



Sector:

ELECTRICAL AND ELECTRONICS

Qualification:

COMPUTER SYSTEMS SERVICING (CSS) -NCII

Unit of Competency:

INSTALL AND CONFIGURE COMPUTER SYSTEM

Module Title:

INSTALLING AND CONFIGURING COMPUTER SYSTEM

**Asian College of Science and Technology Foundation Inc.
1013 Aurora Boulevard Quezon City**

HOW TO USE THIS COMPETENCY BASED LEARNING MATERIAL

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 1 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Welcome to the module in **Computer Systems Servicing NCII**. This module contains training materials and activities for you to complete.

The unit of competency "**Install and Configure Computer System**" contains knowledge, skills and attitudes required for **Computer Systems Servicing NCII**.

You are required to go through a series of learning activities in order to complete each learning outcome of the module. In each learning outcome are **Information Sheets, Self-Checks, Operation Sheets** or **Task Sheets**. Follow these activities on your own. If you have questions, don't hesitate to ask your facilitator for assistance.

The goal of this course is the development of practical skills. To gain these skills, you must learn basic concepts and terminologies. For the most part, you'll get this information from the Information Sheets and suggested resources and references

This module is prepared to help you achieve the required competency, in "**Installing and Configuring Computer System**".

This will be the source of information for you to acquire knowledge and skills in this particular competency independently and at your own pace, with minimum supervision or help from your trainer.

Remember to:

- Work through all the information and complete the activities in each section.
- Read information sheets and complete the self-check. Suggested references are included to supplement the materials provided in this module.
- Most probably your trainer will also be your supervisor or manager. He/She is there to support you and show you the correct way to do things.
- You will be given plenty of opportunity to ask questions and practice on the job. Make sure you practice your new skills during regular work shifts. This way you will improve both your speed and memory and also your confidence.
- Use the Self-checks, Operation Sheets or Task Sheets at the end of each section to test your own progress.
- When you feel confident that you have had sufficient skill, ask your Trainer to evaluate you. The results of your assessment will be recorded in your **Progress Chart and Accomplishment Chart**.

You need to complete this module before you perform the module on **Setting Up Computer Networks**.

COMPUTER SYSTEMS SERVICING NCII

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS - 2015-001
		Date Revised: March 1, 2017	Page 2 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

COMPETENCY-BASED LEARNING MATERIALS

List of Competencies

No.	Unit of Competency	Module Title	Code
1.	Install and configure computer systems	Installing and configuring computer systems	
2.	Set-up Computer Networks	Setting Up computer systems and networks	
3.	Set-up Computer Servers	Setting – up computer servers	
4.	Maintain and Repair Computer Systems and Networks	Maintaining and repairing computer system and networks	

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 3 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

MODULE CONTENT

UNIT OF COMPETENCY : Install and Configure Computer Systems

MODULE TITLE : Installing and Configuring Computer System

MODULE DESCRIPTOR : This unit covers the outcomes required in installing and configuring desktop and workstation computers systems. It consists of competencies to assemble computer hardware, install operating system and drivers for peripherals/devices, and install application software as well as to conduct testing and documentation.

NOMINAL DURATION : 40 hours

At the end of this module the trainee MUST be able to:

Learning Outcomes	Assessment Criteria
1. Assemble computer hardware	1.1 Computer basics 1.2 Occupational Health and Safety; 1.3 Use of Hand tool 1.4 Motherboard Parts Identification 1.5 Motherboard connections 1.6 Identifying RAM's 1.7 Power Supply Unit 1.8 Steps to a Safe and Successful Disassembly and Assembly
2. Install operating system and drivers for peripherals or devices	2.1 Windows 2008 R2 2.2 Make ISO Image Using Power ISO 2.3 Creating Bootable Flash Drive using Rufus 2.4 Installing Windows Server 2008 R2 Standard x64 bit
3. Install application software	3.1 Install application software are based on the software installation guides, end-users requirement and software license. 3.2 Installing WinRAR 3.3 Installing network device driver 3.4 Installing Kingsoft office
4. Network cabling And network Configuration	4.1 Ethernet Cable ; types, connections and guides in making Ethernet cable 4.2 Patch panel; types and guides in patching a patch panel 4.3 Network Connection diagram 4.4 Router; types and configuration 4.5 Windows Firewall
5. PC's Common Troubleshooting Techniques & Strategies	5.1 Troubleshooting tips for new monitor 5.2 Troubleshooting tips for new Motherboard 5.3 Troubleshooting tips after installing a new hard drive 5.4 Troubleshooting for network card 5.5 Troubleshooting for sound card 5.6 Tech Acronym 5.7 Computer Virus; Types and installing anti-virus software

Learning

Disassemble and Assemble Computer Hardware

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS - 2015-001	
		Date Revised: March 1, 2017	Page 4 of 119	
	Developed by: Ronaldo B. Racelis	Revision No.: 02		

Outcome 1

Contents:

1. Types/Parts of computers
 - a. Description and purpose of hardware
 - i. Input devices
 - ii. Processing devices
 - iii. Output devices
2. Safety handling of computer parts (OHS)
 - a. Work Place
 - b. Computer System
 - c. Technician
3. Used of hand tools
 - a. Hand Tools
 - b. Cleaning Tools
 - c. Diagnostic Tools
4. System Unit
 - a. Parts of Motherboard
 - b. RAM
 - c. Power Supply Unit
5. Steps to a Safe and Successful Disassembly and Assembly
 - a. Disassemble
 - b. Assemble

Conditions:

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 5 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

The students/trainees must be provided with the following:

- Tools and test instruments
 - Screwdriver set
 - Philips and flat
 - T-series
 - Hex
 - Headlamp
 - Anti-static wrist strap
 - Long nose pliers
 - Multi-tester (VOM)
 - Table mat
- Desktop PC parts and peripherals
 - Processor, mother board and memory card
 - Video card
 - Network interface card
 - Hard disk and optical drive
 - PC enclosure with switching power supply
 - Keyboard, mouse and speaker
 - Monitor
 - Test speaker (internal)
 - Table mat
- Access to power source (220VAC)

Assessment Method:

- Written exam
- Practical exam/demonstration
- Observation in workplace
- Oral Questioning

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 6 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Information Sheet 1.1

Computer Basics

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to know what a Computer is and identify the key parts of a Personal Computer.

What is a Computer?

A computer is an electronic device that manipulates information, or "data." the computer sees data as one's and zero's but he knows how to combined them into more complex things such as a photograph, a movie, a website, a game and much more.

Computer use a combination of "**Hardware**" & "**Software**"

Hardware is any physical part of the computer which include all the internal components and also the external part like the monitor and the keyboard.

Software is any set of instructions that tells the hardware what to do such as a web browser, media player or word processor.

Types of Computers

The four basic types of computers are as under:

- Supercomputer
- Mainframe Computer
- Minicomputer
- Microcomputer

Supercomputer

The most powerful computers in terms of performance and data processing are the Supercomputers. These are specialized and task specific computers used by large organizations. The supercomputers are very expensive and very large in size. It can be accommodated in large air-conditioned rooms; some super computers can span an entire building.

Mainframe computer

Although Mainframes are not as powerful as supercomputers, but certainly they are quite expensive nonetheless, and many large firms & government organizations uses Mainframes to run their business operations. Banks educational institutions & insurance companies use mainframe computers to store data about their customers, students & insurance policy holders.

Minicomputer

Minicomputers are used by small businesses & firms. Minicomputers are also called as "Midrange Computers". These are small machines and can be accommodated on a disk with not as processing and data storage capabilities as super-computers & Mainframes.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS - 2015-001
		Date Revised: March 1, 2017	Page 7 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Microcomputer

Desktop computers, laptops, personal digital assistant (PDA), tablets & smartphones are all types of microcomputers. The micro-computers are widely used & the fastest growing computers. These computers are the cheapest among the other three types of computers.

Other Devices uses a computer

- A. Mobile phones
- B. Tablets
- C. Game consoles
- D. TV's

The PC System

As a Technician, you should know and be able to identify the components found in a typical personal computer system. The PC is modular by design. It is called a system because it includes all the components required to make a functional computer.

Types/Parts of Computer



A **workstation** is a high-end personal computer designed for technical or scientific applications. Intended primarily to be used by one person at a time, they are commonly connected to a local area network and run multi-user operating systems.



Desktop computer

Desktop computers come in a variety of styles ranging from large vertical tower cases to small form factor models that can be tucked behind an LCD monitor. In this sense, the term 'desktop' refers specifically to a horizontally-oriented case, usually intended to have the display screen placed on top to save space on the desk top. Most modern desktop computers have separate screens and keyboards.



Laptop

A laptop computer or simply "laptop", also called a notebook computer or sometimes a notebook, is a small personal computer designed for portability.



System unit – The main computer cabinet usually referred to as a case, housing the primary components of the system. This includes the main logic board (System board or mother board), processor, memory, disk drives, switching power supply, and the interconnecting wires and cables. The system unit also includes expansion cards to provide audio, video, networking and other functionality. Expansion cards vary from system to system.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS - 2015-001
		Date Revised: March 1, 2017	Page 8 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Keyboard – The most familiar computer input device, the keyboard is used to introduce characters and commands into the system.



central
that



A **central processing unit (CPU)**, also referred to as a **processor unit**, is the hardware within a computer carries out the instructions of a computer program by performing the basic arithmetical, logical, and input/output operations of the system.



A **motherboard** (sometimes alternatively known as the **mainboard**, **system board**, **planar board** or **logic board**, or colloquially, a **mobo**) is the main printed circuit board (PCB) found in computers and other expandable systems. It holds many of the crucial electronic components of the system, such as the central processing unit (CPU) and memory, and provides connectors for other peripherals. Unlike a backplane, a motherboard contains significant sub-systems such as the processor.



A **video card** (also called a **video adapter**, **display card**, **graphics card**, **graphics board**, **display adapter** or **graphics adapter**) is an expansion card which generates a feed of output images to a display. Most video cards offer various functions such as accelerated rendering of 3D scenes and 2D graphics, MPEG-2/MPEG-4 decoding, TV output, or the ability to connect multiple monitors (multi-monitor).



A **network interface controller (NIC)** (also known as a **network interface card**, **network adapter**, **LAN adapter** and by similar terms) is a computer hardware component that connects a computer to a computer network.



A **sound card** (also known as an **audio card**) is an internal computer expansion card that facilitates the input and output of audio signals to and from a computer under control of computer programs. The term *sound card* is also applied to external audio interfaces that use software to generate sound, as opposed to using hardware inside the PC. Typical uses of sound cards include providing the audio component for multimedia applications such as music composition, editing video or audio, presentation, education and entertainment (games) and video projection.



Random-access memory (RAM) is a form of computer data storage. A random-access device allows stored data to be accessed directly in any random order. In contrast, other data storage media such as hard disks, CDs, DVDs and magnetic tape, as well as early primary memory types such as drum memory, read and write data only in a predetermined order, consecutively, because of mechanical design limitations. Therefore the time to access a given data location varies significantly depending on its physical location.

A **hard disk drive (HDD)** is a data storage device used for storing and retrieving digital information using rapidly rotating discs (platters) coated with magnetic material. An HDD



retains its data even when powered off. Data is read in a random-access manner, meaning individual blocks of data can be stored or retrieved in any order rather than sequentially. An HDD consists of one or more rigid ("hard") rapidly rotating discs (platters) with magnetic heads arranged on a moving actuator arm to read and write data to the surfaces.



A **computer case** is also known as a "**computer chassis**", "**tower**", "**system unit**", "**base unit**" or simply "**case**". Also sometimes incorrectly referred to as the "**CPU**" or "**hard drive**", it is the enclosure that contains most of the components of a computer. Form factors typically specify only the *internal* dimensions and layout of the case. For rack-mounted and blade servers form factors may include precise *external* dimensions as well, since these cases must themselves fit in specific enclosures



Mouse – An input device used with graphical user interfaces (GUI) to point to, select, or activate images on the video monitor. By moving the mouse along a surface, the user can cause a cursor on the display to move in a corresponding manner.



Video display or Monitor – A Visual output device that displays characters and graphics on screen.



Printers – A hard copy output device that applies data to paper. Normally, methods of placing information on a page include dot-matrix printer, inkjet printer and laser printer.



Speakers – Audio output devices used to deliver voice, music and coded messages.



A **power supply unit (PSU)** converts mains AC to low-voltage regulated DC power for the internal components of a computer. Modern personal computers universally use a switched-mode power supply. Some power supplies have a manual selector for input voltage, while others automatically adapt to the supply voltage.

Information Sheet 1.2

Occupational Health and Safety

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 10 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to identify and apply OHS policies and procedures in Computer Systems Servicing.

A. Workplace

1. Contingency measures during workplace accidents, fire and other emergencies are recognized.
2. Hazard/risks in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment.
3. Clean the area before and after using it to maintain sanitation and prevent accidents.

B. Computer systems

1. Always power off and unplug the computer before working on it. When making circuit changes switch off and unplug the power cord from the equipment then discharge the capacitors.
2. Replace only fuses with those proper rating (usually on AVR).
3. Handle all sensitive components in non-conducting metallic edge.
4. Check all signal pins and alignment to avoid incorrect connection.
5. Be careful with the sharp edges inside the computer case.
6. Do not use excessive force when installing computer components to prevent damage.
7. Do not clean your system with wet clothes or any liquid detergents.
8. Use brush, compressed air or blower in cleaning the computer system.

C. Technician

1. Personal protective equipment is correctly used in accordance with organization OHS procedures and practices.
2. Always discharge yourself before touching any part of the computer.
3. Use anti-static devices and rubber footwear to disperse static electricity.
4. Do not eat, drink or smoke when working on your computer.
5. do not wear loose clothing

Information Sheet 1.3

Used of Hand Tools

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Revision No.: 02
			Page 11 of 119

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to identify Use of hand tools and proper use.

- A **tool** is a handheld device that aids in accomplishing a task. **Tools** range from a traditional metal cutting part of a machine to an element of a computer program that activates and controls a particular function.

Preparing for the task

- How do you select the best tool for the job? **First**, know and understand in detail the scope of work to be accomplished, **second**, plan for the scope taking into account the sequence of tasks.
- Selecting the best tool for each task requires training in the proper use of the tools, field experience in their safe use, and following the manufacturer's guidance and instructions for that specific tool.
- When obtaining the tool all the associated tooling and consumable parts, as recommended by the manufacturer, must be included. In **addition**, related consumable parts must also be selected and used according to their manufacturer's instructions.

Safe Use of Tools

- Once selected, use the tool for the purpose for which it was designed. Not all tools come with detailed instructions, but there are those that do spell out the safety - **Do's** and **Don'ts** for your safety. If there are set-up or use options, operator judgment must always be based on what is the safest way to use the tool.

Environmental Safety and Health Program requires the following:

- All tools be kept in good condition with regular maintenance
- The right tool be used for the job
- Each tool be examined before use and damaged or defective tools NOT to be used
- Tools be operated according to manufacturer's instructions
- The right protective equipment for the tool and activity be used

Hardware Tools

To complete hardware repairs, it is important to have a toolkit that should contain all of the necessary tools. As you gain experience, you will learn which tools to have available for different types of jobs. **Hardware tools** are grouped into these **four categories**:

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Page 12 of 119
		Revision No.: 02	

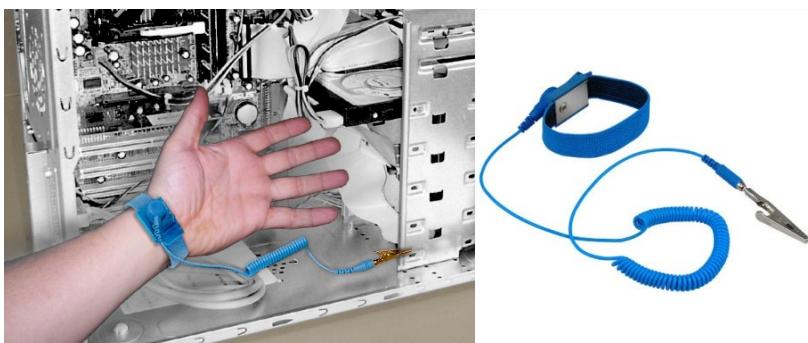
- *Electro-Static Discharge (ESD) tools*
- *Hand tools*
- *Cleaning tools*
- *Diagnostic tools*

Electro-Static Discharge (ESD) Tools

- **Static electricity** is easily generated by friction on carpets, tile flooring, clothing, hair, fabric, and etc. The friction of moving air alone will charge suspended particles and cause the buildup of static electrical charges on people and objects in the environment. **Grounded anti-static work mats** used with **anti-static wrist straps** provide the most basic means for the controlled discharge of **electro-static electricity**.

Examples of ESD Tools

- **Anti-static wrist strap** - used to **prevent** ESD damage to computer equipment.



- **Anti-static mat** - used to **stand on** or **place hardware on** to prevent static electricity from building up.



unionrepair.com

Hand Tools

- A **hand tool** is a device for performing work on a **material** or a **physical system** using only hands. The **hand tools** can be manually used employing force, or electrically powered, using **electrical current**.

Examples of Hand Tools

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 13 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

- **Flat head screwdriver** - used to **loosen** or **tighten** slotted screws.



- **Philips head screwdriver** - used to **loosen** or **tighten** crosshead screws.



- **Torx screwdriver** - used to **loosen** or **tighten** screws that have a star-like depression on the top, a feature that is mainly found on laptop.



- **Hex driver** – sometimes called a **nut driver**, is used to **tighten** nuts in the same way that a screwdriver tightens screws.



- **Needle-nose plier** - used to **hold** small parts.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	
		Date Revised: March 1, 2017	Page 14 of 119	
Developed by: Ronaldo B. Racelis	Revision No.: 02			



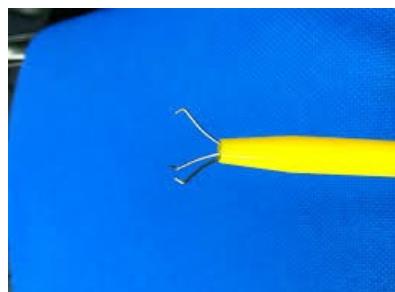
- **Wire cutter** - used to **strip** and **cut** wires.



- **Tweezers** - used to **manipulate** small parts.



- **Part retriever** - used to **retrieve** parts from locations that are too small for your hand to fit.



- **Flashlight** - used to **light up** areas that you cannot see well.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 15 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	



Cleaning Tools

- Having the appropriate **cleaning tools** is essential when **maintaining** or **repairing** computers.
- Using these tools ensures that computer components are not damaged during **cleaning**.

Examples of Cleaning Tools

- Lint-free cloth** - used to **clean** different computer components without **scratching** or **leaving** debris.

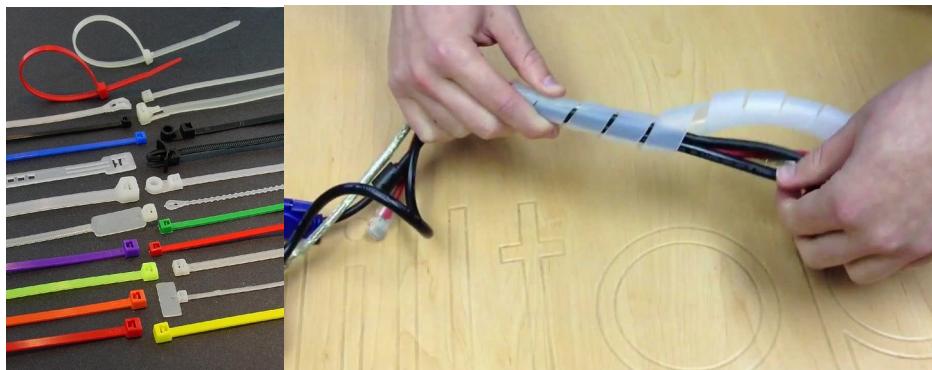


- Compressed air** - used to **blow away** dust and debris from different computer parts without **touching** the components.



- Cable ties** - used to **bundle** cables neatly **inside** and **outside** of a computer.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 16 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	



- **Parts organizer** - used to **hold** screw, jumpers, fasteners and other small parts and **prevents them** from **getting mixed** together.



Diagnostic Tools

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 17 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

- **Computers** are easier to use and more dependable with each new generation of hardware and operating system update, but that doesn't mean they're problem-free.
- **Multimeter** - used to **test** the integrity of circuits and the quality of electricity in computer components.



- **Loopback Adapter** - used to **test** the functionality of computer ports.



Information Sheet 1.4

Motherboards Parts Identification

Learning Objective:

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 18 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

After reading this INFORMATION SHEET, YOU MUST be able to identify Motherboard Parts and Functions.

What are the Different Motherboard Components and their Functions?

Understanding your motherboard components and their functions is simple... Join us as we explain the different parts of a motherboard with pictures.

At the first glance, the components of a motherboard can appear complicated... even daunting to some. How are we supposed to figure out that jumble of connectors, ports, slots, sockets and heat sinks?

The good news: To find your way around a motherboard, all you'll need to know are the major motherboard parts and their functions.

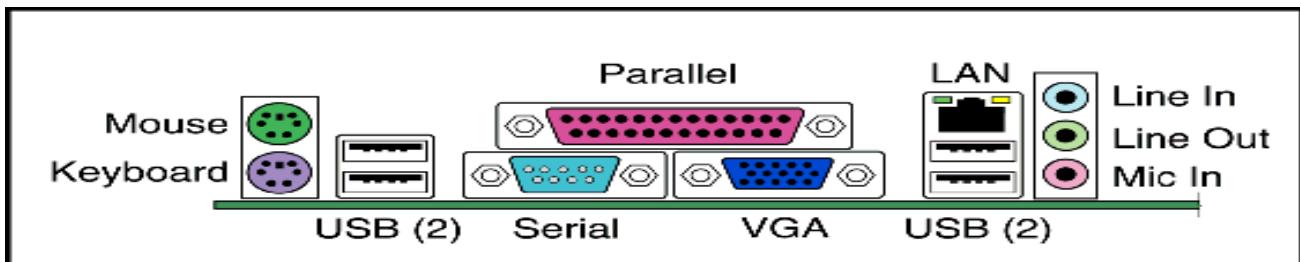
And what better way is there... than to do it with labeled photos? Let's take a closer look at the different motherboard components below:



1. Back Panel Connectors &	Connectors and ports for connecting the computer to external devices such as display ports, audio ports, USB
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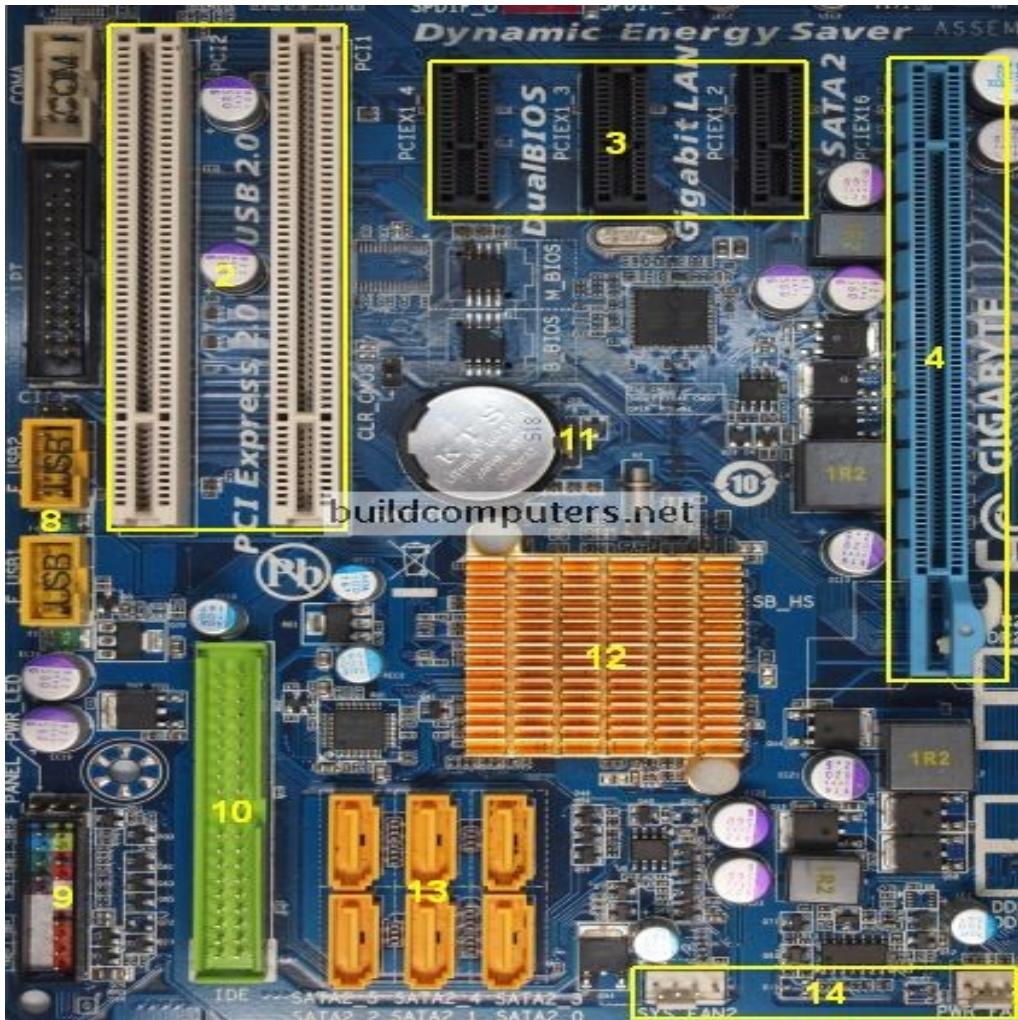
 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS - 2015-001
		Date Revised: March 1, 2017	Page 19 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Ports	ports, Ethernet ports, PS/2 ports etc. See image below for a close-up view.
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2. PCI Slots	<p>PCI: Peripheral Component Interconnect Slot for older expansion cards such as sound cards, network cards, connector cards. See image below for a close-up view.</p> <p>Have been largely replaced by PCI-Express x1 slots (see motherboard parts #3 below).</p>
3. PCI Express x1 Slots	Slot for modern expansion cards such as sound cards, network cards (Wi-Fi, Ethernet, Bluetooth), connector cards (USB, FireWire, eSATA) and certain low-end graphics cards. See image below for a close-up view.
4. PCI Express x16 Slot	Slot for discrete graphic cards and high bandwidth devices such as top-end solid state drives. See image below for a close-up view.
5. Northbridge	<p>Also known as Memory Controller Hub (MCH).</p> <p>Chipset that allows the CPU to communicate with the RAM and graphics card.</p> <p>Beginning from the Sandy Bridge generation of Intel CPUs, motherboards no longer have this component as it has been integrated within the CPU itself.</p>
6. CPU Socket	A CPU socket or CPU slot is a mechanical component(s) that provides mechanical and electrical connections between a microprocessor and a printed circuit board(PCB). This allows the CPU to be replaced without soldering.
7. ATX 12V Power Connector	Connects to the 4-pin power cable of a power supply unit which supplies power to the CPU.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 20 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	



8. Front Panel USB 2.0 Connectors	Connects to USB 2.0 ports at the front or top of a computer case. See image above for a close-up view.
9. Front Panel Connectors	Connects to the power switch, reset switch, power LED, hard drive LED and front audio ports of a computer case. See image above for a close-up view.
10. IDE Connector	Connects to older hard drive disks and optical drives for data transfer. See image above for a close-up view. Have been replaced over by SATA connectors (see motherboard components #13 below).
11. CMOS Battery	Supplies power to store BIOS settings and keep the real-time clock running. See image above for a close-up view. The CMOS battery found on most motherboards is the CR2032 lithium coin cell.
12. Southbridge	Also known as the Input/Output Controller Hub (ICH). Chipset that allows the CPU to communicate with PCI slots, PCI-Express x 1 slots (expansion cards), SATA connectors (hard drives, optical drives), USB ports (USB devices), Ethernet ports and on-board audio.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 21 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

13. SATA Connectors	Connects to modern hard disk drives, solid state drives and optical drives for data transfer. See image above for a close-up view.
14. Fan Headers	Supplies power to the CPU heat sink fan and computer case fans. See image above for a close-up view.
15. RAM Slots	Insert RAM here. To learn how to install RAM, click here for our guide to installing RAM.
16. ATX Power Connector	Connects to the 24-pin ATX power cable of a power supply unit which supplies power to the motherboard.



