

AF_IC05_Motherboards

Unit 2

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Introduction

When you boot a computer, the first thing you can see on the monitor is the BIOS. BIOS means Basic Input/Output System.

It's a chip integrated in the motherboard that contains a set of programs that are needed in order to boot a computer. Usually it is recorded in a ROM Flash that can be updated.

BIOS has a lot of menus and options, but you will learn the most important of these options.

Nowadays, in new motherboards it has been replaced by UEFI (Unified Extension Firmware Interface).

In order to do this Unit you need Internet access.

TO KNOW MORE



<http://en.wikipedia.org/wiki/BIOS>



http://en.wikipedia.org/wiki/Unified_Extensible_Firmware_Interface

Glossary

Visit these webpages one more time. You will learn and listen to some words related to this activity:



[Quizlet activity about motherboard components and form factors](#)



[Quizlet activity about motherboard components and other computer parts](#)

BIOS Boot process

1. System switched on - Power-On Self-Test or POST process: hardware test.
2. After POST, BIOS initializes the necessary system hardware for booting (disk, keyboard controllers etc.)
3. BIOS launches the Master Boot Record (MBR) of the first disk in the BIOS disk order
4. The MBR boot code then takes control from BIOS.
5. And finally Operating System is loaded into system memory (RAM) and launched.

UEFI Boot process

1. System switched on - Power On Self Test, or POST process: hardware test.
2. UEFI firmware is loaded. Firmware initializes the hardware required for booting.
3. Firmware then reads its Boot Manager data to determine which UEFI application to be launched and from where (i.e. from which disk and partition).
4. Firmware then launches the UEFI application as defined in the boot entry in the firmware's boot manager.
5. The launched UEFI application may launch another application or Operating System depending on how the UEFI application was configured.

TO KNOW MORE



https://wiki.archlinux.org/index.php/Arch_Boot_Process



https://wiki.archlinux.org/index.php/Unified_Extensible_Firmware_Interface

Cold boot vs Warm boot

A cold boot or hard boot is a complete boot process, the computer starts from a powerless state. A complete boot sequence is done.

A warm boot or soft boot is a partial boot process, after typing Ctrl-Alt-Del or pressing the Reset button. A partial boot sequence is done, without POST.

TO KNOW MORE



http://en.wikipedia.org/wiki/Reboot_%28computing%29

Beep codes

When something is wrong in POST phase, BIOS or UEFI performs some beeping sounds that are usually different for every BIOS/UEFI maker.

In this web page there are some examples:



