



GOVT. POLYTECHNIC BALASORE

[LAB MANUAL]

COMPUTER HARDWARE LAB

[PR. 2]

DIPLOMA

IN

5TH SEMESTER, E&TC ENGINEERING

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ENGINEERING**

Experiment No. 1

AIM OF THE EXPERIMENT:

To study personal computer layout system.

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment -

To study personal computer layout system.

Equipment required -

Personal computer

Theory -

Computer :

A computer in simple terms can be defined as an electronic device that is designed to accept data, perform the required mathematical or logical operational at high speed and output the result.

Basic computer organization -

A computer is an electronic device that basically perform

- Accepting data or (information) / instructions (input)
- Storing data
- Processing data
- Displaying result (output)
- Controlling and co-ordinating all operation inside a computer.

Input device

This is the process of entering data & instruction into the computer system. This data or instruction can be entered into the computer system by using different input devices such as keyboard, mouse, scanner, joystick, MICR, OMR, BCR, camera etc.

Keyboard –

It is the standard or main input device for computer. It contains various keys in a board such as alphabet key(a-z), number key(0-9),function key(f1 –f12) Escape key, control key, tab key, shift key, caps lock key, enter key, num lock pad, page up & down etc.

Type of keyboard

- Standard keyboard (108keys)
- Multimedia keyboard (115 keys)

Connection of keyboard–

Keyboard can be connected with different ports like serial port, PS/2 port,USB port etc.

Advantage -

The keyboard is easy to use and cheap.

Disadvantage –

The keyboard cannot be used to draw figure.

Mouse –

The mouse is an input device that use for graphical user interface (GUI). Basically mouse is having 2 types-

1. Scroll mouse
2. Wireless/ Cordless mouse
3. Optical mouse

Now days the optical mouse is very much popular. It is used to create graphics such as lines, curves and freehand shapes on the screen.

Mouse can be connected with different ports like serial port, PS/2 port, USB port. It is having left button, right button and scroll button.

Scanner -

It is an input device which scan/ convert the physical images, photograph, written document into a system / computer files.

Camera -

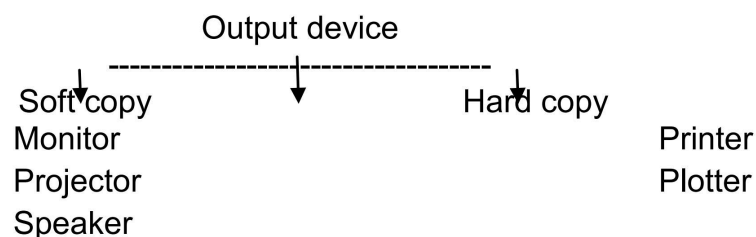
Video input signal device are used to captures video from the outside world into the computer. The term video means moving pictures along with sound. We are having sound card to convert analog audio signal to digital data and vice versa. Like such a manner video card isto convert analogue signal to digital data and vice versa.

Example of video signal device -

1. Digital camera
2. Web camera

Output device –

It is the device that gives information from a computer can be called an output device. Basically output device are electromechanical device that accepts signal digital data(in this form of 0 1 and 1 1) from the computer and convert them into human understandable language.



Soft copy

Soft copy device produce an electronic version of an output.

Monitor (visual display unit/ VDU)

The monitor is a soft copy device generated by the computer through the video card. Different types of VDU/Monitor

1. CRT (Cathode Ray tube)
2. LCD (Liquid Crystal display)

3. TFT (Thin Film Transistor)
4. LED (Light Emitting Diodes)

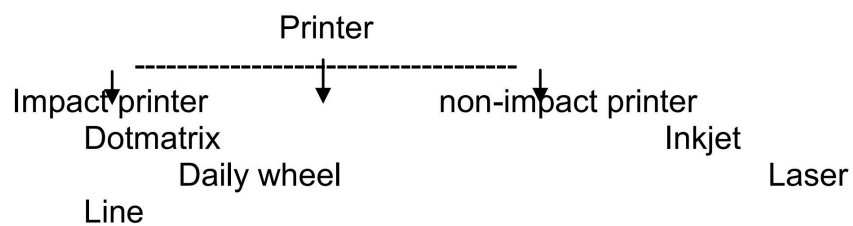
Hardcopy Device-

Hardcopy device produce a physical form of output.

For e.g.:-The content of a file printed on a paper is a form of hardcopy output.

Printer-

A printer is a device that accept the text and graphs information obtained from a computers and print it on to a paper. printers are available in various size, speeds, resolution and memory card.



Conclusion

From the above experiment we have studied the computer's input and output devices .

Experiment-2

AIM OF THE EXPERIMENT:

To study the computer memory and processor.

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment

To study the computer memory and processor.

Equipment required

Personal computer

Theory.

Memory is an external storage area in a computer which is used to store the data and program either temporary or permanently.

Memory is divided in two groups.

- Primary memory
- Secondary memory

RAM	-	Random access memory
FPM	-	Fast Page mode
DRAM-		Dynamic random access memory
SRAM	-	Static ram
EDORAM	-	Extend Data Output ram
SDRAM	-	Synchronous Data ram
RDRAM	-	Rambus Dynamic ram
DDRRAM	-	Dual data rate ram
ROM	-	Read only memory
PROM	-	Programmable rom
EPRPM	-	Erasable programmable rom
EEPROM	-	Electrically Erasable programmable rom
EAPROM	-	Electrically alterable programmable rom
FD	-	Floppy disk
FDD	-	Floppy disk drive
HD	-	Hard disk

Primary memory

Primary memory is the main memory i.e internal memory. It is directly accessed by the CPU. The CPU continuously read the instructions stored in primary memory and execute them.

RAM- Ram is a volatile memory, which is used to store data temporarily.

ROM- Rom is a non-volatile memory, where the system configuration data are stored by the manufacturer.

Secondary memory -

It is also called "auxiliary memory or permanent memory".

Magnetic tape-

Magnetic tape is a medium for magnetic recording, made of a thin, magnetizable coating on a long, narrow strip of plastic film.

Floppy disk-

It has the storage capacity 1.44mb and size is 3.5inch.

Hard disk-

Storage capacity 1 GB, 10GB, 1tb, 2tb.

A **processor**, or "microprocessor," is a small chip that resides in **computers** and other electronic devices. Its basic job is to receive input and provide the appropriate output. Most desktop **computers** contain a **CPU** developed by either Intel or AMD.

Control unit -

It is main unit where instruction should be obeyed and performed time by time.

Alu -

In this unit all arithmetically tasked are performed.

Conclusion

From the above experiment we have studied the computer's memory and processor.

Experiment-3

AIM OF THE EXPERIMENT:

To study the overview of front panel and back panel.

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment-

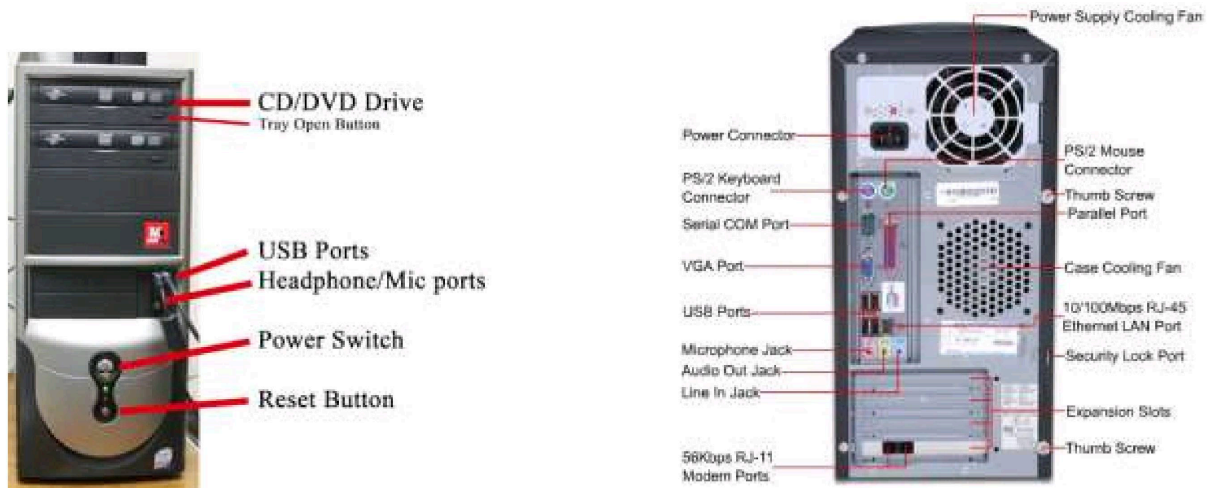
To study the overview of front panel and back panel.

Equipment required-

Personal computer

Theory-

Front panel



- CD drive - This is the drive where any external CD/DVD can be inserted.
- Floppy disk drive - This the drive where any external floppy can be inserted.
- Power button - It is the button where the power can supply in to the system.
- Reset button – It is to restart the system .
- USB ports – It is used to attach any kbd, mouse, printer, pendrive etc.
- Headphone / Mic port – it is use to attach headphone or speaker.
- Led - It is the indicator which shows the power supply current is going on into the system.

Back panel

- SMPS/Power supply – (switch mode power supply) It is having the 3 pin power connector , to supply AC current in to the system. This unit provides all the electrical power needed by all the components of the computer.
- Power supply cooling Fan – This fan cool the smps.
- PS/2 connector – This is 6 pin female port used to connect kbd and mouse.

- Serial com port – This is 9 pin male port used to connect kbd.
- VGA port – This is 15 pin female port used to connect VGA cable.
- Parallel port – This is 25 pin female port used to connect printer.
- USB port - This port can connect up to 127 peripherals (such as mouse, keyboard, printer, pendrive etc.) at once.
- RJ-45 LAN port – The Ethernet port accepts an Ethernet cable which allows you to communicate on a network that runs transmission control protocol/internet protocol (TCP/IP).
- Audio Jack - Mike in port (pink), Audio/Speaker output (green), Line in port (Blue)
- Expansion slots - An **expansion slot** is a socket on the motherboard that is **used** to insert an **expansion** card (or circuit board), which provides additional features to a computer such as video, sound, advanced graphics, Ethernet or memory.
- RJ 11 – Telephone modem card with RJ-11 female connectors to phone line and telephone. (broad band connection)

Conclusion:

From the above experiment we have studied the front and back panel.

Expriment- 4

AIM OF THE EXPERIMENT:

To study motherboard layout of a system

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment

Equipment required

Personal computer

Theory

Mother Board

A Computer Motherboard is commonly known as Main board or MB or System board or logic board is designed on PCB (Printed Circuit Board).That holds or connects all components and parts together on a single sheet. The Computer Motherboard holds all the circuitry to connect the various components of a computer system. Therefore it is also called as backbone of [Personal computer system](#). **The Main board or Motherboard** is the main, crucial and important part of the computer system. It holds many important components such as [Computer memory](#) slots, cpu, sata IDE slots, expansions slots(PCI,AGP etc),capacitor's, resistor's ,BIOS chip etc The Computer main board is made up of thin sheet of non conductive material from plastic.

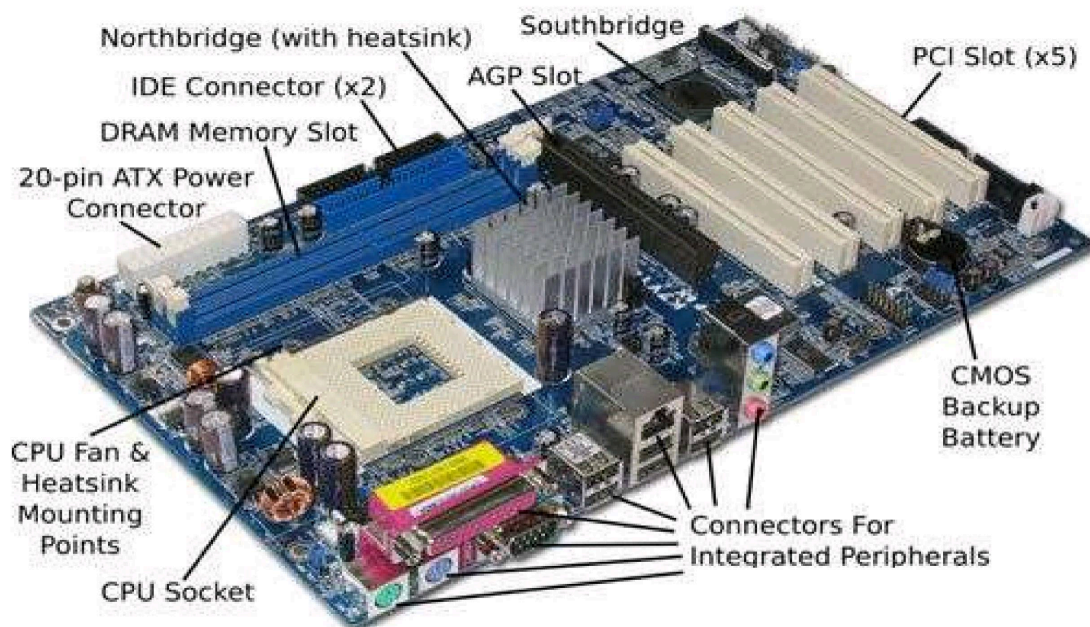
The motherboard may be characterized by the

1. Form factor
2. Chipset
3. Processor socket

Form factor : It refers to the motherboard's geometry, dimensions, arrangement and electrical requirements. Advanced Technology Extended (ATX) is the most common design of motherboard for desktop computers.

Chipset : It is a circuit, which is used to controls the of resources such as the bus interface with the processor, cache memory and RAM, expansion cards, etc. It used to coordinate data transfers between the various components of the computer.

The processor socket : It is a connector into which the processor is mounted. The Basic Input Output System (BIOS) and Complementary Metal – Oxide semiconductor (CMOS) are present on the motherboard



Components of Motherboard

1. PCI Slot – This board has 2 PCI slots. These can be used for components such as Ethernet cards, sound cards, and modems.
2. PCI-E 16x Slot – There are 2 of them on this motherboard diagram, both are blue. These are used for your graphics card. With two of them onboard, you can run 2 graphics cards in SLI. You would only need this if you are a gamer, or working with high end video / graphics editing. These are the 16x speed versions, which are currently the fastest.
3. PCI-E 1x Slot – Single slot – In the PCI e 1x generation, each lane (1 x) carries 250 MB/s compared to 133 MB/s for the PCI slots. These can be used for expansion cards such as Sound cards, or Ethernet cards.
4. Northbridge – This is the Northbridge for this motherboard. This allows communication between the CPU and the system memory and PCI-E slots.

5. ATX 12V 2x and 4 Pin power connection – This is one of two power connections that supply power to the motherboard. This connection will come from your Power Supply.
6. CPU – Fan Connection – This is where your CPU fan will connect. Using this connection over one from your power supply will allow the motherboard to control the speed of your fan, based on the CPU temperature.
7. Socket – This is where your CPU will plug in. The orange bracket that is surrounding it is used for high end heat sinks. It helps to support the weight of the heat sink.
8. Memory slots – These are the slots for your RAM. Most boards will have 4 slots, but some will only have 2. The color coding you see on the motherboard diagram is used to match up RAM for Dual-Channel. Using them this way will give your memory a speed boost.
9. ATX Power connector – This is the second of two power connections. This is the main power connection for the motherboard, and comes from the power supply.
10. IDE connection – The IDE(Integrated Drive Electronics) is the connection for your hard drive or CD / DVD drive. Most drives today come with SATA connections, so you may not use this.
11. Southbridge – This is the controller for components such as the PCI slots, onboard audio, and USB connection.
12. SATA connections – These are 4 of the 6 SATA connections on the motherboard. These will be used for hard drives, and CD / DVD drives.
13. Front Panel connections – This is where you will hook in the connections from your case. These are mostly the different lights on your case, such as power on , hard drive activity etc.
14. FDD connection – The FDD is the floppy Disk controller. If you have a floppy disk drive in your computer, this is where you will hook it up.
15. External USB connections – This is where you will plug in external USB connections for your case or USB bracket.
16. CMOS battery – This is the motherboard's battery. This is used to allow the CMOS to keep it settings.

Types of ports & connectors



Keyboard & Mouse : This Port is used to connect keyboard and mouse , now a day we use USB connector for keyboard and mouse



Serial or COM : It used to connect some types of modem, scanner, or digital camera



Parallel or Printer : You plug your printer into the parallel, or printer, port. But now printers may use a USB port



USB : Designed to replace older Serial and Parallel ports, the USB (Universal Serial Bus) can connect computers with a number of devices, such as printers, keyboards, mice, scanners, digital cameras, PDAs, and more



Video or Monitor : It used to connect your monitor into the video port



Line Out : It used to connect speakers or headphone into the Line Out jack



Line In : The Line In jack allows you to listen to your computer using a stereo system



Microphone : It used to connect a microphone into this jack to record sounds on your computer



Joystick or Game : If you have a joystick, musical (MIDI) keyboard, or other gaming device, this is where you plug it in



Phone or Modem : The phone or modem jack is where you plug your computer into a phone line



Network or Ethernet : You can connect your computer to a network by plugging in an Ethernet cable in this port



SCSI : It used to connect a hard drive, CD-ROM drive, or other device to a computer

Conclusion:

From the above experiment we have studied the motherboard layout system

Experiment-5

AIM OF THE EXPERIMENT:

To study the connection of pen drive, USB and Ipod

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the Experiment

To study the connection of pen drive, USB and Ipod

Equipment Required

Personal Computer

Theory

Connect and enable a pen drive and iPod

1. Insert pen drive and iPod into the USB port
2. It automatically display message (new device found)

3. If the device is having data then it automatically opens with a small window.

Format the pen drive or iPod-

1. Select the pen drive with their specified drive name (E : / F: etc)
2. Press right mouse button above of the drive name.
3. Then click in format
4. Select the quick format option for quickly formatting the device.
5. Click in start button.
6. It will take sometime after that it display a message “format completed”.

