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| **COMP.5201 Information Technology Operations** | **Semester 2, 2017** |

**Portfolio 2**

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| **Milan Humagain** | **10011027** |

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| **Week 06** | **Session 1 - Monday (2 hr)** | **Date - 14/08/2017** | **Present** |  |
| No written journal entries required for this session. The practical's checklist is your journal entry.  See Moodle Week 06: OS Prac - W10 Install and Config.  Portfolio requirements: Have the practical tasks completed and demonstrated. | | | | |

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| **Week 06** | **Session 2 - Thursday (1 hr)** | **Date – 17/07/2017** | **Present** |  |
| No written journal entries required for this session. The practical's checklist is your journal entry.  See Moodle Week 06: OS Prac - W10 Install and Config.  Portfolio requirements: Have the practical tasks completed and demonstrated. | | | | |

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| **Week 06** | **Session 3 - Friday (2 hr)** | **Date – 18/07/2017** | **Present** |  |
| **Task & Activity**  Here in this session we had discussed about the introduction to OS. There are two types of software.one is Application Software which links the users and computers to perform tasks. Google chrome, MS Office, quick books are some renowned examples of application software. Next comes System software which controls the operations of computer and its devices. It acts as the mediator between users, application software and computer hardware. System software is also of two types. Operating system and Utility software. OS consists Windows, Mac OS, Linux, Chrome OS etc. while Utility Software are the software which helps analyse, configure, optimise or maintain a computer. Program such as file manager, disk checkers, Backup and restore, Antivirus, etc. are some examples of utility software.  A computing platform is a pre-existing environment a piece of software that is designed to run a program within its constraints. Computing platform comprise of hardware platform and software platform. Hardware platform is a hardware Architecture. Intel Itanium and ARM are also the examples of hardware architecture where software platform is an OS or programming environment. Microsoft, windows, Android are some examples of OS.  An operating system is a set of programs containing instructions that work together to coordinate all the activities among computer hardware resources. There are two types of booting. Cold boot and warm boot. Turning on the computer that has completely been turned off is called cold boot and use of OS to restart a computer is warm boot. The two main boot methods are BIOS and UEFI. OS kernel is the core of an operating system that carries out all the OS functions. Each time we boot the computer kernel is copied to the RAM from the storage. ntoskrnl.exe is the kernel image for the family of Microsoft windows NT operating systems. It is responsible for the various services like security, cache manager, I/O management and hardware virtualisation. It is in the C:\Windows\System32.  OS primary function is to manage computer hardware and resources like CPU, memory, Devices, Files and allow other programs to run. OS controls the functions such as process managers, Schedulers, Dispatchers, Time Sharing and controls all processing tasks to avoid problems such as deadlock. OS manages the RAM and provide a means to create, store, retrieve, name, copy, move, delete files and folders. There are two types of OS interface. Graphical User Interface which interact via menus visual images and other graphical objects to issue command and Command Line Interface which is used mostly by advanced users using a keyboard to enter data and instructions.  Desktop User Interface consists Linux Desktop and Windows desktop OS. In Linux server Linux kernel is used without a GUI and in windows server it differs in various windows. Win 7 use server 2008 R2 and win 10 use Server 2016.  Windows CLI: PowerShell offers powerful scripting features and is a powerful alternative to the traditional command prompt. Linux(Ubuntu) GUI and CLI can be identified by using the command ls -l / in command prompt.  Windows is case insensitive bit case preserving. But Linux is case sensitive, and ls is a valid Linux command whereas LS is not. In windows each drive has a root directory and uses \ in path names and uses drive letters where Linux use the symbol \ but does not use drive letters. The terms like Multitasking, Multi-user, Multiprocessing, Multithreading are often used for describing OS. Preemptive Multitasking(PMT) prevents one process from taking over the computer’s entire resources. It is the feature of Linux and Modern Windows OS. And Cooperative Multitasking(CMT) is the limitation of early windows OS i.e. prior to windows 95 and windows NT. Switching Users is used to makes easy log in without logging ourselves off and should save files before switching to another user. In Linux Ubuntu OS who-u command is used in command prompt to see the currently logged users.  We can also user task manager to switch user pressing ctrl+alt+delete.  Mainframe computer are supported using dumb terminals connected to the mainframe via serial connections. Front end processor or communications user processor are used to manage hundred and thousands of connected terminals.  Later Mainframes use the networking technologies like LAN and WAN replacing slower serial connections. Terminal emulator applications are used and is text based interface.  Early PCs could support multiple concurrent users using dumb terminals connected to the PC via serial connections. The X windows system (X11) will enable you to display windows and graphics on a PC created by applications running on remote UNIX systems. Virtual Network Computing(VNC) is a popular system of enabling GUI sessions on remote Linux systems.  The Operating System works with the CPU by using a portion of hard disk as Virtual Memory and using it as an extension to RAM. Virtual memory is also a part of storage and works as additional RAM. The portion of hard disk used as Virtual Memory is called swap files as it swaps files between RAM and hard disk. This technique is called paging. Page.file.sys is a virtual memory for traditional desktop application found in root of C: drive. Swapfile.sys is known as metro app. The size of virtual memory is based on the amount of Physical Ram installed the system. If we don’t want to manage the page file, then we can move it to different volumes.  A partition can be used as a part of real hard disk drive which creates multiple physical drives while Partitioning is the creation of one or more regions on a hard disk drive and can manage information in each region separately. | | | | |
| **Problems & Difficulties**  This session is all about the practical we did on windows 10. It’s all about virtual box, antiviruses, security and so on. There aren’t any problems at all. | | | | |
| **Trouble shooting**  No trouble shooting at all | | | | |
| **Reflections**  This session is not as hard as I am expecting But after this class I came to know that ctrl+Alt+dlete is not only used for ending the task which I am doing till now but also have various features including switch users. And now I can extend the RAM with the help of virtual machine. | | | | |