<http://www.computerhope.com/beep.htm>



http://www.technick.net/public/code/cp_dpage.php?aiocp_dp=guide_beep_codes

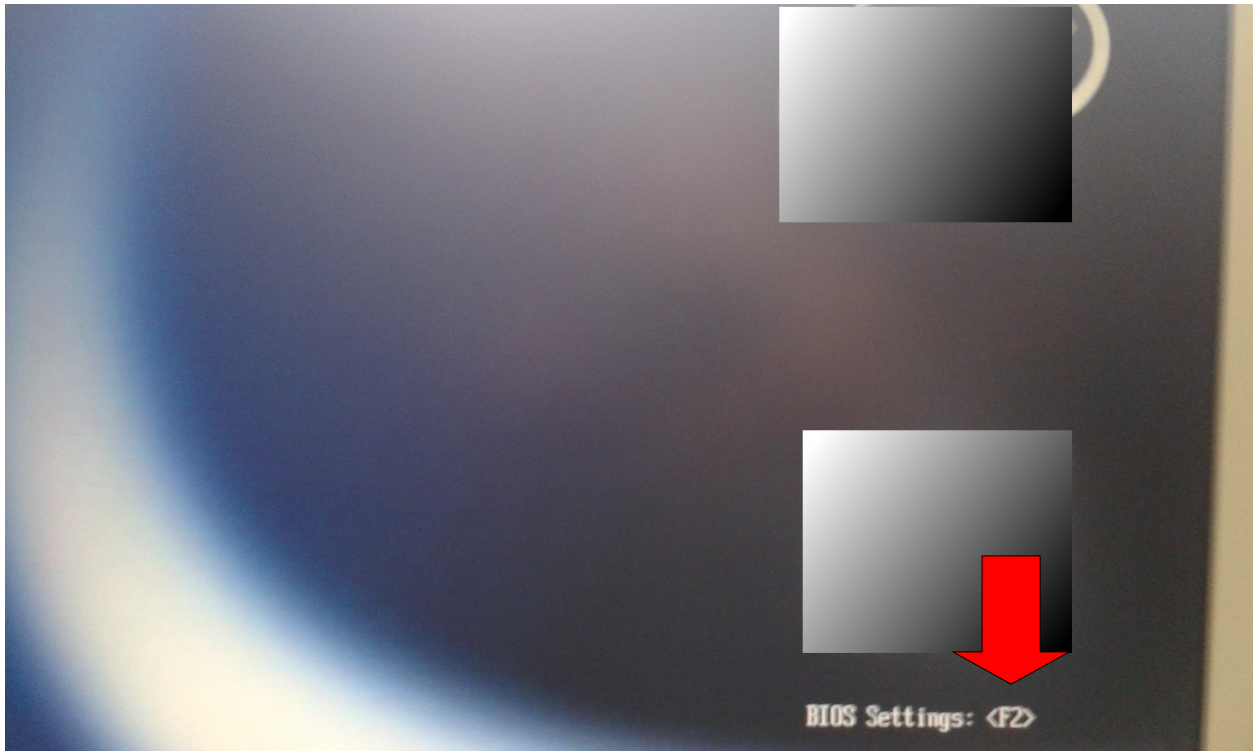
TO KNOW MORE



http://en.wikipedia.org/wiki/Power-on_self-test

BIOS/UEFI setup

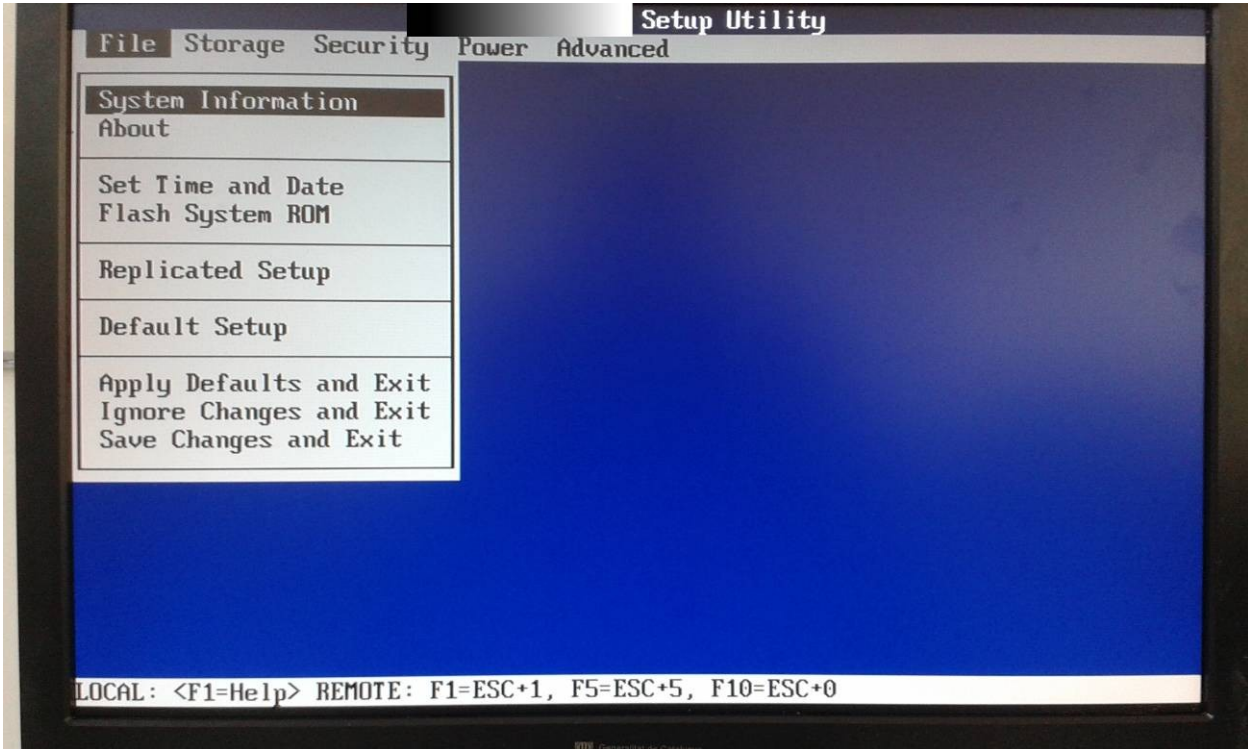
Sometimes a change in BIOS/UEFI setup is needed. In order to change it, a special key must be pressed. It can be: F1, F2, F10, Delete, ...



