OS):

Answers may vary. For example, hard drive, network, USB device

- Fast boot setting: **Answers may vary. For example, fast boot not available; Hyper Boot Disabled; Fast Boot enabled.**
- CSM setting: **Answers may vary. For example, Boot Mode is set to UEFI**
- Secure boot setting: **Answers may vary. For example, Secure Boot is enabled**
- Temperature and fan speed (for all fans listed): **Answers may vary. For example, this info is not available; Front Fan 0 RPM, CPU Fan 1110 RPM; Rear Fan 649 RPM**
- System performance settings (energy saving, performance, etc.): **Answers may vary.**

For example, this info is not available; Enhanced Intel Speedstep Technology is Enabled.

- What password options are available? **Answers may vary. For example, the system offers an Administrator password, User password, and HDD Password, but no passwords are set.**

3. Fill in all the information required in the “UEFI/BIOS Settings and Data” section of the Computer Inventory and Maintenance form that you used in Lab 1.2.

Answer: This information should include BIOS brand and current BIOS version installed.

4. Exit BIOS/UEFI setup without saving any changes to prevent saving accidental changes made while you were exploring the setup utility.

[C HD] Part 3: Explore a BIOS/UEFI Update

BIOSAgentPlus is a free tool that scans a computer to determine if BIOS/UEFI or driver updates are available for that system. To determine whether an update is available for your computer, complete the following steps:

1. Go to the website at **biosagentplus.com**, and download the free BIOSAgentPlus program.
2. Locate the executable file on your computer and install the application. At the time of this writing, the file name was biosagentplus.exe. The scan will run automatically, and results will be presented in your browser. Is a BIOS/UEFI update available for your system?
 - What is the make and model of your computer?

Answers may vary. For example, Sony Corporation SVS151190X

- What is the chipset?

Answers may vary. For example, some laptops don't provide chipset info; for an Intel desktop motherboard, Intel H81 Express chipset

- How does this information compare to information you have already gathered about your system (for example, the information given by HWiNFO in Lab 2.1)?

Answers may vary. For example, this information is not as accurate as that given by HWiNFO.

3. The BIOS/UEFI update files available at the manufacturer's website are most likely to be free of adware, which makes them safer than using links from other websites or scanning tools. Explore the manufacturer's website for your desktop motherboard or laptop brand and model and attempt to locate the update files. If a readme.txt file is available or if other update instructions are available, read through these instructions. It is not necessary to download the update files for this lab. Answer the following questions:

- If you were to proceed with the download, what is the name of the file(s) you would need to download in order to install the update?

Answers may vary. For the Sony laptop above, the filename is EP0000601257.EXE

- Where would you store the BIOS/UEFI update file(s)? For example, sometimes the file must be installed on the hard drive and sometimes on a USB drive before you start the update.

Answers may vary. For example, on the hard drive.

- How do you start the update? (Most updates are started from BIOS/UEFI setup.)

Answers may vary. For example, for the Sony laptop, execute the file in Windows, which causes the system to reboot and install the update.

- Is it possible to make a backup of the current BIOS/UEFI version in case you need to undo the update (called a flash back)? Where is the backup stored?

Answers may vary. For example, the utility itself creates a backup before the update is installed. For other systems, go into BIOS setup and enable rolling back a BIOS flash. When you enable this feature, BIOS creates a backup before the update is performed.

[C HD] Part 4: Troubleshoot BIOS/UEFI Settings

Form workgroups of two to four people and do the following to practice troubleshooting problems with BIOS/UEFI:

1. Propose a change you could make to BIOS/UEFI setup that would prevent a computer from booting successfully. What change did you propose?

Answers may vary. For example, set the computer to boot to the network, but there is no network server to perform the boot.

2. Have your instructor approve the change because some changes might cause information written to the hard drive to be lost, making it difficult to recover from the problem without reloading the hard drive. Did your instructor approve the change?

Answer: yes or no

3. Now go to another team's computer and make the change to BIOS/UEFI setup while the other team makes a change to your system.
4. Return to your computer and troubleshoot the problem. Describe the problem as a user would:

Answers may vary. For example, an error about a missing network component appears

during the boot and before Windows loads.

5. What steps did you go through to discover the source of the problem and fix it?

Answers may vary. For example, enter BIOS setup and check the boot screen and then correct the problem.

6. If you were to encounter this same problem in the future, what might you do differently to troubleshoot it?

Answers may vary. For example, ask the user if someone has been working with BIOS setup or has there been recent power outages in the building.

[B HD] *Challenge Activity*

A technician is often called on to recover from a forgotten power-on password. Do the following to practice this skill:

1. After the computer is working, ask your instructor to configure a power-on password on your computer.
2. Without knowing the password, boot the computer.
3. List the steps required to boot the computer without the power-on password:

Answers may vary. For example, open the computer case and set jumpers on the motherboard to cause the system to reset the power-on password.