17. mSATA Connector	Connects to amSATA solid state drive. In most cases, this SSD is used as cache to speed up hard disk drives, but it's possible to re-purpose it as a regular hard drive.
18. Front Panel USB 3.0 Connector	Connects to USB 3.0 ports at the front or top of the computer case.
19. Power & Reset Button	<p>Onboard button to turn on, turn off and reboot the computer.</p> <p>This motherboard component is more common among high end boards.</p>

Information Sheet 1.5

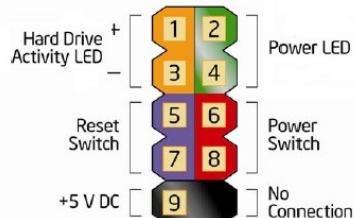
 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 22 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Motherboard Connections

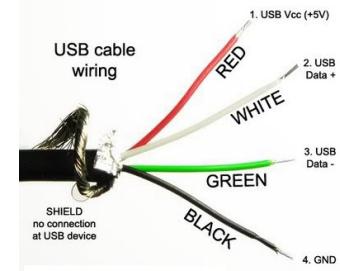
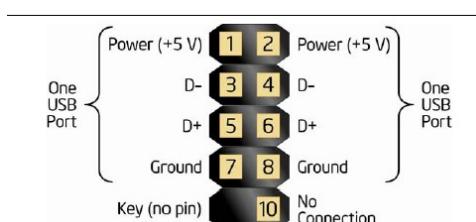
Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to Identify Motherboard Panel Connectors

Front Panel Connectors



USB 1.1 & 2.0 Panel Connectors



Data transfer rate comparison:

USB 1.1 = 12 Mbit/s

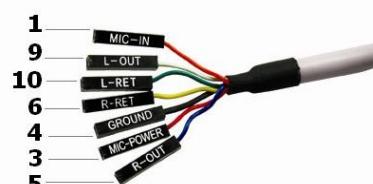
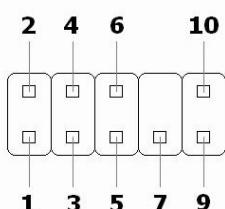
USB 2.0 = 480 Mbit/s

USB 3.0 = 5 Gbit/s

USB 3.0 Panel Connectors



AC'97-compliant front panel Audio



AC'97 & HD or Azalia connector comparison



Information Sheet 1.6

Identifying RAM's

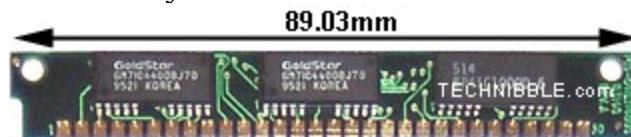
 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	
	Developed by: Ronaldo B. Racelis	Revision No.: 02	Page 23 of 119

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to identify RAM's. There are many different types of RAM which have appeared over the years and it is often difficult knowing the difference between them both performance wise and visually identifying them. This article tells a little about each RAM type, what it looks like and how it performs.

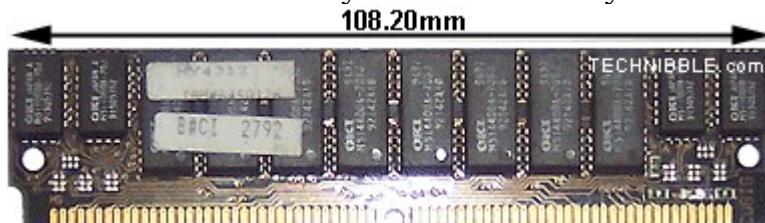
FPM RAM

FPM RAM, which stands for "**Fast Page Mode**" RAM is a type of Dynamic RAM (DRAM). The term "Fast Page Mode" comes from the capability of memory being able to access data that is on the same page and can be done with less latency. Most 486 and Pentium based systems from 1995 and earlier use FPM Memory.



EDO RAM

EDO RAM, which stands for "**Extended Data Out RAM**" came out in 1995 as a new type of memory available for Pentium based systems. EDO is a modified form of FPM RAM which is commonly referred to as "Hyper Page Mode". Extended Data Out refers to fact that the data output drivers on the memory module are not switched off when the memory controller removes the column address to begin the next cycle, unlike FPM RAM. Most early Pentium based systems use EDO.

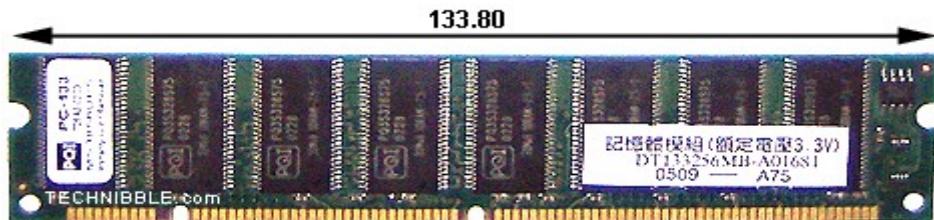


SDRAM

SDRAM , which is short for **Synchronous DRAM** is a type of DRAM that runs in synchronization with the memory bus. Beginning in 1996 most Intel based chipsets began to support SDRAM which made it a popular choice for new systems in 2001.

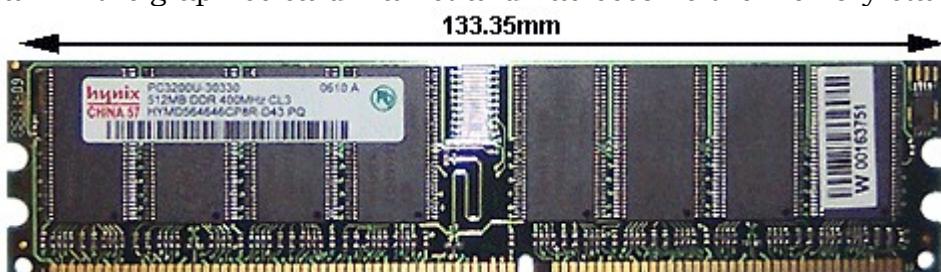
 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 24 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

SDRAM is capable of running at 133MHz which is about three times faster than FPM RAM and twice as fast as EDO RAM. Most Pentium or Celeron systems purchased in 1999 have SDRAM.



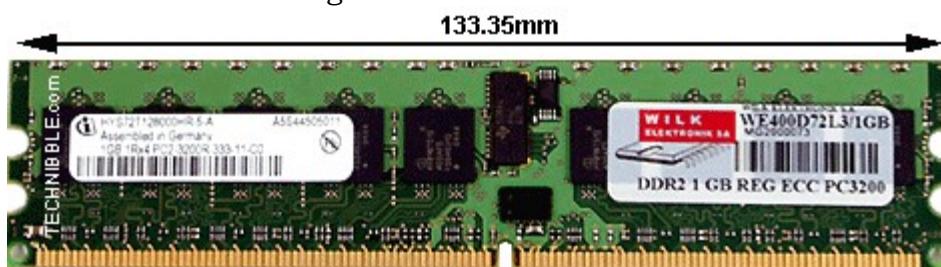
DDR RAM

DDR RAM, which stands for "**Double Data Rate**" which is a type of SDRAM and appeared first on the market around 2001 but didn't catch on until about 2001 when the mainstream motherboards started supporting it. The difference between SDRAM and DDR RAM is that instead of doubling the clock rate it transfers data twice per clock cycle which effectively doubles the data rate. DDR RAM has become mainstream in the graphics card market and has become the memory standard.



DDR2 RAM

DDR2 RAM, which stands for "**Double Data Rate 2**" is a newer version of DDR which is twice as fast as the original DDR RAM. DDR2 RAM came out in mid 2003 and the first chipsets that supported DDR2 came out in mid 2004. DDR2 still is double data rate just like the original DDR however DDR2-RAM has modified signaling which enables higher speeds to be achieved with more immunity to signal noise and cross-talk between signals.

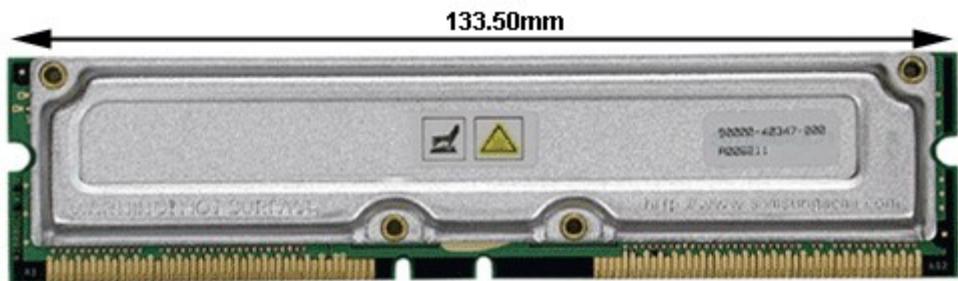


RAMBUS (RIMM) RAM

RAMBUS RDRAM is a type of ram of its own, it came out in 1999 and was developed from traditional DRAM but its architecture is totally new. The RAMBUS design gives smarter access to the ram meaning that units can prefetch data and free some CPU work. The idea behind RAMBUS RAM is to get small packets of data

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 25 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

from the RAM, but at very high clock speeds. For example, SD RAM can get 64bit of information at 100MHz where RAMBUS RAM would get 16bits of data at 800MHz. RIMM ram was generally unsuccessful as Intel had a lot of problems with the RAM timing or signal noise. RD RAM did make an appearance in the Sony Playstation 2 and the Nintendo 64 game consoles.



DDR3 RAM

DDR3 was the next generation memory introduced in the summer of 2007 as the natural successor to DDR2. DDR3 increased the pre-fetch buffer size to 8-bits and increased the operating frequency once again resulting in high data transfer rates than its predecessor DDR2. In addition, to the increased data transfer rate memory chip voltage level was lowered to 1.5 V to counter the heating effects of the high frequency. By now you can see the trend of memory to increase pre-fetch buffer size and chip operating frequency, and lowering the operational voltage level to counter heat.



Information Sheet 1.7

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 26 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

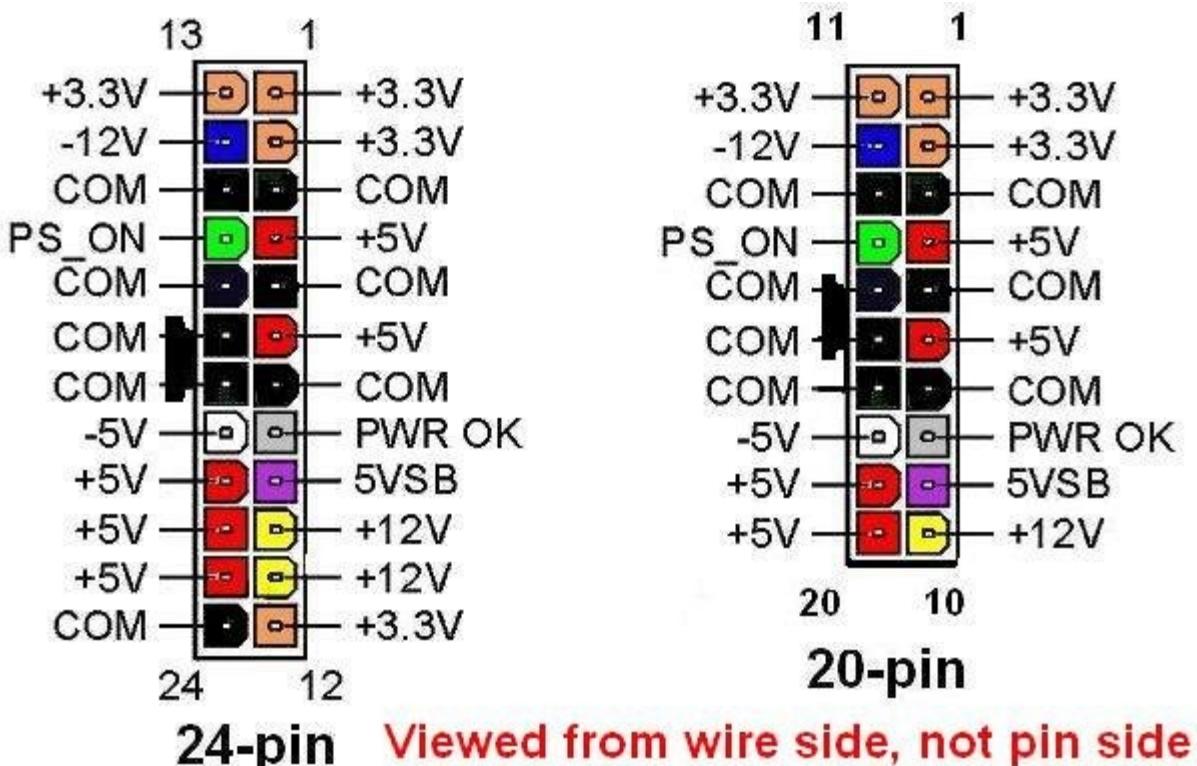
Power Supply Unit

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to know and identify Power Supply Unit and its functions.

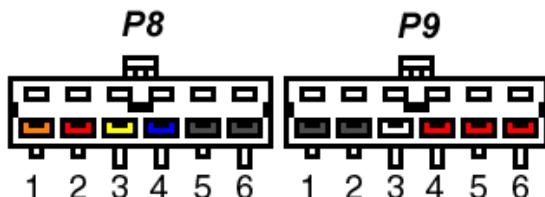
A **power supply unit (PSU)** converts mains AC to low-voltage regulated DC power for the internal components of a computer. Modern personal computers universally use a switched-mode power supply. Some power supplies have a manual selector for input voltage, while others automatically adapt to the supply voltage.

Wiring diagram & Voltage Outputs:



AT power connector wiring diagram:

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 27 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	



**P8 & P9 AT Power Connectors
(from Power Supply)**

Connectors

The 20/24 ATX pin



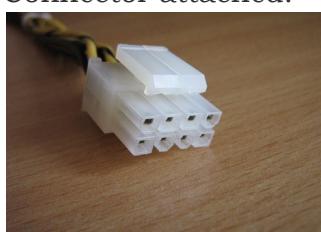
It allows you turn on the motherboard: early models had a 20-pin configuration, whilst the current standard is now 24. Note that it still comes as a block of 20 pins, to which you can add a block of 4 pins. This is to ensure compatibility with older motherboards and their 20-pin connectors.

The "ATX P4"

This connector, called P4-ATX (ATX 12V or as), was introduced by Intel for Pentium 4 (hence the name): it plugs into the motherboard and exclusively powers the processor.

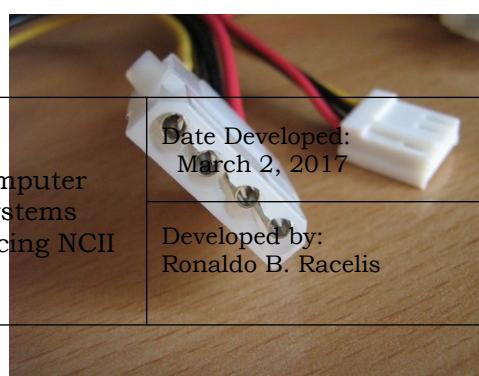
Today, most motherboards possess 4 to 8 pins dedicated to powering up the CPU. The latest standards for power supply make use of an 8-pin connector (sometimes called EPS 12V), made up of 2 x 4-pin blocks, again to ensure compatibility with old motherboards and the classic ATX P4.

Connector attached:



The MOLEX

The most classic. PC, it is sometimes



Still very present in every used directly on the

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 28 of 119
		Developed by: Ronaldo B. Racelis	Revision No.: 02

motherboard (MSI) and is used to connect the hard disk and other drives. Some graphics cards may require this connector too. Note that **Molex/Sata** connectors are easily available nowadays.

The SATA connector

Modern power supply must have at least 4 of these, to power up drives at the SATA standard.



The "PCI Express"

Modern graphics cards need more power. They need to power themselves directly from the power block. This is the role of this connector. Originally a 6-pin configuration and now available in 8-pin.



 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 29 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

If you plan to buy a powerful graphics card, be careful on this point: your power supply should contain at least two PCI Express slots including one convertible at least 6 / 8 pin as follows:



If your power supply doesn't have an 8-pin connector, there are 6 to 8 adapters:



MOLEX to PCI Express



Notes:

The use of these adapters is not recommended and requires the power supply to be of good quality and powerful enough to feed the latest graphics card.

The pins



As you can see, all these connectors are fitted with pins. Never force! Take your time, look at the connector and ask yourself two questions: is this correct? is it in the right direction?

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 30 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Information Sheet 1.8

Steps to a Safe and Successful Disassembly and Assembly

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to successfully disassemble/assemble and apply OHS policies and procedures.

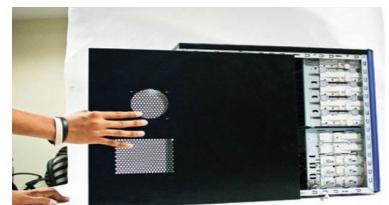
To Disassemble:

1. Prepare all your tools.
 - a. Long Philip Screw Driver
 - b. Anti-static strap

2. Before opening the system case, be sure to turn off the system unit. Turn off and unplug the AVR from the wall socket as well. After that, unplug all the cables connecting to the back of the system unit. After clearing all the connected cables, put the system unit on an empty working table.



3. Touch the unpainted part of your system unit with your bare hands to remove the ESD of your body. Wear anti-static strap. This is an important part before opening your system case. You might destroy your RAM, Chipsets and other components of your motherboard.



4. Remove the screws of the side cover opposite to the side where the ports are. By most system cases, if you are facing the back of the system unit the right side cover is to be removed. Return the screws back to the screw holes to avoid losing them.



5. Once the side cover is removed, turn your system side down where the opened side of the system unit should be facing upward where you can comfortably look down on the inside of your system case.



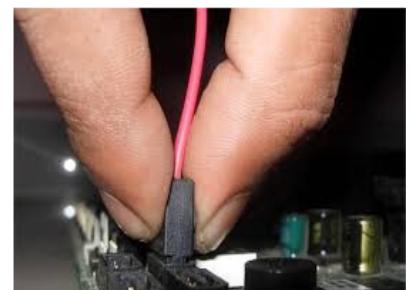
 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 31 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

6. We are now ready to remove the components inside of the computer. The first thing we need to do is remove the power supply. To be able to remove the power supply, remove first the molex connectors or the motherboard power connector, drive power connectors, the floppy drive power connector, the sata power connectors and the four pin 12-volt motherboard connector. With all power connectors removed from the motherboard and drives, the power supply is now ok to be removed as well.

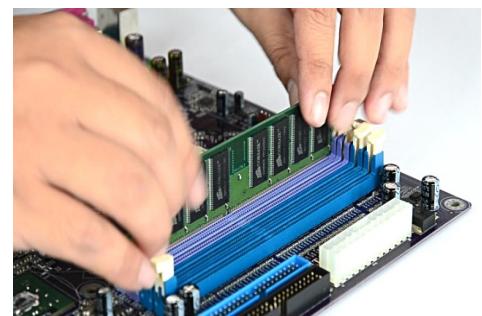


7. With the power supply removed, the data cable should be removed next.

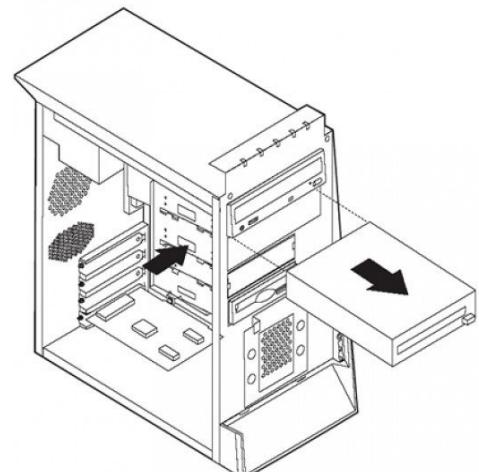
This includes IDE, SATA, and floppy drive cables. Secure the removed data cables.



8. Next to remove are the RAM, Video Card and other card peripheral components. Again have them secured in a safe place and put the screws back. Clean the connector edges of the card peripherals by rubbing the gold colored edge moderately with a rubber eraser then brushing off the shredding. Do not attempt to clean the edge by blowing or brushing it off with your fingers. Our body is acidic and you might only cause the edges to tarnish faster.

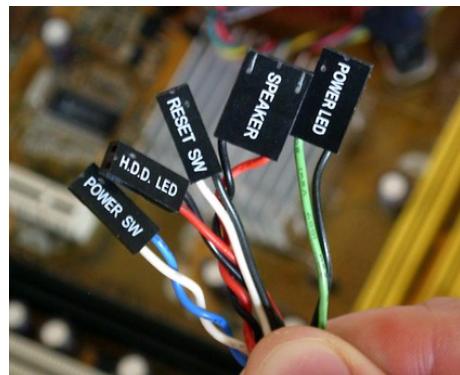


9. Remove all drives. This will include your hard drive, cd/dvd drives, and the floppy drive.



 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 32 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

10. Since all peripherals were removed, the next thing to do is to remove the front panel connectors. This will include the USB, Front Panel (FP) and Audio header. If you are not sure of which connector is being matched to, write down or document the connections and orientation of the connectors before removing them from the headers. Remember that not all motherboards have the same header configuration so be careful and watchful while documenting.



11. After removing the header connectors, we are now ready to remove the motherboard. To remove the motherboard, locate first all the screws and lightly unscrew all screws alternately. With this technique, we are reducing the risk of warping or bending our motherboard. It may not have a large impact on the bending of the motherboard but still it does have even a little. Upon lightly loosening all screws, remove all screws then. Remove the motherboard by carefully and lightly pulling it away from the I/O shield. Why? because we need to free the ports that are fitted from the holes in the I/O shield. After freeing the motherboard ports from the I/O shield holes, lift up the motherboard and put it on the safe place.



 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 33 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

To Assemble:

1. Provided that all peripherals are clean and ready. We are now going to assemble your computer. In assembling back your computer, what we have done during disassembling is just doing the reverse order to assemble it. Since the motherboard was last to be removed, it should then be the first to put back. Remove the retaining screws from the standoff screws of the motherboard and let the motherboard seat on it with the ports facing out towards the I/O shield. Lightly push the motherboard to set its ports to the holes of the I/O shield. Put the retaining screws on the motherboard screw holes but do not tighten it yet. Now be careful in doing this one and if this is your first time doing it, it is best if you lend a hand for assistance. Lightly push the motherboard towards to I/O shield and lightly tighten the motherboard retaining screws alternately until all screws are tight enough but not too tight. This is to ensure that your ports are protruding correctly out of the I/O shield.
2. Once the motherboard is secured, put back the FP, Audio, and USB header connectors as you will be using your documentation for reference.
3. Put back the drives to the correct drive bays.
4. Connect back the RAM, Video Card and other card peripherals to its proper slot inserting it properly and some cards will require screws to be secured.
5. The data cables (IDE, SATA, floppy cable) should be connected to its proper headers and drives. Remember the proper configuration of the placement of the cables specially if you are dealing with the IDE cables.
6. After the data cables are properly connected, put back the power supply and secure it with the screws you removed earlier. After securing the PSU to the chassis, connect the power connectors to the drives and the motherboard.
7. Once all peripherals are connected properly, have a final inspection by visually checking for loose connection or improper connection. Once the system unit connections are thoroughly checked and verified, connect the keyboard; the monitor, and the power connector then power up the computer. This initial powering up of the computer while the side cover is open ensures us that everything is ok before putting back the side cover. In case something goes wrong, we can accessibly correct the problem right away. If everything is fine shutdown the computer, unplugged the AVR and remove the cables connected to the back of your computer. Put the side cover back.
8. Put the assembled computer back to its place and connect the rest of the cables and connectors. Power it up and see if there are unusual effects of your disassembling/assembling procedure done earlier.

Install operating system and drivers for peripherals or devices

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 34 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Learning Outcome 2

Contents:

1. Windows Server 2008 R2
 - a. System Requirements
 - b. Materials/application needed
2. Making ISO image using PowerISO
 - a. What is powerISO
 - b. Procedure to make ISO image
3. Creating bootable flash drive using Rufus
 - a. Things you will need
 - b. Procedure to make a bootable flash drive
4. Installing Windows Server 2008 R2x 64
 - a. What is Bios
 - b. Specify the boot sequence
 - c. Procedure for installing windows Server

Information Sheet 2.1

Windows Server 2008 R2

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 35 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to know the system requirements for windows Server 2008 R2

Windows Server 2008 R2 is a server operating system produced by Microsoft. It was released to manufacturing (RTM) on July 22, 2009 and launched on October 22, 2009. The retail availability was September 14, 2009.¹ It is built on the same kernel used with the client-oriented Windows 7. It is the first 64-bit-only operating system released from Microsoft. Enhancements include new functionality for Active Directory, new virtualization and management features, version 7.5 of the Internet Information Services (IIS) web server and support for up to 256 logical processors.

System Requirements

Before installing Windows Server 2008 R2, the computer must meet the following minimum system requirements

- 1.4 GHz x86/x64 or Itanium 2 processor
- 512 MB RAM (2 GB recommended)
- Super VGA or higher display
- 32 GB disk space (10 GB for Foundation Edition)
- DVD drive
- Keyboard and pointing device

Materials/Application Needed:

Windows Server 2008 R2 Standard x64 bit CD

Power Iso

Rufus

4 Gb or higher USB flash drive

Information Sheet 2.2

Making ISO Image Using Power ISO

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 36 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

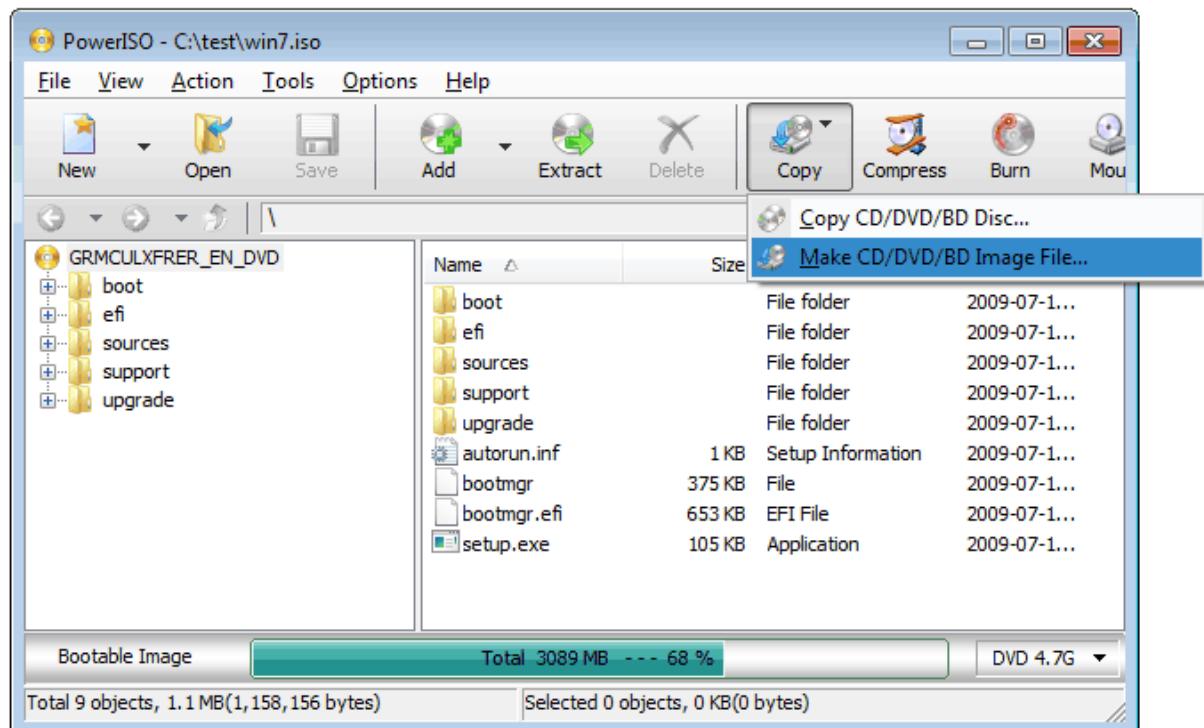
Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to how to create ISO image using PowerISO

PowerISO can make an **ISO file** from a CD, DVD, or Blu-ray disc. PowerISO do a sector-by-sector copying. All information in the disc, including the boot information, will be copied. You can launch the iso maker using the main program or the shell context menu.