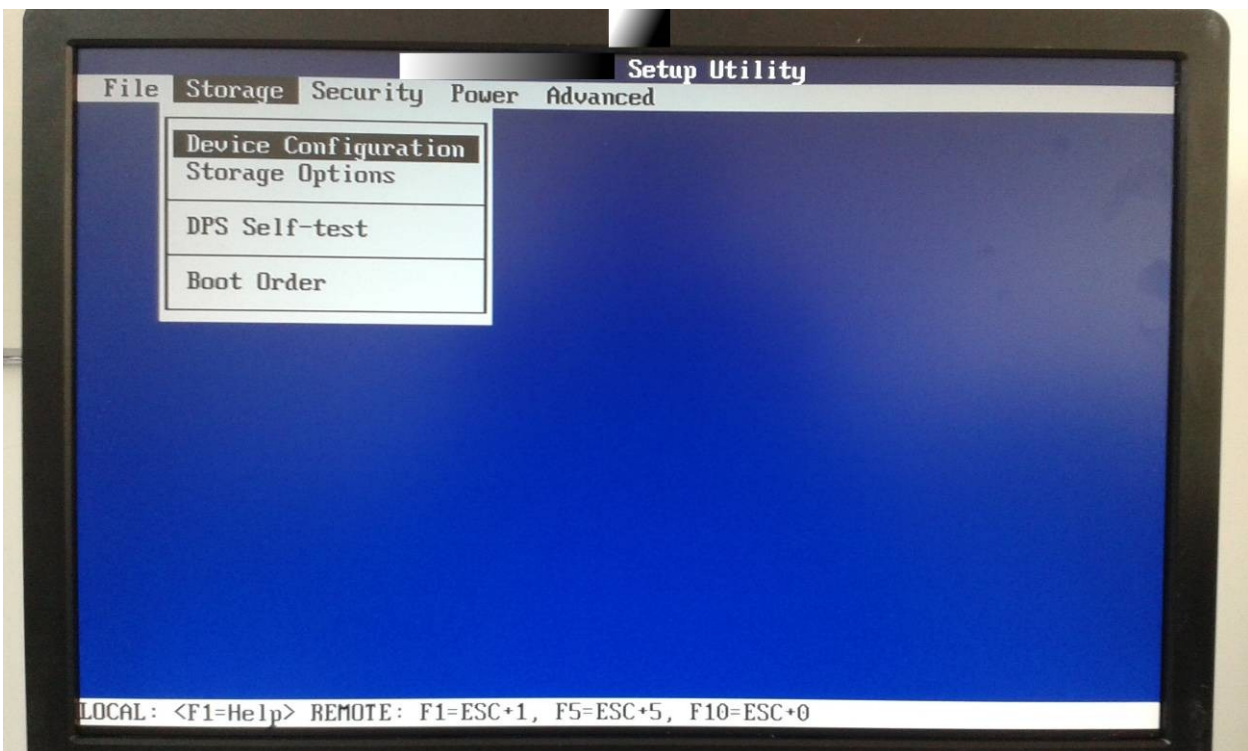
BIOS menus

Images of **BIOS** menus of a desktop computer.

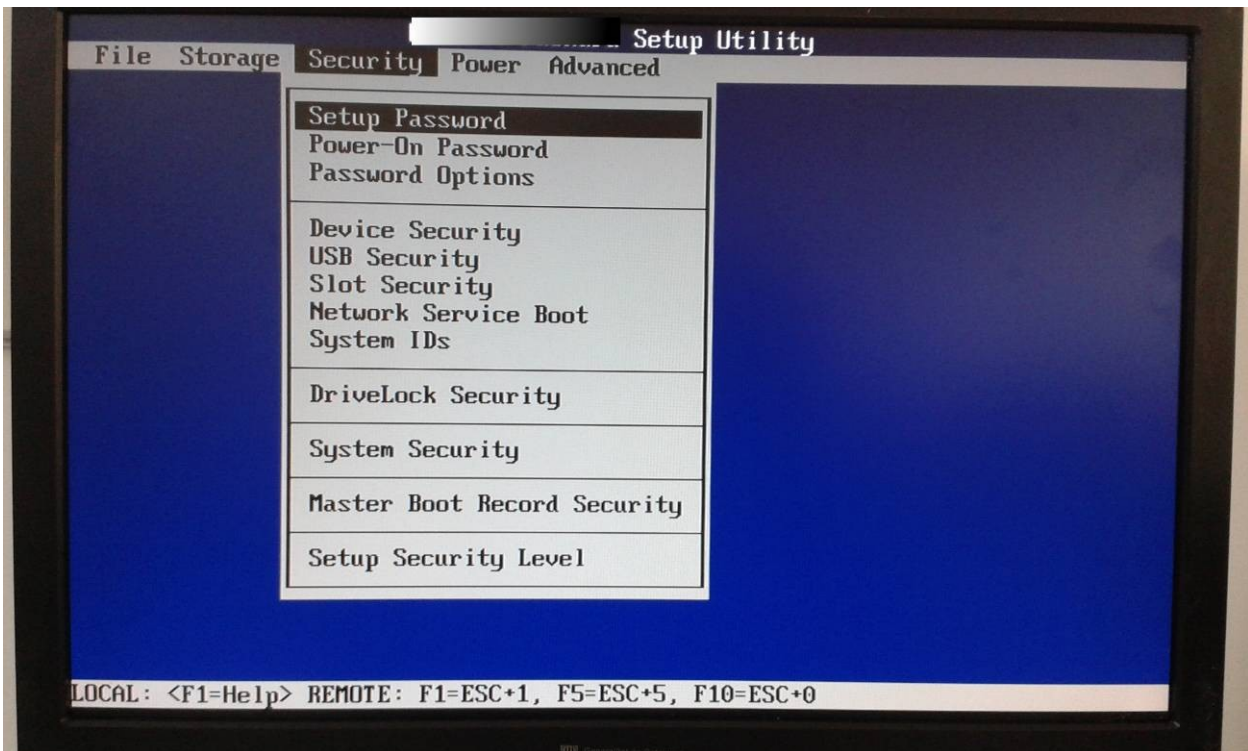
File menu: System information, About BIOS, Time and Date, Save or Discard Changes, ...



Storage menu: configure hard disk and CD/DVD/Blue-ray devices, Order of booting devices, ...