[B HD] *Review Questions*

1. Why does a computer need BIOS/UEFI?

Answers may vary. One possible answer is that the computer needs BIOS/UEFI to start, to manage onboard components, and to launch an operating system.

2. When troubleshooting a computer, why might you have to enter BIOS/UEFI setup? List at least three reasons:

Answer: Answers may vary and might include:

- To enable/disable components, such as a USB, FireWire, or network port
- To verify that the system recognizes a new hard drive correctly
- To change the boot sequence, such as when Windows is corrupted beyond repair and you want to boot the system to a network server that holds a fresh deployment of Windows

3. What happens automatically after you exit BIOS/UEFI setup?

Answer: The system reboots.

4. You plan to use Microsoft Hyper-V Manager to install a virtual machine on your laptop. Which settings should you verify or change in BIOS/UEFI before you launch Hyper-V Manager?

Answer: Turn on support for virtualization.

5. Bluetooth on a laptop computer refuses to work. Which should you do first, update the Bluetooth drivers or update BIOS/UEFI? Why?

Answer: Try updating the Bluetooth drivers first. If that doesn't work, update BIOS/UEFI. When troubleshooting, always apply the least invasive solution first.

6. Where should you go online to get BIOS/UEFI update files?

Answer: The manufacturer's website

7. List at least two precautions you should take before or during the update process to help reduce the chance of problems occurring during the update.

Answer: Answers will vary and might include:

- Make sure the computer stays plugged in.
- Have a printed copy of update instructions on hand.
- Close all open programs and disable anti-malware software.
- Create a backup of the old BIOS/UEFI version.

8. Older motherboards used many jumpers to configure the board, but today's motherboards are likely to have only a single jumper group. What is the purpose of this group of jumpers?

Answer: The jumpers are used to clear BIOS/UEFI settings and can be useful to recover from a forgotten power-on password.

[A HD] Lab 2.6 Flash BIOS/UEFI

[B HD] *Activity*

Before making hardware, software, or BIOS/UEFI changes to a system, it's important to know your starting point so that if problems occur, you know if the problems already existed or if you created them by making changes to the system. Complete the following steps to verify that your computer is functioning:

1. Verify that your computer can boot successfully to a Windows desktop with no errors.
2. How long does it take your computer to boot?

Answers may vary. For example, 3 minutes

When flashing BIOS/UEFI, using the correct BIOS/UEFI update is critical. Using the wrong update can render your system inoperable. Follow these steps to gather information on the motherboard chipset and BIOS/UEFI:

1. Use motherboard documentation or information you gathered in earlier labs to find and record the following:
 - Motherboard manufacturer:

Answers may vary. For example, Asus

- Motherboard model number and version/revision:

Answers may vary. For example, H81M-C Version Rev X.0x

- Chipset manufacturer:

Answers may vary. For example, Intel

- Chipset model number and version/revision:

Answers may vary. For example, Intel H81 Express

Next, you need to record the BIOS/UEFI manufacturer and version as BIOS/UEFI reports it.

Follow these steps:

1. Reboot the system and enter BIOS/UEFI setup.
2. Look on the main screen of BIOS/UEFI setup. What is the BIOS/UEFI identifying information?

Answers may vary. For example, Intel BIOS Version BLH6710H.86A.0105.2011.0301.1654.

- BIOS manufacturer and version:

Answers may vary. For example, Intel BIOS Version BLH6710H.86A.0105.2011.0301.1654

- BIOS release date:

Answers may vary. For example, this information is not available on BIOS screens, but when you search the web on the BIOS version number, you can usually find the release date. For another system, the Build Date is shown as 01/02/2014.

- Motherboard identification string:

Answers may vary. For example, Asus H81M-C

Using the information you gathered, you can search the web to determine what files you need to update your BIOS:

1. The motherboard manual gives detailed directions for how to flash BIOS/UEFI. If you have the manual saved from earlier labs, use it to answer the following questions.

If you don't have the manual or the manual does not give the information you need, search the Support sections of the motherboard manufacturer's website and then the BIOS/UEFI manufacturer's website for information on updating your BIOS/UEFI. Alternatively, search by motherboard model number or BIOS/UEFI version number. Answer the following questions:

- Which manufacturer provides BIOS/UEFI for this system: the BIOS/UEFI manufacturer or the motherboard manufacturer?

Answers may vary. For example, for an Intel motherboard, the manufacturer and the BIOS are both the same. For an Asus motherboard and AMI BIOS, the motherboard manufacturer, Asus, provides a BIOS update.

- What is the latest BIOS/UEFI version released? What is the release date of the latest version?

Answers may vary. For example, for an Intel motherboard and BIOS, the latest version is BLH6710H.86A.0163.2018.1023.1559 and the release date is October 2018.

- Is the latest BIOS/UEFI version a later version than the one you have installed?