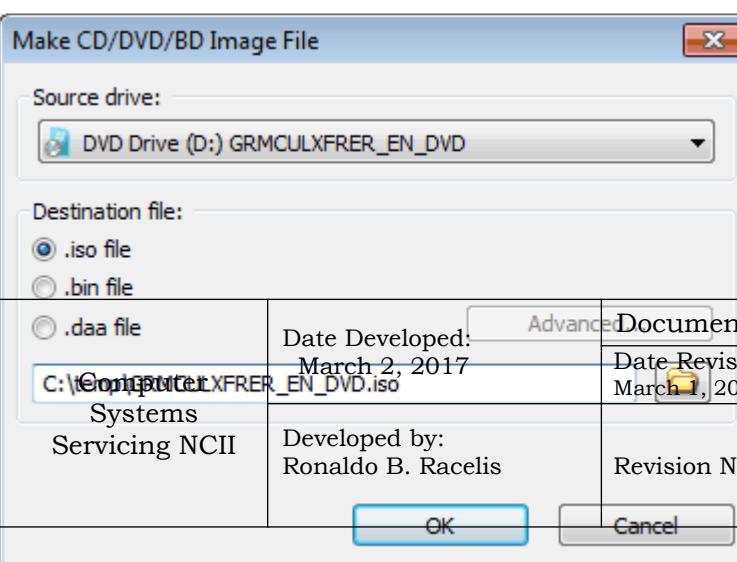
Usage1: Make ISO file using the main program:

- Run PowerISO.
- Click "Copy" button on toolbar, then choose "Make CD / DVD / BD Image File..." from the popup menu.



- PowerISO shows ISO Maker dialog.
- Choose the CD / DVD driver which holds the disc you want to copy.
- Choose the output file name, and set output format to ISO.

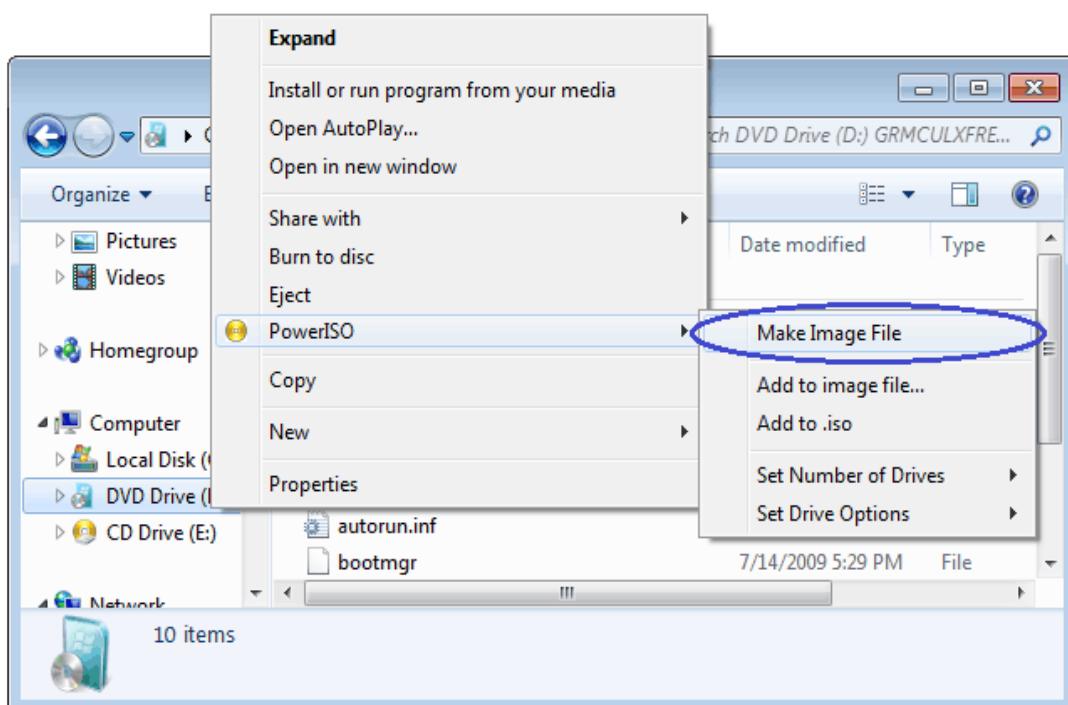
- to the



Click "OK"
make iso file from
selected disc.

Usage2: Make ISO file using the shell context menu:

- Open "My Computer" and select the drive which holds the disc you want to copy..
- Right-click on the drive selected, the shell context menu will popup.
- Choose the menu "Make Image File".
- The "**ISO maker**" dialog will display.
- Choose the output file name, and set output format to ISO.
- Click "OK" to start making.



Information Sheet 2.3

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 38 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Creating Bootable Flash Drive Using Rufus

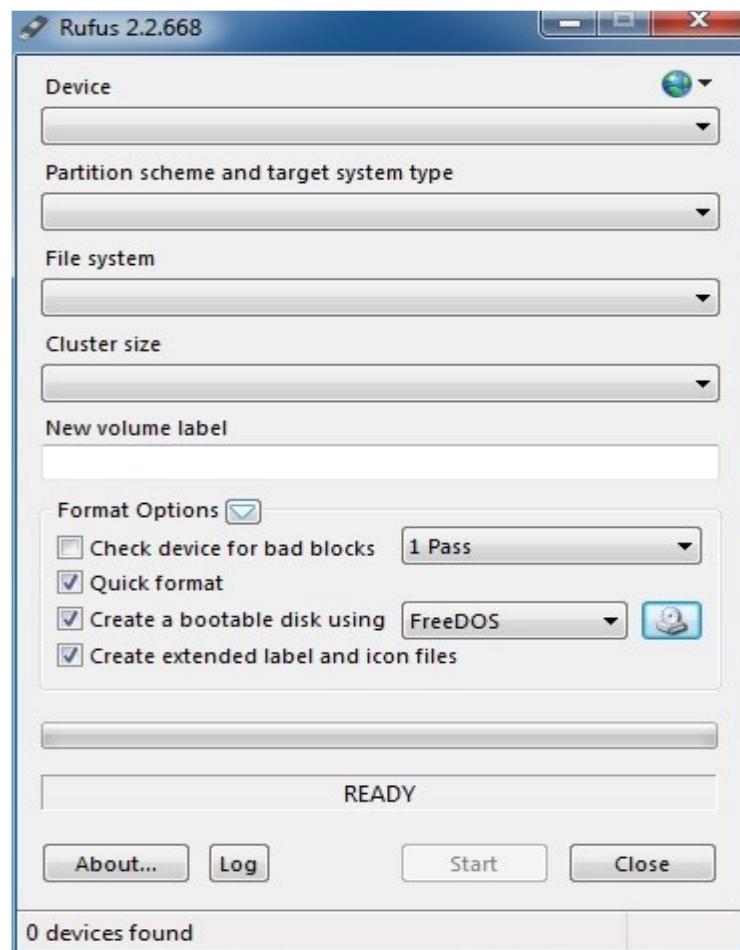
Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to create a bootable Windows Server 2008 R2 x64 USB using Rufus.

Things you will need:

- Windows Server 2008 R2 Standard x64 bit Image file
- Flash Drive (The size of the USB required will vary depending on the size of the ISO you are using. 4GB or higher USB).

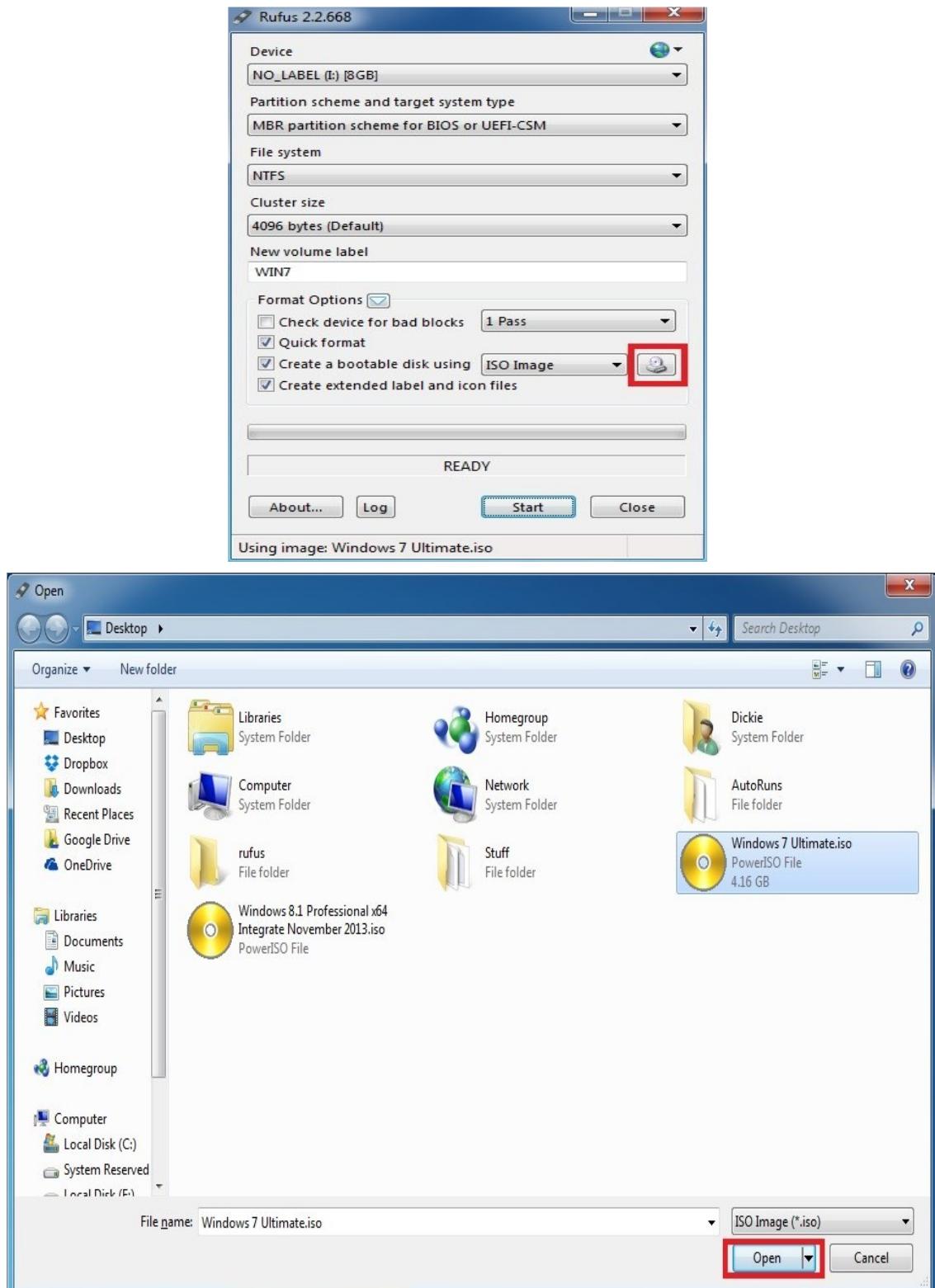
Once you have the required items, you can start by opening up Rufus. Don't worry about any of the settings here as Rufus will automatically do this for you depending on the type of ISO you are using.



By default, it will appear to have many of the options blank until you connect your USB. Once you connect the USB, these fields will be automatically filled for you. Next, connect your USB to your computer

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Revision No.: 02
			Page 39 of 119

Now we need to select our ISO. (Windows server 2008 r2 ISO) Select the icon highlighted as shown below, which will let you browse for the required ISO file.

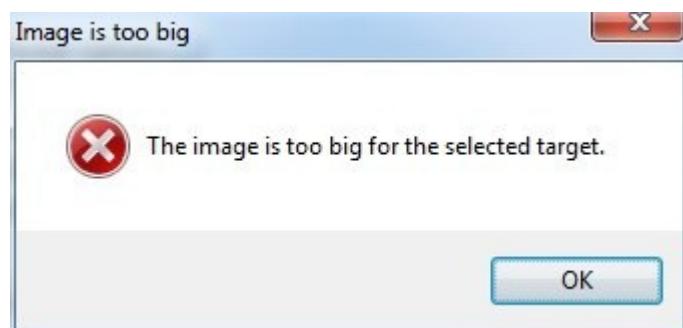


Select the file by left clicking on it once and then clicking on Open.

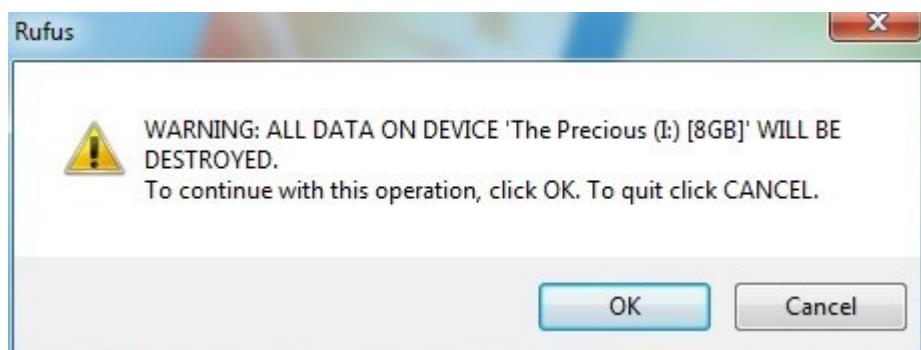
Rufus will now have filled out the fields for you. All you have to do now is hit Start.

 AsianCollege	<p>Computer Systems Servicing NCII</p>	<p>Date Developed: March 2, 2017</p> <p>Developed by: Ronaldo B. Racelis</p>	<p>Document No. CSS – 2015-001</p> <p>Date Revised: March 1, 2017</p> <p>Revision No.: 02</p>	<p>Page 40 of 119</p>
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Note, if you are using a USB stick that is too small, like using a 2GB USB for an ISO that is larger than 2GB you will get the following error:



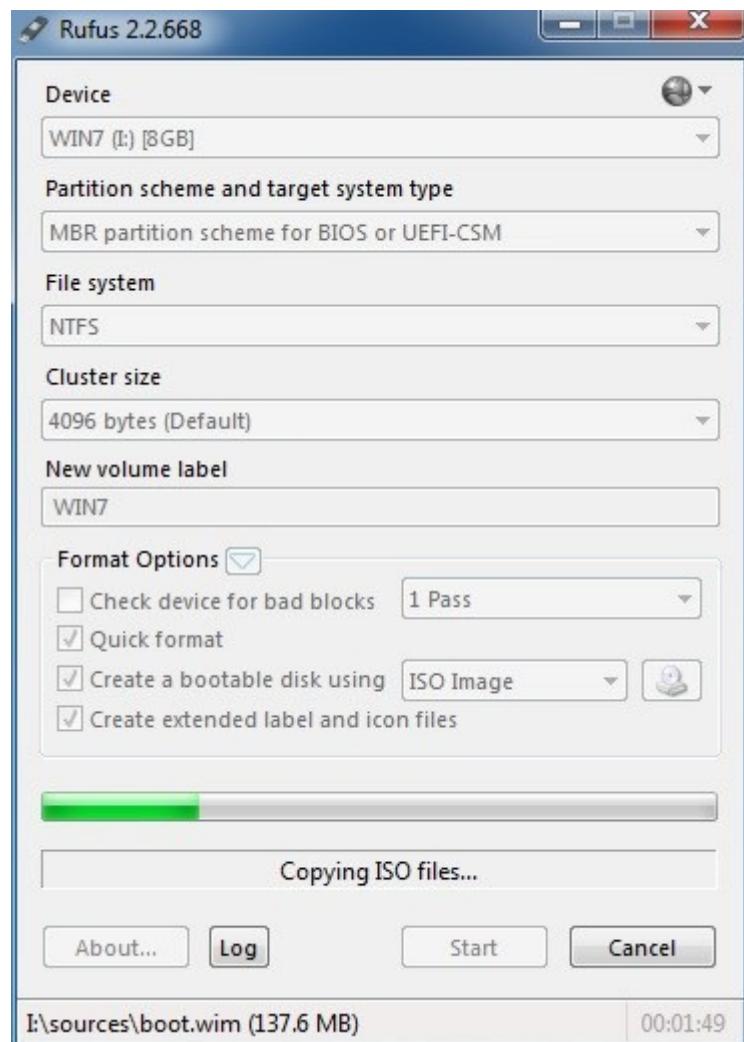
If your USB is the correct size then you will get a standard warning telling you that any data/partitions that was on the USB before starting the process will be permanently deleted.



Click OK, to start.

How long the process will take to complete will depend on the specs of your computer, the USB (read/write speeds) and the size of the ISO you are using.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 41 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	



That's it. You now have a bootable USB.

Information Sheet 2.4

Installing Windows Server 2008 R2 Standard x64 bit

Learning Objective:

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 42 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

After reading this INFORMATION SHEET, YOU MUST be able to install and configure Windows server 2008 R2.

To boot from a CD, DVD or USB device, make sure that the device has boot sequence priority over the hard drive.

BIOS Boot

BIOS (Basic Input Output Subsystem) is a programmable chip that controls how information is passed to various devices in the computer system. A typical method to access the BIOS settings screen is to press ESC, F1, F2, F8 or F10 during the boot sequence.

BIOS settings allow you to run a boot sequence from a floppy drive, a hard drive, a CD-ROM drive or an external device. You may configure the order that your computer searches these physical devices for the boot sequence.

The first device in the order list has the first boot priority. For example, to boot from a CD-ROM drive instead of a hard drive, place the CD-ROM drive ahead of the hard drive in priority.

Before you set boot priority for a USB device, plug the device into a USB port.

To specify the boot sequence:

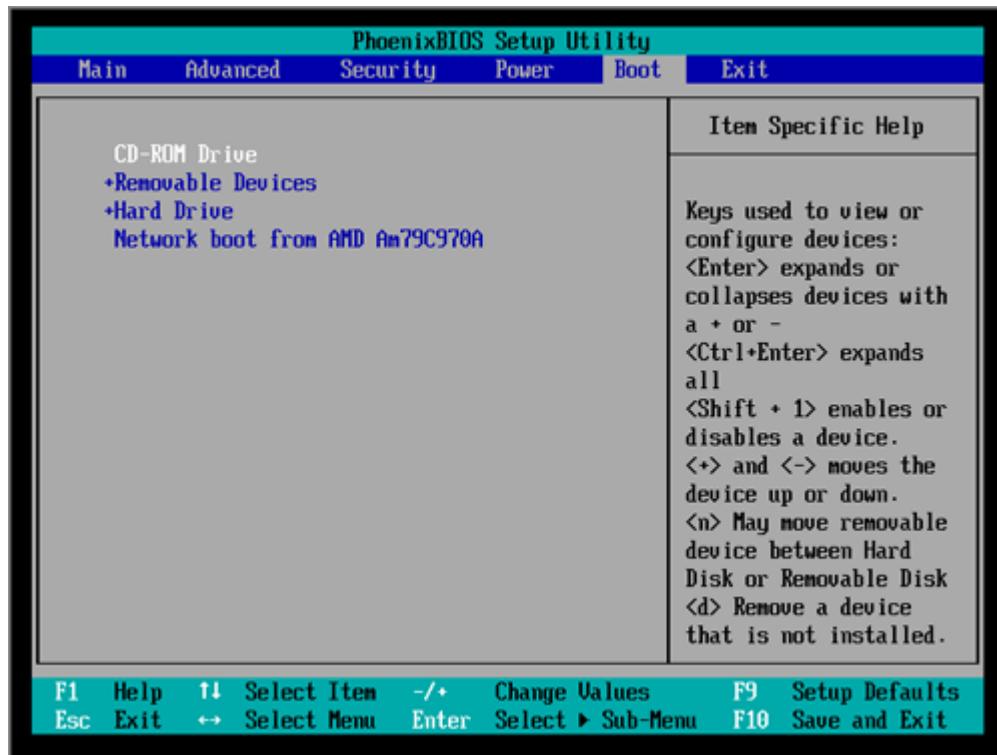
1. Start the computer and press **ESC, F1, F2, F8 or F10** during the initial startup screen. Depending on the BIOS manufacturer, a menu may appear.
2. Choose to enter BIOS setup. The BIOS setup utility page appears.
3. Use the arrow keys to select the **BOOT** tab. System devices appear in order of priority.
4. To give a CD or DVD drive boot sequence priority over the hard drive, move it to the first position in the list.
5. To give a USB device boot sequence priority over the hard drive, do the following:

Move the hard drive device to the top of the boot sequence list.
Expand the hard drive device to display all hard drives.
Move the USB device to the top of the list of hard drives.

6. Save and exit the BIOS setup utility.
7. The computer will restart with the changed settings.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 43 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Boot Priority Options:



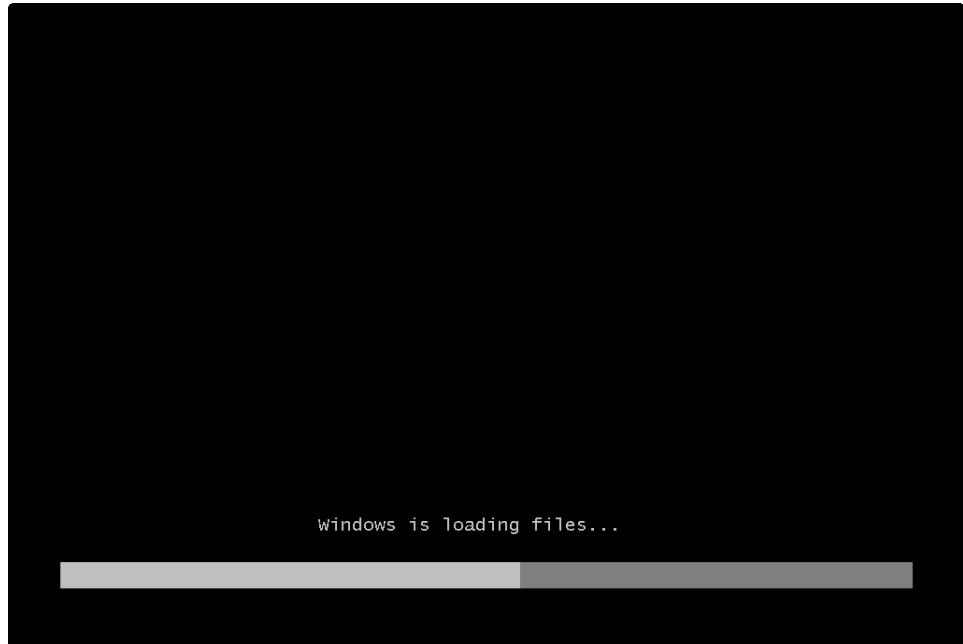
Some computer manufacturers allow you to select the device that contains the boot sequence from a special device selection menu. The example below uses a Dell system board.

To set boot priority using a device selection menu:

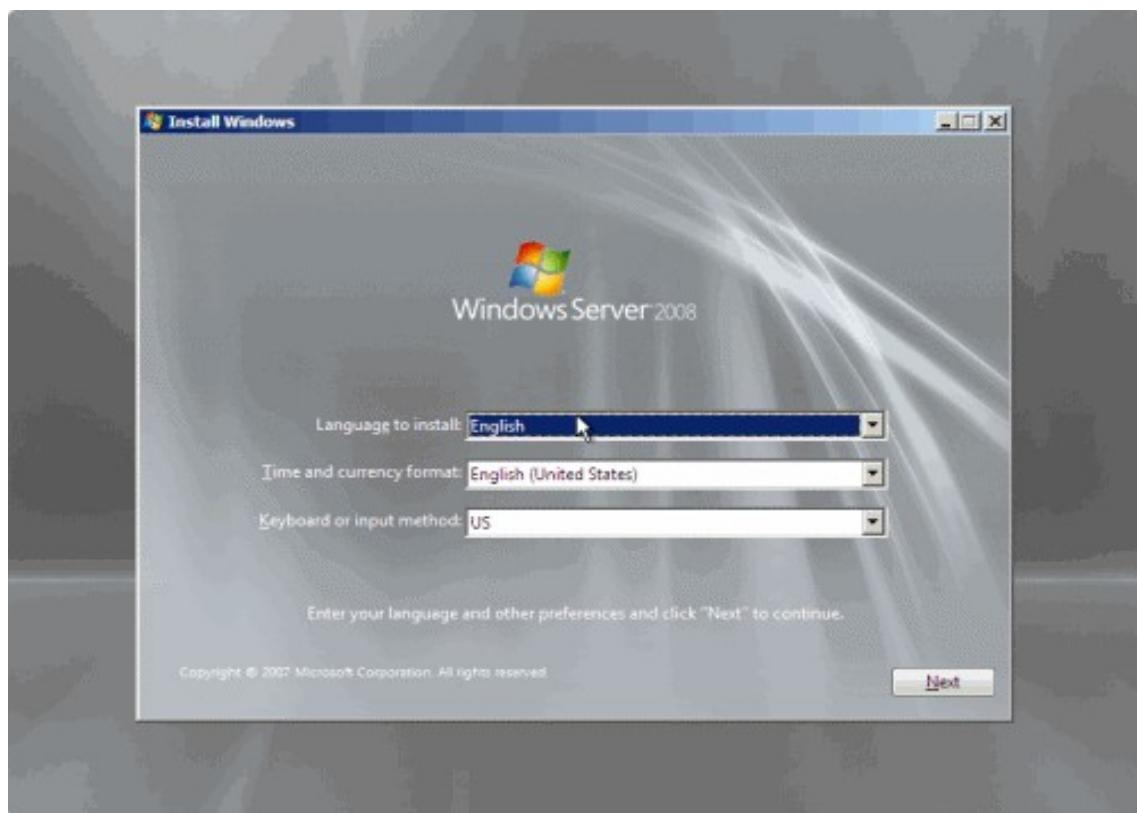
- When the computer starts to boot up, after the manufacturer's ID screen, press F12 several times. The device selection menu appears.
- Use the up and down arrows to select **CD-ROM or an USB Flash Drive.**
- To boot from the selected device, press **ENTER.**

1. Reboot the computer.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 44 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	



2. When prompted for an **installation language** and other regional options make your selection and press **next**.



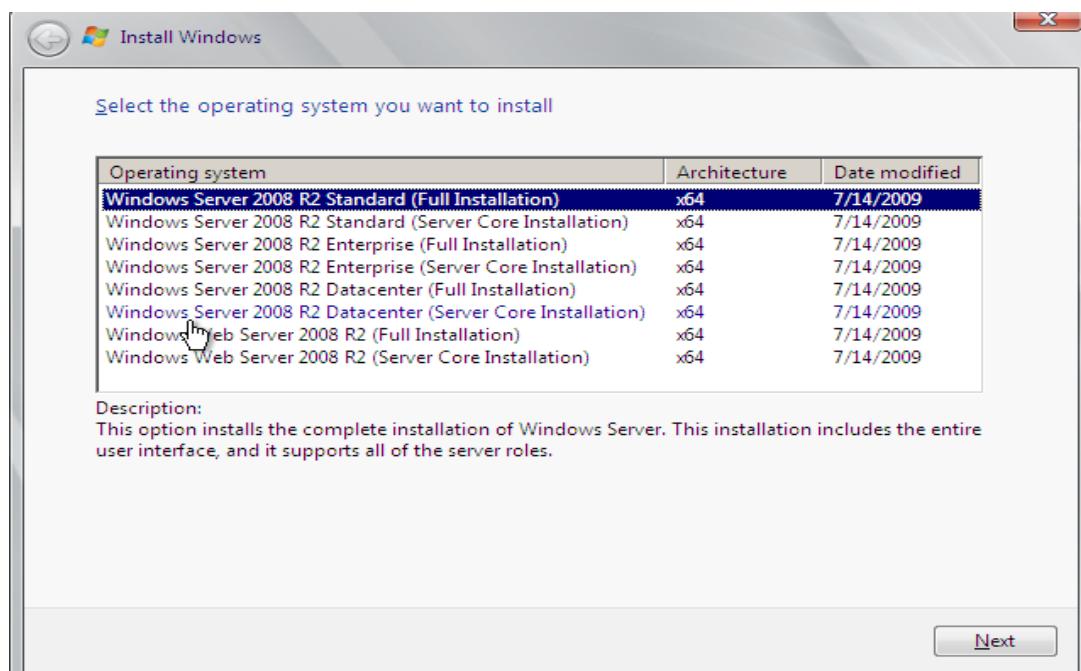
3. Next, press **Install Now** to begin the installation process.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 45 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

4.