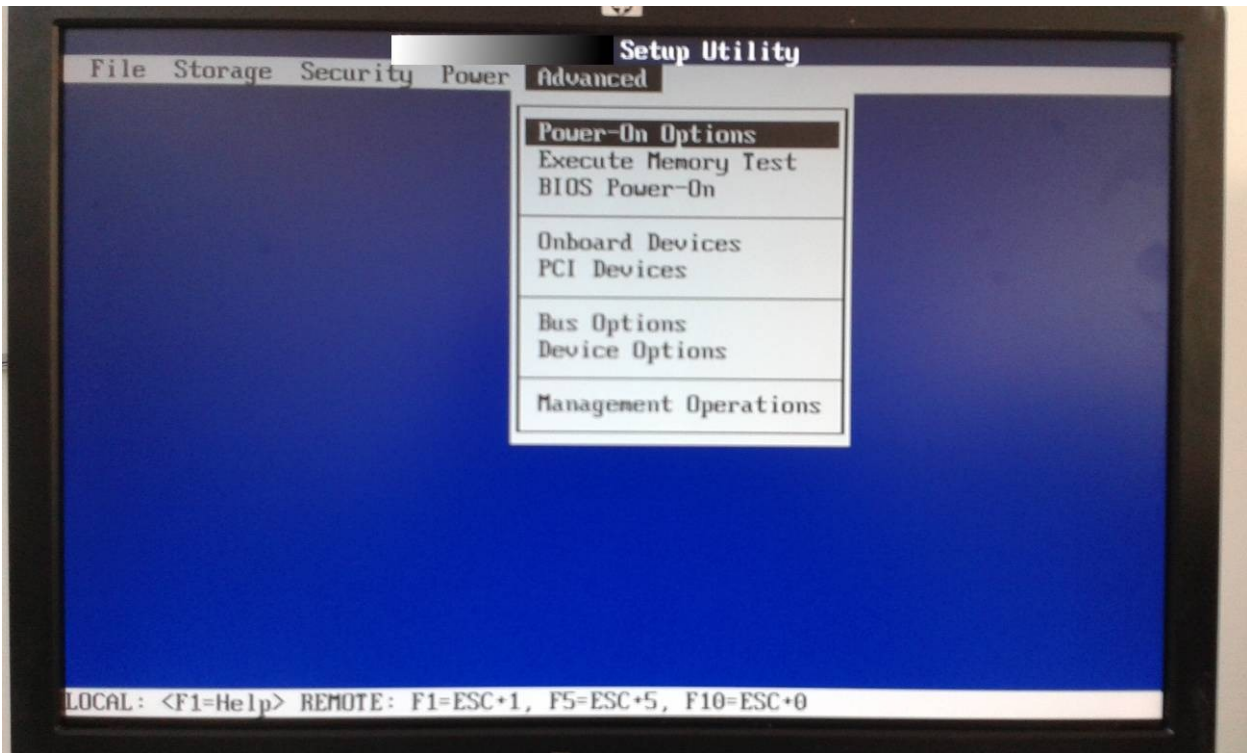
Security: BIOS and Power-On password and other security options.



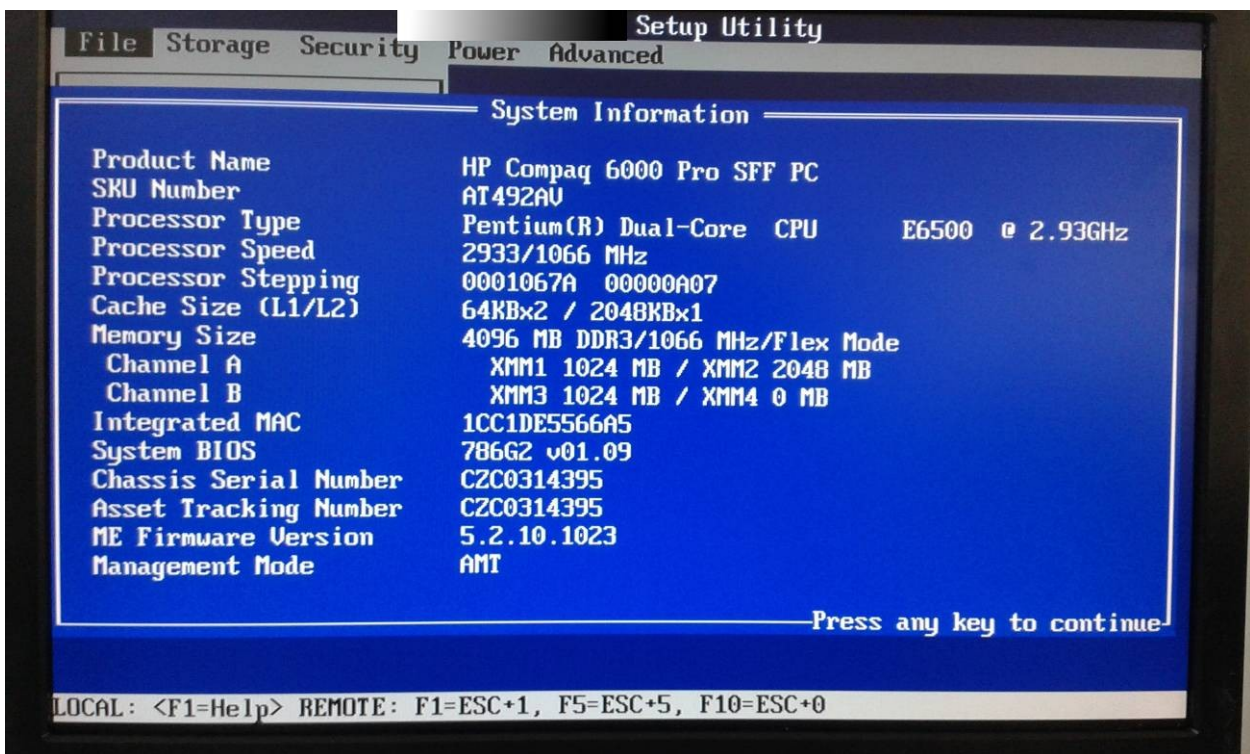
Power: some power options.