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| **Week 07** | **Session 1 - Monday (2 hr)** | **Date – 28/08/2017** | **Present** |  |
| No written journal entries required for this session. The practical's checklist is your journal entry.  See Moodle Week 07: OS Prac – VirtualBox and Linux.  Portfolio requirements: Have the practical tasks completed and demonstrated. | | | | |

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| **Week 07** | **Session 2 - Thursday (1 hr)** | **Date – 31/08/2017** | **Present** |  |
| No written journal entries required for this session. The practical's checklist is your journal entry.  See Moodle Week 07: OS Prac – VirtualBox and Linux.  Portfolio requirements: Have the practical tasks completed and demonstrated. | | | | |

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| **Week 07** | **Session 3 - Friday (2 hr)** | **Date – 01/09/2017** |  |  |
| **Task & Activity**  This session is all about the introduction to operating system and how OS get match with each hardware platform. We take the example of super computer which is known as Taiho Light which is no.1 among all 500. There are various OS for various devices includes smart TV, patient monitoring, wireless router, sewing machine, etc. During this course we concentrate on IBM computers with intel core CPU mostly windows 10.  We also compare the history of Microsoft OS for PC’s from MS Dos to windows 10. There are two types of windows app. First comes Desktop Apps which are related to the traditional computers and the another one is Universal windows Platform(UWP) apps which is used from PC’s to Xbox and internet and are preliminary download via Windows Store. We also look at the two different modes of windows 10.  Linux Overview: It’s like unix but not a Unix at all as it is not a SUS compliant. Linux is widely used as servers and is popular among the mobile devices as android also use Linux. Ubuntu is also the one distros of Linux which is Debian-based Linux OS. Requirements for OS instllation was also mentioned there and it was through DVD. We had also discussed about the memory limits and found same in Professional, Enterprise and education which 4GB of memory In 32-bit OS and 2048 in 64-bit OS.But in home 32-bit OS had 4GB and 64-bit had 128GB.  The most important duty of OS is to Store and Manage files. We went through Windows File System and found ReFS can work only on file servers . It had various file systems with various versions.  Virtualisation is the place where computer hardware share its resources with VMs. Type 1 Hypervise is the software that is installed directly on the host and type 2 is an application that is installed on the existing host. Microsoft Hyper-V was first introduced by Microsoft server in 2008. Virtualisation – Terminology have Host computer-The host is Cyclone in our computers, Guest Computer-VM running on host computer, Host OS- Win 10 is our host OS and Guest OS- Linux(Ubuntu) is our guest OS. | | | | |
| **Problems & Difficulties**  The various difficulties that I found during the study time is about Ubuntu as It was the first time that is heard that word. Actually, still I don’t know what does that Debian-based Linux is. | | | | |
| **Trouble shooting**  There are various websites from where Stefan linked his powerpoint slides .From the same links and through the practical that we had done in class I recovered every other things except the meaning of Debian-based Linux. | | | | |
| **Reflections**  From this session I became able to work on windows 10, linux(Ubuntu) and came to know the requirements of windows installation. Previously, I didn’t know about Virtualisation and Terminology but after this session I should not stuck on these things and can work smoothly. The most important thing I know is to differentiate each computers by looking its system setting or properties. | | | | |