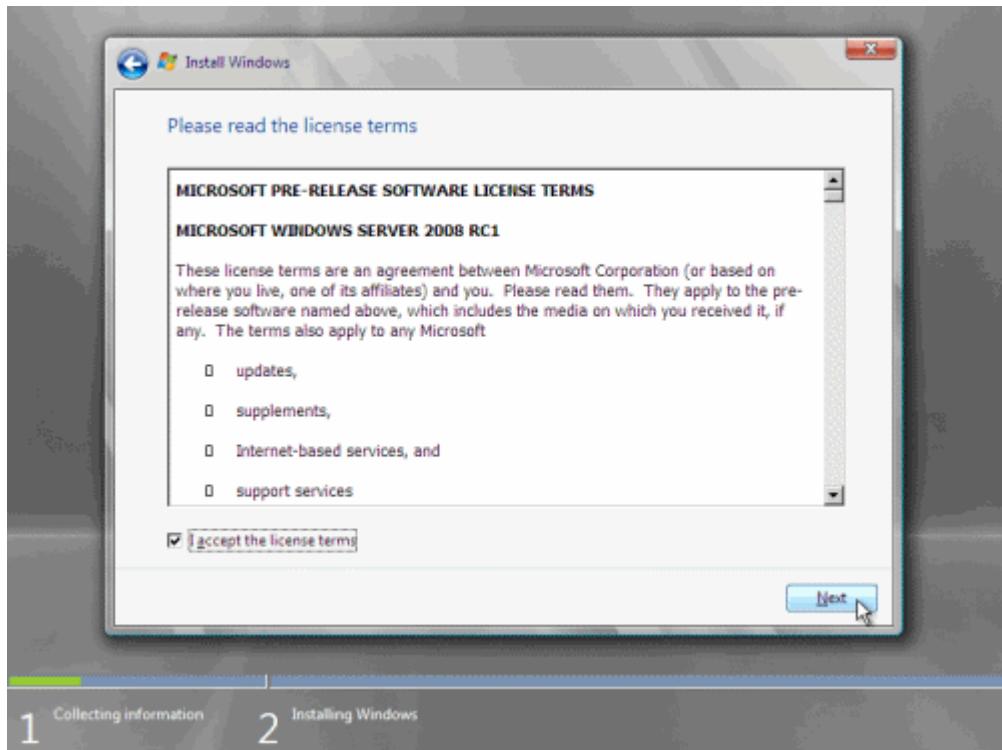


On **Select the Operating System you want to install** page, from the displayed Windows Server 2008 R2 editions (choose: **Standard full Installation**), edition

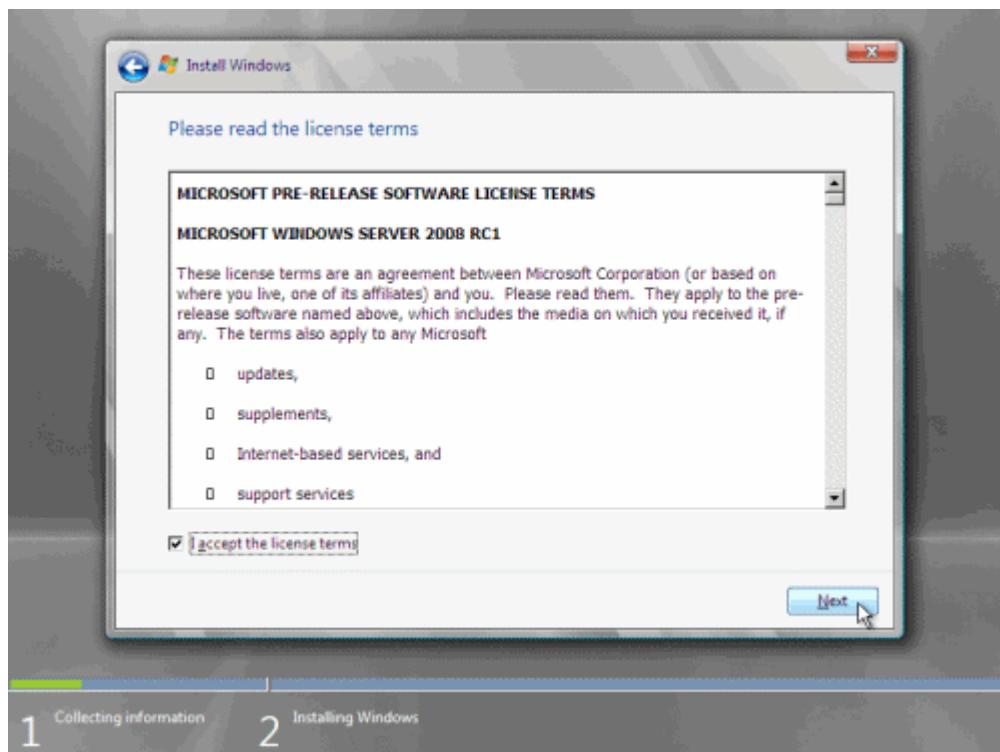


 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 46 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

- 5.** Read and accept the license terms by clicking to select the **checkbox** and pressing **Next**.

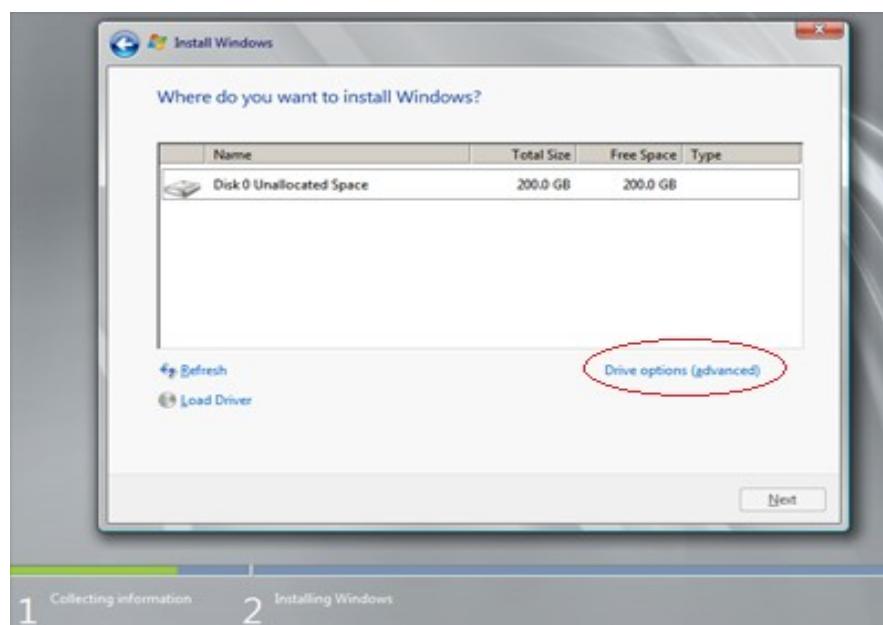


- 6.** In the “**Which type of installation do you want?**” window, click the only available option – **Custom (Advanced)**.

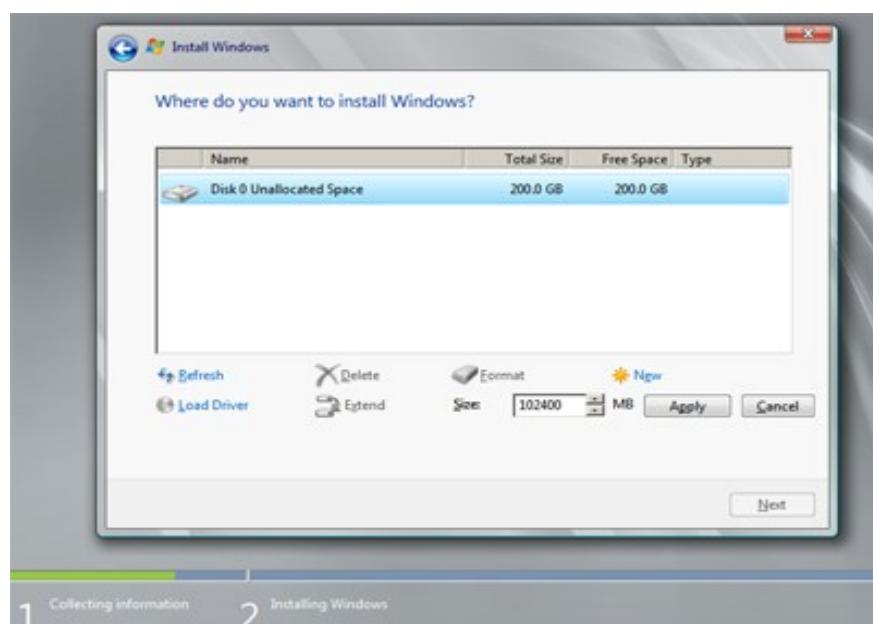


 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 47 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

7. On **Where do you want to install Windows** page, ensure that the hard disk drive on which Windows Server 2008 R2 is to be installed is selected. Once selected, click **Drive options (advanced)**.

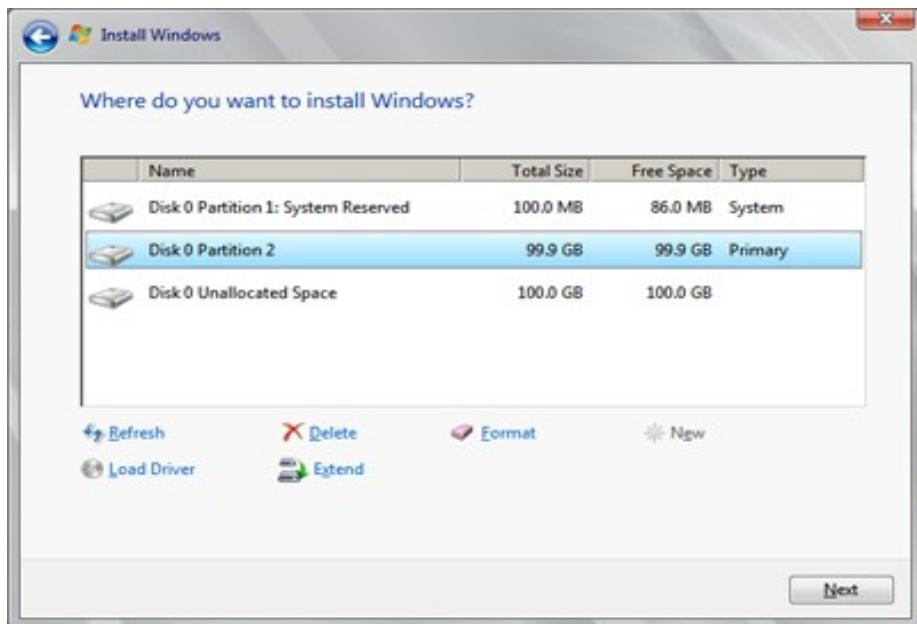


8. From the enabled options, click **New** to create a new disk drive partition. On the **Size** field, specify the size of the new volume in MB.

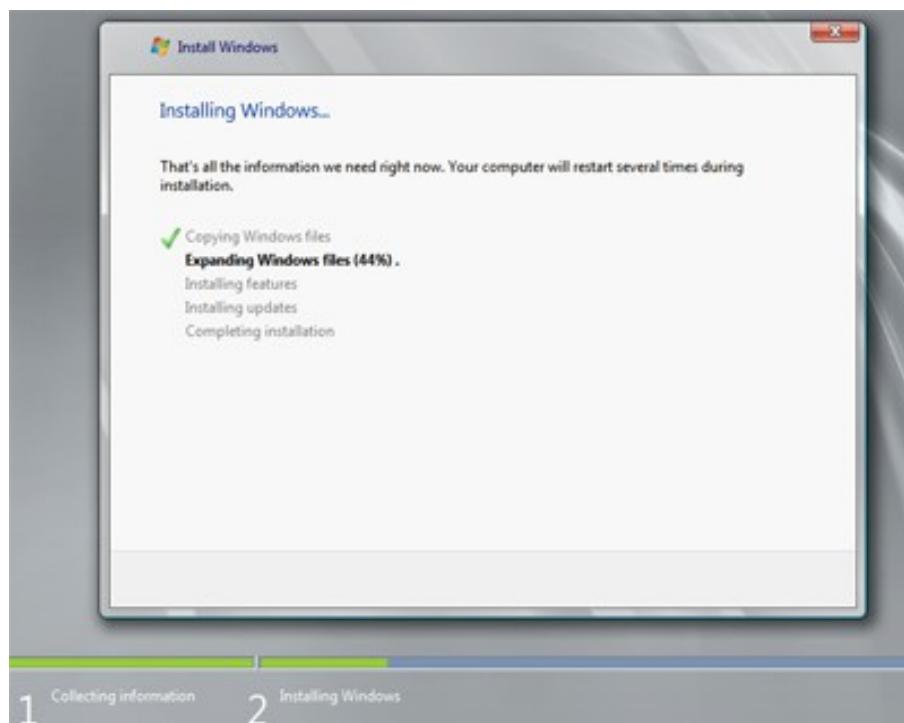


 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 48 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

9. On the displayed **Install Windows** message box, click **OK**. Back on the same page, click to select the hard disk drive partition (**E. g. Disk 0 Partition 2**, in this demonstration) where Windows Server 2008 R2 is to be installed and click **Next**.



10. On the **Installing Windows** page, wait till the Windows Server 2008 R2 installed and the computer get restarted.



 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 49 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Note: Do not press any key if the screen displays the message, '**Press any key to boot from CD or DVD**' while computer restarts for the first time, to resume the installation process.

11. After second restart, on the displayed screen, click **OK** to change the user password before logging on for the first time. On the available fields, type and retype the new password and press **Enter**.



12. On the next confirmation screen, click **OK** to log on to the Windows Server 2008 R2 computer.

Install application software

Learning Outcome 3

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 50 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Contents:

1. Application Software
 - a. Types of Application software
2. WinRAR
3. Network Device Driver
4. Installing Kingsoft Office

Information Sheet 3.1

Install application software are based on the software installation guides, end -users requirement and software license.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 51 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Application software

An application is any program, or group of programs, that is designed for the end user..



Types of Application Software

Application software can be divided into two general classes: *systems software* and *applications software*. Applications software (also called *end-user programs*) include such things as database programs, word processors, Web browsers and spreadsheets.

Information Sheet 3.2

Installing WinRAR

Learning Objective:

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Revision No.: 02
			Page 52 of 119

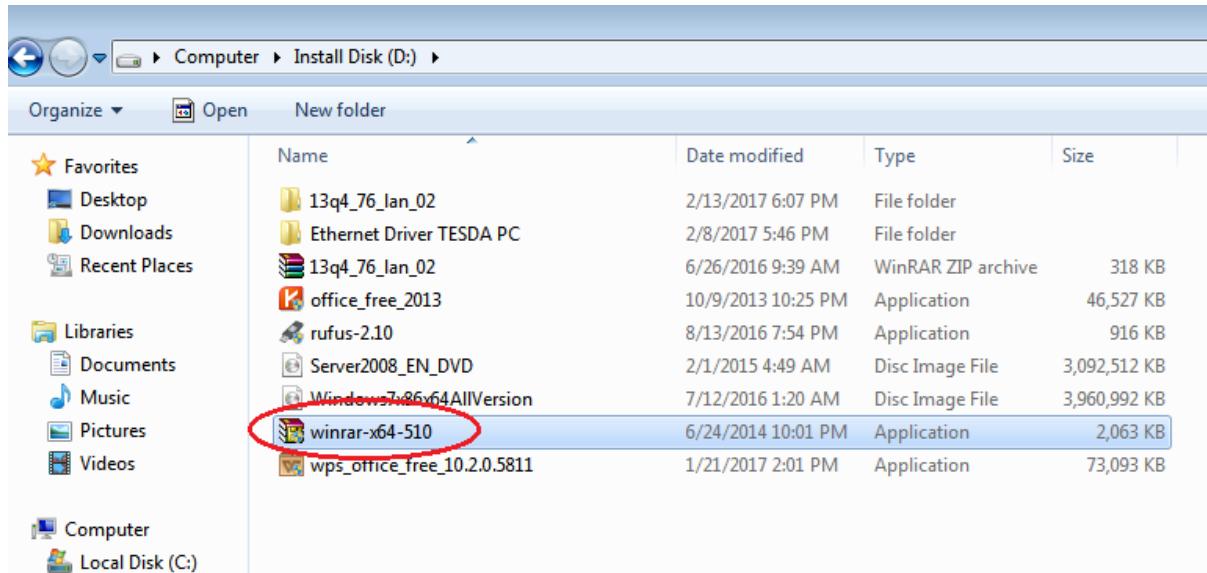
After reading this INFORMATION SHEET, YOU MUST be able to install winRAR and to use WinRAR for creating Archive, zip, and unzip files

WinRAR is a trialware file archiver utility for Windows. It can create and view archives in RAR or ZIP file formats, and unpack numerous archive file formats.

1. Open your web browser. Double-click on any web browser on your desktop. Download WinRaR



2. Click the Icon of the WinRAR



3. Click Yes



4. Click [Install]

Packed by :Bodmas (Creative3): @<http://astatalk.com> .

All credits to SeVeN (FFF Team) for making a great Keygen

**PLEASE CAREFULLY READ THE LICENSE AGREEMENT
BELOW BEFORE CONTINUING THE INSTALLATION PROCESS.**

END USER LICENSE AGREEMENT

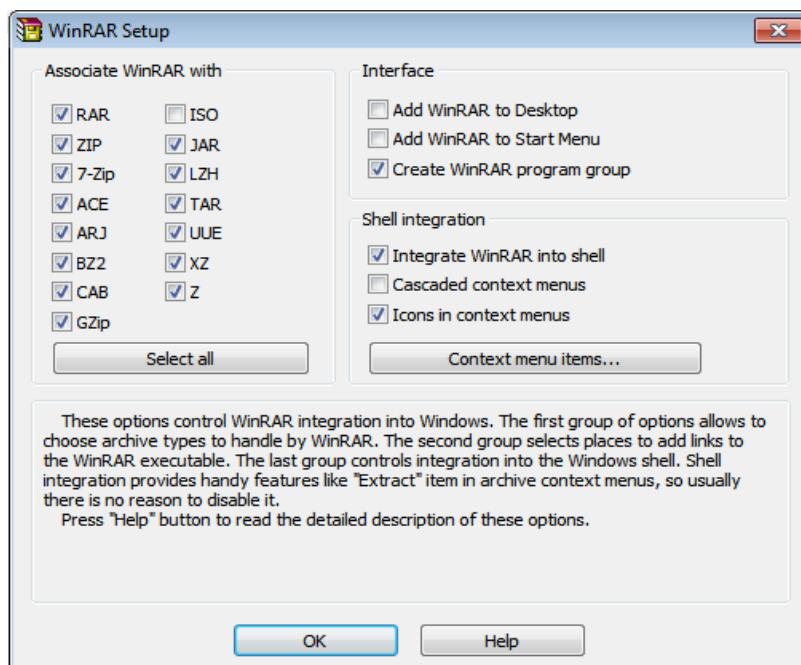
If you agree to the END USER LICENSE AGREEMENT (EULA), please click [Install]. If you do not agree, please click [Cancel].

Install

Cancel



5. Click “ok” and your done

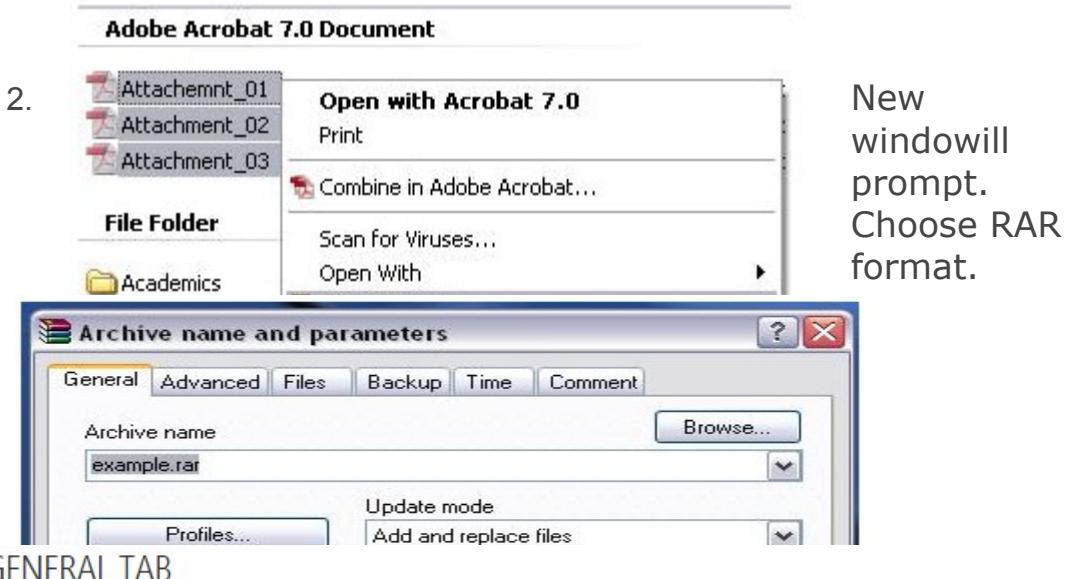


How to use WinRAR for creating Archive, zip, and unzip files

How to use WinRAR for creating Archive

1. Compressing 3 pdf files and creating RAR archive. Usually people use it for the larger files. WinRAR reduces the size of a file into RAR and ZIP file format.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Revision No.: 02
			Page 54 of 119



WinRAR GENERAL TAB

1) ARCHIEVE NAME:

- a) ZIP extension(.ZIP)- can be opened with WinRAR and WinZip.
 - b) RAR extension(.RAR)-can be opened with WinRAR but not with WinZip.
- 2) COMPRESSION MODE: Choose always 'NORMAL'.
- 3) SPLIT METHOD: leave it Blank now.
- 4) UPDATE MODE: Add and replace file.
- 5) ARCHIEVE OPTION: donot select any.

ADVANCED Settings TAB in WinRAR

Set the password if you want to make your file password protected. Remember your password if you forgot it there is no way to unZip it.

3) when you are ready to zip the file.Click 'Ok'. WinRAR will start to compress .



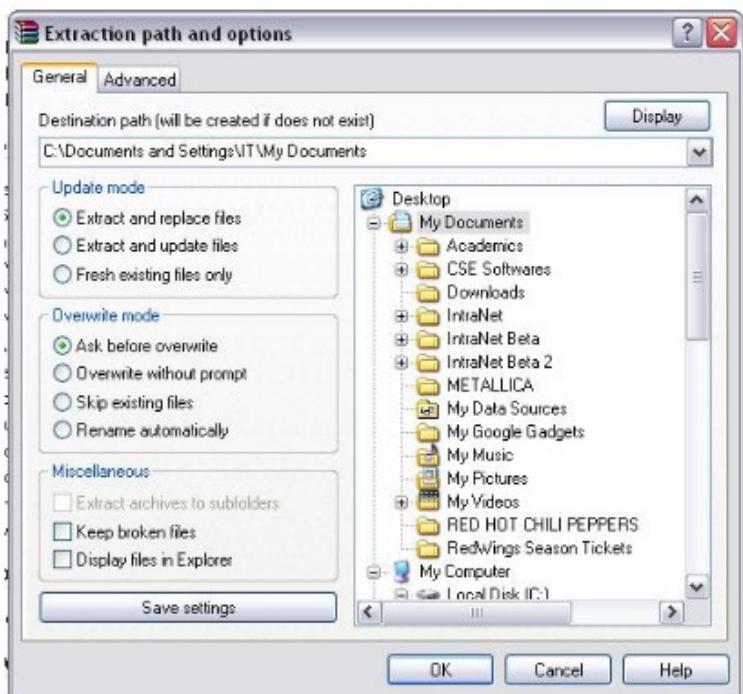
How To Use WinRAR For Extract/Unzip/Decompressing

- 1) Right Click on the RAR or ZIP file an

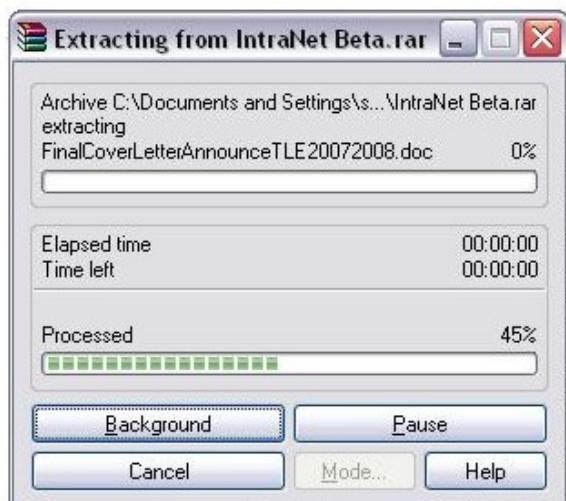
 AsianCollege	Computer Systems Servicing NCII	 example.rar	IntraNet METALL My Data My Goo My Musi My Pictu My Vide	Open Extract files... Extract Here Extract to example\ Scan for Viruses... Open With	Document No. CSS – 2015-001 Date Revised: March 1, 2017 Revision No.: 02
			Date Developed: March 2, 2017 Text Do Developed by: Ronald B. Racelis WinRAR	Send To: RedWin Copy Create Shortcut Delete Rename	Page 55 of 119

choose the 'EXTRACT FILES...'

2) Extraction window will be prompt and select the destination where you want to unzip the file.



3) Click OK when destination is selected. Now WinRAR will start to UNZIPPING.