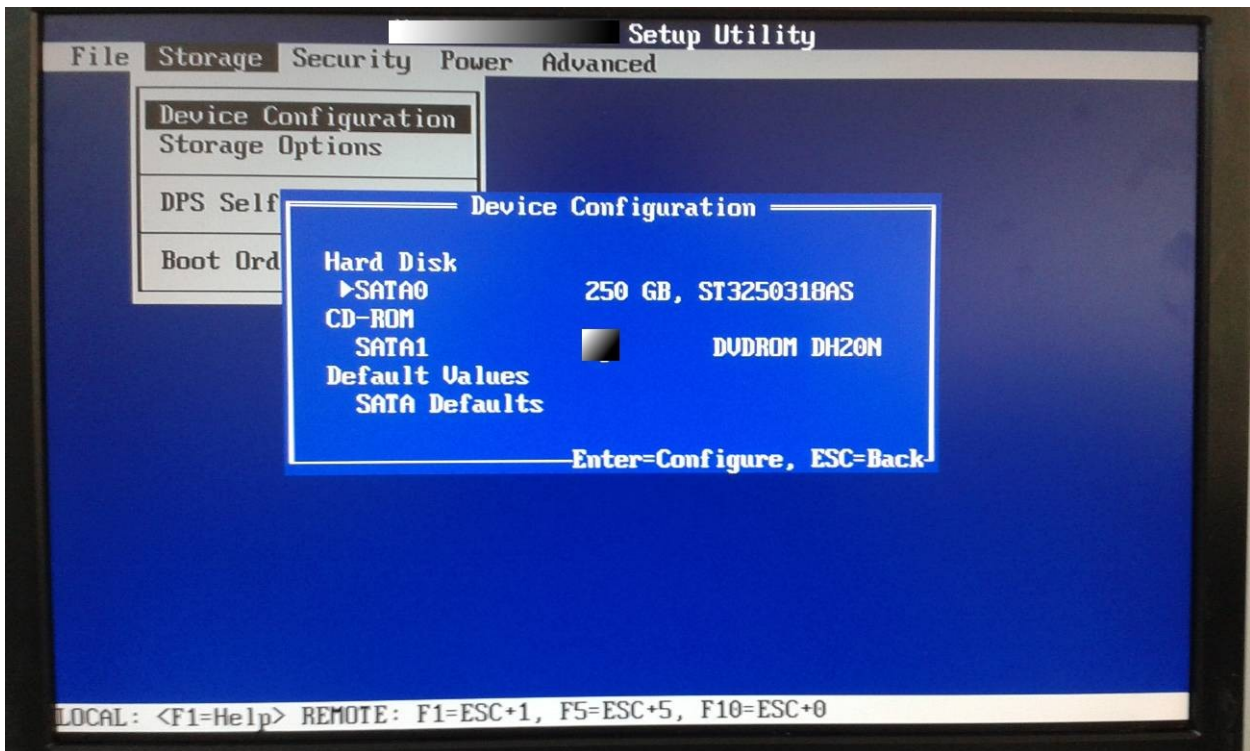
Advanced: Power-On option, test memory, configure motherboard integrated and PCI devices, ...



System Information: Product, CPU, memory, ...