Copy files and folders from pen drive/l ports to hard disk

1. Open my computer.
2. Select the pen drive.
3. Double click for open the pen drive.
4. Select files or folders by left click.
5. Click right mouse button above the selected files or folders.
6. Click on copy.
7. Select the hard disk (C: / D:)
8. Right click at blank place.
9. Click in the paste.

Copy files and folders from hard disk to pen drive

1. Open my computer.
2. Select the C: / D: drive.
3. Double click it for opening the C: / D: drive.
4. Select files or folders by left click.
5. Click right mouse button above the selected files or folders.
6. Select the pen drive for copy.
7. Right click on the blank space.
8. Click in paste.

Conclusion:

From the above experiment we have studied and about use of pendrive / ipod, and transfer the data from hard disk to pendrive & vice versa.

Experiment - 6

AIM OF THE EXPERIMENT:

To study CMOS setup utility in PC.

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To study CMOS setup utility in PC.

Experiment requirement:

Personal Computer

Theory:

CMOS : **CMOS** (Complementary metal-oxide-semiconductor) is the term usually used to describe the small amount of memory on a computer motherboard that stores the BIOS settings.

The BIOS setup has also been called the "CMOS setup" or "CMOS RAM," because settings were initially held in a battery-backed CMOS memory circuit. Subsequently, BIOS settings were stored in non-volatile flash memory.

Accessed at Startup

The BIOS setup is accessed at startup. Soon after a PC is turned on, a short screen message typically passes by very quickly indicating which key to press (usually Esc, F1, F12 or Del).

CMOS setup utility:

1. Standard BIOS feature
2. Advance BIOS feature
3. Advance chip set features
4. Boot configuration feature
5. Power management feature
6. PnB/PCI Configuration
7. PCL health status
8. BIOS security feature
 - ❖ load fail-safe default
 - ❖ Load optimized default
 - ❖ Save exit setup
 - ❖ Exit without saving

Conclusion:

From the above experiment we have studied the CMOS setup utility in PC.

Experiment -7

AIM OF THE EXPERIMENT:

To study installation of FDD drive.

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To study installation of FDD drive.

Equipment required:

Personal Computer

Theory

1. When physically installing the standard floppy disk drive, ensure the computer is powered down and unplugged.

2. Open the computer case and connect the floppy drive to the computer using screws or a bracket.
3. After installing the floppy drive, connect the floppy interface cable (small gray flat cable) to the back of the floppy drive. The floppy cable has a side with a blue or red line indicating pin number one. This side of the cable points to the power connection. If your computer floppy cable has three connections or a twist in the cable, verified it's connected correctly by referring to the picture below.
4. After connecting the floppy interface cable, connect the drive power cable to the back of the floppy disk drive. This cable is relatively small, compared to the majority of power cables coming from the power supply.

NOTE : Today, most computers and computer floppy disk drives have cables that only have two connections: one for the motherboard and one for the floppy disk drive. If your cable only has two connections, the above picture does not apply.



Setup BIOS

Once the floppy drive is fully connected to the computer, put the case back on the computer. Then, connect the keyboard, monitor, and power to the computer.

Once connected, turn on the computer and enter the BIOS setup. Verify the floppy drive is recognized and properly configured in BIOS, most likely as a 1.44 MB 3.25" floppy.



Conclusion :

From the above experiment we have studied about the installation of FDD drive.

Experiment no-8

AIM OF THE EXPERIMENT:

To study installation of DVD Multirecorder drive.

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To study the installation of DVD Multirecorder drive.

Equipment requirement:

Personal Computer.

Theory

How to Install a CD/DVD Drive in a PC

1. Power down the PC completely. After the computer has safely shut down, turn off the internal power by flipping the switch on the back of the power supply and removing the AC power cord.
2. Open the computer to install the CD or DVD drive. The method for opening the case varies depending upon your computer model. Most use a panel or door on the side of the computer. Older computers may require you to remove the entire cover. Remove and set aside any screws that fasten the cover or panel to the computer case and then remove the cover.
3. Remove the drive slot cover. [Most computer cases](#) have several slots for external drives but only use a few. Any unused drive slot has a cover that prevents dust from entering the computer. Remove the 5.25-inch drive slot cover by pushing tabs either on the inside or outside of the case. Sometimes a cover might be screwed into the case.
4. Set the IDE drive mode. Most CD and DVD drives for desktop computers use the IDE interface, which allows for two devices on a single cable. Place each device on the cable into the appropriate mode. One drive is the primary, and the other drive is the secondary. One or more jumpers on the back of the drive usually handle this setting. Consult the documentation or diagrams on the drive for the location and settings.

If you plan to install the CD/DVD drive on an existing cable, set the drive to the Secondary mode. If the drive will reside on an [IDE cable](#) alone, set it to the Primary mode.

5. Place the CD/DVD drive into the computer. The method for installing the drive varies depending on the case. The two common methods for installing a drive are either through drive rails or directly into the drive cage.
 - a) **Drive Rails:** Position the drive rails on the side of the drive and fasten the rails with screws. Once you place the drive rails on both sides of the drive, slide the drive and rails into the appropriate slot. Affix the drive rails, so the drive is flush with the case when you fully insert it.
 - b) **Drive Cage:** Slide the drive into the slot in the case, so the drive bezel is flush with the computer case. Fasten the drive to the computer case by placing screws into the appropriate slots or holes.
6. Attach the internal audio cable. To use CD/DVD drives to listen to music, the audio signal from the CD drive must route to the computer audio solution. Typically, a small two-wire cable with a standard connector handles this. Plug this cable into the back of the CD/DVD drive. Then, plug the other end into either a PC audio card or motherboard depending upon the computer's audio setup. Lastly, plug the cable into the connector labeled as CD Audio.

7. Attach the CD/DVD drive to the computer using an IDE cable. Usually, the drive resides secondary to the hard drive. If so, locate the free connector on the [IDE ribbon cable](#) between the computer and the hard drive, then plug it into the drive. If the drive will be on its own cable, connect the IDE cable to the motherboard and one of the other connectors of the cable into the CD/DVD drive.
8. Plug the drive into the power supply. Locate one of the [4-pin Molex connectors](#) from the power supply and insert it into the power connector on the CD/DVD drive.
9. After you install the drive, close the computer. Replace the panel or cover to the computer case. Fasten the cover or panel to the case using the screws you set aside when you removed the cover.
10. Plug the AC cord into the power supply and flip the switch to the **On** position.
11. The computer system should automatically detect and use the new drive. Since CD and DVD drives are standardized, you shouldn't have to install any specific drivers. Consult the instruction manual that came with the drive for instructions for your particular operating system.



How to read/write using CD/DVD:

- ❖ Open the DVD drive in my computer
- ❖ Double click above the icons to display to content.
- ❖ To open the file, double click just above of the file or folder
- ❖ For writing, copy any file and paste in CD/DVD or by writing software like NERO 8.

Conclusion:

From the above experiment, we studied about the installation of DVD multirecorder drive

Experiment no-9

AIM OF THE EXPERIMENT:

To study installation of HDD.

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To study the installation of HDD.

Equipment requirement:

Personal computer.

Theory

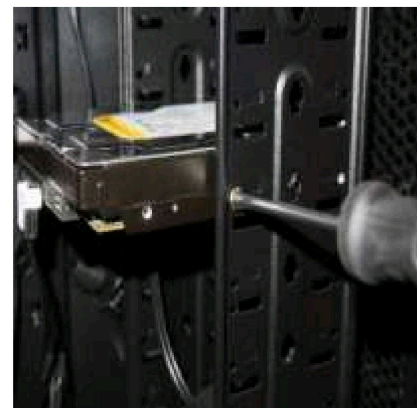
Install a hard drive in to a computer

Installing an internal hard drive is the process usually requires no more than mounting it, connecting a couple of cables, and formatting the drive for use. Still, there are a few things you should know to make installation as smooth as possible.

Installing a hard drive in your PC doesn't necessarily follow the same procedure as installing an SSD. If you've opted for a solid-state drive, be sure to check out our companion guides explaining [how to install an SSD in a desktop](#) and [a laptop](#). SSDs tend to offer much faster speeds than hard drives, but hard drives offer significantly more capacity at lower prices.

Drive cages, bays, and mounting options

Internal 3.5-inch hard disk drives are typically mounted in a drive cage or in an available drive bay. Placement and orientation of the cages or bays will vary from case to case. The most common location is at the lower front, near the intake fans and away from other components. Drive cages/bays will most often be mounted perpendicular to the bottom of the chassis, while drives mounted in the cages usually sit parallel to the bottom of the case.



Mounting your hard drive

Physically mounting the hard drive in a PC is probably the most difficult part of the installation process.

Securing the drive to a cage usually requires four screws on the sides or bottom of the drive. Many cases—especially enthusiast cases—use tool-less trays that hold the drives with simple pins and clips.

Drives last longer when they stay nice and cool. When mounting drives in a system, try to leave as much space between them as possible to maximize airflow over the tops and bottoms. Positioning the drives directly in front of an intake fan also helps.

Connect the hard drives with SATA

Once the drive is mounted, connecting it to your system is quick and easy.

Virtually all new desktop hard drives sold today use the SATA interface (unless you're dealing with servers). SATA uses simple cables that are keyed to fit on the drive and motherboard



connector one way. Connect one end of the SATA cable to the drive, and the other end to an available SATA port on your motherboard.

Prepare the hard drive for use

Once you've mounted and connected the drive, power up your system and enter the BIOS/UEFI. You can usually access the BIOS/UEFI by pressing the DEL or F2 keys right after powering up the system. Usually, your system will display a message along the lines of "Press DEL to enter Setup."

In the BIOS, go to the standard System Settings menu or the *Integrated Peripherals* > *SATA* menu to see all of the drives installed in the system. If all of your drive controllers are enabled and the drive is properly connected (and functional), it should be listed in the BIOS.

If the drive isn't listed, shut down your PC. Double-check all of the connections, boot into the BIOS and check again. If the drive still isn't showing up and all the connections are secure, try plugging the SATA data cable into a different port on the motherboard.

To confirm that Windows recognizes the drive, open up Device Manager. In Windows 10, right-click the Windows button on your desktop and select Device Manager. Check for the drive in the Disk Drives section.

When you boot into Windows after installing the drive, you may see the New Hardware Found wizard pop up if the drive is detected. **The last thing you need to do is partition and format the drive.**

And with that, the drive should be available for use. If you split the drive up into multiple partitions, you should see several drives appear in File Explorer, each with its own drive letter and label.

Create and format a hard disk partition

To create a partition or volume (the two terms are often used interchangeably) on a hard disk, you must be logged in as an administrator, and there must be either unallocated disk space or free space within an extended partition on the hard disk.

If there is no unallocated disk space, you can create some by shrinking an existing partition, deleting a partition, or by using a third-party partitioning program.

To create and format a new partition (volume)

1. Open Computer Management by selecting the **Start** button. Then select **Control Panel > System and Security > Administrative Tools**, and then double-click **Computer Management**.
2. In the left pane, under **Storage**, select **Disk Management**.
3. Right-click an unallocated region on your hard disk, and then select **New Simple Volume**.
4. In the **New Simple Volume Wizard**, select **Next**.
5. Enter the size of the volume you want to create in megabytes (MB) or accept the maximum default size, and then select **Next**.

6. Accept the default drive letter or choose a different drive letter to identify the partition, and then select **Next**.
7. In the **Format Partition** dialog box, do one of the following:
8.
 - If you don't want to format the volume right now, select **Do not format this volume**, and then select **Next**.
 - To format the volume with the default settings, select **Next**.
9. Review your choices, and then select **Finish**.

Note: When you create new partitions on a basic disk, the first three will be formatted as primary partitions. Beginning with the fourth, each one will be configured as a logical drive within an extended partition.

To format an existing partition volume

Warning: Formatting a volume will destroy any data on the partition. Be sure to back up any data you want to save before you begin.

1. Open Computer Management by selecting the **Start** button. Then select **Control Panel > System and Security > Administrative Tools**, and then double-click **Computer Management**.
2. In the left pane, under **Storage**, select **Disk Management**.
3. Right-click the volume that you want to format, and then select **Format**.
4. To format the volume with the default settings, in the **Format** dialog box, select **OK**, and then select **OK** again.

Notes:

- You cannot format a disk or partition that is currently in use, including the partition that contains Windows.
- The **Perform a quick format** option will create a new file table, but will not fully overwrite or erase the volume. A **quick format** is much faster than a normal format, which fully erases any existing data on the volume.

Conclusion:

From the above experiment we have studied the installation of HDD.

Experiment no-10

AIM OF THE EXPERIMENT:

To study the installation of printer and trouble shooting.

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To study the installation of printer and trouble shooting.

Equipment required:

Personal computer, printer.

Theory

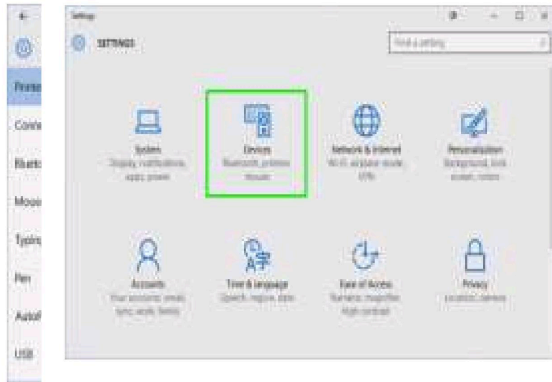
Installing printer

Installing a USB Printer

1. **Read the installation guide for your printer if you have it.**
2. **Plug the printer into your computer.** Make sure to plug it into a USB port directly on your computer, and not a USB hub. Some printers will need to be plugged into a power source as well.
3. **Turn the printer on.** You should hear the page feed mechanism start and the printer should light up.
4. **Wait for your operating system to detect and install the printer.**
5. **Install the software that came with the printer.** This will usually install any drivers that weren't installed automatically by Windows, and may install extra printing software that allow you to take advantage of additional features on your printer.
6. **Download the drivers from the manufacturer's website.** If you don't have the disc and the printer wasn't installed automatically, you can download the drivers directly from the manufacturer. You will need to know your printer's model number, which should be prominent on the printer itself.
7. **Run the downloaded drivers.** After installing the drivers, your printer should now be ready to print from any program on your computer that supports printing.

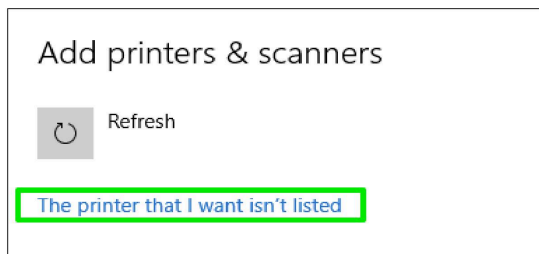
Add a Local Printer

1. **Connect the printer to your computer using the USB cable** and turn it on.
2. **Open the Settings app** from the Start menu.
3. **Click Devices.**
4. **Click Add a printer or scanner.**



5. If Windows detects your printer, **click on the name of the printer and follow the on-screen instructions** to finish the installation. And you're done.

If Windows doesn't find your connected printer, click on "The printer that I want isn't listed" link.

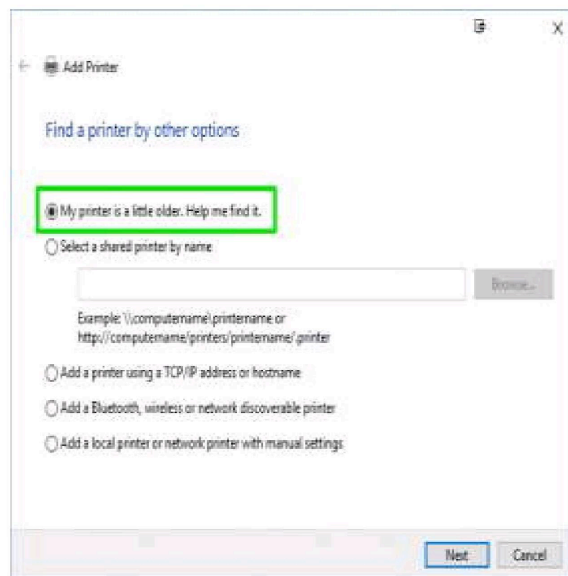


Then let the Windows troubleshooting guide help you find your printer. It will search for available printers and help you download the drivers for them.

If that doesn't work, head to your printer manufacturer's website and download the drivers and installation tools for your printer.

Add a Wireless Printer

The steps to install a wireless printer may vary by manufacturer. In general, however, modern printers today will detect your network and automate the installation.



1. **Use the printer's LCD panel to enter the wireless setup.** On my Epson printer this is under Setup > Wireless LAN Settings.