Information Sheet 3.3

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Revision No.: 02
			Page 56 of 119

Installing network device driver

Learning Objective:

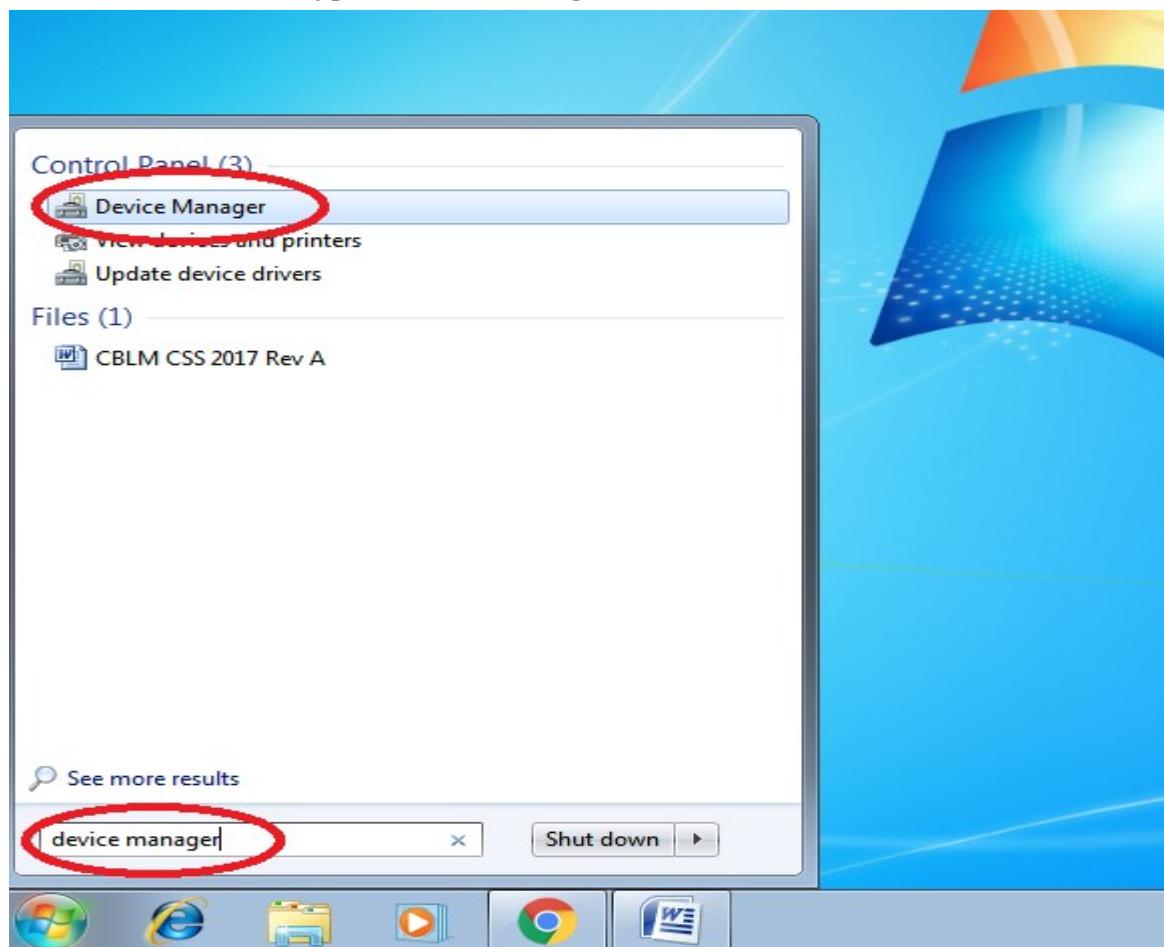
After reading this INFORMATION SHEET, YOU MUST be able to install network device driver.

A **network device driver** is a device driver that enables a network device to communicate between the computer and operating system as well as with other network computers and network devices.

Open Device Manager, and then follow the instructions in the procedure.

Step 1

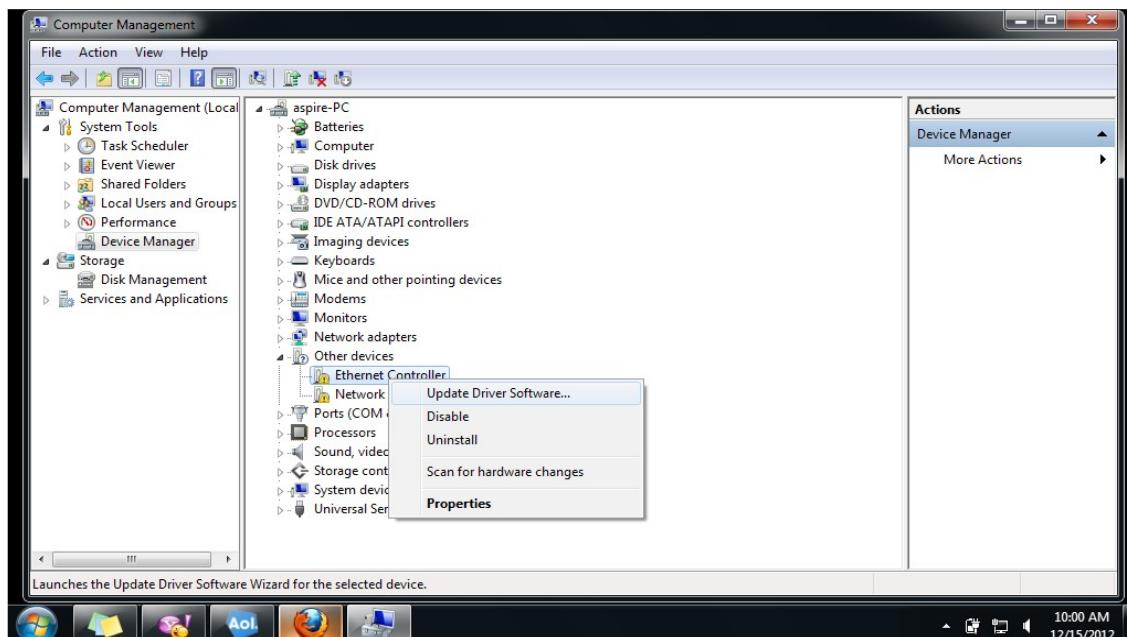
Select the **Start** button, type **Device Manager**, and select it from the list of results.



 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 57 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

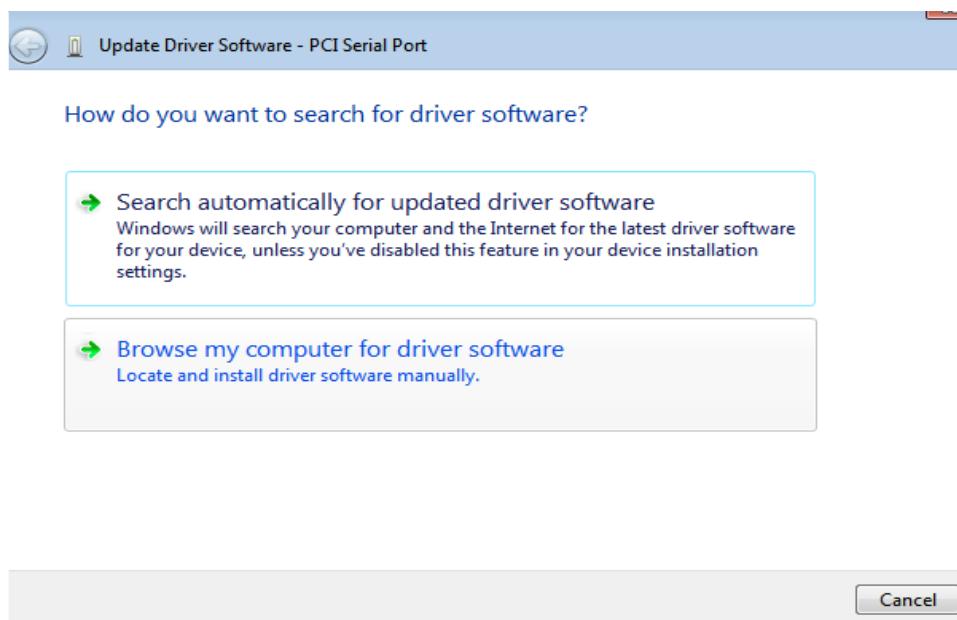
Step 2

Right-click on your Ethernet card and click "Update Driver Software..."



Step 3

Select the option to search automatically for updated driver software. This option will search the Internet for any new drivers available for your Ethernet card. If you presently have the latest drivers then you will be prompted that the latest drivers are already installed on your system and the window will close. If new drivers are available they will be automatically installed.



 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 58 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

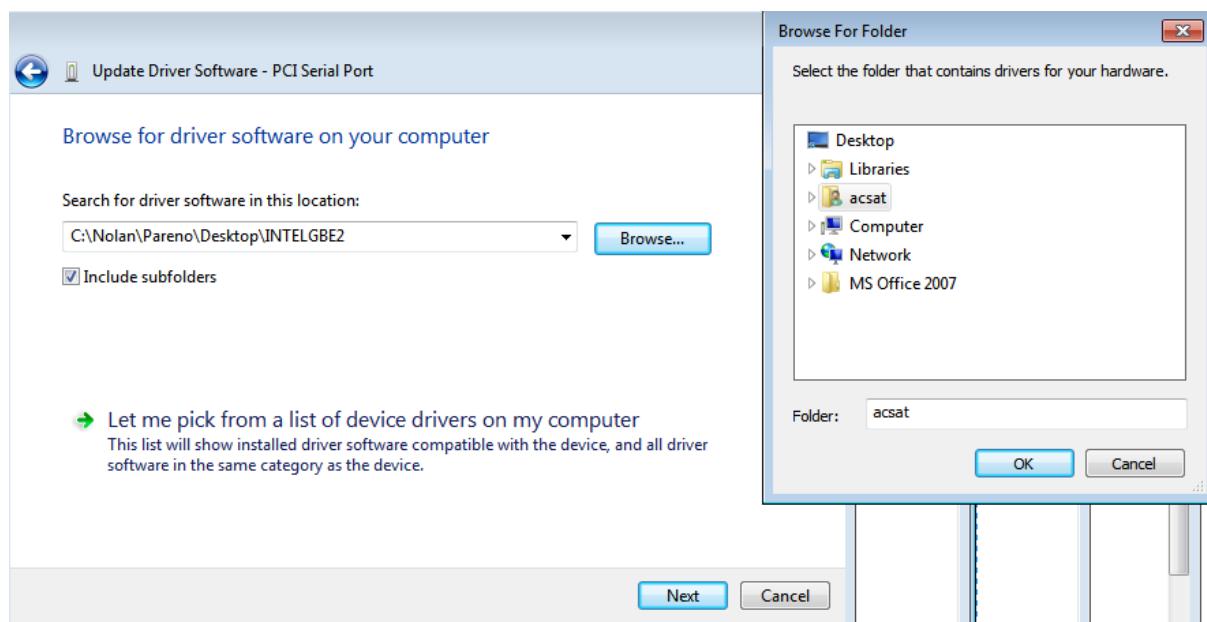
Step 3

Or choose “browse my computer for driver software” if you have a driver file in your computer.



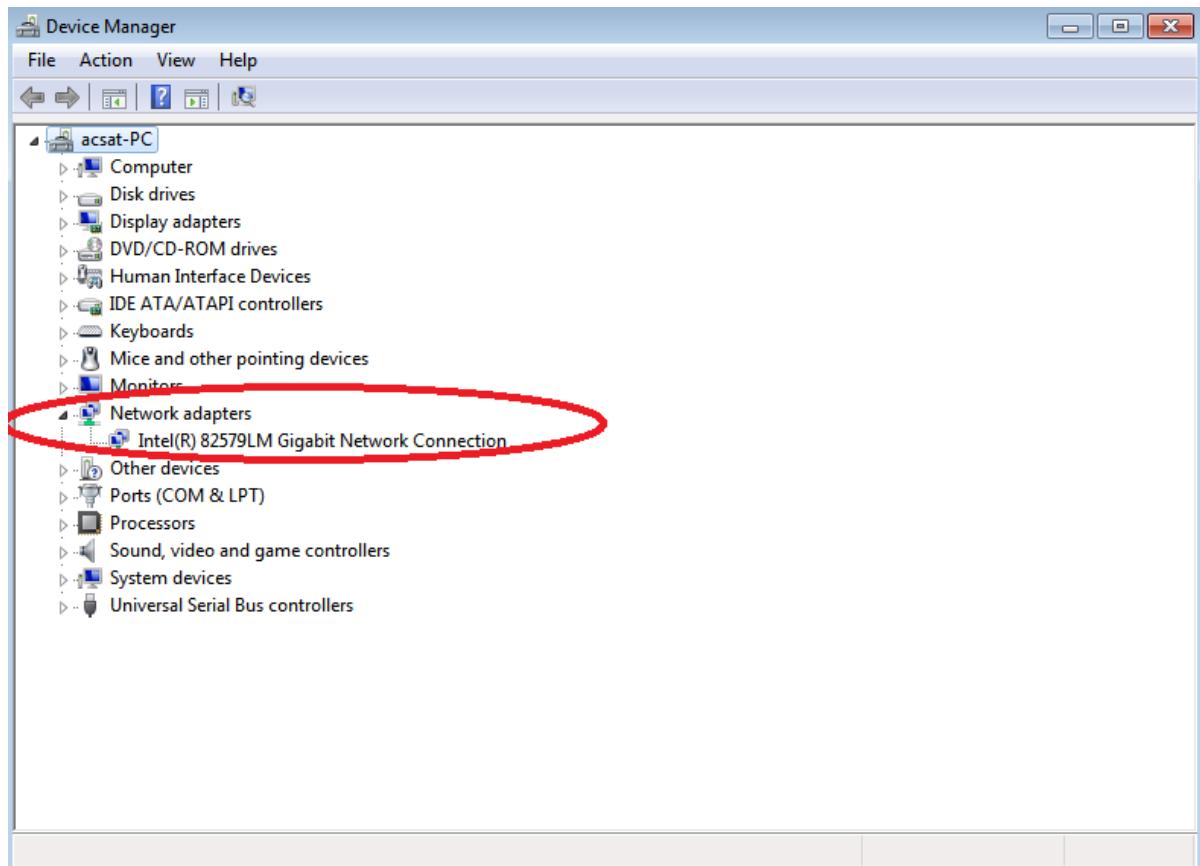
Step 4

Then browse the driver in your file then click next



 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 59 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

If successfully installed you will see the driver that currently installed in the network adapters.



Information Sheet 3.4

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 60 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

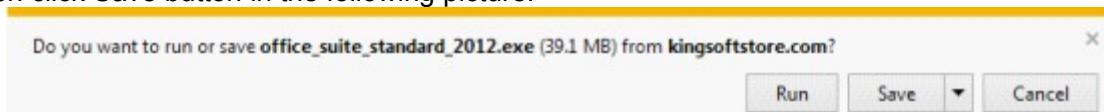
Installing Kingsoft office

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to install Kingsoft office.

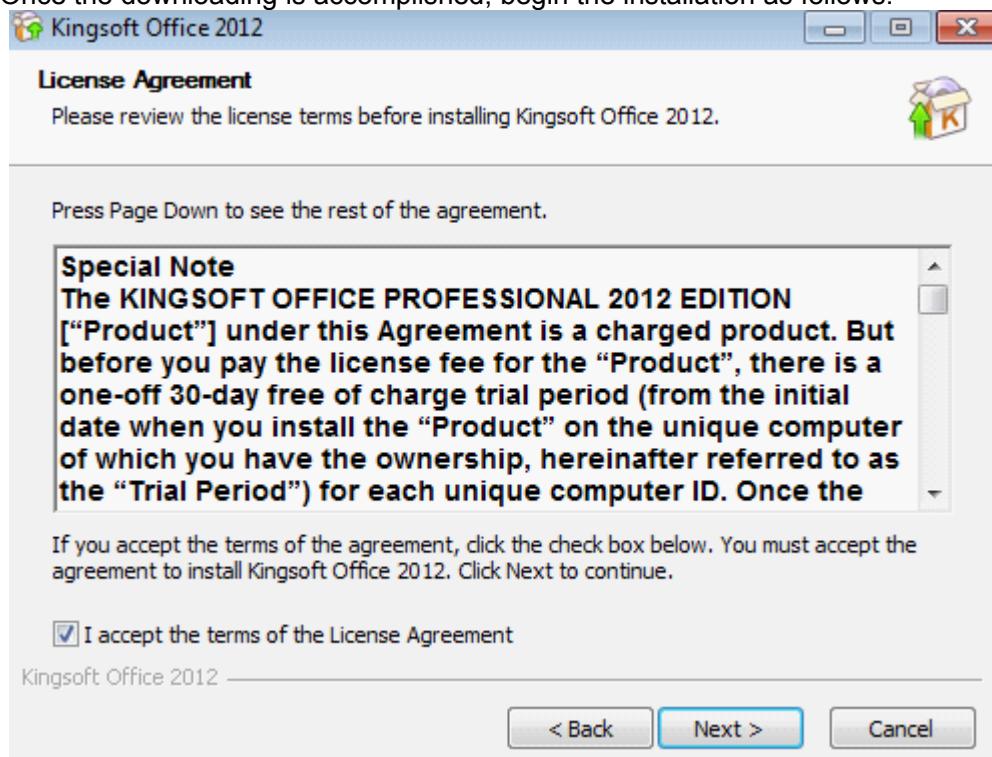
Step 1: To install Kingsoft Office to your PC, first [download the office to your computer](#).

Then click Save button in the following picture:



Step 2: It will be automatically saved in your system files unless you choose to save it in specific file. Then just wait for it to finish the downloading as the following picture:

Step 3: Once the downloading is accomplished, begin the installation as follows:



It's required that you accept the License Agreement. It's required that you accept the License Agreement, otherwise the installation will fail.

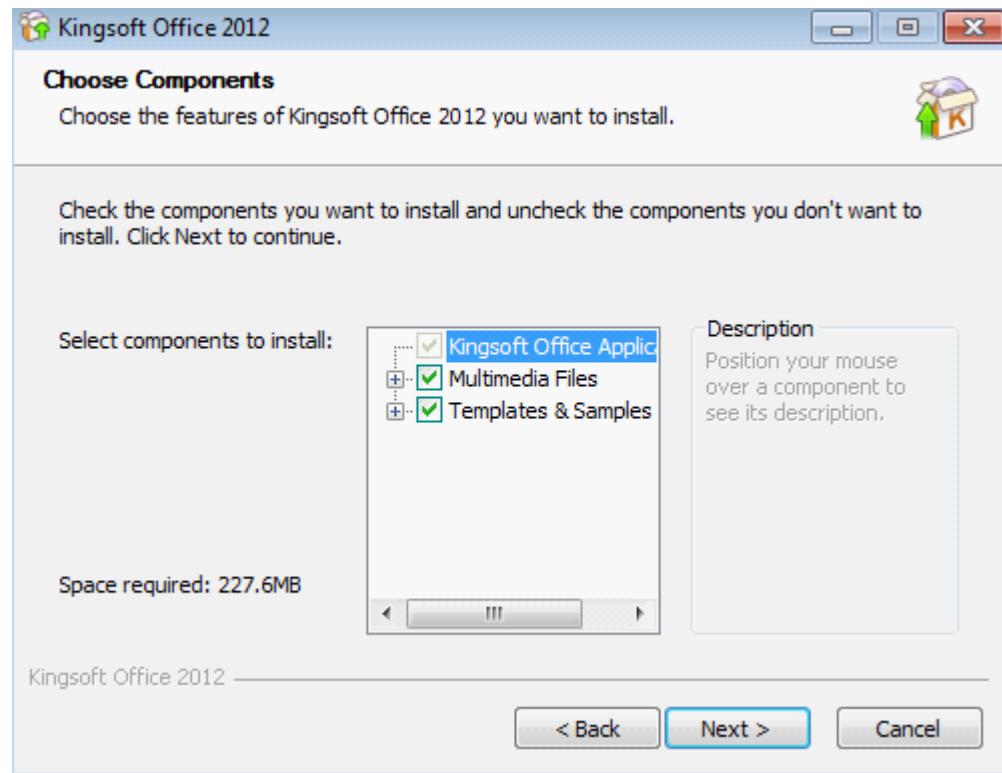
Step 4: Then for further access, input serial number which you will obtain once purchasing the product. Or You may have access the product for free within 30 days.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 61 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	



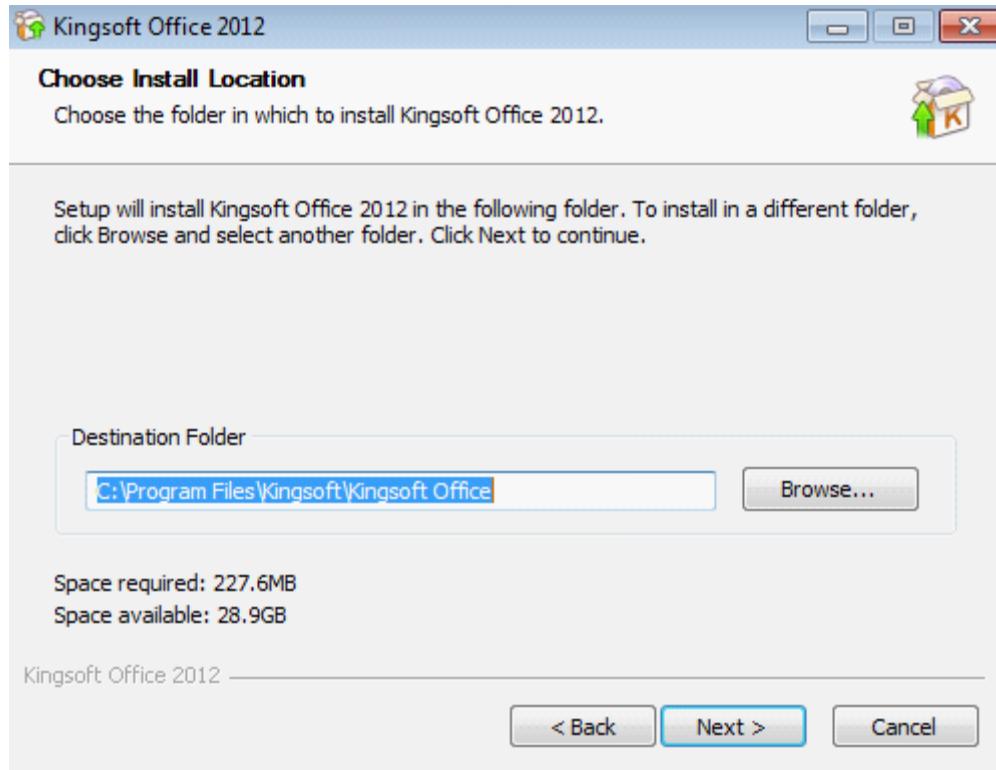
Several components will be available that you will feel free to choose:

Step 5:



Then you can browse The Kingsoft Office in the file you prefer, or leave it to be automatically stored.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 62 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	



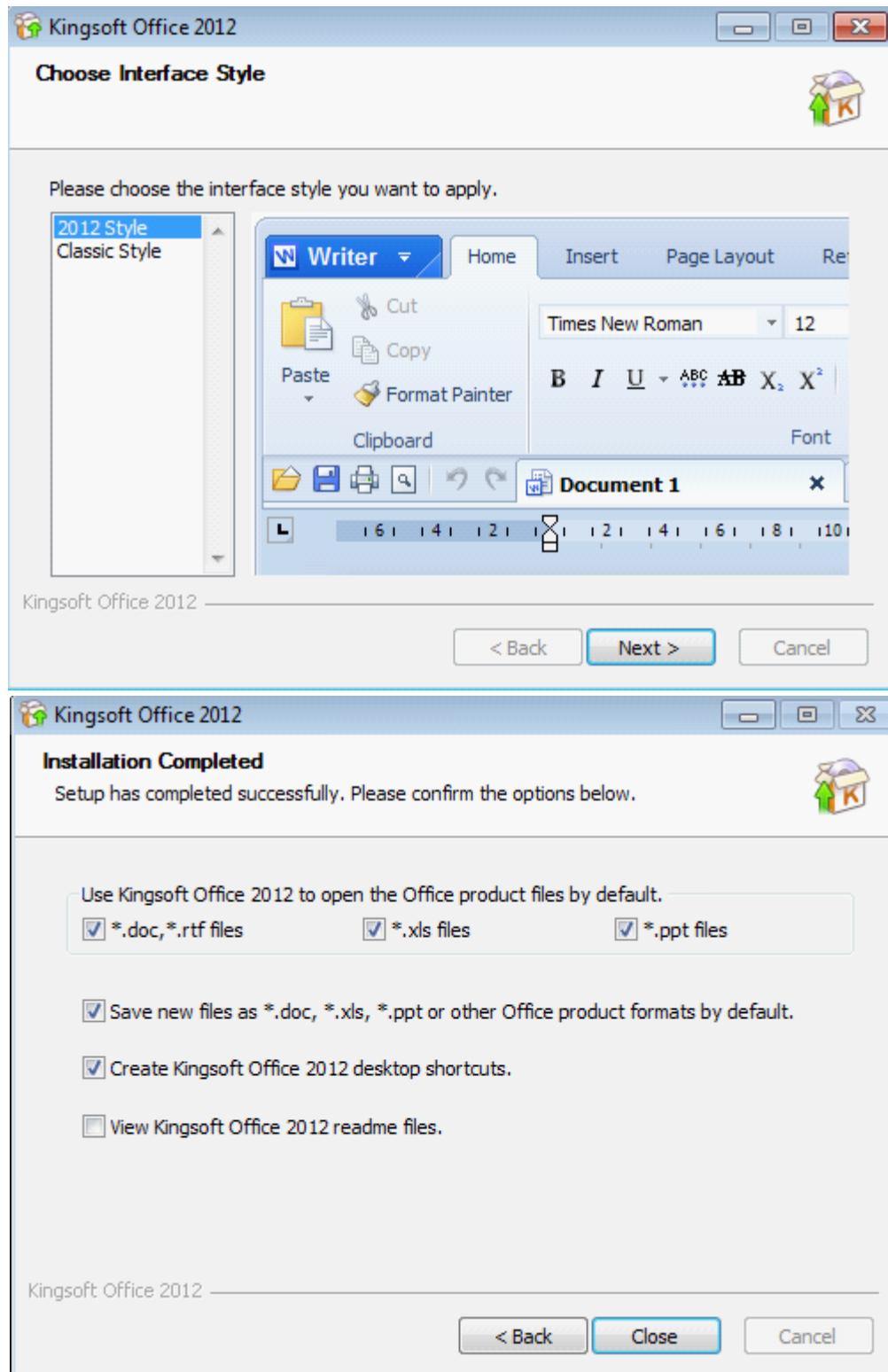
Please notice that the options above aren't compulsory. If you tick them, the system will automatically open and save all the office files via Kingsoft Office. In case you've got used to MS office, you may choose not to tick them and only open or save the office files via Kingsoft Office when you're in need.



Then click the Install and wait for it to complete the setup:

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001 Date Revised: March 1, 2017	Page 63 of 119
		Developed by: Ronaldo B. Racelis	Revision No.: 02	

Then feel free to choose your favorite interface style and the installation is thus completed.



Till now we've accomplished the Kingsoft Office Installation. You can close it.

How to Remove Kingsoft Office from your Computer?

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Page 64 of 119

It is convenient to remove Kingsoft Office from your computer. Below is the simple illustration:
Find the Uninstall button from Start menu > Kingsoft Office > Kingsoft Office Tools > Uninstall.



Click **Uninstall** and the removal of the Kingsoft Office will be accomplished.