Storage devices configuration: hardisk and CD/DVD/Blue-ray



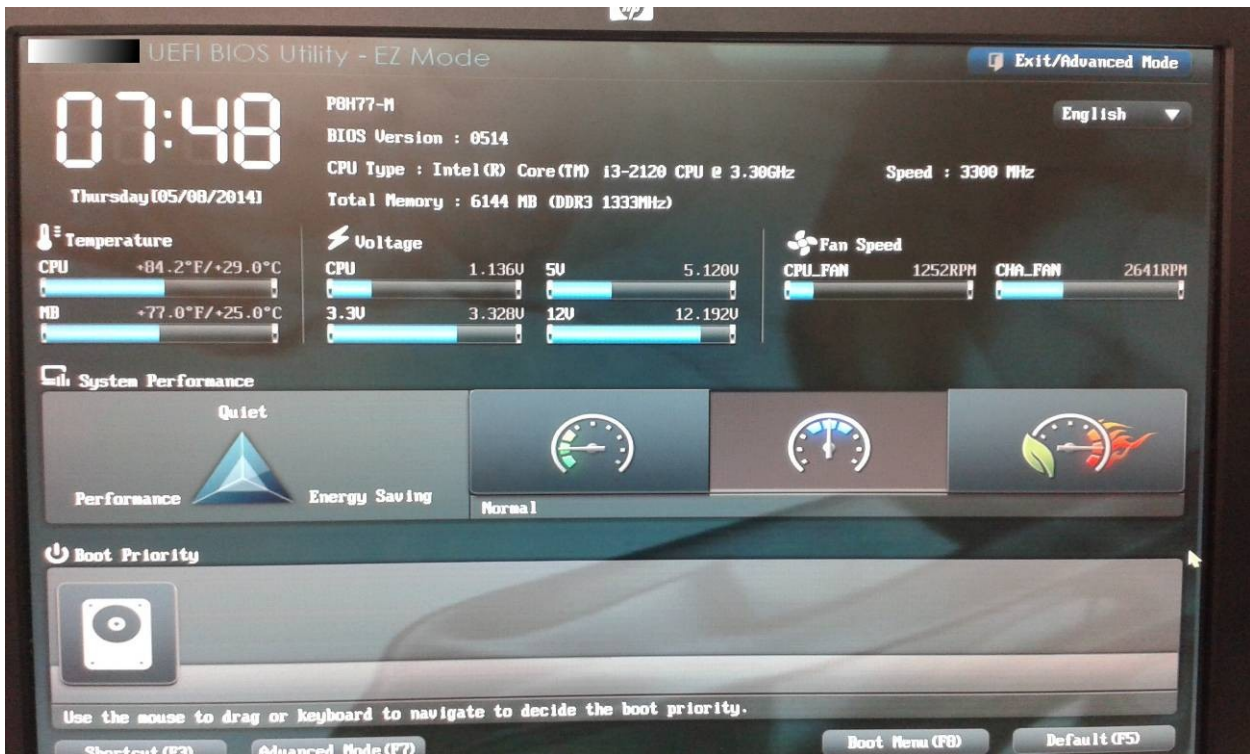
Devices boot order: 1t CD, 2d USB, 3d hard drive, 4h Network



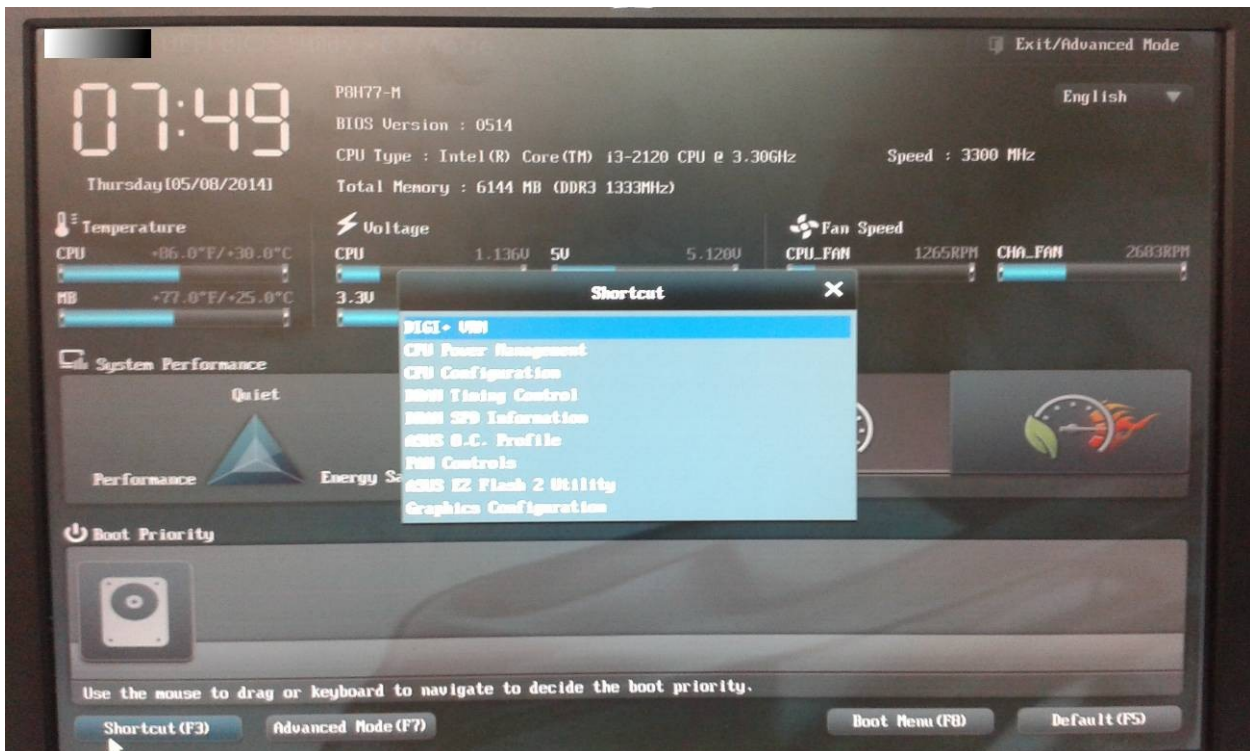
UEFI menus

Images of UEFI menus of a desktop computer.