Answers: Yes or No

- Do you think your system would benefit from flashing BIOS/UEFI? Explain your answer.

Answers may vary. For example, no, because it is not a good idea to flash BIOS unless a problem must be fixed.

2. Download the files to update your BIOS/UEFI or, if your computer is running the latest

BIOS/UEFI version, download the files to refresh your existing BIOS/UEFI.

- Were the files you downloaded to update or refresh your BIOS/UEFI? What is the path and name of the files you downloaded?

Answers may vary. For example, for a BIOS update by Asus, the file is H81M-C-ASUS-3602.zip, which is stored at C:\Users\<username>\Downloads

3. Search the motherboard manual or the manufacturer's website for the steps to flash your BIOS/UEFI. Print this procedure so that you can use it during the upgrade. Download any additional BIOS/UEFI utility or flash utility the procedure requires, as documented in the manual or on the website.
4. If you are having problems finding the directions to flash your BIOS/UEFI, research flash utilities on *wimsbios.com*. Wim's BIOS is an excellent website for researching BIOS information in general. List the names and descriptions of three BIOS utilities available on this site:

Answers may vary. For example:

- **BIOSAgentPlus checks for BIOS updates available and gives details about the current BIOS**
 - **Asus Live Update app identifies a motherboard and updates the BIOS on an Asus motherboard**
 - **WinZip Driver Updater for Windows 10/8/7/XP updates motherboard drivers for most motherboards**
5. The next step is to record any changes you have made previously to BIOS/UEFI settings. Generally, when BIOS/UEFI is updated, settings are returned to their default state, so you

probably will need to return the settings to their present state after you have flashed BIOS/UEFI. Use the BIOS/UEFI Settings and Data section of the Computer Inventory and Maintenance form from Lab 1.2 to record any settings you know you changed, any hard drive settings that might have to be reconfigured after you update BIOS/UEFI, and any additional settings specified by your instructor. For example, after you update BIOS/UEFI on a system that supports motherboard RAID, you will need to turn RAID back on after the update.

Record the following information:

- Hard drive information:

Answers may vary. For example, RAID 10 set for 3 SATA drives

- Settings you have changed:

Answers may vary. For example, Virtualization enabled, Fast Boot disabled.

- Settings specified by your instructor:

Answers may vary. For example, Administrator password, power-on password

6. At this point, if your update procedure requires using an external medium, verify that the boot order allows you to boot from it before the local hard drive.
7. Sometimes you need to recover from a failed BIOS/UEFI update, which can be tricky. What directions, if any, does the documentation give about recovering from a failed BIOS/UEFI update?

Answers may vary. For example, for an Asus motherboard, store the update files on a USB flash drive and update the BIOS from within BIOS setup. The process stores a backup of

BIOS on the flash drive. If a recovery is needed, the flash drive is used for the recovery.

8. Before you flash BIOS/UEFI, find out if the manufacturer offers a way to save the current BIOS/UEFI code. If so, list these steps to save BIOS/UEFI before you flash it:

Answers may vary. For example, for Asus, the flash utility makes the backup before the update happens.

- On what storage media does the manufacturer recommend you save the BIOS/UEFI code?

Answers may vary. For example, a USB flash drive

9. Why would you want to save the current BIOS/UEFI before you update it?

Answer: In case something goes wrong with the update and you need to recover the BIOS from backup.

10. Prepare to update your BIOS/UEFI. Uncompress any files, double-check the necessary procedures, read any readme.txt files included in the upgrade files (which often contain last-minute adjustments to the procedure), and create the upgrade boot disk, if necessary.

11. If your instructor permits, follow the BIOS/UEFI update procedure to flash your BIOS/UEFI. During the procedure, if you're given the opportunity to save your old BIOS/UEFI, do so. This information makes it possible to return to the previous BIOS/UEFI version if you encounter problems with the new BIOS/UEFI.

12. Reboot, verify BIOS/UEFI settings, make any changes, and verify that the computer boots to a Windows desktop successfully.

[B HD] *Review Questions*

1. At what point in the boot process is BIOS/UEFI information displayed?

Answer: During POST (power-on self test)

2. Why is it so important to record BIOS/UEFI and motherboard information correctly?

Answer: It is important so you get the correct version. If the wrong version is used to flash BIOS/UEFI, permanent damage can occur.

3. What file might contain last-minute adjustments to the upgrade procedures?

Answer: Readme.txt

4. In what state are BIOS/UEFI settings usually placed after an update?

Answer: The default state

5. Why should you not update BIOS/UEFI unless a computer needs it?

Answer: Because updating BIOS/UEFI can cause problems with the computer

6. When flashing BIOS/UEFI, why is it always important to save the old version of the BIOS/UEFI code?

Answer: Save the BIOS/UEFI so that if you encounter problems with a new version, you can revert to the previous version.