Information Sheet 4.0

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 65 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

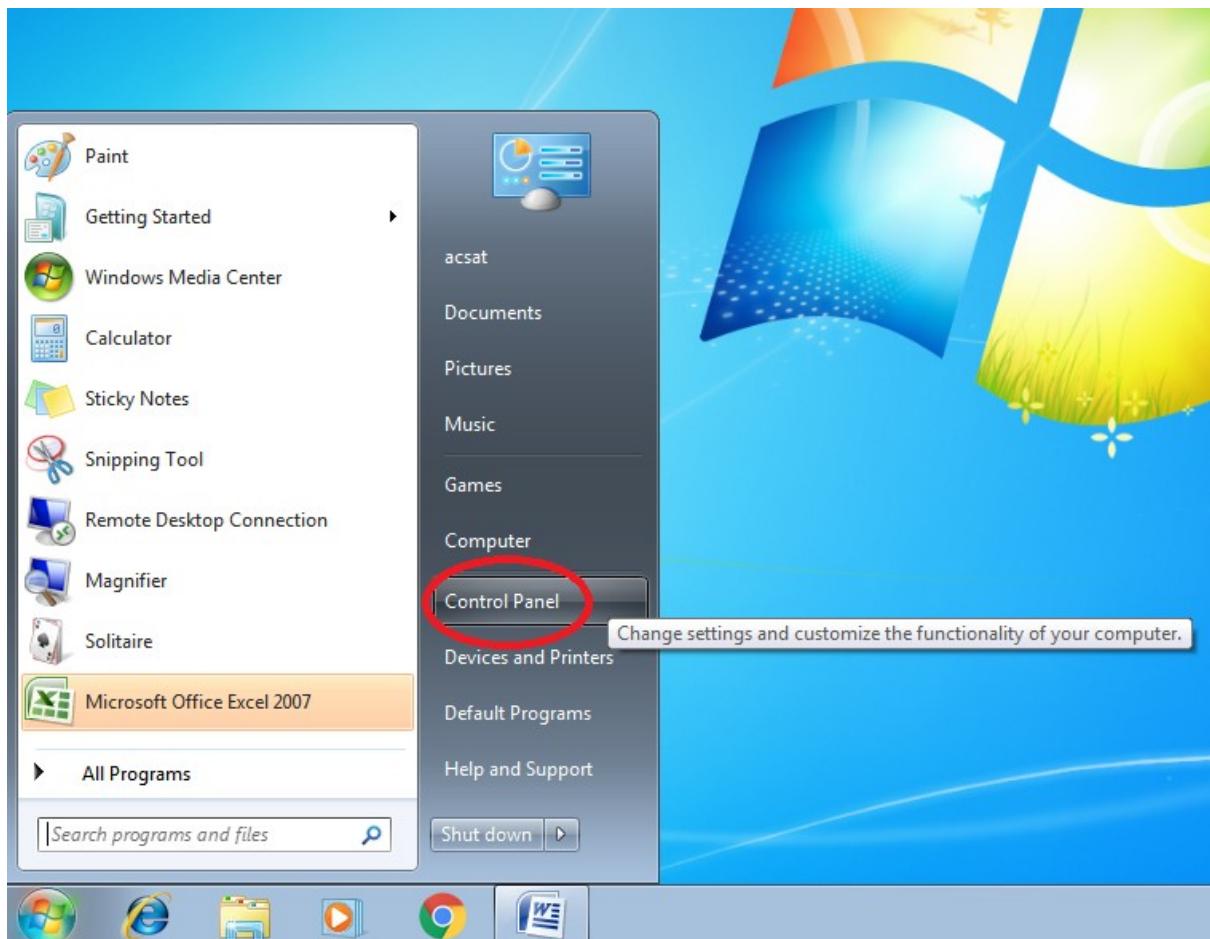
Firewall

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to know how use the Windows firewall

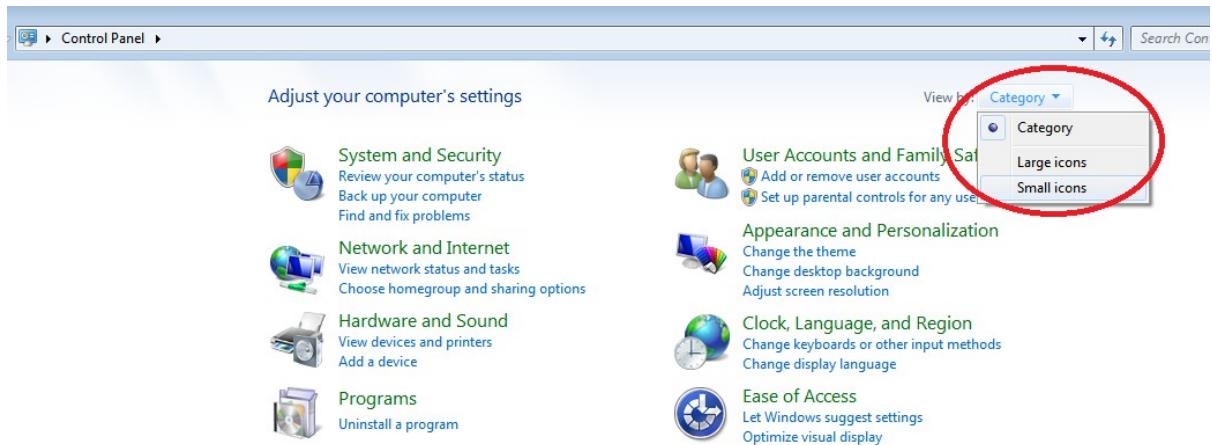
Windows Firewall is a software component of Microsoft Windows that provides firewalling and packet filtering functions. It was first included in Windows XP and Windows Server 2003.

1. At the start menu click control panel

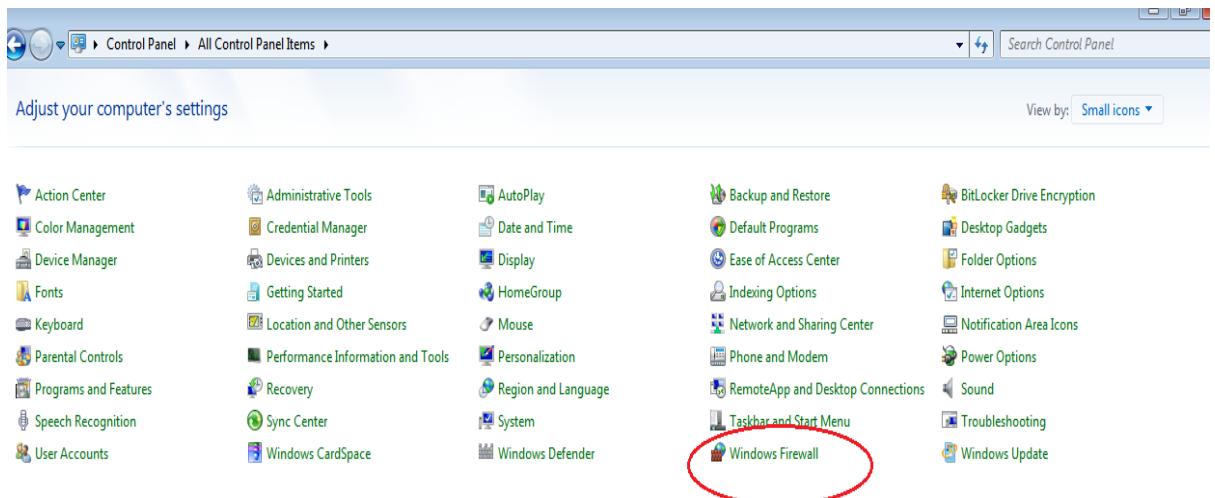


 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 66 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

2. Click “category” then choose small icons

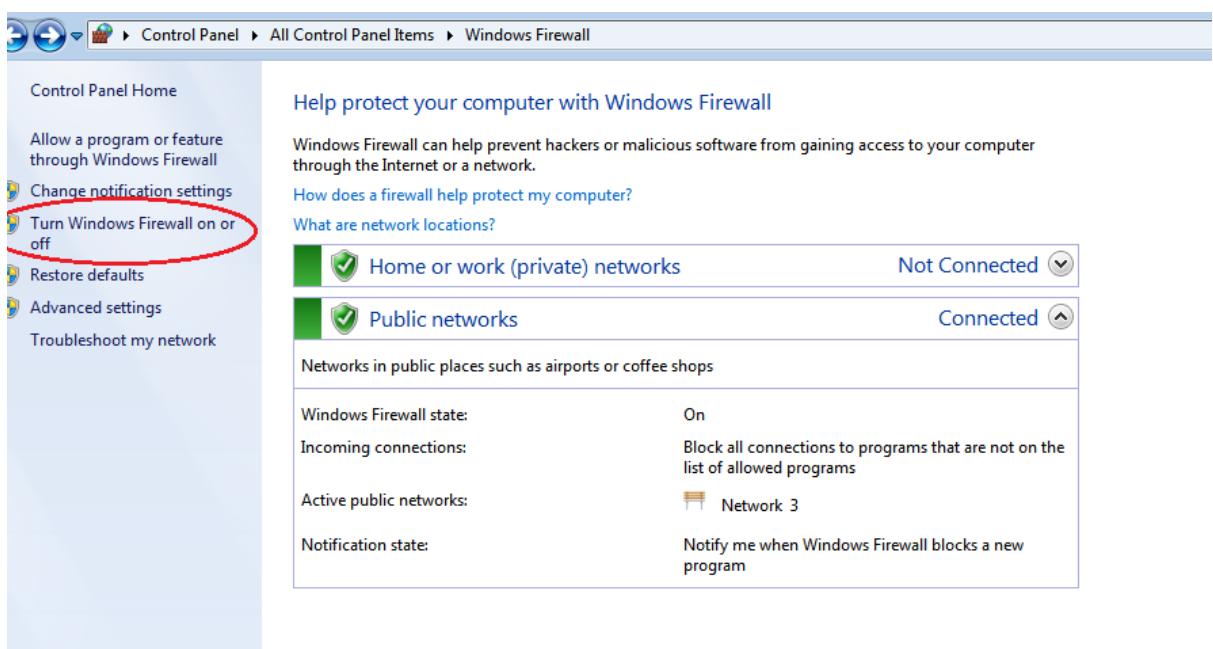


3. Click Windows firewall.



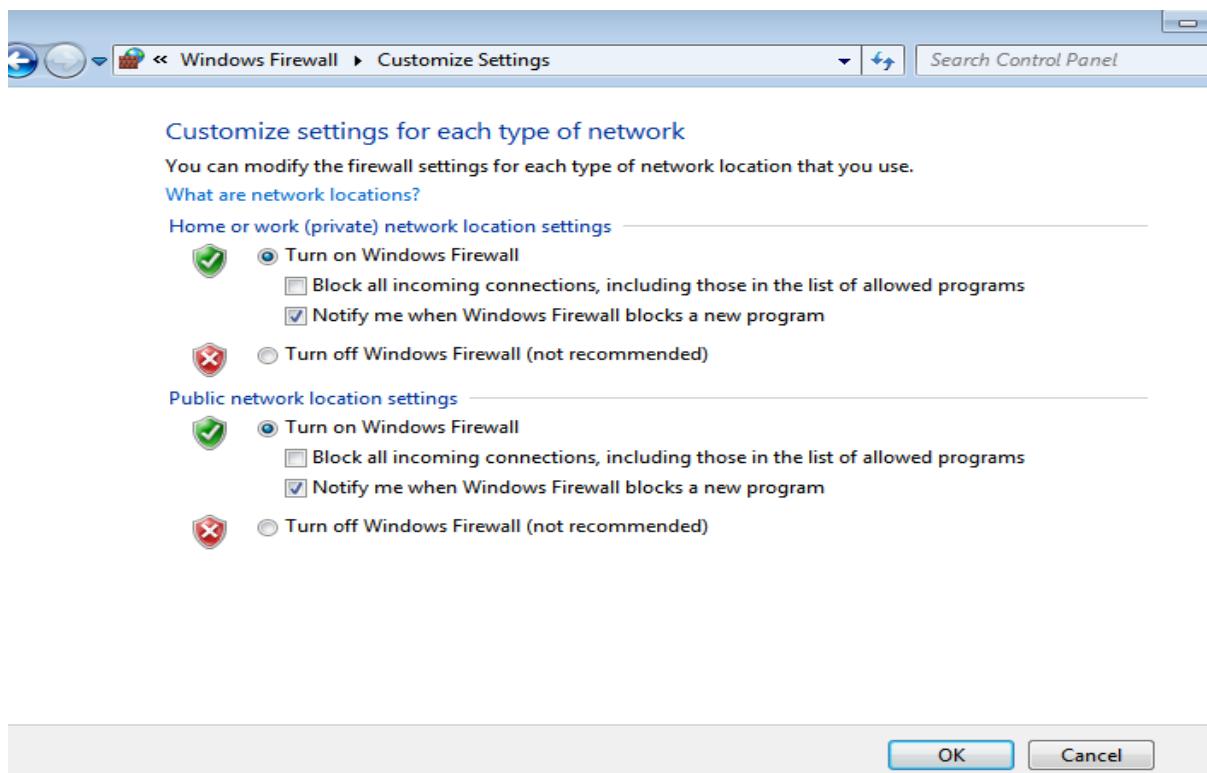
 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 67 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

4. Choose “turn windows firewall on or off” to turn the firewall on or off.



 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 68 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

- Check the boxes that you want to configure in your computer. Then click ok.



What is Windows Firewall with Advanced Security?

Windows Firewall with Advanced Security combines a host firewall and Internet Protocol security (IPsec). Unlike a perimeter firewall, Windows Firewall with Advanced Security runs on each computer running this version of Windows and provides local protection from network attacks that might pass through your perimeter network or originate inside your organization. It also provides computer-to-computer connection security by allowing you to require authentication and data protection for communications.

Default Settings for Windows Firewall with Advanced Security

Applies To: Windows 7, Windows Server 2008 R2

The following tables list the default values for Internet Protocol security (IPsec) settings.

Key exchange

Settings	Value

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 69 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Key lifetimes	480 minutes/0 sessions*
Key exchange algorithm	Diffie-Hellman Group 2
Security methods (integrity)	SHA1
Security methods (encryption)	AES-128 (primary)/3-DES (secondary)

*A session limit of zero (0) causes rekeys to be determined only by the **Key lifetime (minutes)** setting.

Data integrity

Setting	Value
Protocol	ESP (primary)/AH (secondary)
Data integrity	SHA1
Key lifetimes	60 minutes/100,000 kilobytes (KB)

Data encryption

Setting	Value
Protocol	ESP
Data integrity	SHA1
Data encryption	AES-128 (primary)/3-DES (secondary)
Key lifetimes	60 minutes/100,000 KB

Authentication method

Computer Kerberos version 5 authentication is the default authentication method.

How default settings work with Group Policy

Policies created using the Windows Firewall with Advanced Security snap-in and distributed with Group Policy are applied in this order:

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 70 of 119
		Developed by: Ronaldo B. Racelis	Revision No.: 02

1. Highest precedence Group Policy object (GPO).
2. Locally defined policy settings.
3. Service defaults, as shown in the tables in this topic.

Configuring Firewall Rules

Applies To: Windows Server 2008 R2

Because Windows Firewall with Advanced Security blocks all incoming unsolicited network traffic by default, you need to configure program, port, or system service rules for programs or services that are acting as servers, listeners, or peers. Program, port, and system service rules are managed on an ongoing basis as your server roles or configurations change. The roles and features that you can install by using Server Manager typically create and enable firewall rules for you when the role or feature is installed. They also remove or disable the rules when the role or feature is removed. A growing number of other, non-Microsoft programs and services also automatically configure Windows Firewall with a set of rules to permit their operation.

PC's Common Troubleshooting Techniques & Strategies

Learning Outcome 4

Contents:

1. Techniques and strategies to solve common computer hardware problems.
 - a. Trial and Error
 - b. It's the Cable
 - c. Don't be frustrated
 - d. Take notes
 - e. Take a Look
2. Troubleshooting Tips for new monitor
3. Troubleshooting Tips for a Motherboard
4. Trouble Shooting Tips after Installing a New Hard Drive
5. Troubleshooting Tips for Network Card
6. Troubleshooting Tips for Sound Card

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	
		Date Revised: March 1, 2017	Page 71 of 119	
Developed by: Ronaldo B. Racelis	Revision No.: 02			

7. Tech Acronyms
8. Computer Virus
 - a. Types of Computer Virus
 - b. Symptoms of an infected computer
9. Symptoms of an infected computer
10. Antivirus Software

PC's Common Troubleshooting Techniques & Strategies

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to know the PC's common troubleshooting techniques & Strategies.

Here are five common-sense techniques and strategies to solve common computer hardware problems.

(1) Trial-and-error

Personal computers are highly modular by design. The most powerful troubleshooting technique is to isolate the problem to a specific component by trial-and-error. Swap compatible components and see if the system still works. Try different peripherals on different machines and see if the same problem occurs. Make one change at a time.

(2) "It's the cable, s-----."

More than 70% of all computer problems are related to cabling and connections. Ensure all cables are connected firmly. IDE and floppy ribbon cables and power cables can often go loose. Ensure microprocessor, memory modules, and adapters such as video card and sound card are inserted correctly and didn't "pop-up" during transportation.

(3) Don't be frustrated!

Don't be afraid of computer problems. It is often the best opportunity to learn. Trouble-shooting is part of the fun of owning a computer. Imagine the satisfaction you could get by solving a problem yourself.

Of course the fun could run out quickly once you are frustrated and have spent too

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	
		Date Revised: March 1, 2017		Page 72 of 119
		Developed by: Ronaldo B. Racelis	Revision No.: 02	

much time on the same problem. If you feel frustrated, it's time to leave it for a while and go back with some new ideas or call someone who can help. Rule of thumb: You shouldn't spend more than three hours on the same problem at one time.

(4) Take notes!

Take notes of what you have done and all the error messages. You may need to use them later. For instance, when you see unusual blue screen with an error message you may copy the entire message onto a piece of paper. In many situations, that message may point to the right direction in getting the problem solved quickly.

(5) Take a look?

It's OK to open a computer case and take a look inside. There is only 5V and 12V DC voltage supplied to the components outside the power supply. Those who have never seen the inside of a computer are often amazed by how simple it looks. **Of course, still always power down and unplug the power cord first.**

Information Sheet 5.1

Troubleshooting Tips for New Monitors

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to know the troubleshooting for new monitors.

Here are some basic troubleshooting tips for new monitors:

1. The picture does not appear

- Check to make sure the signal cable is firmly connected in the socket.
- Check to see if the computer system's power is ON.
- Check that the Brightness Control is at the appropriate position, not at the minimum.

2. The Screen is not synchronized

- Check to make sure the signal cable is firmly connected in the socket.
- Check that the output level matches the input level of your computer.
- Make sure the signal timing of the computer system is within the specification of the monitor.

3. The position of the screen is not in the center

- Adjust the H-Size, H-Phase or V-Size, V-Center controls.
- Check if the signal timing of the computer system is within the specification of the monitor.

4. The screen is too bright or too dark

- Check if the Brightness or contrast control is at the appropriate position, not at the maximum or minimum.
- Check if the specified voltage is applied

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 73 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

- c. Check if the signal timing of the computer system is within the specification of the monitor.
- d. Especially, check the horizontal frequency.

5. The screen is shaking

- a. Move all objects that emit a magnetic field, such as a motor or transformer, away from the monitor.
- b. Check if the specified voltage is applied.
- c. Check if the signal timing of the computer system is within the specification of the monitor.

Information Sheet 5.2

Troubleshooting Tips for a Motherboard

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to know the troubleshooting for a motherboard

More than 70% of all computer problems are related to cabling and connections. Ensure all cables are connected and connected firmly. IDE and floppy ribbon cables and power cables can often go loose. Ensure microprocessor, memory modules, and adapters such as video card are inserted correctly and didn't "pop-up" due to vibration.

System has no power at all. Power light does not illuminate, fan of power supply does not turn on, and indicator light on keyboard does not turn on.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Power cable is unplugged.	Visually inspect power cable.	Make sure power cable is securely plugged in.
Defective power cable.	Visual inspection, try another cable.	Replace cable.
Power supply failure.	Power cable and wall socket are OK, but system is still dead.	Contact technical support
Faulty wall outlet; circuit breaker or fuse blown.	Plug device into socket to know to work and test.	Use different socket, repair outlet, reset circuit breaker or replace fuse.

System inoperative. Keyboard lights are on, power indicator lights are lit, and hard drive is spinning.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 74 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Expansion card is partially dislodged from expansion slot on the motherboard.	Turn off computer. Take cover off system unit. Check all expansion cards to ensure they are securely seated in slots.	Using even pressure on both ends of the expansion card, press down firmly on expansion card.
Defective floppy disk drive or tape drive.	Turn system off. Disconnect the cables from one of the floppy drives. Turn on the system, check to see if the keyboard operates normally. Repeat until you have located defective unit.	Contact Support. Technical
Defective expansion card.	Turn computer off. Remove an expansion card.	Make sure expansion card is secure in expansion socket.

System does not boot from hard disk drive, can be booted from floppy disk drive.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Connector between hard drive and system board unplugged.	When attempting to run disk to disk controller on the FDISK utility described in the HARD DISK section of the manual you get an message, INVALID DRIVE SPECIFICATION.	Check cable running form the board. Make sure both ends are securely plugged in the HARD DISK section of the manual you get an message, INVALID DRIVE SPECIFICATION. (in your motherboard manual).
Damaged Hard Disk or Disk Controller.	Format hard disk; if unable to do so, the hard disk may be defective.	Contact Technical Support.

System only boots from Floppy Disk. Hard Disk can be read and applications can be used, but booting from Hard Disk is impossible.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Hard Disk boot program has been destroyed.	A number of causes could be behind this.	Back up data and applications files. Reformat the Hard Drive as described in the Hard Drive section of the manual. Reinstall applications and data

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 75 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

		using backup disks.
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Error message reading "SECTOR NOT FOUND" or other error messages indication certain data is not allowed to be retrieved.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
A number of causes could instead of an image level format of the hard disk be behind this.	Use a file by file backup/ format, partition, and high level backup to backup the drive (see Hard Disk section of your manual for instructions). Re-install all saved data when completed.	Back up any salvageable data. Then do a low level

Disk formatted on IBM PS/2 will not operate with this system.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
The IBM PS/2 uses a IBM PS/2 disk format will different format than others not work in an AT type computers.		Format disk in the AT type computer insert disk into the IBM PS/2 and copy the files you wish.

After install an expansion card (network card, tape drive card, etc.) the system no longer works properly.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
No power to monitor.	All or part of the system may be inoperable. The new card may work but a mouse or COM port may not work.	Change the interrupt or RAM address on the new expansion card. See the documentation that came with the new card in order to change pin settings. Many expansion devices come with proprietary software that will assist you in doing this.

Screen message says "Invalid Configuration" or "CMOS Failure."

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Incorrect information entered into the configuration program (setup).	Check the configuration program. Replace any incorrect information.	Review system's equipment. Make sure correct information is in setup.

Screen is blank.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 76 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
No power to monitor.	Power connectors may be loose or not plugged in.	Check the power connectors to monitor and to system. Make sure monitor is connected to display card, change I/O address on network card if applicable.
Monitor not connected to computer.		See instructions above.
Network card I/O address conflict.		See instructions above.

System does not boot from hard disk drive, can be booted from floppy disk drive.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Connector between hard drive and system board unplugged.	When attempting to run the FDISK utility described in the HARD DISK section of the manual you get a message, INVALID DRIVE SPECIFICATION.	Check cable running from disk to disk controller on the board. Make sure both ends are securely plugged in; check the drive type in the Standard CMOS Setup (in your

Problem

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Memory problem, display card jumpers not set correctly.		Reboot computer. Re-install memory, make sure that all memory modules are installed in correct sockets. Check jumper and switch settings on display card. See display card section for information of settings.
Computer virus.		Use anti-virus programs (McAfee/PC-cillin, E-port, etc) to detect and clean viruses.

Screen goes blank periodically.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Screen saver is enabled.		Disable screen saver.

Keyboard failure.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	
		Date Revised: March 1, 2017	Developed by: Ronaldo B. Racelis	Revision No.: 02
				Page 77 of 119

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Keyboard is disconnected.		Reconnect keyboard. Check keys again, if no improvement, replace keyboard.

No color on screen.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Faulty Monitor.		If possible, connect monitor to another system. If no color, replace monitor.
CMOS incorrectly set up.		Call technical support.

Floppy drive lights stays on.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Floppy Drive cable not connected correctly.		Reconnect floppy cable making sure PIN1 on the Floppy Drive corresponds with PIN1 on floppy cable connector.

Error reading drive A:

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Bad floppy disk.		Try new floppy disk.
Floppy disk not formatted		Format floppy disk(type ENTER)

C: drive failure.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
SETUP program does not have correct information.		Boot from drive A: using DOS system disk. Input correct information to SETUP program.
Hard Drive cable not connected properly.		Check Hard drive cable.

Cannot boot system after installing second hard drive.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Master/Slave jumpers not set correctly.		Set master /Slave jumpers correctly.
Hard Drives not compatible / different manufacturers.		Run SETUP program and select correct drive types. Call drive manufacturers for compatibility with other drives.

Missing operating system on hard drive.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 78 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
CMOS setup has been changed.		Run setup and select correct drive type.

Certain keys do not function.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Keys jammed or defective.		Replace keyboard.

Keyboard is locked, no keys function.

PROBABLE CAUSE	DIAGNOSIS	SOLUTION
Keyboard is locked.		Unlock keyboard

Information Sheet 5.3

Trouble Shooting Tips after Installing a New Hard Drive

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to know the troubleshooting tips after installing a new hard drive.

1. Basic Troubleshooting Tips after Installing a New Hard Drive

Based on Seagate IDE hard drives.

If you have installed your drive and it does not function properly, perform the following **basic checks**:

Warning: Always turn off the computer before changing jumpers or unplugging cables and cards. Wear a ground strap or use other antistatic precautions while working on your computer or handling your drive.

- **Verify compatibility.** Verify that the host adapter and drive are appropriately matched to each other and to your computer. Refer to the relevant documentation for details.
- **Check all cards.** Verify that all cards are seated in their slots on the motherboard and secured with mounting screws.
- **Check all connectors and cables.** Make sure all ribbon and power cables are securely connected. Ribbon cables are easily damaged, especially at the connector. Try a new cable that you know is good. Make sure no connector pins are bent. Verify that pin 1 on the interface cable is aligned with pin 1 on the drive and host adapter (see Figure 2 on page 6).
- **Verify jumper settings.** Review the instructions in this guide and in your host adapter installation guide. Make sure all appropriate jumpers are installed or removed as necessary.
- **Check your power-supply specifications.** Each time you add a new device to your computer, make sure your computer's internal power supply can support the total power demand. If necessary, consult your dealer for a new power supply.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	
	Developed by: Ronaldo B. Racelis	Revision No.: 02	Page 79 of 119

- **Verify the drive-type settings in the system setup program.** The drive-type settings in the system BIOS must not exceed the physical specifications of your drive. Also, the settings must not exceed the limitations set by the operating system and BIOS.
- **Check for viruses.** Before you use someone else's diskette in your system for the first time, scan the diskette for viruses.

Additional Troubleshooting Tips

If you have performed the preceding basic checks but the problem persists, follow these guidelines for troubleshooting specific cases:

- After you install your new drive, your computer will not boot, and no error message appears on the screen.
- The screen remains blank when you power up the system.
- The system does not recognize the drive.
- The dealer partitioned and formatted the drive for you in the store, but the drive does not respond when you install it.
- The system hangs in FDISK or fails to create or save the partition record.
- The system error message, "Drive not Ready," appears.
- The FDISK error message, "No Fixed Disk Present," appears.
- The drive does not format to full capacity.
- The DOS message "Disk Boot Failure," "Non-System Disk" or "No ROM Basic - SYSTEM HALTED" appears.
- The system error message, "HDD controller failure" appears.