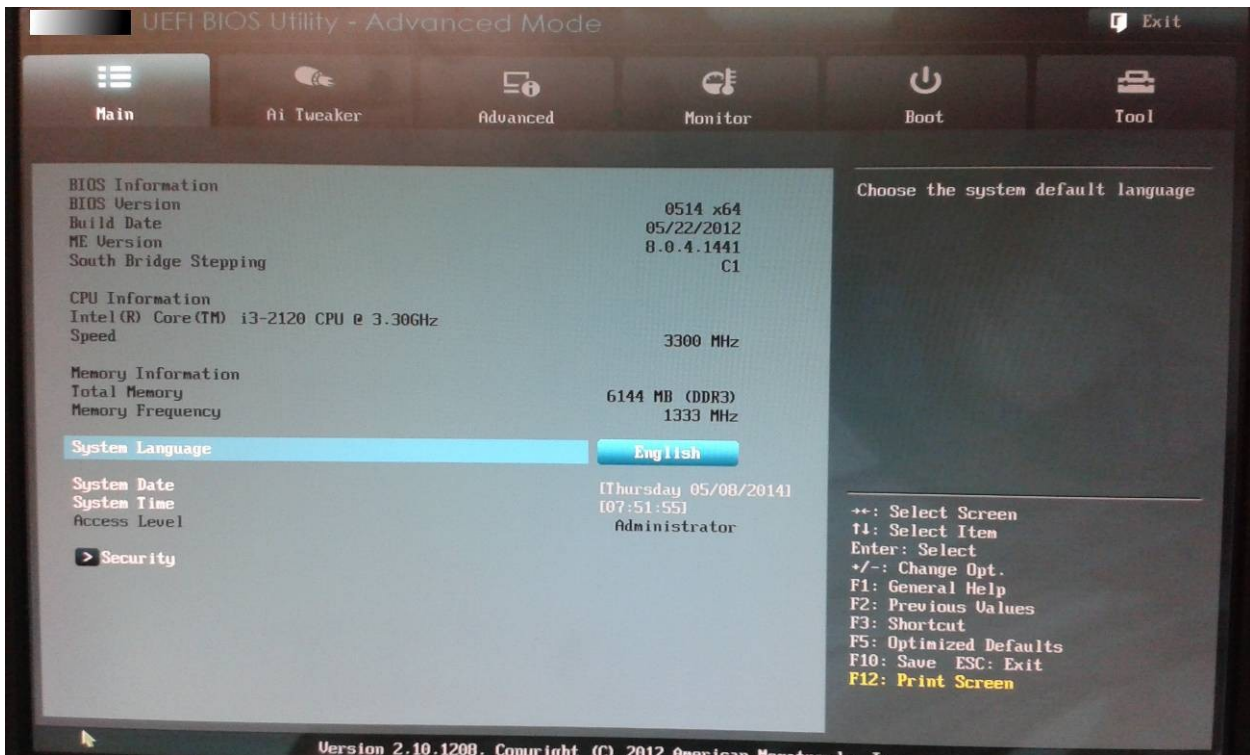
Initial UEFI screen: CPU, memory, temperature, ... and boot order



F3: short-cut to other screens



Main screen: BIOS, CPU and memory information.



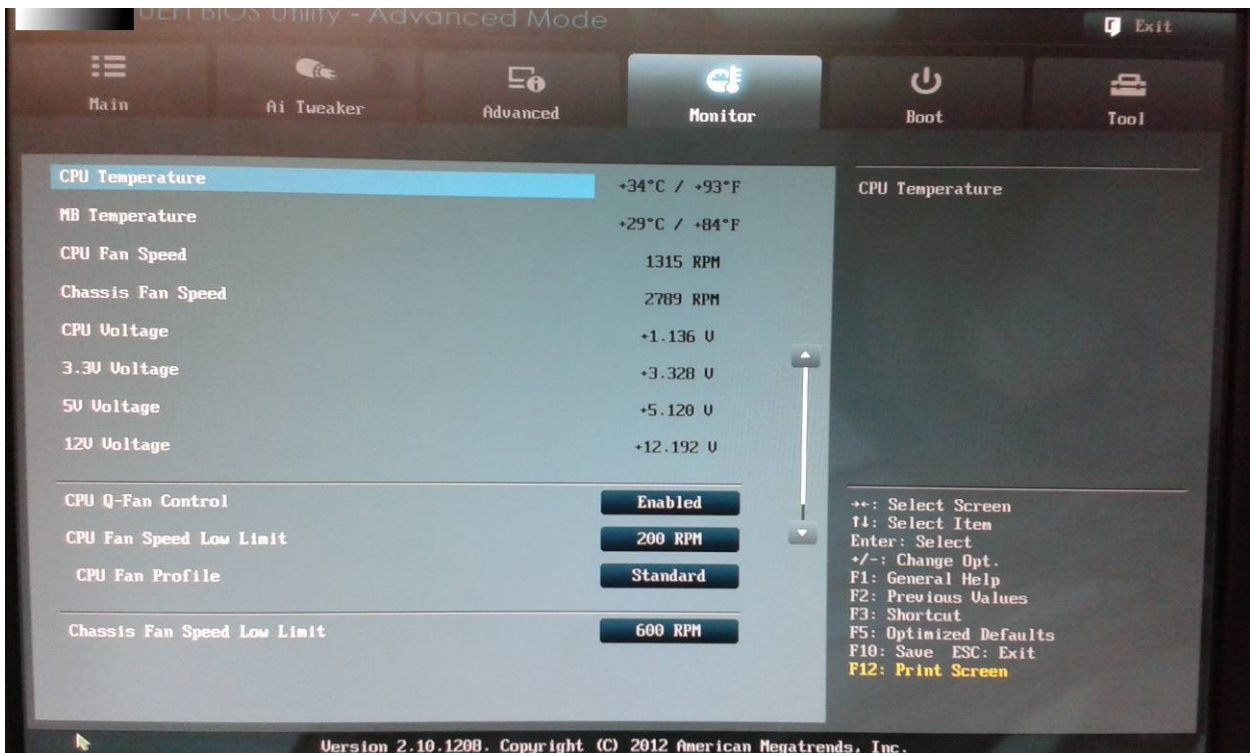
Ai Tweaker: adjust system configuration: from energy saving to performance.