2. **Select your Wi-Fi network.** You'll need to know your home network's SSID, which you can find by hovering your mouse over the Wi-Fi icon in the taskbar.

3. **Enter your network password.**

In some cases, you might need to temporarily connect your printer to your computer via USB to install software. But otherwise, that's it. You should find your printer automatically added in the Printers & scanners section under Settings > Devices.

If you run into trouble, make sure your printer is relatively close to your computer and not too far from your wireless router. If your printer has an Ethernet jack, you could also connect it directly to your router and manage it with a browser interface.

Add a Shared Printer

Windows' home networking feature called HomeGroup automatically shares printers and certain files with other computers on your home network. Here we'll set up a HomeGroup, if you don't already have one set up, and connect to the shared printer.

Set Up a HomeGroup

Skip this step if your home network already has a HomeGroup set up. If you're not sure, follow steps 1 and 2 below to check.

1. **Right-click on the wireless icon in the taskbar** and select "Open Network and Sharing Center".
2. **Click "Ready to create"** next to HomeGroup. If a HomeGroup already exists on your network, it will say "Joined."
3. **Click the Create a homegroup button.**
4. **Click Next.**
5. **Select what you want to be shared.** Printers & Devices are shared by default.
6. **Write down the HomeGroup password** Windows creates for you. You'll need it for each computer you want to join the HomeGroup.
7. **Click Finish.**

Connect to a Shared Printer on the HomeGroup

Now head to the other computer(s) on your network to join the Home Group.

1. **Click Homegroup and then the Join now button** in Windows Explorer
2. **Click Next.**
3. **Verify what you want to share and click Next.**
4. **Enter the password and click Next.**
5. **Click Finish.**
6. **Click Network** in Windows Explorer and you should see the shared printer installed.

Conclusion:

From the above experiment, we have studied about the installation of printer and trouble shooting.

Experiment no-11

AIM OF THE EXPERIMENT:

To study the installation of scanner.

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To study the installation of scanner.

Equipment required:

Personal computer.

Theory

Installation of scanner

1. Connecting the scanner to your PC/ laptop's USB port. (See your scanner manual for information about how it connects to your PC/laptop.)
2. Turn the scanner on. Some scanners use Plug and Play, a technology that Windows uses to recognize equipment, install it automatically, and set it up.

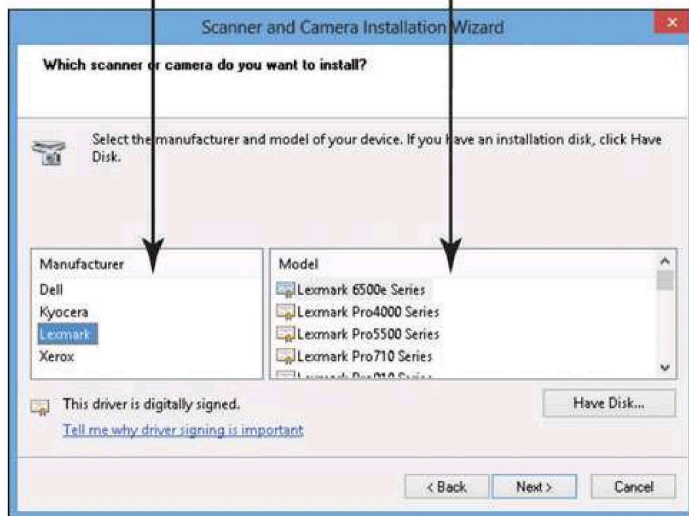
If your scanner is Plug and Play-enabled, Windows 8.1 shows a Found New Hardware message on the taskbar notification area. Most Plug and Play devices will install automatically; then the message changes to indicate that the installation is complete.

If that doesn't happen, either you're not using a Plug and Play device or Windows doesn't have the driver for that device. Click the Found New Hardware message to proceed.

3. In the resulting Found New Hardware Wizard (this starts only if you don't permit Windows 8.1 to connect automatically to Windows Update), click Yes, This Time Only and then click Next.
4. If you have a DVD for the scanner, insert it in your CD/DVD drive and click Next. Windows 8.1 searches for your scanner driver software and installs it.
5. Display the Control Panel. In the Search box, type **scanners**. Windows returns a set of links. Click the View Scanners and Cameras link. In the resulting Scanners and Cameras window, click the Add Device button.
6. In the resulting Scanner and Camera Installation Wizard window, click Next. In the next screen of the wizard, click your scanner's manufacturer in the list on the left and then click the model in the list on the right.



Select a manufacturer Then select a model



7. Follow the wizard directions for the model of scanner you chose in Step 6.

HOW TO SCAN A PICTURE / DOCUMENT

Once your scanner is installed, use the Windows Scan app to scan a picture or document. Here's how:

Note: Need to install the Windows Scan app ?

1. Make sure your scanner is turned on.
2. Open the scan app by using search box.
3. Do one of the following:
 - a) Place the item you want to scan face down on the scanner's flatbed and close the cover.
 - b) Place the item you want to scan in the scanner's document feeder.
4. On the Scan page, do the following:
 - a) Under **Scanner**, select the scanner you want to use.
 - b) Under **Source**, select the location you prefer to scan from.
 - c) Under **File type**, select the type of file you want the scan to be saved as. For example, you can save the file in different file formats—such as JPEG, Bitmap, and PNG.
 - d) Select **Show more** to show the **Save file to** options.
 - e) Under **Save file to**, browse to the location where you want to save the scan.
5. Select **Scan** at the bottom of the screen to scan your document or picture.
6. After your scan is finished, select **View** to see the scanned file before you save it, or select **Close** to save it. You can edit the scanned document or picture in the preview that appears when you select **View**.

Conclusion:

From the above experiment, we have studied about the installation of scanner.

Experiment no - 12

AIM OF THE EXPERIMENT:

To study the installation of MODEM.

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To study installation of MODEM.

Equipment required:

Personal computer.

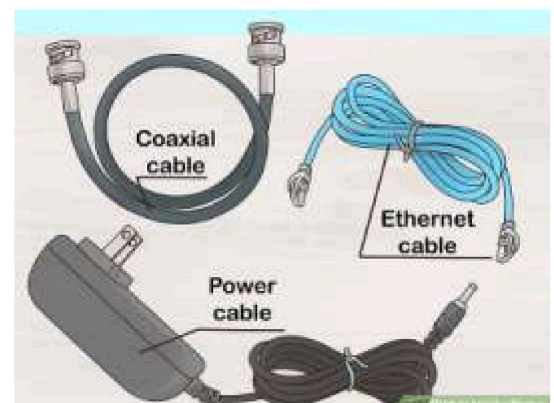
Theory

Installation of modem

How to install a modem for your home or workplace Internet. If you want to have Wi-Fi, you will need to [buy a router](#) and [connect the modem to the router](#) as well.

1. **Make sure that your modem will work with your Internet subscription.** While rare, some modems encounter issues when paired with a specific Internet company
2. **Find your room's cable output.** there will be a cable connected to the cable outlet.
3. **Decide the place to mount the modem.** U need to have a power outlet nearby.

4. **Make sure that you have all of the required cables.** A modem generally requires a coaxial cable to connect to the cable output, as well as a power cable to connect to an electrical outlet. Both of these cables should come with your modem. If you plan on attaching the modem to a router, you will also need an Ethernet cable.



5. **Read your modem's user manual instructions.**

6. **Attach one end of the coaxial cable to the cable output.** The coaxial cable has a connection that resembles a needle on each end. This will plug into the cable output. Make sure that you screw the coaxial cable onto the cable outlet to ensure that the connection is solid.



7. **Attach the other end of the cable to the input on your modem.** On the back of the modem, you should see an input that resembles the cable output

cylinder. Attach the free end of the coaxial cable to this input, making sure to tighten as needed.

8. **Plug your modem's power cable into an electrical outlet.**



9. **Insert the modem power cable's free end into the modem.** You'll usually find the power cable input port at the bottom of the back of the modem.

10. **Place your modem in its spot.** With the cables attached, gently move your modem into its designated position.



11. **Attach the modem to a router.** If you have a Wi-Fi router that you want to use in conjunction with your modem, plug one end of an [Ethernet cable](#) into the square port on the back of the modem, then plug the other end into the "INTERNET" (or similarly labeled) square port on the back of the router. As long as the router is plugged into a power source, the router should immediately light up. Give your modem and router a few minutes to boot up before attempting to [connect to Wi-Fi](#).



You can also connect your computer directly to your modem via Ethernet if you have an Ethernet port enabled computer.

Conclusion:

From the above experiment, we have studied about the installation of MODEM.

Experiment no - 13

AIM OF THE EXPERIMENT:

To study the installation of configuration of windows 7.

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To study the installation of configuration of windows 7

Equipment required:

Personal computer.

Theory

Windows 7 DVD is bootable. In order to boot from the DVD you need to set the boot sequence. Look for the boot sequence under your BIOS setup and make sure that the first boot device is set to CD-ROM/DVD-ROM.

Step 1 – Place Windows 7 DVD in your dvd-rom drive and start your PC. Windows 7 will start to boot up and you will get the following progress bar.

Step 2 – The next screen allows you to setup your language, time and currency format, keyboard or input method. Choose your required settings and click next to continue.

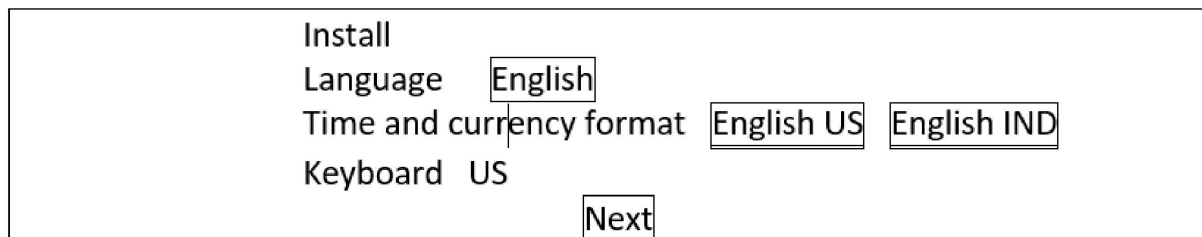
Step 3 – The next screen allows you to install or repair Windows 7. Since we are doing a clean install we will click on “install now”.

Step 4 – Read the license terms and tick I accept license terms. Then click next to continue.

Step 5 – You will now be presented with two options. Upgrade or Custom (Advanced). Since we are doing a clean install we will select Custom (Advanced).

Step 6 – Choose where you would like to install Windows 7. If you have one hard drive you will get a similar option to the image below. You can click next to continue. If you have more than one drive or partition then you need to select the appropriate drive and click next. If you need to format or partition a drive then click Drive options (advance) before clicking next.

1. Move to the CMOS setup to change boot priority in BIOS.
2. Before going inside to BIOS, put the window OS CD/DVD in DVD drive .
3. In BIOS booting system is selected as CD/DVD and it display one dialogue box.



4. Click on next.
5. Install now

This is for your first time install topic

OS	Architecture.	Date modify
Windows 7	x86 (32bites) x64 (64bites)	

6. select 32 bites, click in next.
7. Click on 7 to access the license terms
8. Click in next.
9. Now it display upgrade or custom advance

10. Now select custom advance

11. It display drives with size.

Name	Total size	Presize
Partition 1	50GB	28.1GB
2	150GB	11.3GB
3	2331GB	233.0GB

12. Here, select the partition for "C" drive, to detect it, select drive option -> OK
-> delete -> ok.

13. Or select drive option -> ok -> format -> ok.

14. After delete, it is having Unallocated space.

15. click in new size for different partition, so, apply "ok".

16. It automatically display 100MB reserved

17. Like such as a manner, it display 100% complete

18. It take some time to restart your system.

19. It restart from harddisk, set date & time & other features.

20. After this system is again restart, then after whatever driver is necessary install it like printer, lan, wan, modem, scanner etc.

Conclusion:

From the above experiment, we have studied the installation and configuration of windows OS.

Experiment no - 14

AIM OF THE EXPERIMENT:

To study the Assemble a PC

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To study the Assemble a PC

Equipment required:

All Peripherals need for PC.

Theory

How to Assemble a Basic Desktop PC

Steps to Assembling a PC

- [1. Gather What You Need to Build a PC](#)
- [2. Open Case and Prepare for Installation](#)
- [3. Mount Additional Case Fans \(Optional\)](#)
- [4. Prepare Motherboard for Out-of-Case Installation](#)
- [5. Insert Processor Onto Motherboard](#)

Step 1: Procuring Parts

First you will need to purchase the parts necessary to build the computer.

1. Processor (CPU)
2. Computer Case
3. Optical Drive (DVD RW and SATA capable)
4. Memory (RAM)
5. Power Supply
6. SATA Cables
7. Motherboard (SATA Capable)
8. Processor Fan
9. Case Fan
10. Hard Drive (SATA Capable)
11. Assortment of case and drive screws

Step 2: Gather Tools and Supplies

Collect the tools that are need for the project:

1. Screwdriver (for slotted and Phillips head screws)
2. Wire cutters and strippers
3. Needle-nosed pliers

4. Utility knife
5. Small flashlight
6. Adjustable wrench
7. Small container to hold screws
8. Heat sink compound
9. Grounding Strap

Step 3: Open the Case

Open the computer case by removing the side panels. Find the screws that hold the side panels in place and remove them.

Warning: Case may have sharp edges. Handle with care to avoid injury.

Step 4: Prepare the Case for Assembly

- Three things need to be done before assembly begins: Remove any parts or packaging materials that may have been shipped inside the case .
- Remove the cover for the optical drive. On our case, we will be removing the cover on the highest drive bay to mount our DVD drive.
- Make note of the cables pre-installed in the case. These should be front panel connections for features such as the power switch, audio jacks and usb ports. If they are not labeled, consult the manufacturer's documentation and label them yourself now before other parts are installed in the case.

Step 5: Ground Yourself

Put the grounding strap on your wrist and connect the other end to the computer case. If your strap is not equipped with a clip to hook to the case, find a place to wedge against the metal . This will prevent any buildup of static electricity on your body from damaging the computer components.

Step 6: Install Motherboard

1. Follow these steps to install the motherboard in the case: Install the I/O bezel plate into the opening in the back of the case. It pushes in from the inside.
2. Install standoffs in the case. The standoffs screw into the motherboard mounting holes. Check the screw hole locations on the motherboard for exact placement.
3. Lower the motherboard into the case and align with the I/O bezel.
4. Install the screws.

Step 7: Install Hard Drive

The hard drive is the device that stores all of your data. It is 3.5" wide and needs to be mounted so that you can gain access to the cable connections on the back . If that is not possible you may need to connect cables before you install the drive. To mount the drive:

1. Find a 3.5" drive bay to install the drive in. If you have trouble finding a place to mount the drive consult your case documentation for suggestions.
2. Slide the drive into place until the screw holes on the sides are lined up with the holes in the case.
3. Install the screws.

Step 8: Install Optical Drive

The optical drive is 5.25" wide and is installed in the drive bay that we removed the cover from in a previous step. Cable access considerations apply to this drive also. To install the drive:

1. Slide the drive into the drive bay until the screw holes are lined up and the front of the drive is flush with the front of the case. Make sure that it is orientated correctly.
2. Install the screws.

Step 9: Install the CPU

The CPU is the brain of the computer. It is installed on the motherboard in the socket .To install the CPU :

Find the corner marking that designates pin 1 of the CPU . On this AMD brand processor, the corner is marked with an arrow. Consult the manufacturer's documentation for specific information about your processor.

Lift the small metal rod next to the socket .

Find the corresponding marking on the CPU socket and insert the CPU so that the markings are lined up.

Push the rod down to lock the processor in place.

Step 10: Install RAM

The RAM is the temporary memory location that the processor works from. Permanently stored data is pulled from disks and stored in RAM while the processor works with it. The memory is easy to install: Set the RAM board in the socket . Check to see that the notch in the board is in the correct location. If it is not, turn it around 180°.

Press firmly on both ends of the board to set it into the socket. Make sure the tabs lock into place .

Caution: Pressing the boards in when the tab is not aligned could cause damage to the RAM boards as well as the motherboard.

Step 11: Install the CPU Fan

The CPU fan is really a combination of a heat sink and fan together. The unit draws heat away from the CPU . To install the fan:

1. Place thermal compound to the CPU following the instructions provided with the compound.
2. Set the fan assembly on the CPU with mounting tabs aligned.
3. Pull the locking rod down on the fan assembly to lock into place.
4. Connect the fan assembly's power connector to the motherboard. Consult the manual to determine proper placement.

Caution: Failure to apply thermal compound will result in insufficient cooling and will cause damage to the CPU and/or motherboard.

Step 12: Install Case Fan

The case fan is usually installed on the back panel of the case. If the fan mount is not obvious consult the case documentation. To mount the fan:

1. Align the mounting holes by holding the fan to the mounting pad on the inside of the case. The fan needs to be mounted so that it blows air out of the case.
2. Insert the screws from the outside of the case and tighten.

Step 13: Install Power Supply

Consult your case documentation for details and then follow these directions to install the power supply:

1. Align the mounting holes in the case and power supply .
2. Insert screws and tighten.

Step 14: Connect Cables

With all of the components installed in the case, the jungle of wires can be daunting. It is important to consult the motherboard manual in order to make sure proper connections are made. There are two kinds of connections, power and data.