2. After you install your new drive, your computer will not boot, and no error message appears on the screen.

Check your computer manual or BIOS manufacturer to determine whether your BIOS supports drives that have more than 4,092 cylinders. If your system has this limitation, use the following procedure to configure your computer:

- Turn off your computer, open the case, and remove your new drive.
- CAUTION:** To avoid electrostatic discharge damage to your computer or hard drive, make sure you are well grounded before touching the drive, cable, connector or jumpers.
- Move the jumper on the alternate-capacity jumper, as shown in Figure 6. This causes the drive to appear to your BIOS as having a 2.1-Gbyte capacity (4,092 cylinders, 16 heads, 63 sectors per track). You may need third-party partitioning software, such as Disk Manager, to achieve full capacity of the drive.
 - Remount your drive in the computer and replace the computer cover.
 - Insert a bootable system diskette into drive A and turn on the computer. It should boot from drive A and automatically detect the new drive as a 2.1-Gbyte drive.
 - Insert your DiscWizard diskette into drive A and type A:XDM. Then press ENTER. This runs the Disk Manager program.
 - Follow the Disk Manager instructions to install the dynamic drive overlay and to partition and format your new drive to its full capacity.
 - After Disk Manager is done, reboot your system. You should see the Disk Manager banner and be able to access the full capacity of your new drive.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	
		Date Revised: March 1, 2017		
Developed by: Ronaldo B. Racelis		Revision No.: 02	Page 80 of 119	

The screen remains blank when you power up the system.

If the steps listed above do not remedy this problem, try the following:

- Make sure the monitor is plugged in and turned on.
- Check all cards.
- Make sure the video card is seated in its slot and secured with mounting screws.
- Turn off the computer and remove the drive host adapter. If the screen turns on after you reboot, the host adapter may be incompatible or defective. If so, see your dealer.

The system does not recognize the drive.

- Check all cables.
- Make sure the power supply is adequate for system needs.
- Reboot the computer and listen to make sure the drive motor starts up. If the drive is very quiet, it may be difficult to hear its discs reach operating speed. If the drive motor does not start up, recheck all drive cables.
- Verify that for each drive, a drive-type is listed in the system setup program.
- Try rebooting your computer by pressing the CTRL, ALT and DELETE keys simultaneously. If the drive is recognized after you reboot the system, the computer BIOS test may be completing before the drive is ready. One solution is to slow the processor speed during startup. If your computer has a turbo switch, set it to slow speed before turning the computer on. If there is no turbo switch, you may be able to use keyboard commands; see your computer manual for details. After the computer is up and running, return the processor to the fast speed. Another solution is to warm-boot your computer after every power-on.
- Check for I/O address conflicts. To isolate the conflict, verify that the drive and host adapter are compatible with your computer. Turn off the computer and remove all the peripheral adapter cards except for the video card and host adapter. If the computer recognizes the drive when you reboot the computer, turn off the computer. Reinstall the other peripheral cards, one at a time, until the conflict reoccurs. After you have isolated the source of the address conflict, you can resolve the conflict by changing the 1/0 address of the peripheral that appears to cause the conflict.
- If Disk Manager has installed the DDO on your hard drive and you have booted directly from a diskette, the information in the boot record for the drive may not have been loaded. Make sure there is no diskette in drive A and reboot. If you want to boot from the diskette, follow the "Booting with a Diskette" instructions under "Advanced Disk Manager Options" on page 20.

The dealer partitioned and formatted the drive for you in the store, but the drive does not respond when you install it.

- Reboot the computer and make sure the drive spins up.
- Check all cables.
- Make sure the power supply is adequate for system needs.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Page 81 of 119
		Revision No.: 02	

- Make sure the DOS or Windows version the dealer used to partition and format the drive is the same version you have installed in your computer. If it isn't, see your dealer.
- Verify the drive-type values in the system setup program. You must install the drive using the same drive-type values your dealer used to partition the drive.
- Check for 1/0 address conflicts between peripheral cards.
- Check for viruses.

The system hangs in FDISK or fails to create or save the partition record.

- Check all cables.
- Your setup system diskette may be corrupted. Try using a backup diskette.
- Make the partitions smaller.
- Change the interrupt jumper setting on the host adapter.
- Some BIOS have a Track 0 protection feature that protects Track 0 from viruses. This may cause FDISK to hang the system. You must disable this feature in the system setup program before you can use FDISK. See your computer reference guide for assistance. Be sure to re-enable this important feature when FDISK is done.

The system error message, "Drive not Ready," appears.

- Check all cable connections. Make sure pin 1 of the drive is connected to pin 1 of the hard-disc controller or host adapter.
- Make sure the power supply is adequate for system needs.
- Reboot the computer and make sure the drive spins up.

The FDISK error message, "No Fixed Disk Present," appears.

- Make sure the power supply is adequate for system needs.
- Verify the drive-type values in the system setup program.
- Check for 1/0 address conflicts.

The drive does not format to full capacity.

- Verify the drive-type values in the system setup program. One of the following problems may have occurred:
- The values may be set with an incorrect translation characteristic.
- You may have entered a parameter value that exceeds the physical capacity of the drive.
- You entered a translation characteristic that does not take full advantage of the drive's capacity.
- The drive's physical specifications exceed the translation limits imposed by the BIOS.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	
		Date Revised: March 1, 2017		
		Developed by: Ronaldo B. Racelis	Revision No.: 02	Page 82 of 119

1 CAUTION: If you change the drive-type values in the system setup program, you must partition and format the drive again. **This erases data on the drive.**

2

- If you have partitioned the drive into individual logical drives, you may need to make the partitions smaller to access the full drive capacity.
- If your computer supports LBA mode, you may need to enable LBA mode in the system setup program to access the full capacity of the drive. Refer to your computer's reference guide to find out how to enable LBA.
- Your computer may not support drives that have more than 4,092 cylinders. Follow the instructions on page 25 for after you install your new drive, your computer will not boot, and no error message appears on the screen.

3

4

5

The DOS message "Disk Boot Failure," "Non-System Disk" or "No ROM Basic - SYSTEM HALTED" appears.

- Reinstall the DOS system files using the DOS SYS utility.
- Check all cables.
- Use FDISK to verify that the primary partition is active.
- Check for viruses.

The system error message, "HDD controller failure" appears.

- Confirm the jumper settings on the drive.
- Verify the drive-type settings in the system setup program.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 83 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Information Sheet 5.4

Troubleshooting Tips for Network Card

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to know the troubleshooting for Network Card.

1. If you can't connect to a server or if Windows reports an error after you double-click Network Neighborhood, try the following first:

- Make sure you're using the drivers that are on the drivers disk that ships with the network interface card (NIC).
- Make sure the driver is loaded and the protocols are bound. Check the Device Properties list for trouble indicators (an "X" or "!" symbol).
- Test the NIC adapter with the diagnostic utilities that often came with the driver installation.
- Check with your LAN administrator - you may need to install additional networking software.

2. If the problem persists, follow these guidelines:

- **Make sure the cable is installed properly.** The network cable must be securely attached at both RJ45 connections (adapter and hub). The maximum allowable distance from adapter to hub is 100 meters. If the cable is attached and the distance is within acceptable limits but the problem persists, try a different cable. If you're directly connecting two computers without a hub or switch, use a crossover cable.
- Try another network cable.
- **Check the LED Lights on the NIC.** Before the LEDs can be used for troubleshooting, the network interface card (NIC) must be connected to the network and the network driver must be installed. Most NICs come with LEDs near the connection. The meaning of the LED signals may be different from one manufacturer to the other. Here is a common LED description for 3COM 10/100BT dual speed NIC. Please consult your NIC manual for any difference.

LED	Description	Flashing	Steady (On)	Off
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 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	Page 84 of 119
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017	
			Revision No.: 02	

10 LNK	Green: Link integrity	Reversed polarity	Good connection	10BT	No connection between NIC & hub
100 LNK	Green: Link integrity	Reversed polarity	Good connection	100BT	No connection between NIC & hub
ACT	Yellow: Port traffic for either speed	Network traffic present	Heavy network traffic	network	No traffic

3. The computer hangs when the drivers are loaded.

- Change the PCI BIOS interrupt settings. See your NIC and system manuals for more details.
- If you are using EMM386, it must be version 4.49 or newer.

4. Diagnostics pass, but the connection fails or errors occur.

- At 100BT, use Category 5 wiring and make sure that the network cable is securely attached.
- At 100BT, connect to a 100BT hub/switch (not 100Base-T4).
- For NetWare, make sure you specify the correct frame type in your NET.CFG file.
- Make sure the duplex mode setting on the adapter matches the setting on the switch.

5. The LNK LED doesn't light.

- Make sure you've loaded the network drivers.
- Check all connections at the adapter and the hub/switch.
- Try another port on the hub/switch.
- Make sure the duplex mode setting on the adapter matches the setting on the hub/switch.
- Make sure you have the correct type of cable between the adapter and the hub. 100Base-TX requires two pairs. Some hubs require a crossover cable while others require a straight-through cable.

6. The ACT LED doesn't light.

- Make sure you've loaded the correct network drivers.
- The network may be idle. Try accessing a server.
- The adapter isn't transmitting or receiving data. Try another adapter.
- Make sure you're using two-pair cable for TX wiring.

7. The adapter stopped working without apparent cause.

- Run the diagnostics program that came with the NIC.
- Try reseating the NIC in its slot, or try a different slot if necessary.
- The network driver files may be corrupt or missing. Remove the drivers and then reinstall them.

8. The Wake on LAN (WOL) feature is not working.

- Make sure the WOL cable is attached and that power is being applied to the computer.
- Check the BIOS for its WOL setting. Some computers may need to be configured for WOL.
- Make sure the network cable is fully attached to the adapter.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 85 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

9. Crossover cable troubleshooting tips.

When you work with network cabling, concentrators (hubs or switch), and NICs from different vendors, it is possible to connect everything and still have no communication between file servers and workstations. When there are several unknown variables, it is difficult to determine which component is broken. Use these tips to isolate the problem.

- **Determine whether your equipment complies with the 10Base-T or 100Base-TX standard.** This is particularly important for hubs and switches.
- **Connect a straight-through cable from the PC to the hub.** The hub performs an internal crossover so that the signal can go from TD+ to RD+ and TD- to RD- (see How to Make Network Cables). When you look at an RJ-45 connector from the front, pin 1 is identified on the left-hand side when the metal contacts are facing up.
- **Make sure that the TD+ and TD- wires are twisted together , and that the RD+ and RD- wires are twisted together.** Using wires from opposing pairs can cause signals to be lost. For a 100Base-TX cable, pins #1 and #2 , and #3 and #6 must be on the same twisted strand.

10. When there is doubt whether a hub is performing correctly, or if the impedance settings are in question, a crossover cable can help you isolate the failing component:

- Connect a file server and a client PC back to back with a crossover cable to verify that the NIC and network operating system are properly configured.
- To make a crossover cable, simple connect TD+ to RD+ and TD- to RD-. The cable performs the crossover that is usually performed by the hub. Make sure that two twisted-pair wires are used. If the file server and client PC function together as a small network, then either the existing cabling or the hub is the problem.
- If there is a proper crossover, the appropriate LED comes on. If there is a straight-through connection, the LED does not light. A blinking LED indicates that there is a polarity mismatch (that is, TD+ to RD- instead of TD+ to RD+).

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 86 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Information Sheet 5.5

Troubleshooting Tips for Sound Card

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to know the troubleshooting tips for soundcard.

No sound is heard from audio (music) CDs

Various conditions may cause this problem. To troubleshoot, check the following:

- Microsoft Volume Control or your mixer programs mute options and volume sliders.
- Connect headphones to the stereo phone jack on your CD-ROM drive's front panel; adjust the volume control settings on the drive. If there is sound from your headphones, check the CD audio cable connection from the CD-ROM drive to the audio card.
- Ensure the speakers are properly connected to the audio card's output connector.

Joystick port is not working

To troubleshoot, check the following:

- The audio card joystick port conflicts with another joystick port in the system. Disable the audio card joystick port, and use the system's joystick port.
- The joystick drivers, MSJSTICK.DRV and VJOYD.VXD, may not be installed. Uninstall the joystick, then reinstall to load the drivers. The drivers should come with the driver CD or floppy diskette with your sound card.

Computer hangs or restarts during installation

A hardware conflict may cause the computer to hang or restart during the installation procedure. Check the following to resolve the conflict:

- A hardware conflict with another device in your system.
- Previously installed sound card hardware or software needs to be removed.
- The audio card is not seated in the slot properly.
- PCI bus mastering devices may be interfering with the operation of the audio card. Temporarily remove non-essential PCI bus mastering devices.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Revision No.: 02
			Page 87 of 119

Resolving hardware conflicts

Hardware conflicts occur when two or more devices contend for the same resources. Conflicts between your audio card and another device may occur regarding the I/O address, IRQ line, or DMA channel:

1. Right-click the *My Computer* icon on your desktop, and select *Properties*. The System Properties dialog appears.
2. Click the *Device Manager* tab. In the Device Manager, a plus sign(+) represents an expandable list of items. A minus sign (-) represents an expanded list. A circled exclamation mark denotes a conflict.
3. Double-click *Sound, video, game controllers*. A list of multimedia devices appears.
4. Select your audio card.
5. Choose the *Properties* button.
6. Click the *Resources* tab.
7. Uncheck the *Use automatic settings* option.
8. Change "Settings based on:" if alternate settings are available.
9. Determine the conflict by reviewing the "Conflicting device list".
10. Select the conflicting item in the "Resource Settings" list.
11. Click the *Change Settings* button.
12. Use the mouse to select a new setting.
13. Select OK to close each of the properties windows, and restart your computer.

Audio card is not automatically detected

To manually configure your audio card for Windows 95/98:

1. Click "Start" on the taskbar, and select *Settings* from the Start menu.
2. Select *Control Panel*. The Control Panel group appears.
3. Double-click the *Add New Hardware* icon. The Add New Hardware Wizard dialog appears.
4. Select *Next* to continue.
5. Choose *Yes* to have Windows search for new hardware, then select *Next*.
6. Select *Next* to continue.
7. Select *Finish*, and follow the prompts to complete the new hardware installation.

CD does not automatically run when you insert it in the drive

To enable the "Audio insert notification" feature:

1. Right-click the *My Computer* icon on your desktop, and select *Properties*. The System Properties dialog appears.
2. Click the *Device Manager* tab. A list of devices appears.
3. Double-click *CD-ROM*, and select your CD-ROM drive.
4. Choose the *Properties* button. The CD-ROM drive properties dialog appears.
5. Choose the *Settings* tab.
6. Click the "Auto insert notification" option to enable.
7. Select OK until all Properties dialogs are closed, and restart Windows for the changes to take effect.

No sound is heard from speakers

Verify the following:

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 88 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

- Check the Microsoft Volume Control or the Audio Mixer Program mute options and volume sliders.
- Ensure the speakers are properly connected to the audio card's output connector.
- Check the volume control and power connection of the speakers, if they are amplified. (Refer to the speakers documentation for detailed information).
- Ensure a hardware conflict does not exist between your audio card and another device in your system.
- PCI bus mastering devices may be interfering with the operation of the audio card. Temporarily remove non-essential PCI bus mastering devices. If the device is a display card, upgrade the display card drivers, or set the card to the default Windows VGA mode.

If you are experiencing no sound only during audio CD playback, see "No sound is heard from audio (music) CDs" above.

Static sounds are heard in wave files

Check to see if the static sounds are heard in all wave files. If the difficulty occurs only with certain games, refer to the software manufacturer's documentation. To troubleshoot static sounds heard in all wave files:

- Try different resource settings for the audio card, or set the card to use low DMA.
- Move the audio card to another PCI slot. Feedback from the power supply or another device may be responsible.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	
		Date Revised: March 1, 2017		
		Developed by: Ronaldo B. Racelis	Revision No.: 02	Page 89 of 119

Information Sheet 5.6

Tech Acronyms

Learning Objectives:

After Reading this information sheet you will be able to know the different Computer and Internet acronyms.

Computer and Internet acronyms

Acronyms Meanings

<u>ACL</u>	Access Control List
<u>ADC</u>	Analog-to-Digital Converter
<u>ADF</u>	Automatic Document Feeder
<u>ADSL</u>	Asymmetric Digital Subscriber Line
<u>AGP</u>	Accelerated Graphics Port
<u>AIFF</u>	Audio Interchange File Format
<u>AIX</u>	Advanced Interactive Executive
<u>ALU</u>	Arithmetic Logic Unit
<u>ANSI</u>	American National Standards Institute
<u>API</u>	Application Program Interface
<u>ARP</u>	Address Resolution Protocol
<u>ASCII</u>	American Standard Code for Information Interchange
<u>ASP</u>	Active Server Page or Application Service Provider
<u>ATA</u>	Advanced Technology Attachment
<u>ATM</u>	Asynchronous Transfer Mode
<u>BASIC</u>	Beginner's All-purpose Symbolic Instruction Code
<u>Bcc</u>	Blind Carbon Copy
<u>BIOS</u>	Basic Input/Output System
<u>Blob</u>	Binary Large Object
<u>BMP</u>	Bitmap
<u>BSOD</u>	Blue Screen of Death
<u>CAD</u>	Computer-Aided Design
<u>Cc</u>	Carbon Copy
<u>CCD</u>	Charged Coupled Device
<u>CD</u>	Compact Disc

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 90 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

<u>CD-R</u>	Compact Disc Recordable
<u>CD-ROM</u>	Compact Disc Read-Only Memory
<u>CD-RW</u>	Compact Disc Re-Writable
<u>CDFS</u>	Compact Disc File System
<u>CDMA</u>	Code Division Multiple Access
<u>CGI</u>	Common Gateway Interface
<u>CISC</u>	Complex Instruction Set Computing
<u>CLOB</u>	Character Large Object
<u>CMOS</u>	Complementary Metal Oxide Semiconductor
<u>CMS</u>	Content Management System
<u>CMYK</u>	Cyan Magenta Yellow Black
<u>CPA</u>	Cost Per Action
<u>CPC</u>	Cost Per Click
<u>CPL</u>	Cost Per Lead
<u>CPM</u>	Cost Per 1,000 Impressions
<u>CPS</u>	Classroom Performance System
<u>CPU</u>	Central Processing Unit
<u>CRM</u>	Customer Relationship Management
<u>CRT</u>	Cathode Ray Tube
<u>CSS</u>	Cascading Style Sheet
<u>CTP</u>	Composite Theoretical Performance
<u>CTR</u>	Click-Through Rate
<u>DAC</u>	Digital-to-Analog Converter
<u>DAW</u>	Digital Audio Workstation
<u>DBMS</u>	Database Management System
<u>DCIM</u>	Digital Camera IMages
<u>DDL</u>	Data Definition Language
<u>DDR</u>	Double Data Rate
<u>DDR2</u>	Double Data Rate 2
<u>DDR3</u>	Double Data Rate Type 3
<u>DFS</u>	Distributed File System
<u>DHCP</u>	Dynamic Host Configuration Protocol
<u>DIMM</u>	Dual In-Line Memory Module
<u>DLC</u>	Downloadable Content
<u>DLL</u>	Dynamic Link Library
<u>DMA</u>	Direct Memory Access
<u>DNS</u>	Domain Name System
<u>DOS</u>	Disk Operating System
<u>DPI</u>	Dots Per Inch
<u>DRAM</u>	Dynamic Random Access Memory
<u>DRM</u>	Digital Rights Management
<u>DSL</u>	Digital Subscriber Line
<u>DSLAM</u>	Digital Subscriber Line Access Multiplexer
<u>DTD</u>	Document Type Definition
<u>DV</u>	Digital Video
<u>DVD</u>	Digital Versatile Disc
<u>DVD+R</u>	Digital Versatile Disc Recordable
<u>DVD+RW</u>	Digital Versatile Disk Rewritable

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	
		Date Revised: March 1, 2017	Page 91 of 119	Revision No.: 02
		Developed by: Ronaldo B. Racelis		

<u>DVD-R</u>	Digital Versatile Disc Recordable
<u>DVD-RAM</u>	Digital Versatile Disc Random Access Memory
<u>DVD-RW</u>	Digital Versatile Disk Rewritable
<u>DVI</u>	Digital Video Interface
<u>DVR</u>	Digital Video Recorder
<u>ECC</u>	Error Correction Code
<u>EDI</u>	Electronic Data Interchange
<u>EIDE</u>	Enhanced Integrated Drive Electronics
<u>EPS</u>	Encapsulated PostScript
<u>EUP</u>	Enterprise Unified Process
<u>EXIF</u>	Exchangeable Image File Format
<u>FAQ</u>	Frequently Asked Questions
<u>FDDI</u>	Fiber Distributed Data Interface
<u>FIFO</u>	First In, First Out
<u>FiOS</u>	Fiber Optic Service
<u>FLOPS</u>	Floating Point Operations Per Second
<u>FPU</u>	Floating Point Unit
<u>FSB</u>	Frontside Bus
<u>FTP</u>	File Transfer Protocol
<u>Gbps</u>	Gigabits Per Second
<u>GIF</u>	Graphics Interchange Format
<u>GIGO</u>	Garbage In, Garbage Out
<u>GIS</u>	Geographic Information Systems
<u>GPS</u>	Global Positioning System
<u>GPU</u>	Graphics Processing Unit
<u>GUI</u>	Graphical User Interface
<u>GUID</u>	Globally Unique Identifier
<u>HDD</u>	Hard Disk Drive
<u>HDMI</u>	High-Definition Multimedia Interface
<u>HDTV</u>	High Definition Television
<u>HDV</u>	High-Definition Video
<u>HFS</u>	Hierarchical File System
<u>HSF</u>	Heat Sink and Fan
<u>HTML</u>	Hyper-Text Markup Language
<u>HTTP</u>	HyperText Transfer Protocol
<u>HTTPS</u>	HyperText Transport Protocol Secure
<u>I/O</u>	Input/Output
<u>ICANN</u>	Internet Corporation For Assigned Names and Numbers
<u>ICF</u>	Internet Connection Firewall
<u>ICMP</u>	Internet Control Message Protocol
<u>ICS</u>	Internet Connection Sharing
<u>ICT</u>	Information and Communication Technologies
<u>IDE</u>	Integrated Device Electronics or Integrated Development Environment
<u>IEEE</u>	Institute of Electrical and Electronics Engineers
<u>IGP</u>	Integrated Graphics Processor
<u>IM</u>	Instant Message
<u>IMAP</u>	Internet Message Access Protocol
<u>InterNIC</u>	Internet Network Information Center

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	
		Date Revised: March 1, 2017	Page 92 of 119	Revision No.: 02
		Developed by: Ronaldo B. Racelis		

<u>IP</u>	Internet Protocol
<u>IPX</u>	Internetwork Packet Exchange
<u>IRC</u>	Internet Relay Chat
<u>IRQ</u>	Interrupt Request
<u>ISA</u>	Industry Standard Architecture
<u>iSCSI</u>	Internet Small Computer Systems Interface
<u>ISDN</u>	Integrated Services Digital Network
<u>ISO</u>	International Organization for Standardization
<u>ISP</u>	Internet Service Provider
<u>IT</u>	Information Technology
<u>IVR</u>	Interactive Voice Response
<u>JFS</u>	Journaled File System
<u>JPEG</u>	Joint Photographic Experts Group
<u>JRE</u>	Java Runtime Environment
<u>JSF</u>	JavaServer Faces
<u>JSON</u>	JavaScript Object Notation
<u>JSP</u>	Java Server Page
<u>Kbps</u>	Kilobits Per Second
<u>KDE</u>	K Desktop Environment
<u>KVM Switch</u>	Keyboard, Video, and Mouse Switch
<u>LAMP</u>	Linux, Apache, MySQL, and PHP
<u>LAN</u>	Local Area Network
<u>LCD</u>	Liquid Crystal Display
<u>LDAP</u>	Lightweight Directory Access Protocol
<u>LED</u>	Light-Emitting Diode
<u>LIFO</u>	Last In, First Out
<u>LPI</u>	Lines Per Inch
<u>LTE</u>	Long Term Evolution
<u>LUN</u>	Logical Unit Number
<u>MAC Address</u>	Media Access Control Address
<u>MAMP</u>	Mac OS X, Apache, MySQL, and PHP
<u>MANET</u>	Mobile Ad Hoc Network
<u>Mbps</u>	Megabits Per Second
<u>MBR</u>	Master Boot Record
<u>MCA</u>	Micro Channel Architecture
<u>MIDI</u>	Musical Instrument Digital Interface
<u>MIPS</u>	Million Instructions Per Second
<u>MMS</u>	Multimedia Messaging Service
<u>MP3</u>	MPEG-1 Audio Layer-3
<u>MPEG</u>	Moving Picture Experts Group
<u>MTU</u>	Maximum Transmission Unit
<u>NAT</u>	Network Address Translation
<u>NetBIOS</u>	Network Basic Input/Output System
<u>NIC</u>	Network Interface Card
<u>NNTP</u>	Network News Transfer Protocol
<u>NOC</u>	Network Operations Center
<u>NTFS</u>	New Technology File System
<u>NUI</u>	Natural User Interface

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	
		Date Revised: March 1, 2017	Page 93 of 119	Revision No.: 02
		Developed by: Ronaldo B. Racelis		

<u>NVRAM</u>	Non-Volatile Random Access Memory
<u>OASIS</u>	Organization for the Advancement of Structured Information Standards
<u>OCR</u>	Optical Character Recognition
<u>ODBC</u>	Open Database Connectivity
<u>OEM</u>	Original Equipment Manufacturer
<u>OLAP</u>	Online Analytical Processing
<u>OLE</u>	Object Linking and Embedding
<u>OOP</u>	Object-Oriented Programming
<u>OSD</u>	On Screen Display
<u>OSPF</u>	Open Shortest Path First
<u>P2P</u>	Peer To Peer
<u>PC</u>	Personal Computer
<u>PCB</u>	Printed Circuit Board
<u>PCI</u>	Peripheral Component Interconnect
<u>PCI-X</u>	Peripheral Component Interconnect Extended
<u>PCMCIA</u>	Personal Computer Memory Card International Association
<u>PDA</u>	Personal Digital Assistant
<u>PDF</u>	Portable Document Format
<u>PHP</u>	Hypertext Preprocessor
<u>PIM</u>	Personal Information Manager
<u>PMU</u>	Power Management Unit
<u>PNG</u>	Portable Network Graphic
<u>POP3</u>	Post Office Protocol
<u>POST</u>	Power On Self Test
<u>PPC</u>	Pay Per Click
<u>PPGA</u>	Plastic Pin Grid Array
<u>PPI</u>	Pixels Per Inch
<u>PPL</u>	Pay Per Lead
<u>PPM</u>	Pages Per Minute
<u>PPP</u>	Point to Point Protocol
<u>PPPoE</u>	Point-to-Point Protocol over Ethernet
<u>PPTP</u>	Point-to-Point Tunneling Protocol
<u>PRAM</u>	Parameter Random Access Memory
<u>PROM</u>	Programmable Read-Only Memory
<u>PS/2</u>	Personal System/2
<u>PUM</u>	Potentially Unwanted Modification
<u>PUP</u>	Potentially Unwanted Program
<u>QBE</u>	Query By Example
<u>RAID</u>	Redundant Array of Independent Disks
<u>RAM</u>	Random Access Memory
<u>RDF</u>	Resource Description Framework
<u>RDRAM</u>	Rambus Dynamic Random Access Memory
<u>RFID</u>	Radio-Frequency Identification
<u>RGB</u>	Red Green Blue
<u>RISC</u>	Reduced Instruction Set Computing
<u>ROM</u>	Read-Only Memory
<u>RPC</u>	Remote Procedure Call

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 94 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

<u>RPM</u>	Revenue Per 1,000 Impressions
<u>RSS</u>	RDF Site Summary
<u>RTE</u>	Runtime Environment
<u>RTF</u>	Rich Text Format
<u>RUP</u>	Rational Unified Process
<u>SaaS</u>	Software as a Service
<u>SAN</u>	Storage Area Network
<u>SATA</u>	Serial Advanced Technology Attachment
<u>SCSI</u>	Small Computer System Interface
<u>SD</u>	Secure Digital
<u>SDK</u>	Software Development Kit
<u>SDRAM</u>	Synchronous Dynamic Random Access Memory
<u>SDSL</u>	Symmetric Digital Subscriber Line
<u>SEO</u>	Search Engine Optimization
<u>SERP</u>	Search Engine Results Page
<u>SIMM</u>	Single In-Line Memory Module
<u>SIP</u>	Session Initiation Protocol
<u>SKU</u>	Stock Keeping Unit
<u>SLA</u>	Software License or Service Level Agreement
<u>SLI</u>	Scalable Link Interface
<u>SMART</u>	Self-Monitoring Analysis And Reporting Technology
<u>SMB</u>	Server Message Block
<u>SMM</u>	Social Media Marketing
<u>SMS</u>	Short Message Service
<u>SMTP</u>	Simple Mail Transfer Protocol
<u>SNMP</u>	Simple Network Management Protocol
<u>SO-DIMM</u>	Small Outline Dual In-Line Memory Module
<u>SOA</u>	Service Oriented Architecture
<u>SOAP</u>	Simple Object Access Protocol
<u>SQL</u>	Structured Query Language
<u>SRAM</u>	Static Random Access Memory
<u>sRGB</u>	Standard Red Green Blue
<u>SSD</u>	Solid State Drive
<u>SSH</u>	Secure Shell
<u>SSID</u>	Service Set Identifier
<u>SSL</u>	Secure Sockets Layer
<u>TCP/IP</u>	Transmission Control Protocol/Internet Protocol
<u>TFT</u>	Thin-Film Transistor
<u>TIFF</u>	Tagged Image File Format
<u>TTL</u>	Time To Live
<u>TWAIN</u>	Toolkit Without An Informative Name
<u>UAT</u>	User Acceptance Testing
<u>UDDI</u>	Universal Description Discovery and Integration
<u>UDP</u>	User Datagram Protocol
<u>UGC</u>	User Generated Content
<u>UML</u>	Unified Modeling Language
<u>UNC</u>	Universal Naming Convention
<u>UPnP</u>	Universal Plug and Play

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 95 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

<u>UPS</u>	Uninterruptible Power Supply
<u>URI</u>	Uniform Resource Identifier
<u>URL</u>	Uniform Resource Locator
<u>USB</u>	Universal Serial Bus
<u>UTF</u>	Unicode Transformation Format
<u>VCI</u>	Virtual Channel Identifier
<u>VDSL</u>	Very High Bit Rate Digital Subscriber Line
<u>VDU</u>	Visual Display Unit
<u>VFAT</u>	Virtual File Allocation Table
<u>VGA</u>	Video Graphics Array
<u>VLB</u>	VESA Local Bus
<u>VLE</u>	Virtual Learning Environment
<u>VoIP</u>	Voice Over Internet Protocol
<u>VPI</u>	Virtual Path Identifier
<u>VPN</u>	Virtual Private Network
<u>VRAM</u>	Video Random Access Memory
<u>VRML</u>	Virtual Reality Modeling Language
<u>W3C</u>	World Wide Web Consortium
<u>WAIS</u>	Wide Area Information Server
<u>WAMP</u>	Windows, Apache, MySQL, and PHP
<u>WAN</u>	Wide Area Network
<u>WDDM</u>	Windows Display Driver Model
<u>WEP</u>	Wired Equivalent Privacy
<u>Wi-Fi</u>	Wireless Fidelity
<u>WINS</u>	Windows Internet Name Service
<u>WPA</u>	Wi-Fi Protected Access
<u>WWW</u>	World Wide Web
<u>XHTML</u>	Extensible Hypertext Markup Language
<u>XML</u>	Extensible Markup Language
<u>XSLT</u>	Extensible Style Sheet Language Transformation
<u>Y2K</u>	Year 2000
<u>ZIF</u>	Zero Insertion Force

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 96 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Information Sheet 5.7

Computer Virus

What is a computer virus?