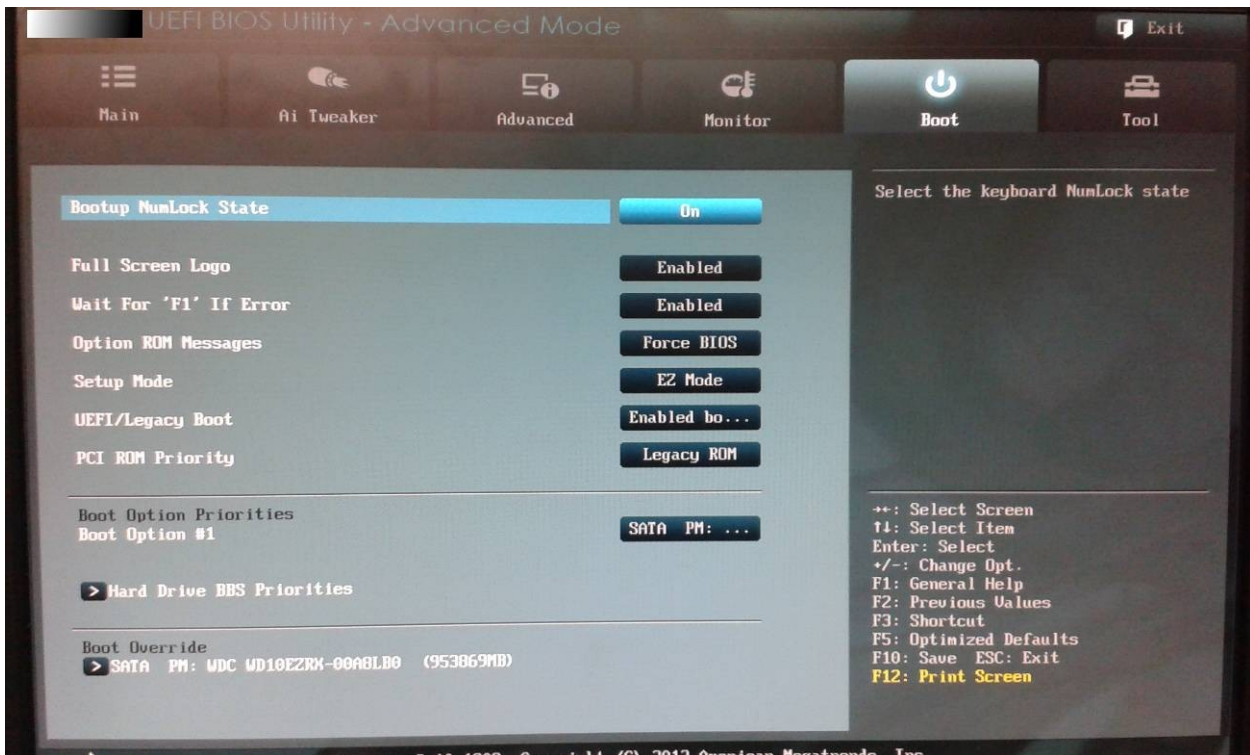
Advanced configuration: CPU, SATA, ...



Monitor: temperature, voltage, ...



Boot configuration: Numlock, logo, messages, ... and boot order.



Tool: BIOS update



Activities

1. Using your own computer or classroom computer, enter to BIOS/UEFI setup, then answer and take a picture of the screen(s) where you have found the information:
 1. BIOS brand and version.
 2. CPU: brand, model, clock speed.
 3. RAM: number of modules, type of memory, size.
 4. Are there free memory slots?
 5. Boot sequence.
 6. SATA devices.
 7. IDE devices.
 8. Is it possible to boot the computer using Wake-on LAN? And using a clock alarm?
 9. Does the motherboard have an integrated graphics card? Is it possible to disable it?
 10. Search for a newer BIOS/UEFI version and describe the process for updating it.

Bibliography and Webgraphy



<http://en.wikipedia.org>



<https://wiki.archlinux.org>



<http://www.thefreedictionary.com>



<https://dl.dropboxusercontent.com/u/1159579/SMX-M01.zip>

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