1. Every device that has been installed needs power. The motherboard has two power connections, and there are two connectors specifically for SATA devices (drives). The other connectors will run fans and other non-SATA devices.
2. Data cables connect drives and front panel devices to the motherboard. Please consult the motherboard documentation for the exact placement of connectors.

Warning: Incorrect connections can damage components and cause bodily injury.

Step 15: Wrap-up

Now that the components are completely installed, the last thing to do is to reinstall the side panels on the case. The computer is now ready to be turned on and to have software loaded on it. If the computer has problems starting up, check all component connections and mounting to make sure that you have hooked everything up correctly. Consult individual component manuals for specific troubleshooting information if problems persist.

Conclusion:

From the above experiment, we have studied about the assemble of personal computer.

Experiment no - 15

AIM OF THE EXPERIMENT:

**To Familiarize : SCANDISK, PC Diagnostic software, Anti virus software
To study the Assemble a PC**

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To Familiarize : SCANDISK, PC Diagnostic software, Anti virus software

Equipment required:

Personal Computer

Theory

SCANDISK

ScanDisk is a disk analysis and repair tool, first released in Microsoft DOS 6.2, that checks a drive for errors and corrects any problems that it finds.

Scandisk is a Windows utility that is used to diagnose errors and bad sectors on a hard disk and will attempt to correct them. Using Scandisk is an important part of your **regular PC maintenance** as it ensures your data remains safe from corruption.

Steps to run Scandisk

1. Press **Windows key + E** on your keyboard to open File Explorer.
2. In the File Explorer window, click on **This PC** in the left navigation pane.
3. A list of drives is displayed on the right side of the window. Right-click on the drive you want to run Scandisk on and select **Properties**.
4. In the Properties window, click on the **Tools** tab.
5. Click the **Check** button in the Error Checking section.
6. The computer needs to restart to run Scandisk without any interruptions.

PC Diagnostics software

Computer diagnostics tools are pieces of software that give you the knowledge you need to be able to potentially repair your own computer. Some of these tools come built in to your operating system while others come from 3rd party software developers. Either way, these tools help save you time and money.

Computer diagnostic tools can be used scan your computer's hard drive, check your ram for errors, check cpu temp and give you information about any other devices connected to your computer. These tools are made to find problems

that may be disrupting your computer's normal performance. Once a problem is found, you can then plan your repair.

1. Windows Performance Monitor

The first one on our list is built right in to Windows operating systems. The performance monitor gives you a quick view of vital information related your computers hardware. From here, you can check out your CPU, Memory, Disk info and Ethernet information. You can use Performance Monitor to examine the effects of your running applications in both real time and by collecting data to check out for later analysis.

Step : search task manager in search tab

2. Windows Resource Monitor

Windows Resource Monitor is number two on our list. This diagnostic tool is more robust than Windows Performance Monitor. It is better suited for tracking individual aspects of CPU, Network, memory and disk usage. This tool gives you an in depth look at what processes are affecting your CPU, how much memory is being used what is using it, individual process disk activity and network information like current TCP connections and what processes are listening on what port.

Step – Search Resource Monitor in search tab

3. Open Hardware Monitor

Open Hardware Monitor is a free open source application that runs on Windows and Linux systems. This diagnostic tool monitors your computers temperature sensors, fan speeds, voltages, load and clock speeds. If your computer is shutting down by itself, hanging or crashing, this tool can come in real handy by telling you that your system is overheating or the fans aren't working properly.

Step – Search Hardware Monitor

4. HD Tune

HD Tune Pro is a great tool for HDD and SSD diagnostics. This utility allows you to benchmark your storage device showing you the minimum, maximum and average transfer rates along with many other useful tools. The other features of HD Tune include detailed drive info, error scanning, & drive health. The pro version allows you to check the health status of multiple drives, offers folder usage info, secure erase, file benchmark, disk monitor, cache test & extra tests.

Step – Search HD Tune

Computer diagnostics are meant to serve a vital purpose. They are important tools which work automatically, with very little effort necessary from the end user. They help you discover and fix problems within your hard disks and network configurations. Rather than manually searching for small, hard-to-find problems on your own, you can simply allow computer diagnostics tools to take care of your problems for you!

Anti-Virus

Antivirus software is a **type** of program designed and developed to protect **computers** from malware like **viruses**, **computer** worms, spyware, botnets, rootkits, keyloggers etc.

That means it is a set of programs which can detect and remove all the harmful and malicious software from your device. This anti-virus software is designed in a manner that they can search through the files in a computer and determine the files which are heavy or mildly infected by a virus. There are many versions and **types** of **anti-virus** programs are present on the market.

Different name of antivirus software which is most commonly used:

- **Norton Antivirus**
- **QUICKHEAL**
- **Kaspersky Antivirus**
- **AVAST Antivirus**
- **McAfee Antivirus**

Install Quick Heal Total Security / Internet Security Antivirus from CD/DVD

Insert Quick Heal CD in the CD drive of your PC.

1. The installer will autorun without any external action.
2. Click on Install Quick Heal.
3. Follow the steps in the setup wizard.
4. Read the User and License and Agreement carefully and check the box that says 'I Agree'
5. Select the drive where the software is to be installed.
6. Let it install files in the selected drive, till it is 100% complete.
7. Once completed, it will ask you to register the product. Click on 'Register Now'.
8. you have the product key and the installation number with you.
9. The product key can be found printed either on or inside the product packaging or will be provided when you [purchase Quick Heal Antivirus Total Security/Internet security.](#)
10. Fill the registration form and enter the product key received after buying the product.

Conclusion:

From the above experiment, we have studied about the scandisk, recent antivirus software and recent PC diagnose system.

Experiment no - 16

AIM OF THE EXPERIMENT:

Install & configure windows NT 2016 OS

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To install & configure windows NT 2016 OS

Equipment required:

Personal Computer

Theory

Windows NT Servers

The Windows Server operating system was first introduced in the 1990s, and Microsoft branded it with “NT” (short for “New Technology”) up until the year 2000. The company had several releases of the NT version of the operating system, as follows: Windows NT 3.1, Windows NT 3.5, 3.51, Windows NT 4.0

The Evolution of Windows Server

In 2000, the branding for Windows servers changed. Microsoft dropped the “NT” and released Windows Server 2000 to highlight its relevance for modern systems. After that, the server versions were named based on the year each edition was released.

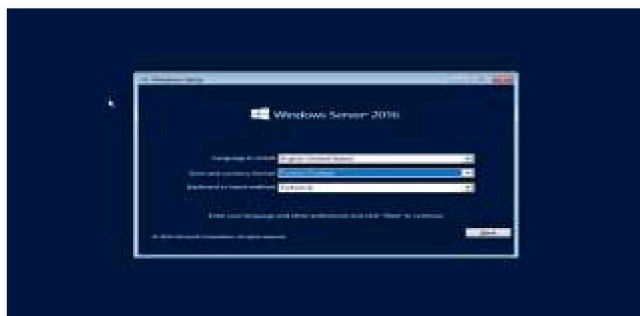
Windows Server 2000, Windows Server 2003, WS 2003 R2, WS 2008, WS 2008 R2, WS 2012, WS 2016, 2019 etc.

Installation of NOS

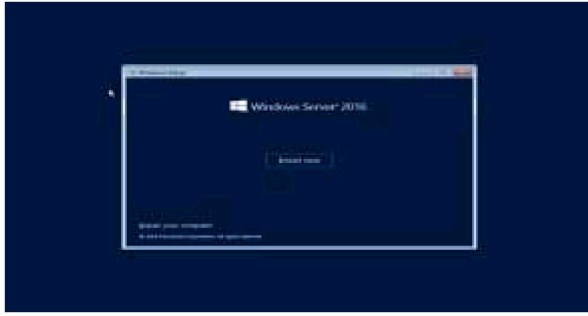
Windows Server 2016 Installation

First boot your system by using windows server 2016 installation disc .

Installation started now, on this screen we can able to configure language, region and time, keyboard settings. We should configure correct settings here and then select “Next” for continue.

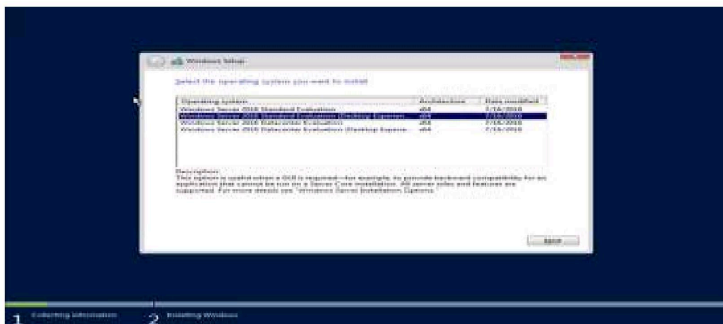


We should select “Install Now” in coming screen.



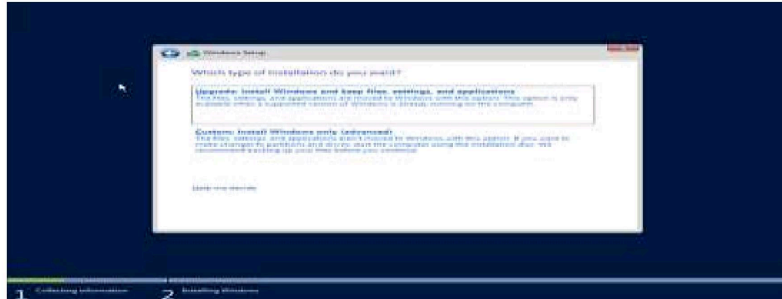
We can choose the Server 2016 version on this menu. We need Server 2016 Standard with GUI so selected “Server 2016 Standard (Desktop Experience).

Also, if you need to install Server 2016 without GUI you should select “Windows Server 2016 Standard” here. Further Windows Server 2016 has different edition: Datacenter, Standard and Essentials editions.

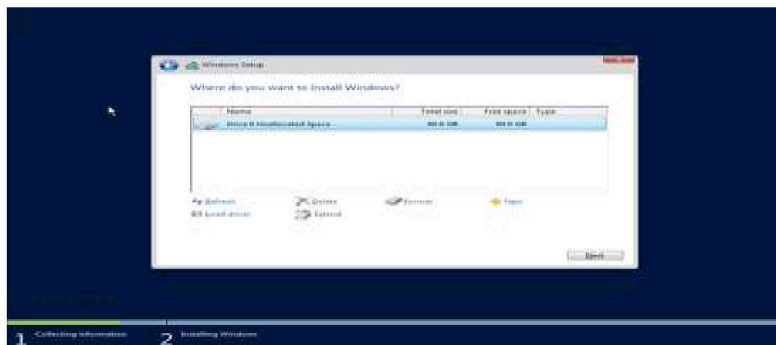


We can see the licence terms on this screen, select “I accept Licence Terms” then click Next to continue.

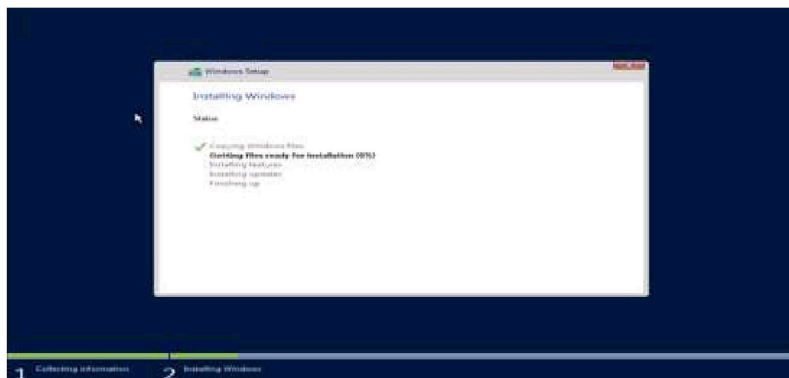
Select "Custom: Install Windows only (advanced)" here because we will do a clean installation OS. But if you need an in-place upgrade you should select "Upgrade: Install and Keep files, settings and applications" here. This option suitable for supported OS, features, services and roles. But keep in mind you should not prefer in-place upgrade for critical roles like Active Directory Directory Services, etc.



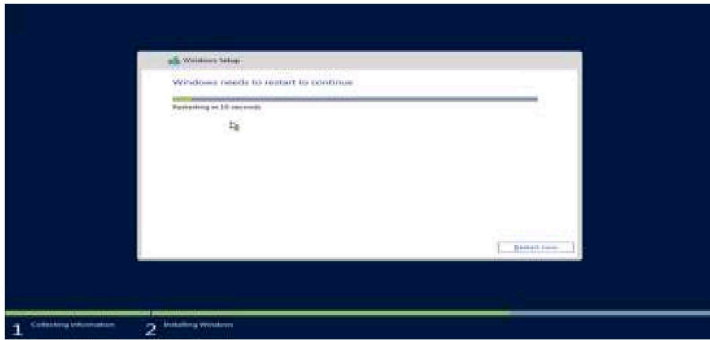
We can select and configure disc information on this screen. (You can set the installation disc, size, etc.) Used default settings here.



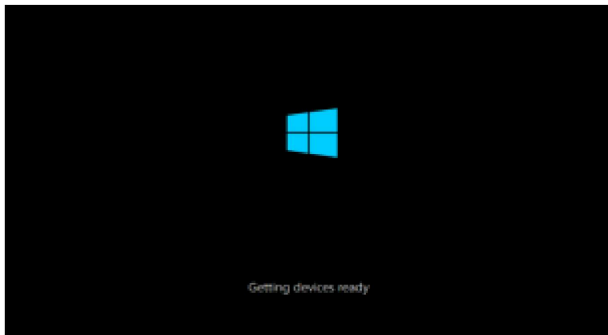
You can see that the necessary files are copied and the installation process is running on this screen



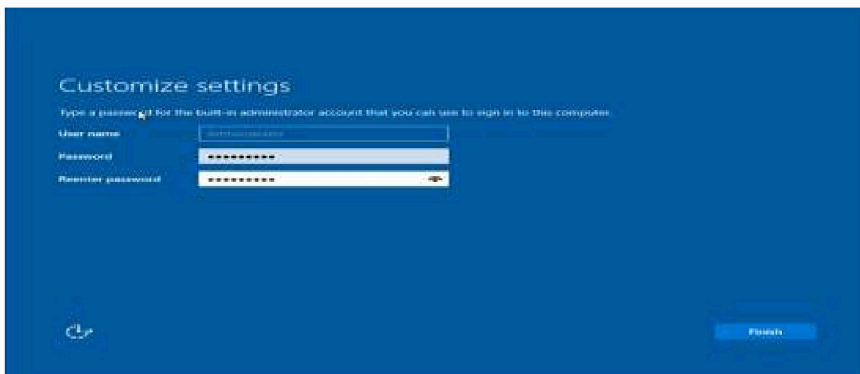
The installation process is done and rebooting.



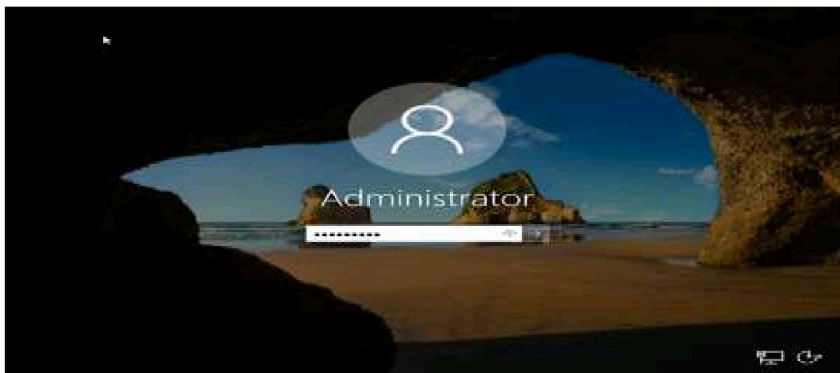
Screen showing that the necessary settings were made before the server was started.



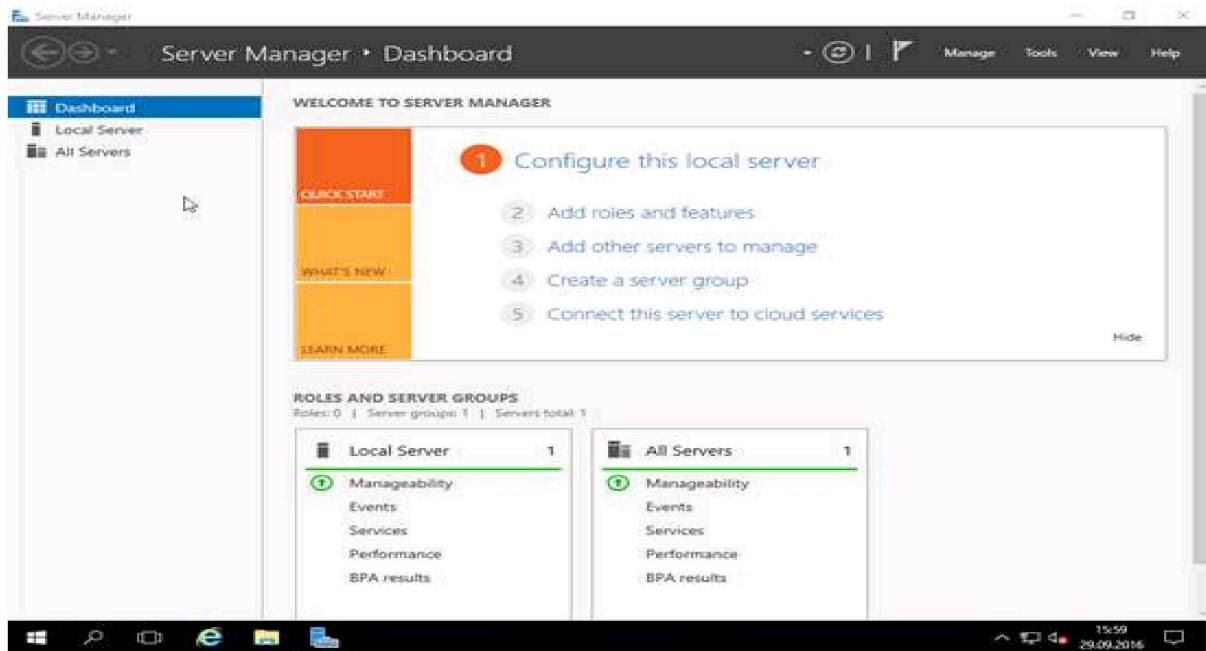
We can set a password for the local administrator account. You should configure a secure password for local admin.