A Computer Virus is a kind of malicious software written intentionally to enter a computer without the user's permission or knowledge, with an ability to replicate itself, thus continuing to spread.

How do computer viruses reach you?

Different types of computer viruses would reach you through the normal web activities like,

1. Opening email attachments from fake accounts.
2. Clicking inappropriate internet advertisements without understanding fully.
3. Installing/downloading the free games, tool-bars or system utilities.
4. Visiting an infected webpage
5. Setting up of software without license agreements and so on.

Not only with web activities, if you are not running the latest updates of your operating system and not using the good antivirus software, computer viruses would reach you easily.

Types computer viruses

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Revision No.: 02
			Page 97 of 119

Many types of viruses are present and some popular viruses types are:

1. Macro Virus

Macro virus is a type of email virus which mainly targets to infect the programs that contain Macros like Microsoft office files. These are mini programs which have the power to infect the template and document of that file.

2. Memory resident virus

Memory resident virus automatically fixes themselves in the computer memory and if the operating system started to run, it gets activated. It hideout in the computer memory and allocates space to execute its own code. It can easily corrupt the files which are recently used.

3. Multipartite Virus

Multipartite virus spreads in multiple ways and infects the programming files. They used to hide in the memory like Memory resident virus and do infect the hard disk.

4. Polymorphic Virus

Polymorphic virus are the powerful virus which might guards itself with encryption algorithm and has the tendency to change automatically when certain conditions are meet. Because of having encrypting capability, it is tough to find it by even with an antivirus program.

5. FAT virus

FAT virus spoils the file allocation system section (Information where the location of files and the details of the available spaces are stored) and might cause crucial damage to it. It would result in defeating the individual files or complete directories.

Not only these! There are still some common types of computer viruses like Web scripting viruses, Boot sector viruses, time/logic bombs, direct action viruses, Trojan horse virus, Root kits, spywares and worms have affinity to disrupts the computer operation.

Most dangerous computer viruses

In late 1980's, computer viruses has started to born. **Did you know about the first computer virus?** It is "The Brain" released from Pakistan in the year 1986. So the 25th anniversary of the first PC virus was marked in 2011. The danger rating of the first computer virus is very low, but the most dangerous viruses came into existence in 1990's. Let's check some worst types of computer viruses now.

1. Code red

A powerful worm named "Code red" had made the anti-virus researchers in hindrance and it infected millions of computers and lakhs of servers. It took advantage in Microsoft internet information server too and was first detected by the employees of eEye digital security. It is not necessary to open an email attachment or execute a file, it catches your PC if you open a specific webpage.

2. Melissa

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 98 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Melissa is a well-known worm which infected the MS word document files through email attachments using MS outlook. This virus caused a serious destruction to the computers in 1999 and the damage was estimated in millions of dollars. It had made the popular concerns like Intel and Microsoft temporarily to shut down.

3. My doom

My doom was considered a powerful virus in 2004 as it had the proficiency to stop accessing the antivirus program by the operating system. This virus spread through email with the text “Mail transaction failed” and gets downloaded into the system once the message got clicked. Millions of computers were infested through this virus and loss was estimated in billions.

4. Nimda

Nimda virus had risen in the year 2001 and it is just the reverse form of the word “Admin”. This virus targeted to slow down the internet traffic and it propagated to the system in different ways through emails, while sharing files, server weakness etc. Once this worm gets activated on the computer, the attacker would have the full control to the system if certain conditions are meet.

5. Conficker

Conficker is the widespread internet virus and so the anti-virus researchers called it as “Super worm”. Microsoft operating systems was targeted by this dangerous virus and so millions of computer which had vulnerable Windows OS had hit by it. This worst virus might spread through removable drives and assembled in such a way to take the financial and other vital data from the system. If you’re are using computer from long, then you might be aware of some other worst types of viruses like I love you (2000), Stuxnet (2009), agent.btz (2008), SQL Slammer (2003) and Blackworm (2006).



Types of computer viruses in 2012

Now, do check some types of computer viruses which caused significant damage to the computers in the year 2012.

Shamoon

Shamoon was discovered in August 2012 that has been used for cyber spying. It infects the system runs on Windows NT, Windows me and Windows 9x. The attacker uses the “dropper” function to spread in the network to the hard disk of the computer so that to compile the list of files on attacked computers. Then the attacker receives the data with the help of “reporter” program. “Wiper” is the function used to erase the involved files and this might create problems in booting by overwriting action.

Gauss

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 99 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Gauss is the highly destructive computer worm which was intentionally created to steal the data from Middle-east banks. It was discovered in June 2012 by a Russian lab and it affected thousands of computers. It can infect the USB drives and collected information will be stored as a hidden file on the removable drives.

DNS changer

Cyber-criminals created this virus to redirect the internet traffic to a phishing website. The DNS changer computer virus modified the Domain Name System (DNS) configuration of computers and redirects the users to a specific website. FBI got involved in this virus and the interim servers were official shutdown on July 9, 2012.

Belgian

Belgian is the worst computer virus spreads through spam emails or hacked webpages. It locked the computers and then asked for some money to unlock the data. This global virus has the power to gain the remote access to computers to track the files and launch the malware when Windows gets started.

Flame

Flame is the complex malware found in 2012 which used Bluetooth to send commands. It was discovered in Russian lab and it grabs the data from chats, emails and screenshots. It steals sensitive data and infects many computers in Iran and Middle east countries.

Many types of computer viruses are created everyday and the new computer virus like Ransomware (freezes the PC and ask to pay ransom to unlock) have started to cause damage to the computer this year. Even though the anti-virus researches are working to prevent these actions with powerful anti-virus software, cyber-criminals are tactically creating the malware.

Symptoms of an infected computer

Computer virus symptoms are not cast in stone, but rather a moving target. Just like with the human viral conditions, they evolve through generations – which in computer technology terms may mean weeks or even days. Some symptoms may not necessarily mean an infection – for example, if you are sneezing, you do not necessarily have a flu, it may be just an allergy – which means different cause, and different treatment methods. Same with computers – if your system seems to be slower than usual, it may be a symptom of a virus, but it may also be a symptom of “program overload” – when you have too many programs running at once, and it crashes your computer system’s performance.

With that in mind, let’s go over some of the most common symptoms that can alert you to the potential virus within your computer system, or even your computer network, presented here in no particular order.

1. Hardware Troubles – It’s Alive!

If sudden sounds of the CD-ROM tray opening completely out of its own will give you the heebie jeebies, I don’t blame you! If your hardware – computer, printer, etc. – started acting up on its own, without you requesting any action by means of keyboard

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 100 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

or mouse, you are likely having a virus in your computer system. When you work on the computer, especially if you are performing some actions by using programs, your hard drive is expected to be making some noises.

If you are not doing anything, and your computer seems to be putting in extra effort and looks like it is communicating with 8th dimension completely by itself, consider an emergency antivirus scan.

2. No Response – Is Anyone Home?

We've all been there: working away, and then BAM – nothing happens! You can't move your mouse, the keyboard does zilch, you go into panic mode "ouch, did I save that document I was writing for the past 2 hours?".... (Now, in the voice of "desperate housewives narrator: "Yes. We all had the frozen iceberg for a computer before"). Lockup alone may not necessarily mean you have a virus – it could also be a symptom of a desperate need for a cleanup (we will be going over it in another article) – but if it presents itself in array of other symptoms, be on a lookout for a virus.

Check out our Computer Keeps Freezing section for more info

3. Slow Performance – Are We There yet?

If you notice that certain actions take much longer than usual, you should be concerned. As in the previous paragraphs – you must account for specifics of certain files and programs when making a judgment of the slow performance: one PDF document may take much longer time to open simply because it is of a much larger size, and it will not be indicative of the computer virus.

However, keep in mind that some viruses can reproduce and multiply your files and overcrowd disk space, overloading disk usage. In another example, when you are browsing your documents folders and you notice that it takes – unusually – longer to browse from one folder to another, or if it takes more and more time to open the same program, you should be on a lookout for other computer virus symptoms.

4. Slow Startup – Easy doesn't.

Another important symptom of a computer virus is a slow startup. Do not confuse it with wishful thinking. As a collective, we are impatient beings. Did you ever catch yourself pushing an elevator button, mumbling to yourself, "It must be the slowest elevator ever"? My point exactly! When considering the startup process – think of the typical (however slow you may feel it is) to the actual startup time. Does it seem to be much slower than usual? Does it seem to just sit there, and not even a blink or a squeak happens?

If it takes way too long, then it may be a symptom of a viral infection in your computer.

5. Crashing – Crash and Burn, Baby!

When your computer crashes spontaneously, be careful. After computer restarts, you may notice it does not seem to run normally. If it self-restarts frequently, every few minutes – beware of a virus. This symptom alone may indicate that your system is infected. If your computer crashed, best course of action – Do Not Resuscitate and call your IT support company.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Revision No.: 02
			Page 101 of 119

6. Missing files – Gone With the Wind...

When you notice that applications on your computer do not work correctly, you may also notice some of your files are missing. That includes different types of files. Some may be the files that you created, such as images or documents you had saved on your drive. You may physically notice absence of those when you actually look for them and can't seem to find them anywhere. As a result of computer virus infection your computer may also be missing system files. As a user, you may not know what they are and may not notice they are gone, however, if you are trying to use certain applications (browser, email client, document editor, etc.) sometimes those application will refuse to run properly and pop up a warning for you that "critical file is missing" – usually accompanied by the name of the file that is MIA – alerting you to a loss of some files.

7. Disks or Disk Drives Are Not Accessible – Who Ate My Porridge?

If you are loosing the network connection – or worse yet cannot connect to the USB drive you just plugged in, or you go to My Computer and only see one drive instead of your usual X number of drives, you may be in trouble. If you cannot connect to all, some of the drives or cannot access your CD-ROM, it may be one of the symptoms indicating your computer is infected.

8. Extra Files – Who Sat In My Chair?

You may visually notice extra pop ups and extra programs that seem to be running on your computer, especially on startup. You may notice (if you check for it) that your disk space suddenly quadrupled in size without you making 200 copies of your vacation photos folder on your C: drive.

9. Printer Issues – Is This Thing On?

If you cannot get your documents to print correctly, or cannot print at all, you may be dealing with a virus. First, rule out your printer not being turned on. Next, ensure it is connected to your network and is not offline. If it turned on and it is online (connected to your network), and you still have problems with printer, your computer system may have a virus and may affect not just your drive, but your network, as well.

10. Unusual Error Messages – Did You See That?

This may include gibberish messages, messages you hadn't seen before, undesired ad messages and such. Special attention must be paid to messages that disguise themselves as anti-virus warning messages. They are designed to trick you into thinking that you are at risk, and must take action to protect your computer system. Sometimes that is how the virus introduces itself into the system, and sometimes it may already be in your system, and that is how it takes over it, making your more and more vulnerable, and doing further damage to your computer. Again, when you are in doubt, it is best to call professional computer Support Company.

How to Protect Your Computer With Antivirus Software

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
			Revision No.: 02
			Page 102 of 119

Antivirus software protects your computer from worms, Trojan horses and many other types of threats. Without a antivirus application your computer is vulnerable to these types of attacks.

Steps

1. Decide if you want to spend some extra money and pay for your antivirus software or use a free antivirus application.

If you decide to pay for your antivirus software you can buy it directly from the antivirus company or head out to your local store with a electronic section and buy it there.

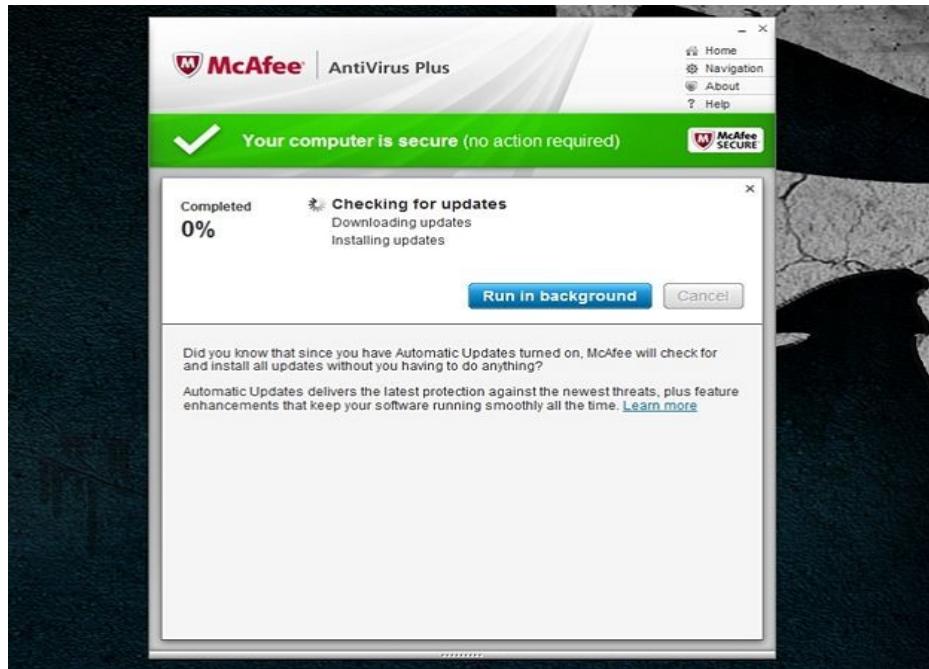


If you decide to download a free antivirus application you can download it from directly from the antivirus company's website. If you have dial-up internet it may take hours to download.

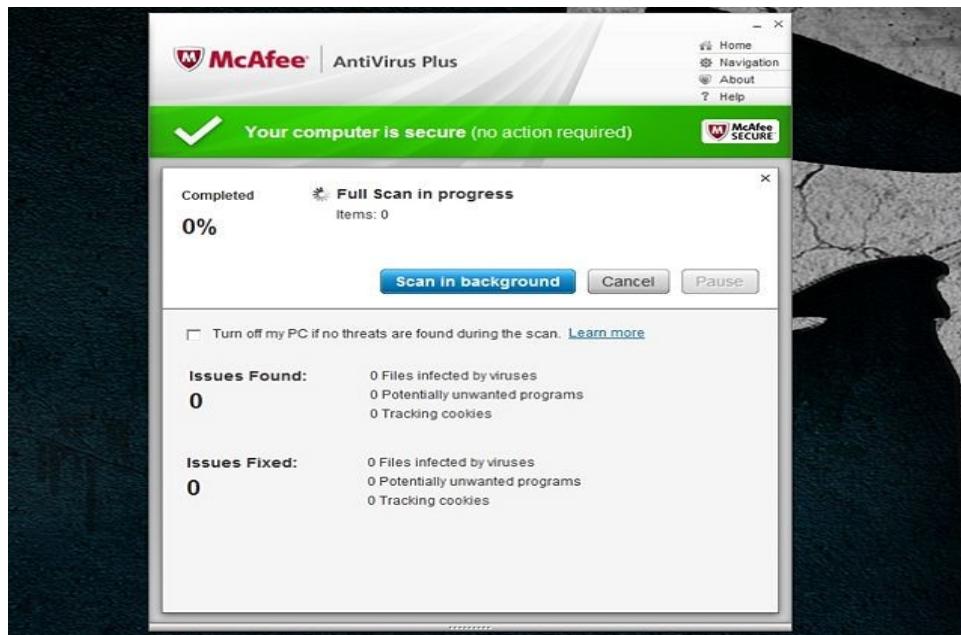
A screenshot of a McAfee product download page and a file download security warning dialog box. The main page shows various McAfee products like Total Protection, Internet Security, and AntiVirus Plus with 'Learn More' and 'Buy Now' buttons. A 'File Download - Security Warning' dialog box is overlaid, asking 'Do you want to run or save this file?'. It shows the file name 'KSU McAfee Anti-Virus 8.5i.exe', type 'Application, 22.6MB', and source 'licensed.kent.edu'. It has 'Run', 'Save', and 'Cancel' buttons. A shield icon with a warning message at the bottom says: 'While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not run or save this software. [What's the risk?](#)'.

2. Run the installer for your antivirus application. Follow all steps exactly as the installer says too. About all antivirus installers setup the antivirus application for maximum protection.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Developed by: Ronaldo B. Racelis	Date Revised: March 1, 2017
		Revision No.: 02	Page 103 of 119



- Once installed it is a good idea to check for updates if the installer did not do it during the installation.



- Once everything is setup and updated it is also a good idea to run a scan and remove any virus that may have been on your computer before the antivirus application was installed.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001	
		Date Revised: March 1, 2017	Page 104 of 119	
Developed by: Ronaldo B. Racelis		Revision No.: 02		

Self- Check _____

(Information Sheet 1.1)

Computer Basics

(Identification) : (Identify the term being described for each of the following)

1. An input device used with graphical user interfaces (GUI) to point to, select, or activate images on the video monitor.
2. Is the hardware within a computer that carries out the instructions of a computer program by performing the basic arithmetical, logical, and input/output operations of the system?
3. A hard copy output device that applies data to paper.
4. is also known as a "**computer chassis**", "**tower**", "**system unit**", "**base unit**" or simply "**case**". Also sometimes incorrectly referred to as the "**CPU**" or "**hard drive**"
5. Converts mains AC to low-voltage regulated DC power for the internal components of a computer.
6. The most powerful computers in terms of performance and data processing.
7. Are any physical part of the computer which include all the internal components and also the external part like the monitor and the keyboard.
8. It holds many of the crucial electronic components of the system, such as the central processing unit (CPU) and memory, and provides connectors for other peripherals.
9. Is any set of instructions that tells the hardware what to do such as a web browser, media player or word processor.
10. Is an electronic device that manipulates information, or "data." the computer sees data as one's and zero's but he knows how to combined them into more complex things such as a photograph, a movie, a website, a game and much more.

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 105 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

ANSWER KEY _____
(Computer Basics)

1. Computer Mouse / Mouse
2. Central processing Unit (CPU)
3. Printer
4. Computer Case
5. Power Supply Unit (PSU) / Power Supply
6. Super Computer
7. Hardware
8. Motherboard
9. Software
10. Computer

Information Sheet 1.2

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 106 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

(Occupational Health and Safety)

(Situational) : (Answer the following question regarding Occupational health and safety)

1. Why is it important to wear Personal Protective Equipment in the workplace?
2. How will you disperse static electricity before assembling a computer?
3. What will you use to cleaning the computer system?
4. Why do we need to identify Hazard/risks in the workplace?
5. What will you do first before assembling or dissemble your computer?

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 107 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

ANSWER KEY _____
(Occupational Health and Safety)

1. To protect the user against health or safety risks at work.
2. Use anti-static devices and rubber footwear.
3. Use brush, compressed air or blower in cleaning the computer system.
4. To minimize or eliminate risk to co-workers, workplace and environment.
5. Always power off and unplug the computer before working on it.

(Information Sheet 1.3)

Used of Hand Tools

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 108 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

(Identification) : (Identify what is this tool.. tell what is that tool for)

- **Multimeter** - used to **test** the integrity of circuits and the quality of electricity in computer components.
- **Anti-static wrist strap** - used to prevent ESD damage to computer equipment
- **Flashlight** - used to **light up** areas that you cannot see well.
- **Needle-nose pliers** - used to **hold** small parts.
- **Wire cutter** - used to **strip** and **cut** wires.
- **Compressed air** - used to **blow away** dust and debris from different computer parts without **touching** the components.
- **Cable ties** - used to **bundle** cables neatly **inside** and **outside** of a computer.

(Information Sheet 1.3)

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 109 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Motherboard Parts Identification

TASK SHEET _____	
Title:	
Performance Objective: Given (condition), you should be able to (performance) following (standard).	
Supplies/Materials : Motherboard	
Equipment : Motherboard	
Steps/Procedure: <ol style="list-style-type: none">1. Identify each part of the motherboard2. What is the function of that part	
Assessment Method: oral questioning	

Information Sheet 1.7

Power Supply Unit

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 110 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

(Identification) : (Identify what is the value or meaning of the following color codes of the PSU)

Yellow

Red

Orange

Black

Purple

Green

Grey

White

Blue

ANSWER KEY —

Power Supply Unit

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 111 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Yellow: +12V

Red: +5V

Orange: +3.3V

Black: Ground

Purple: 5V SB (standby voltage)

Green: /PS_ON (it can be shorted to ground to start PSU)

Grey: PWR_OK (status signal generated by PSU to indicate voltages are OK)

White: -5V (optional on newer ATX-2 PSUs)

Blue: -12V

Information Sheet 1.8

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 112 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

TASK SHEET _____	
Title: Assemble and Disassemble	
Performance Objective: Given (assemble and dissemble a computer), you should be able to (identify each parts and function) following (steps to a safe and successful disassemble and disassemble process).	
Supplies/Materials : Anti-static strap/screw driver	
Equipment : system unit (desktop computer)	
Steps/Procedure: <ol style="list-style-type: none">1. Disassemble the computer2. Assemble the Computer3. Identify the parts of the computer4. Identify the function of the parts of the computer	
Assessment Method: actual/oral questioning	

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 113 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Learning Outcome 2

Making ISO Image Using Power ISO

TASK SHEET _____	
Title: Making ISO image using PowerISO	
Performance Objective: Given (use powerISO to make an ISO image), you should be able to (create ISO image) following (The step in making ISO image).	
Supplies/Materials : PowerISO	
Equipment : system unit (desktop computer)	
Steps/Procedure: <ol style="list-style-type: none">1. Download PowerISO2. Install PowerISO3. Create ISO image	
Assessment Method: actual/oral questioning	

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 114 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Creating Bootable Flash Drive using Rufus

TASK SHEET _____	
Title: Creating Bootable Flash drive using Rufus	
Performance Objective: Given (use Rufus to make a bootable flash drive), you should be able to (create a bootable flash drive) following (The step in making bootable flash drive).	
Supplies/Materials : Rufus/flash drive 4gb or higher	
Equipment : system unit (desktop computer)	
Steps/Procedure: <ol style="list-style-type: none">1. Download Rufus2. Install Rufus3. Create Bootable flash drive using Rufus	
Assessment Method: actual/oral questioning	

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 115 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Installing Windows Server 2008 R2 Standard x64 bit

TASK SHEET	
Title: Installing Windows Server 2008 R2 Standard x64 bit	
Performance Objective: Given (Install Windows Server 2008 R2), you should be able to (Install Windows Server) following (The step in Installing Windows 2008 R2).	
Supplies/Materials	: Bootable Flash Drive (Windows Server 2008 R2)
Equipment	: system unit (desktop computer)
Steps/Procedure: <ol style="list-style-type: none">1. Change the BIOS boot order so the USB device option is listed first.2. Create a partition for the hard drive; Drive C: 40 % Drive D: 60 %3. Install Windows Server 2008 R24. Put password : asian@12345	
Assessment Method: actual/oral questioning	

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 116 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

Learning Outcome 3

TASK SHEET _____

Title: **Install Application Software**

Performance Objective: Given (**Install Application Software**), you should be able to (**Install: WinRAR, Network device Driver and Kingsoft**) following (**steps to install; WinRAR, Network device Driver and Kingsoft process**).

Supplies/Materials : WinRAR, Network device Driver and Kingsoft

Equipment : system unit (desktop computer)

Steps/Procedure:

1. Install winRAR
2. Install Network device driver
3. Install kingsoft office

Assessment Method: **actual/oral questioning**

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 117 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

REFERENCES AND FURTHER READING

Computer Basics:

<http://www.gcflearnfree.org/computerbasics/what-is-a-computer/1/>

Disassembling/Assembling:

<http://clhidohsr.blogspot.com/2010/11/steps-for-safe-and-successful-system.html>

<https://turbofuture.com/computers/Dissassembling-and-Assembling-the-computer-system>

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 118 of 119
	Developed by: Ronaldo B. Racelis	Revision No.: 02	

 AsianCollege	Computer Systems Servicing NCII	Date Developed: March 2, 2017	Document No. CSS – 2015-001
		Date Revised: March 1, 2017	Page 119 of 119
		Developed by: Ronaldo B. Racelis	Revision No.: 02