On the login screen, we can login with "Administrator" account and related password.



And finally, you can see new Server 2016 interface. It's similar to old Server 2012 interface but there are a lot of new features coming with Server 2016.



you should fully patch new Server 2016 before you add or configure roles, services.

Conclusion:

From the above experiment, we have studied about the installation of windows server 2016.

Experiment no - 17

AIM OF THE EXPERIMENT:

To install windows server 2016, setup server, ADDC, create domain, add user

APPARATUS REQUIRED:

Sl. no.	Name of Equipment
1	Personal Computer

Aim of the experiment:

To install windows server 2016, setup server, ADDC, create domain, add user

Equipment required:

Personal Computer

There are several reasons to create and use a local domain even in relatively small home networks. To list a few:

Centralized user management

- Users sign in to domain instead of signing in to just a certain PC. No separate user account setup on each machine, a domain user can sign in on each domain joined machine, access level controlled by server admin
- Centrally managed Group Policies; Restrict or expand user rights with group policies on server, all policies applied throughout the domain
- And so on...

To create a local domain, you need a **Windows Server operating system** (yes, of course you can set up a Linux server, too,). It can be installed on physical hardware with quite modest specifications, or on a virtual machine. Naturally, to guarantee that your domain and **Active Directory** which controls and manages the users and computers on your domain function, the server should be always on, up and running.

Setting up an **Active Directory Domain Controller** can be divided to five phases:

1. Install Windows Server
2. Set up the server (static IP, updates, server name etc.)
3. Create the domain
4. Setup Active Directory Domain Services
5. Create domain / AD users

Contents

<u>Part One:</u>	Install Windows Server 2016
<u>Part Two:</u>	Setup Windows Server 2016
<u>Part Three:</u>	Setup Active Directory Domain Controller
<u>Part Four:</u>	Create a domain
<u>Part Five:</u>	Add users to Active Directory
<u>Part Six:</u>	Additional videos

Part One

Install Windows Server 2016

1.1) Download Windows Server 2016: [Technet Evaluation Center](#). Notice that you need to register to be able to download

1.2) If installing on a virtual machine select the ISO file as install media. On a physical machine you need first to create a DVD or flash install media.

1.3) Boot from Windows Server 2016 install media

1.4) When prompted, enter the generic product key shown in **Preinstall Information:**

Windows Server 2016 Technical Preview 5
Evaluations

Download

Description

Preinstall Information

1. Review Windows Server 2016 Technical Preview 5 release notes and system requirements
2. Register, then download and install the preview. Technical Preview 5 expires December 31, 2016.
3. Receive email with resources to guide you through your preview

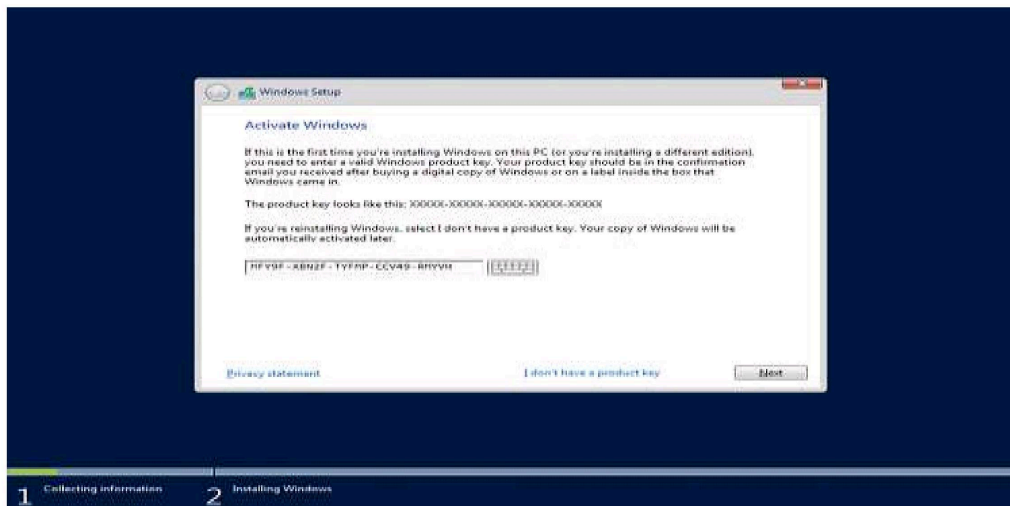
Installation Guidelines

When moving from a previous version of Windows Server to Windows Server 2016 Technical Preview 5, you will need to uninstall the previous version for a clean installation of Technical Preview 5.

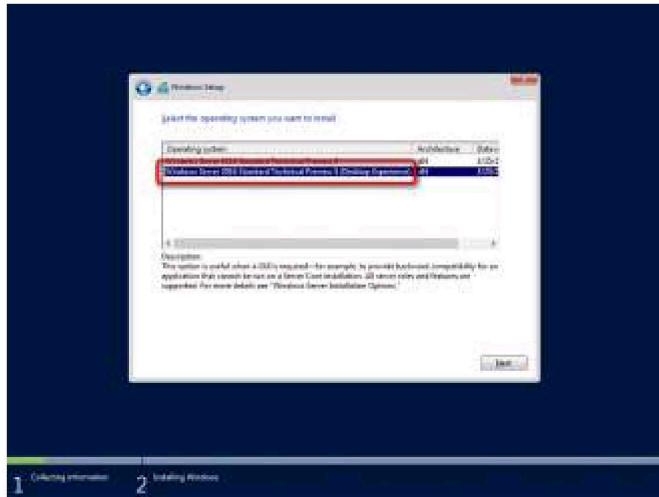
Upon installation, you will be prompted to activate. Windows Server 2016 Technical Preview 5 will require a product key:

- Standard Key: MFY9F-X8N2F-TYFMP-CCV49-RMYVH
- Datacenter Key: 6XBNX-4JCGW-QX6QG-74P76-7ZV67

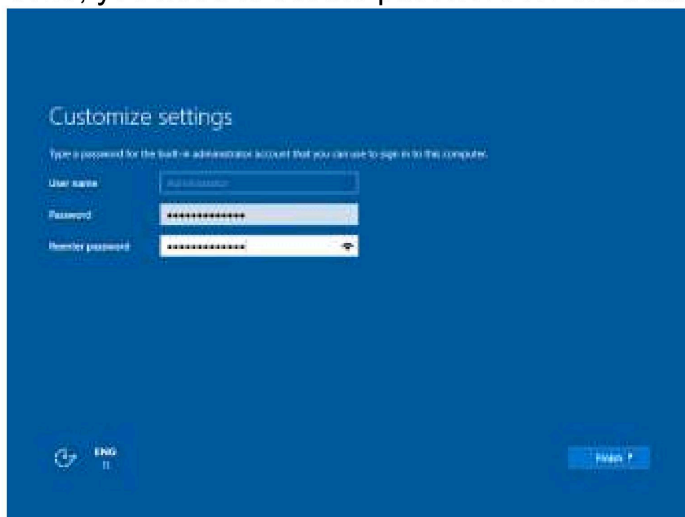
PLEASE READ PRIOR TO INSTALLING THE CONTAINER OS IMAGE: The license terms of the Microsoft Windows Server Pre-Release software ("License Terms") apply to your use of the Microsoft Windows Container OS Image supplement (the "supplemental software"). By downloading and using the supplemental software, you agree to the License Terms, and you may not use it if you have not accepted the License Terms. Both the Windows Server Pre-Release software and the supplemental software are licensed by Microsoft Corporation.



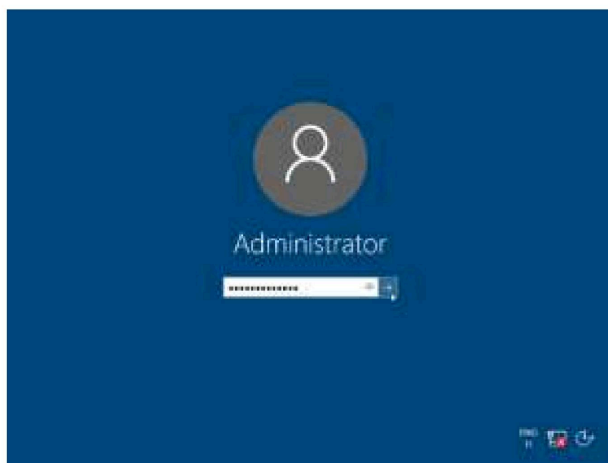
1.5) Select the Desktop Experience version:



1.6) Install Windows normally, as any other Windows version. When installation is done, you need to set the password for the built-in administrator



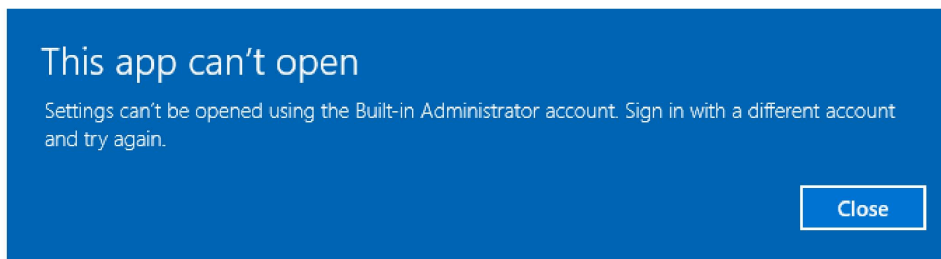
1.7) Press **CTRL+ALT+DEL** to enter the sign-in dialog, enter the password, hit **Enter** to sign in:



Part Two

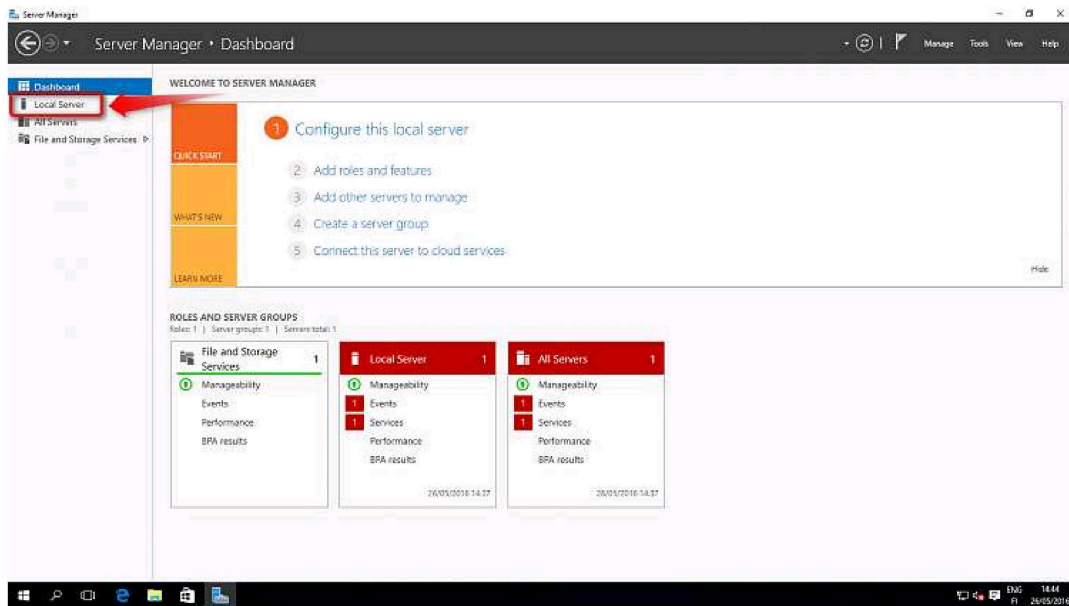
Setup Windows Server 2016

2.1) Server Dashboard opens automatically by default (when closed it can be opened from Start). First thing is to change the resolution, after the installation Windows defaults to 1024*768, aspect ratio 4:3. To work comfortably you need better resolution. Minimize the Dashboard, select **Display Settings** from desktop context menu. This warning will be shown:

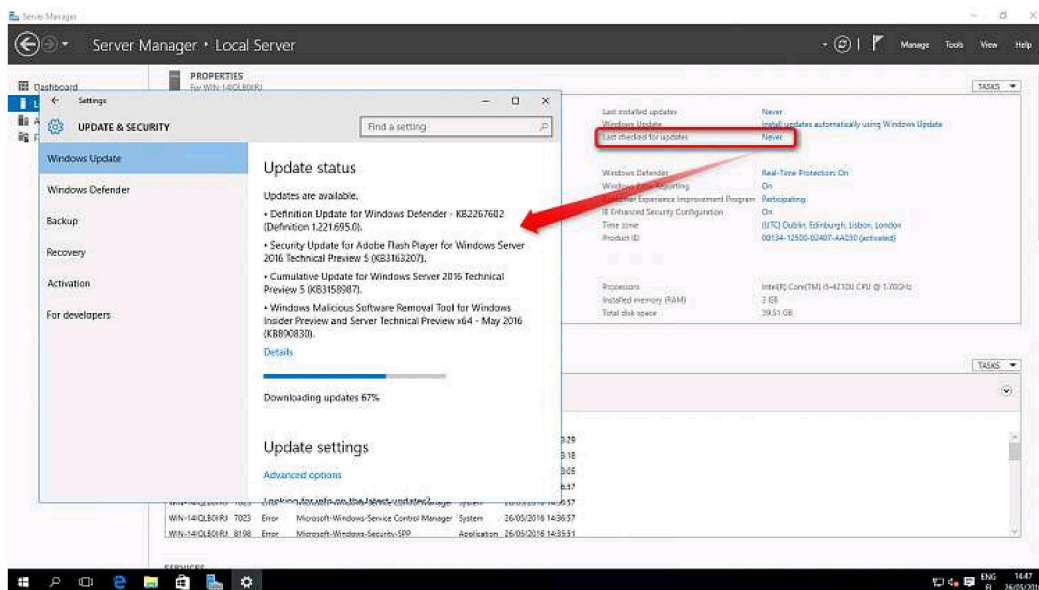


Just ignore the warning, click **Close** to open display settings and change the resolution to what you prefer

2.2) Maximize / open the **Dashboard**. Select **Local Server** on left pane



It is extremely important that Windows Server is fully updated before going any further. Click **Never** after **Last checked for updates**, run Windows Update, restart if prompted:



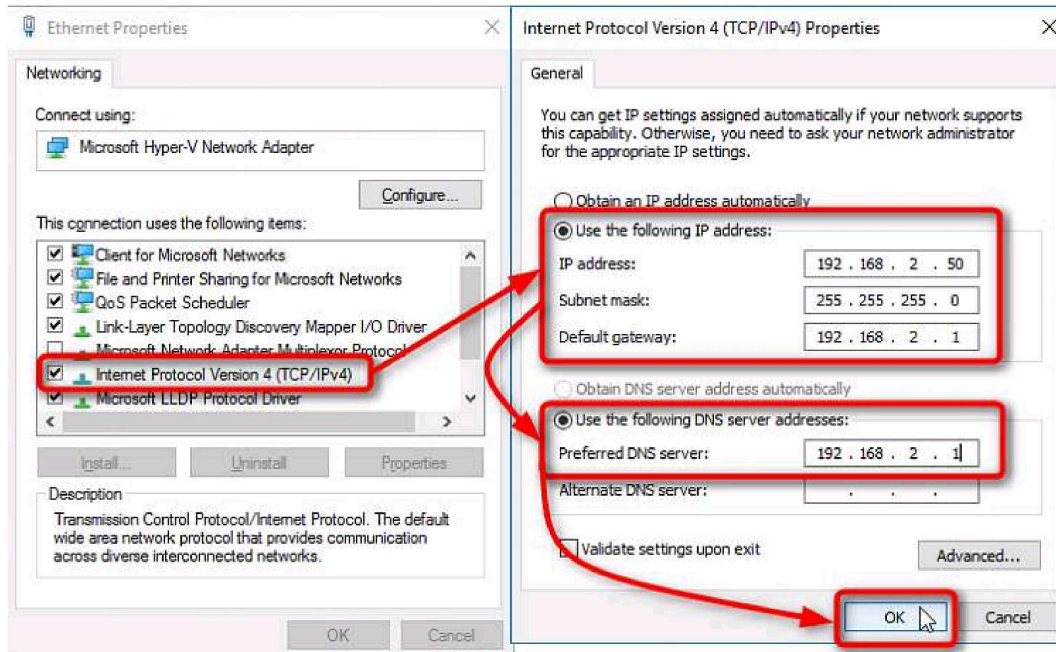
2.3) Change the computer name to something easier to remember and recognize. In this example I changed the name to **TenForumsServer**. Remember to restart after computer name change!

2.4) Set a static IP address for server. Select an IP outside the DHCP IP pool your router uses to assign dynamic IP addresses.

In this example I checked my router settings, learned that the IP pool it uses is from **192.168.2.100** to **192.168.2.200**, router itself using **192.168.2.1**:

Start-IP:	192 . 168 . 2 . 100
End-IP:	192 . 168 . 2 . 200

I chose **192.168.2.50** for the server, set it as static IP, setting both **Default Gateway** and **Preferred DNS server** to use the router IP **192.168.2.1**:



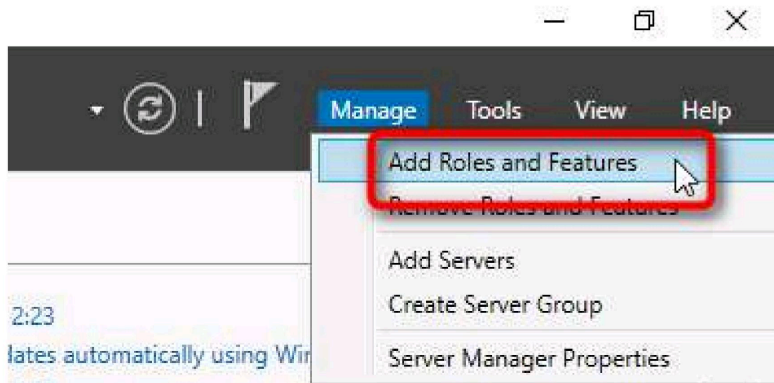
PROPERTIES
For TenForumsServer

Computer name	TenForumsServer
Workgroup	WORKGROUP
Windows Firewall	Private: On
Remote management	Enabled
Remote Desktop	Disabled
NIC Teaming	Disabled
Ethernet	192.168.2.50, IPv6 enabled

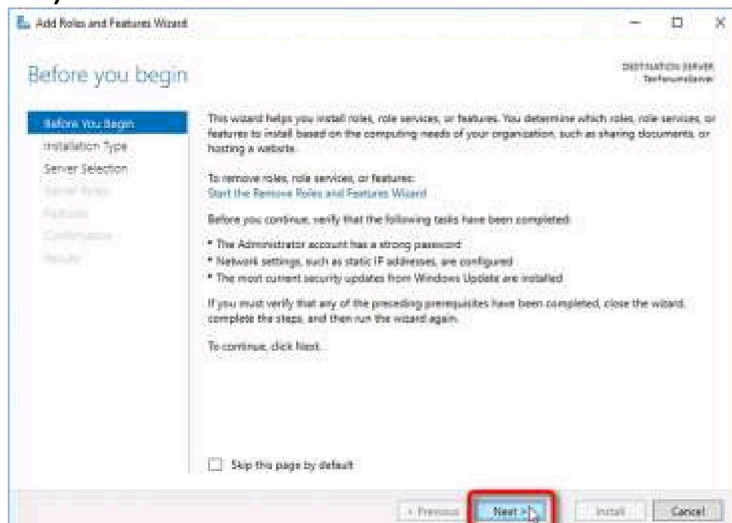
Part Three

Setup Active Directory Domain Controller

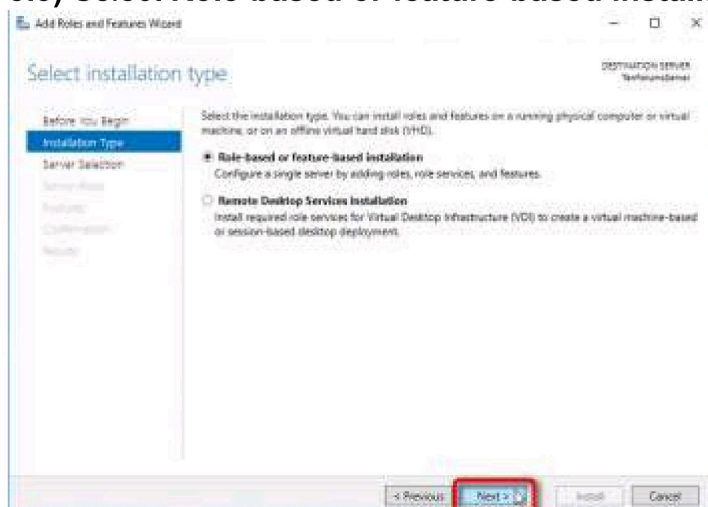
3.1) Select **Add Roles and Features** from the **Manage** menu top right:



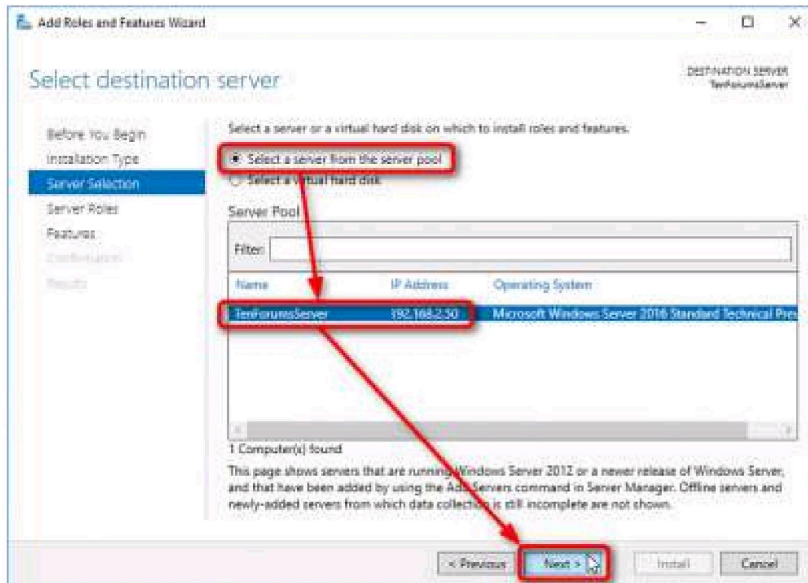
3.2) Click **Next**:



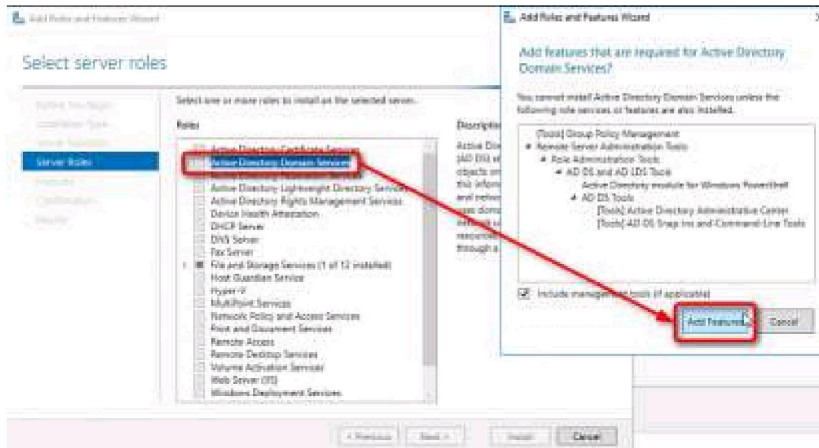
3.3) Select **Role-based or feature-based installation**, click **Next**:



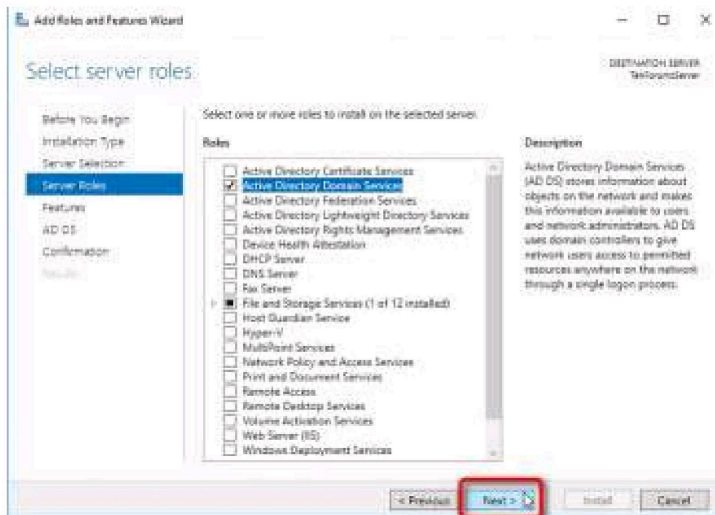
3.4) See that your server is listed, select it and choose **Select a server from the server pool**. Click **Next**:



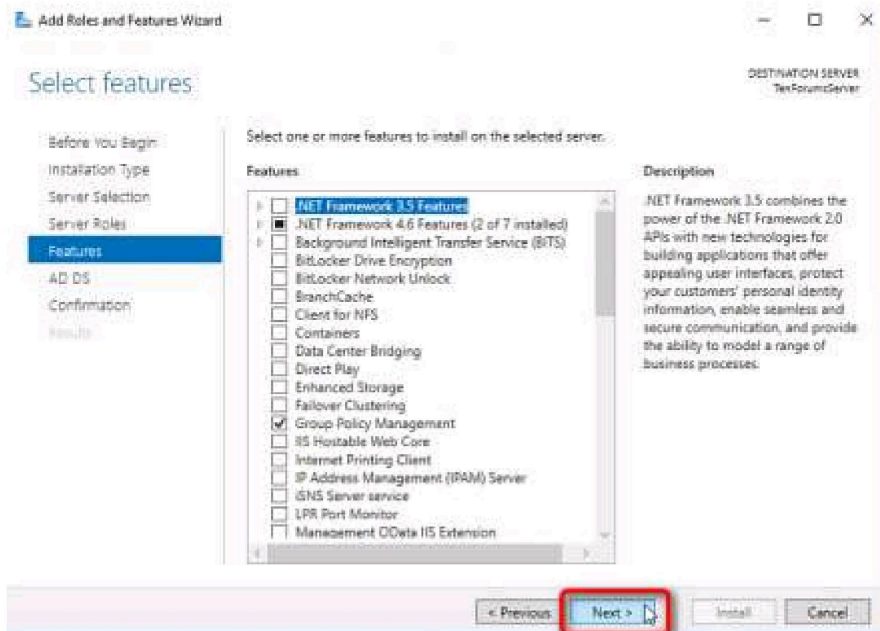
3.5) Click on the selection box **Active Directory Domain Services**. A dialog opens, click **Add Features**:



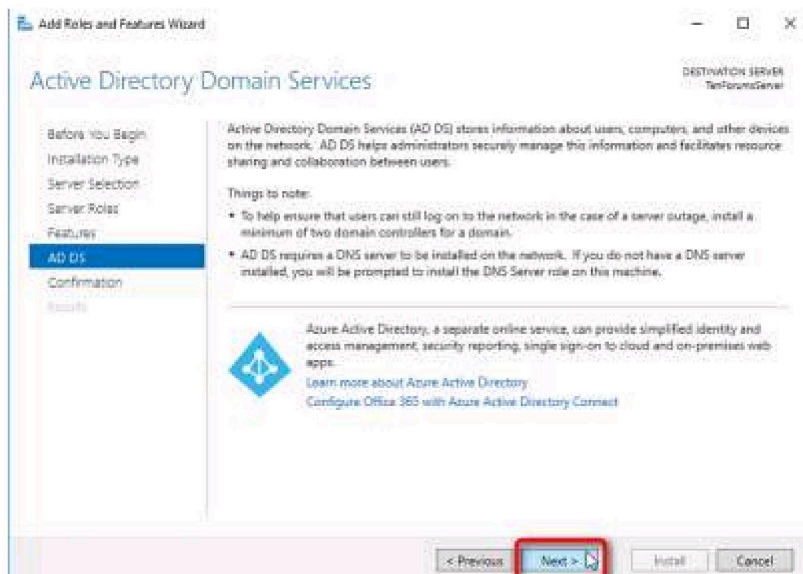
3.6) Click **Next**:



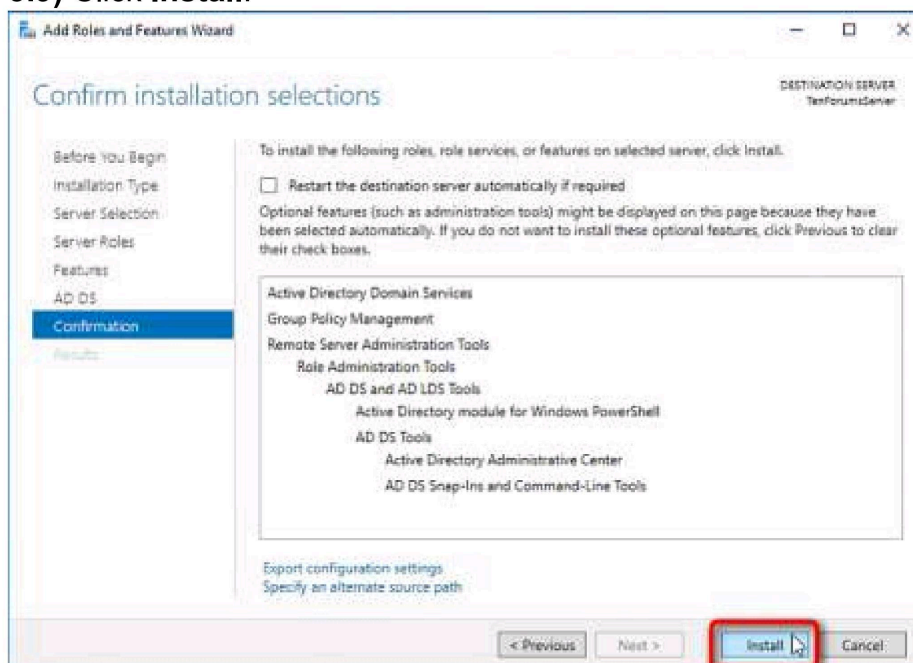
3.7) Click Next:



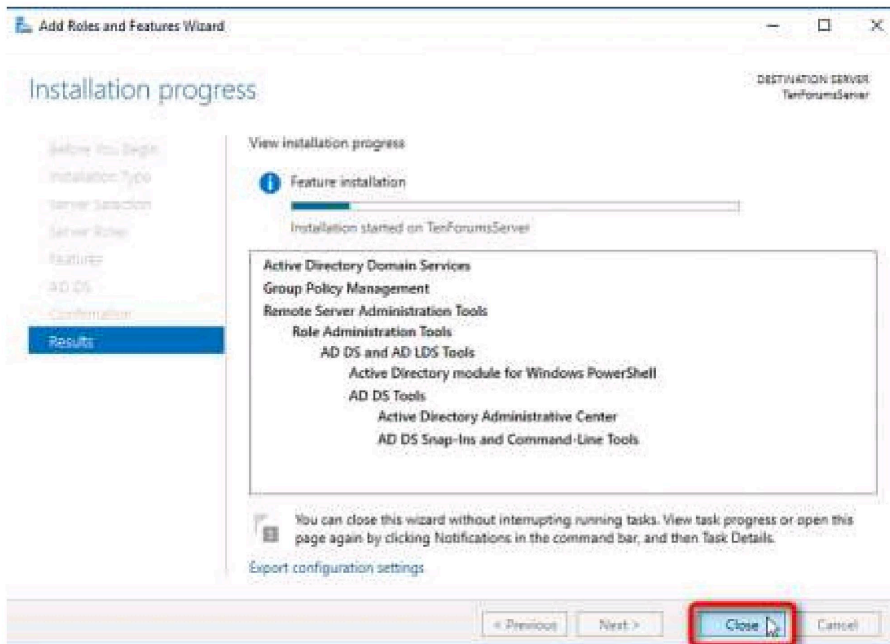
3.8) Click Next:



3.9) Click Install:



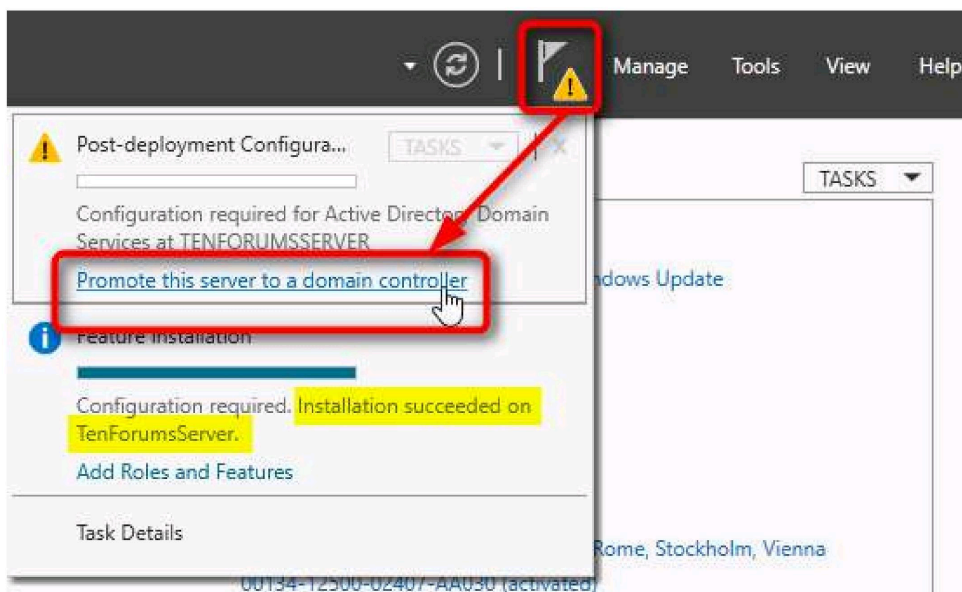
3.10) You can close the wizard now, installation continues in the background:



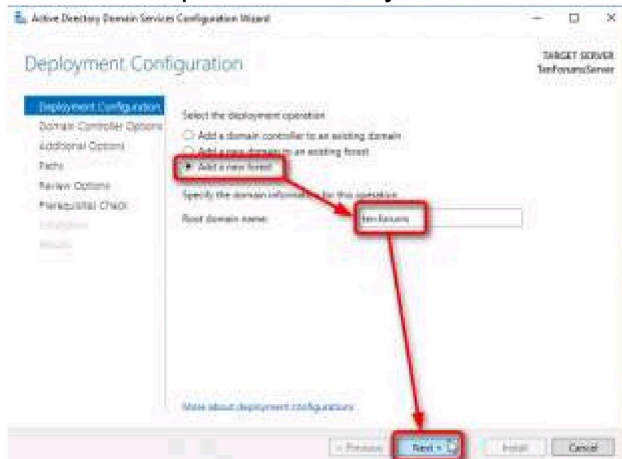
Part Four

Create a domain

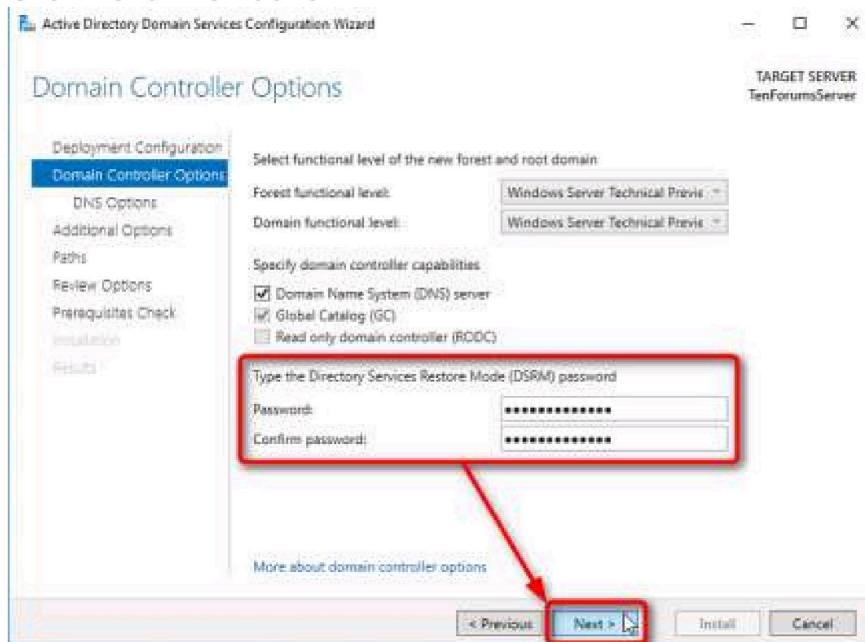
4.1) You should now see a yellow warning sign next to **Notifications** flag in menu bar top right. Click the flag to open the menu. When it tells you **Installation succeeded on ServerName**, select **Promote this server to a domain controller**:



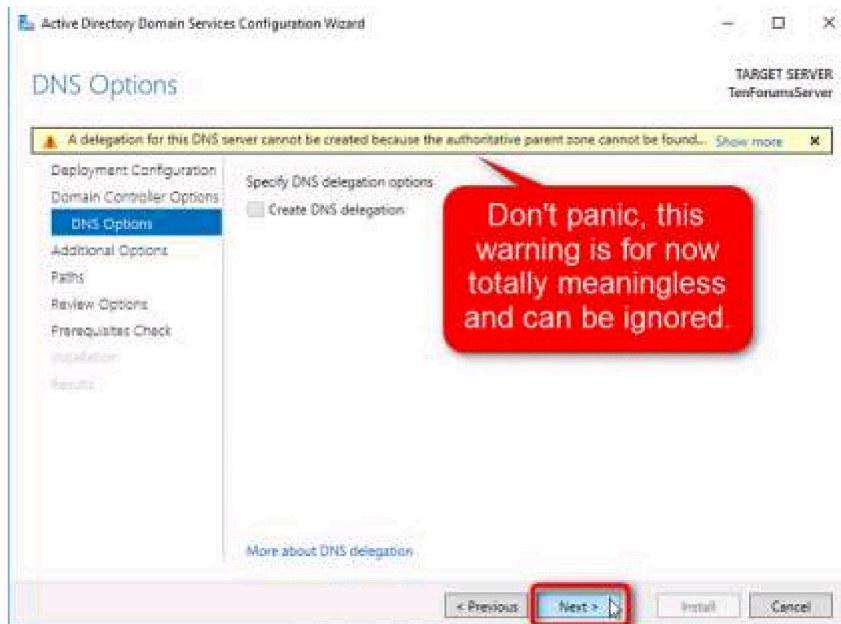
4.2) Select **Add a new forest, enter your chosen local domain name (prefix.suffix). In this example I named my domain as **ten.forums**:**



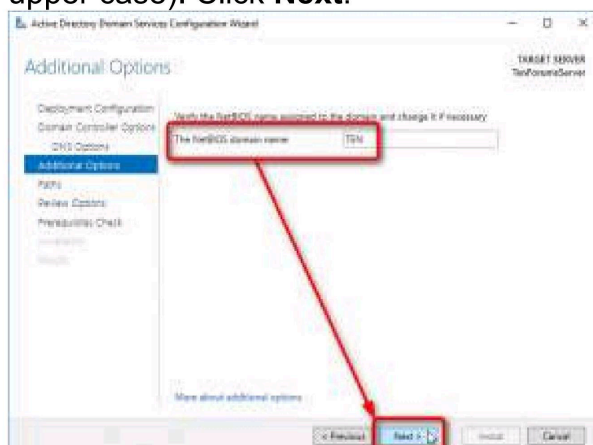
4.3) *This is important:* on the next page of the wizard you need to set up a password you wish you will never need: A recovery password in case something goes awfully wrong and you need to run **Directory Services Restore**. Select a good password, it may but don't have to be the same as your server admin password. Click **Next** when done:



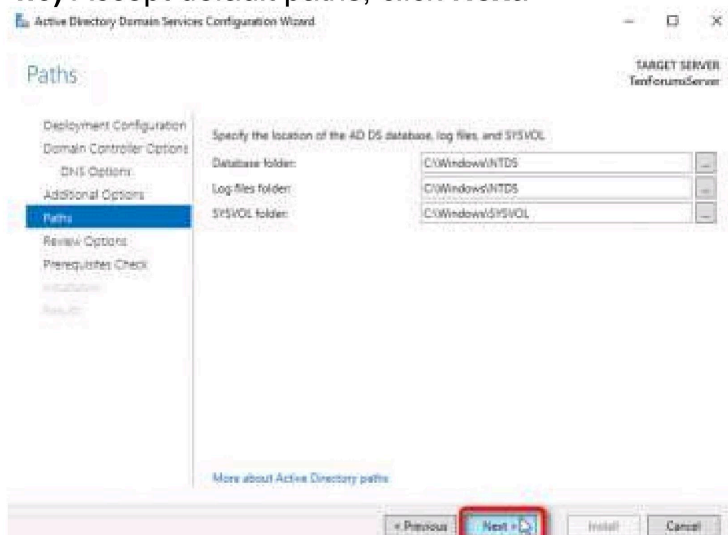
4.4) The **DNS options page shows you a warning which you can completely ignore. Click **Next**:**



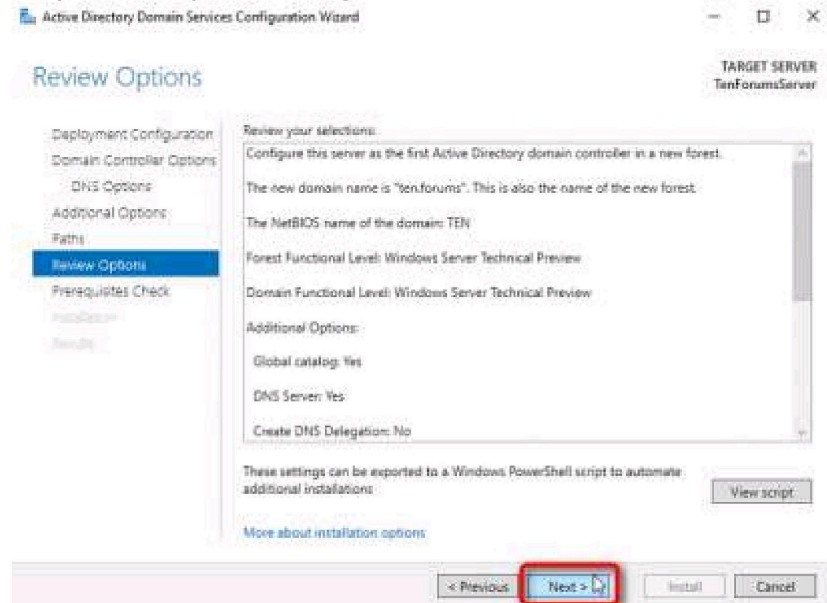
4.5) On Additional Options page check that NetBIOS name is correct; it should be the prefix of your local domain. In this example I named my domain as **ten.forums, the NetBIOS name therefore being **TEN** (NetBIOS names are usually written with upper case). Click **Next**:**



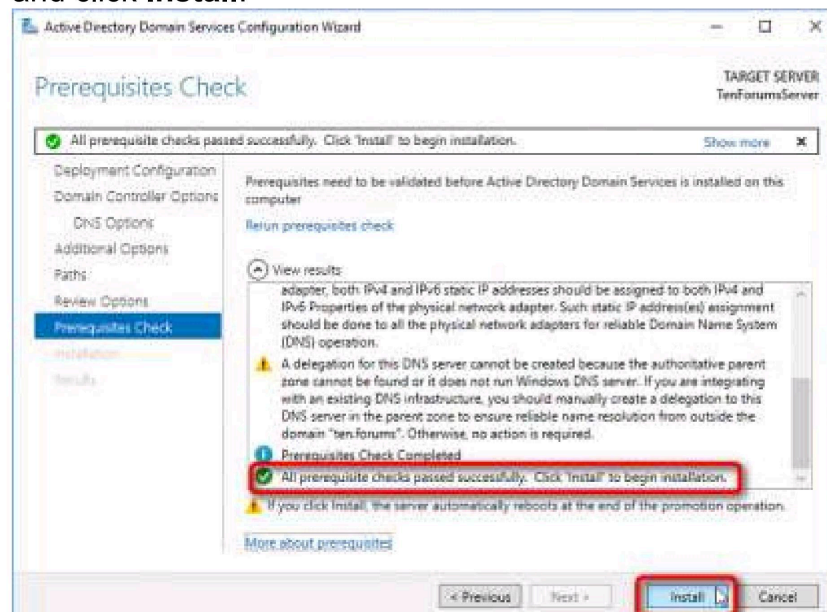
4.6) Accept default paths, click **Next:**



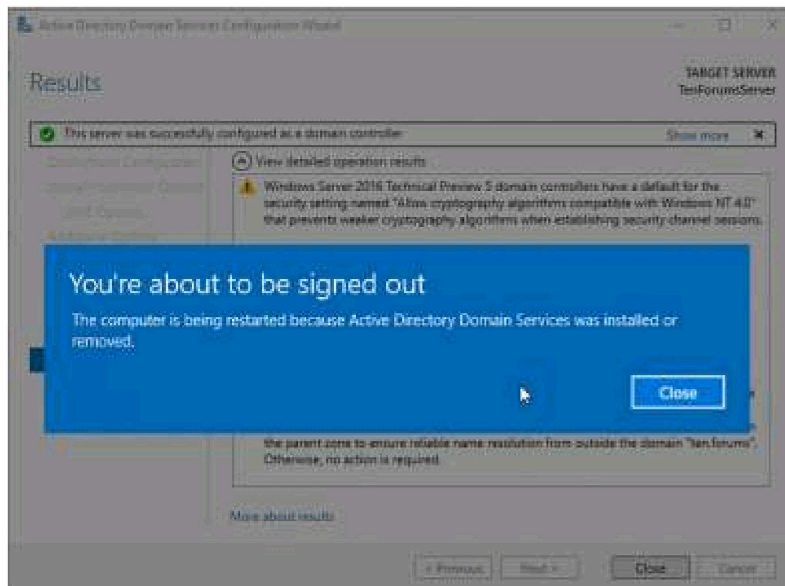
4.7) Review your settings, click **Next**



4.8) You will now see a list of warnings. As long as the bottom of this list tells you that **All prerequisite checks passed successfully**, you can ignore the warnings and click **Install**:



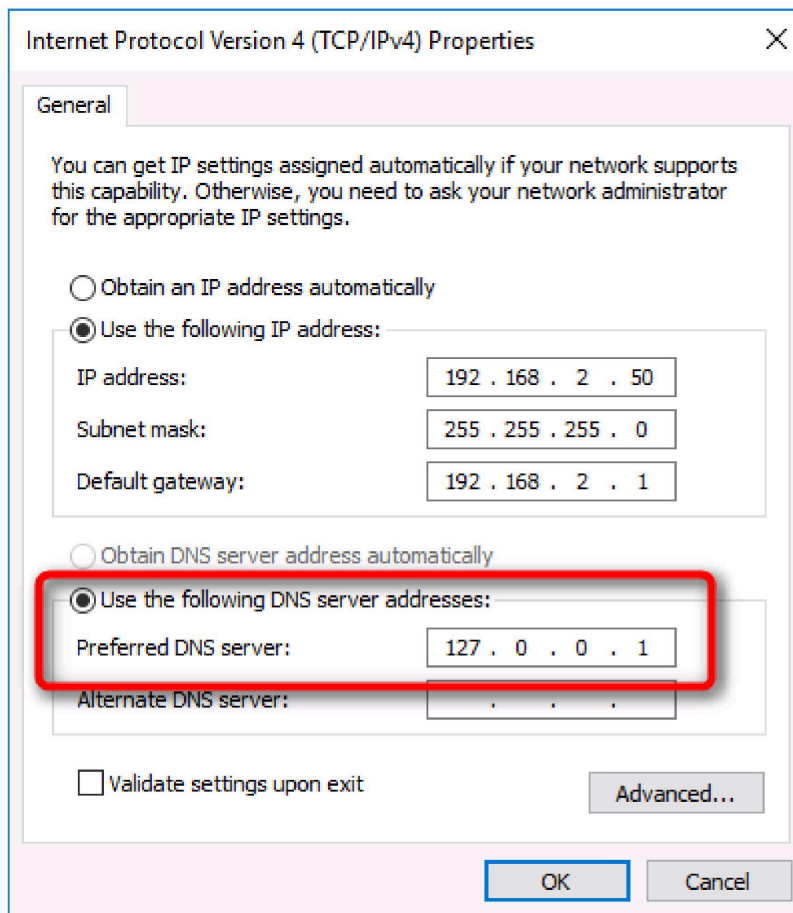
4.9) Windows Server will restart automatically to finalize the installation:



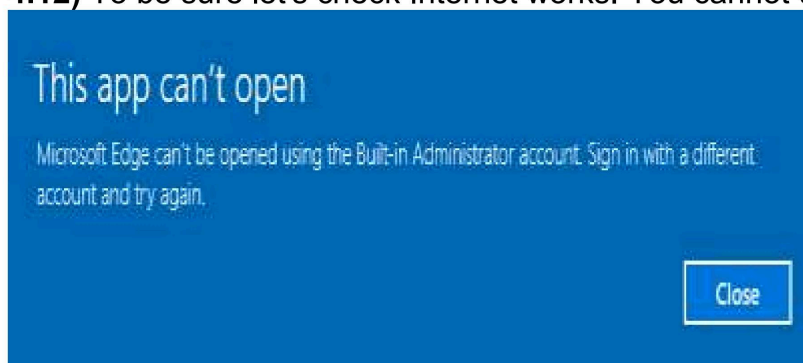
4.10) Sign in. Notice the missing network connection:



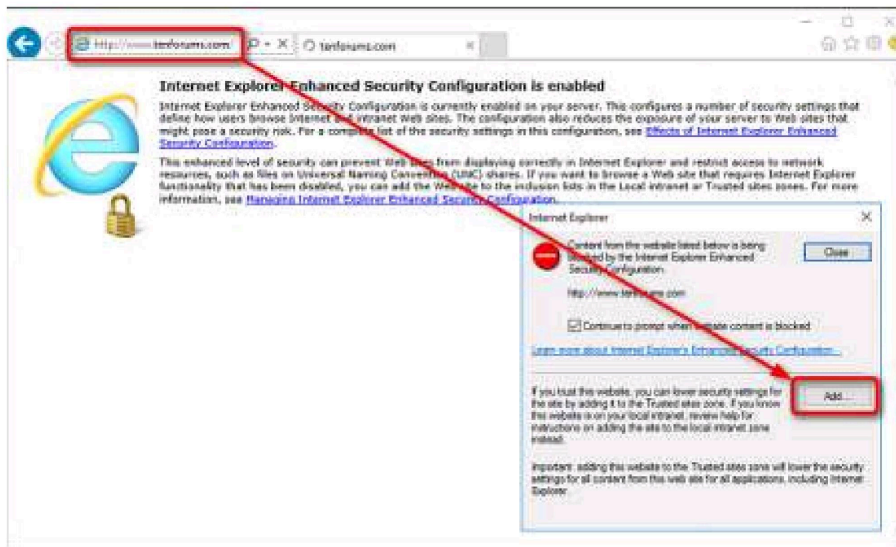
4.11) Fix the DNS server IP error (see previous screenshot in step 4.10 for explanation), change it back to your default gateway IP. In my case now for this example I changed it back to **192.168.2.1**:



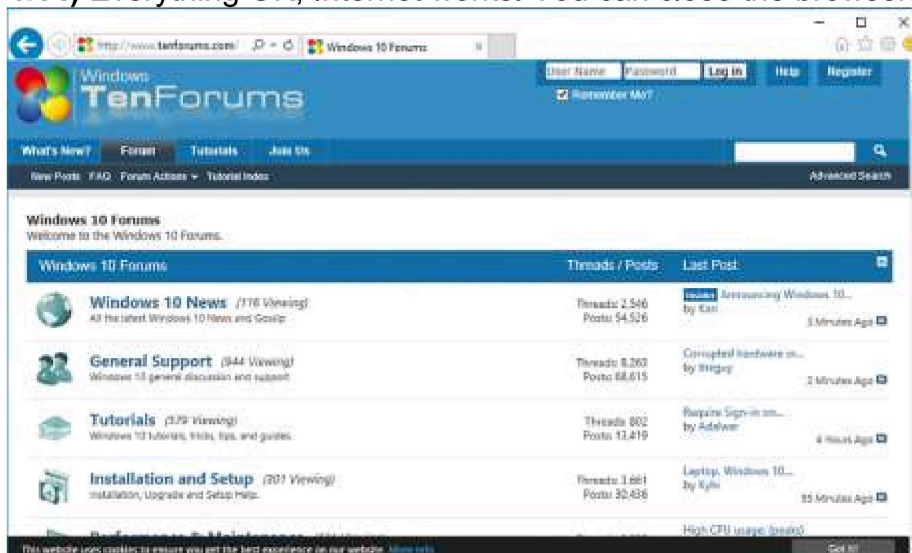
4.12) To be sure let's check Internet works. You cannot use **Edge**:



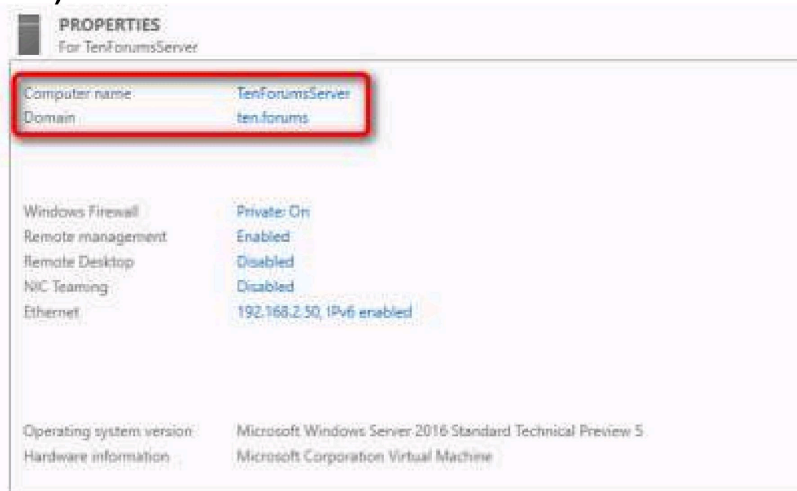
4.13) Instead open **Internet Explorer** (WIN+R, type **ieexplore**, hit Enter). You will be notified that **Enhanced Security** is enabled. You need to manually add websites you want to visit to list of allowed sites:



4.14) Everything OK, Internet works. You can close the browser:



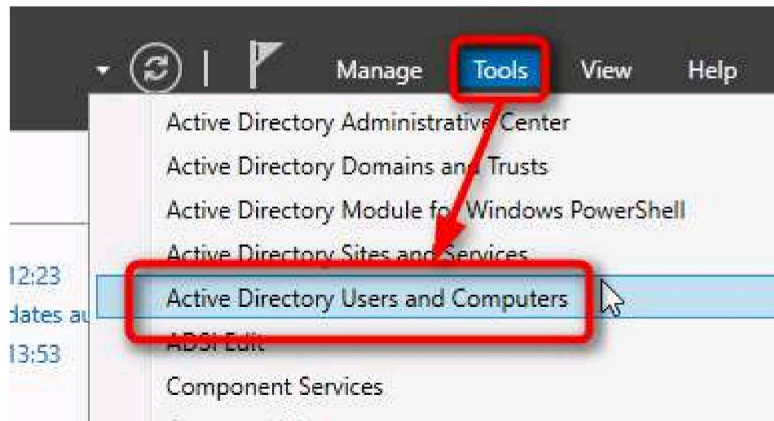
4.15) Dashboard > Local Server shows the domain is OK:



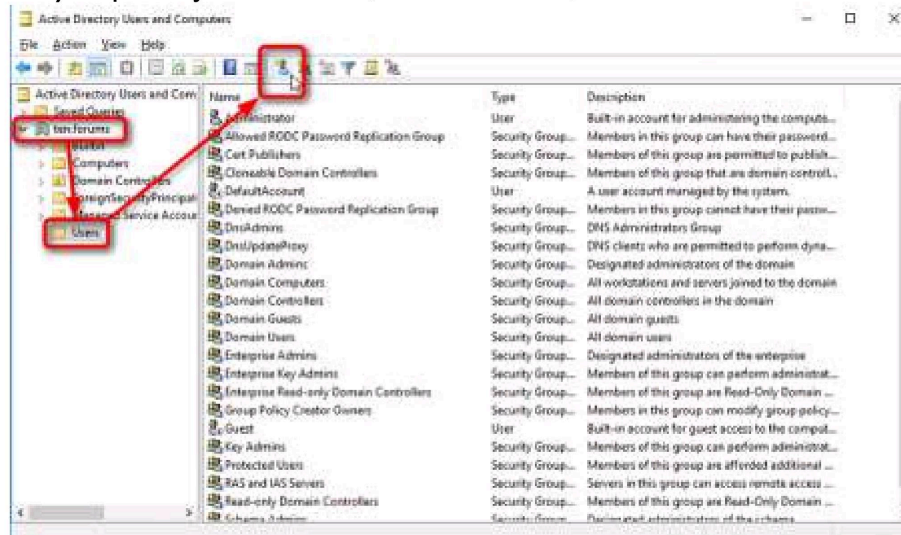
Part Five

Add users to Active Directory

5.1) A domain without users allowed to sign in is useless. To create users, open **Tools** menu, select **Active Directory Users and Computers**:



5.2) Expand your domain, select **Users**, click **New User** button:



5.3) Add a user, click **Next**:

New Object - User

Create in: ten.forums/Users

First name: Kari Initials: KF

Last name: Finn

Full name: Kari KF. Finn

User logon name: kari @ten.forums

User logon name (pre-Windows 2000): TEN\ kari

< Back Next > Cancel

5.4) Set password for this user. As this is a private home domain, select **Password never expires, click **Next**:**

New Object - User

Create in: ten.forums/Users

Password:

Confirm password:

User must change password at next logon

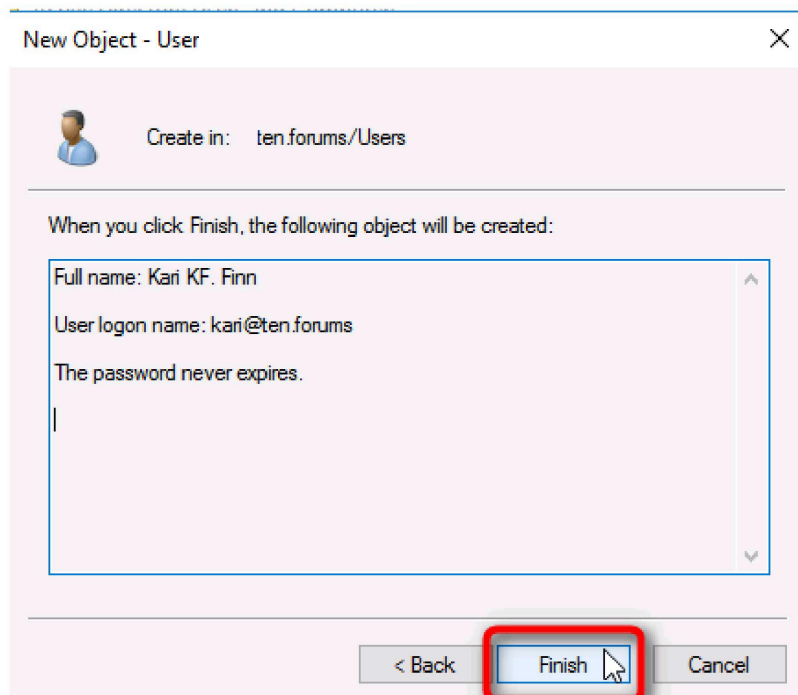
User cannot change password

Password never expires

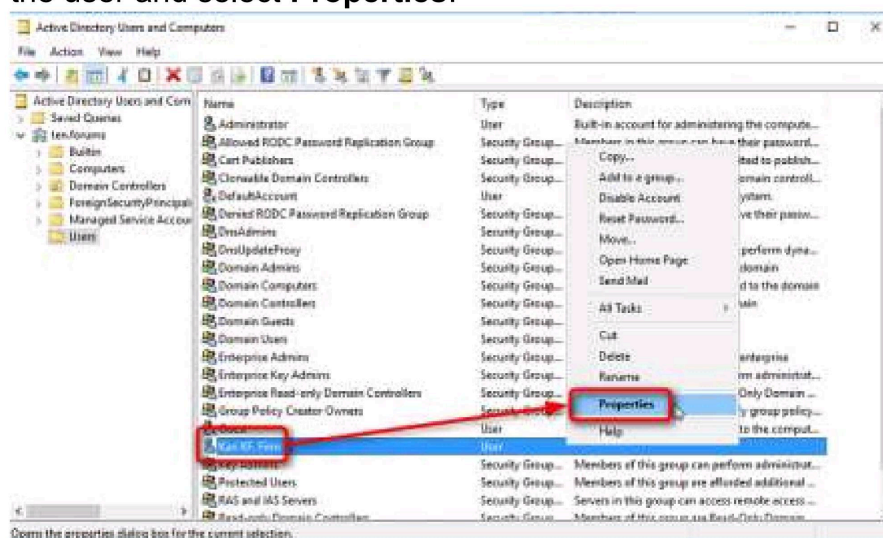
Account is disabled

< Back Next > Cancel

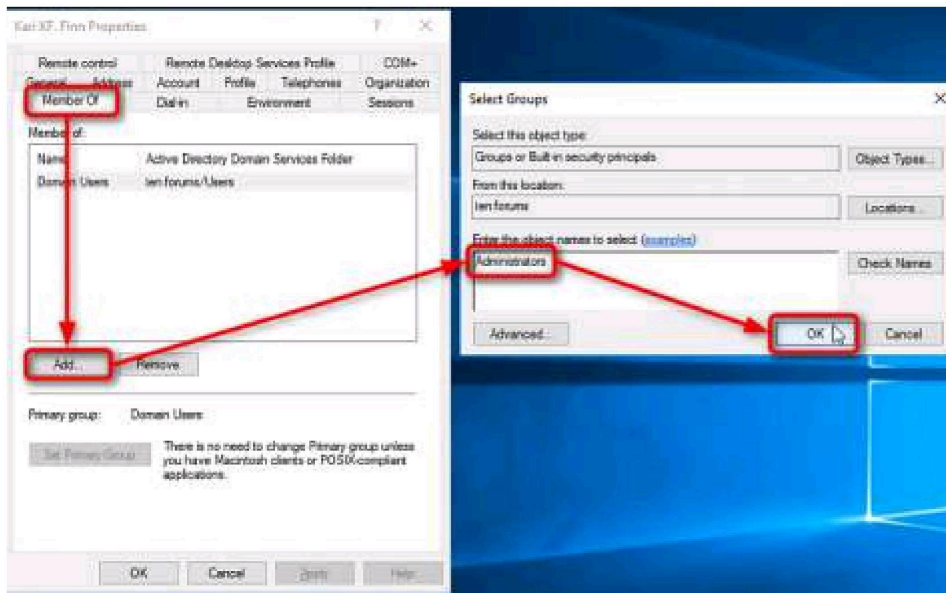
5.5) Review the information, click **Finish:**



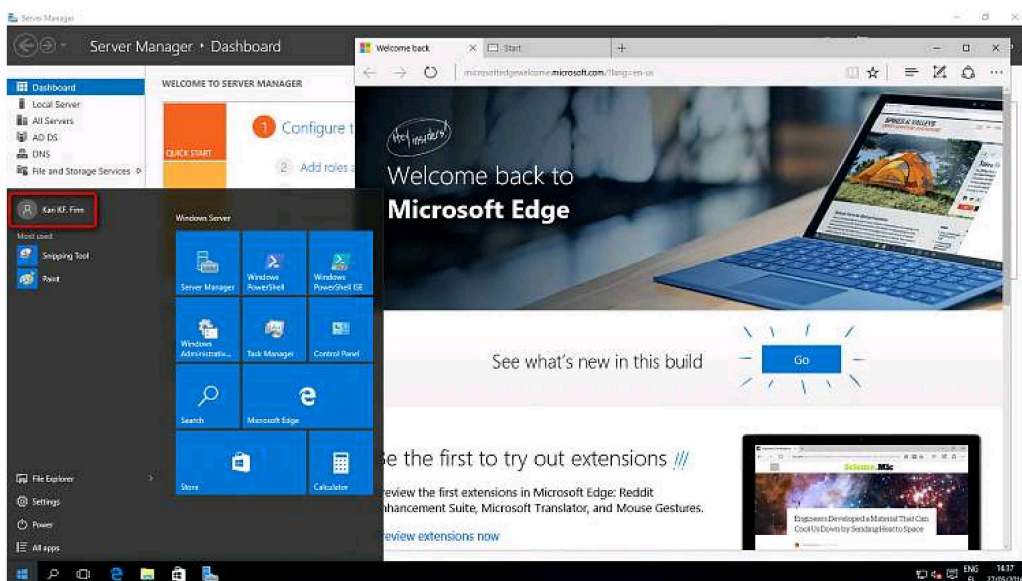
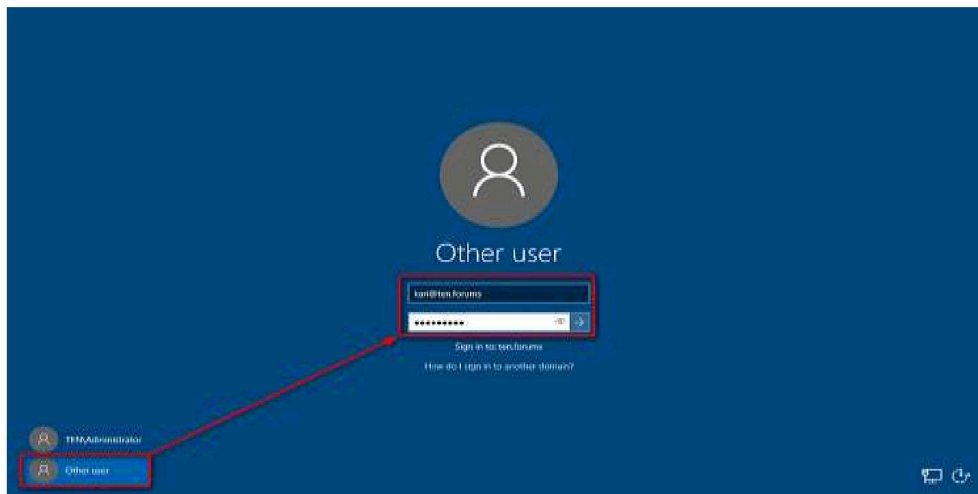
5.6) The first user is usually yourself. To add this user to **Administrators**, right click the user and select **Properties**:



5.7) Add user to **Administrators**:



5.8) In the future you can sign in to server with your own domain user credentials



Conclusion:

From the above experiment, we have studied about setup windows server, setup active directory domain controller, create a domain, add users to active directory

COURSE OUTCOME OF COMPUTER HARDWARE LAB (PR-2)	
CO1	Analyze the personal computer system layout (input, output, process, motherboard) and functions of hardware ports, connectors and parts of PC
CO2	Assemble physical parts or components of computer (FDD, DVD,HDD, Printer, Scanner, Modem, PC)
CO3	Install operating system and Network operating system.
CO4	Use the PC Diagnostic software
CO5	Write and explain the procedure of the experiments conducted.