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| **Week 08** | **Session 1 - Monday (2 hr)** | **Date – 04/09/2017** | **Present** | **Absent** |
| **Task & Activity**  **Running msinfo32 we get the system information of computer along with the system name version manufacturer, processor, and every other system information. Again, running the dxdiag we get the information related with date and time, processor computer memory and so on. As a part of practical I also had a quick overview on intel processor ID utility after installing and installed CPU-Z and GPU-Z.**  C:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (5).png  **Installing Speccy and HWMonitor on PC I had quick look at the summary, CPU, RAM and so on.**  C:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (14).png  C:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (13).png | | | | |
| **Problems & Difficulties**  There is little problem knowing about the GPU-Z but I went through it and look at its properties had a look at the  Google and it more easy. | | | | |
| **Trouble shooting**  This part of practical is the most easiest among all and what we do is just running [\\nl-fs](file:///\\nl-fs) installing hwmonitor and note  the things that appear in notepad as shown in the picture above. | | | | |
| **Reflections**  This session is totally new for me but easy as well. Where I found difficulties, I went through it following the power point  Slides and just following the steps on my caddy and looking at the properties of the CPU, Memory and so on.  The most important part I found here is running msinfo32 and working on it. | | | | |

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| **Week 08** | **Session 2 - Thursday (1 hr)** | **Date – 07/09/2017** | **Present** |  |
| **Task & Activity**  Above one is for both session 1 and session 2. | | | | |
| **Problems & Difficulties** | | | | |
| **Trouble shooting** | | | | |
| **Reflections** | | | | |

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| **Week 08** | **Session 3 - Friday (2 hr)** | **Date – 08/09/2017** | **Present** |  |
| **Task & Activity**  In this session we did mem test and sea tools. Besides, we had done windows memory diagnostic, CPU, GPU, HDD, performs stress test for CPU and RAM taking 5 minutes each. While installing the mem test it took a lot of time to pass the test and same for sea tools. Computer is testing each and every parts going deeply.  C:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\20171020_150052 (1).jpg  C:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\20170929_152854 (1).jpg | | | | |
| **Problems & Difficulties**  No any problems doing this practical because after putting the CD inside the CPU computer works on itself but takes a lot of time to complete this two sessions. | | | | |
| **Trouble shooting**  While doing windows diagnostic I am waiting for the diagnosed result for capturing the photos but it disappears after the computer gets restart. | | | | |
| **Reflections**  This is that where we r testing each and every components of our computer so I found it great and can also do it nicely in the coming days with the knowledge I gain from this session. | | | | |

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| **Week 09** | **Session 1 - Monday (2 hr)** | **Date – 11/09/2017** | **Present** |  |
| **Task & Activity**  Here in G- Parted we had formatted the partition with file system. Some file system such as NTFS are more specifically used by the windows OS. Other ext 4 are used by Linux OS. Typically, disks are initialised as either “MBR” or “GPT” partition types. G- parted uses the name msdos to refer the MBS partition type.  C:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\pkt g.jpg | | | | |
| **Problems & Difficulties**  After putting the G-parted cd in the cd drive I went on upto the place where I captured a picture but I get stuck there and can’t move further. | | | | |
| **Trouble shooting**  I didn’t know about the separation of partition because of that I can’t move further but after taking help from the friends I get the knowledge to do it. | | | | |
| **Reflections**  I was fully new on G-parted and this is the first time I had worked on the partitions with ntfs, ext and so on. But taking the help from the friends now I can create the partitions and put it as per their file type. | | | | |

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| **Week 09** | **Session 2 - Thursday (1 hr)** | **Date – 14/09/2017** | **Present** |  |
| **Task & Activity** | | | | |
| **Problems & Difficulties** | | | | |
| **Trouble shooting** | | | | |
| **Reflections** | | | | |

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| **Week 09** | **Session 3 - Friday (2 hr)** | **Date – 15/09/2017** | **Present** |  |
| **Task & Activity**  Binary to Decimal In relation to IPv4 addresses. Although IP6 is transitioning on the internet IP4 is still predominant. The caddy we used in our computer lab have get connected to the bcs.net.nz which support both IPv6 and IPv6 is disabled and only show IPv4 addresses. We can see this all using the command ipconfig/all in command prompt.  Byte represent a character of a number for calculation which represent the other computer information. Computer Addresses in network(Binary): Computers use both on and off state, so they use 0, 1 i.e. binary. Binary are perfect for the computers but not for the human. Human need to configure network addresses. There are 232 IPv4 addresses i.e. 4294967296(approx. 4 billion. Computer cooperates with human with the symbol and characters human input in computer. So, there is a need of binary to decimal and decimal to binary conversion. At first human use IPv4 address like **11000000 10101000 00000010 01001101 but it’s hard to remember so, it gets converted to decimal 192 168 2 77 for the human easiness**  **Before the Binary to Decimal human are using different number system that is Non-positional number system.eg. Roman use the symbol like I, V, X, L etc while positional Number system use the symbol 0-9. Good example for non-positional number is I, II, III, IIII, IIIII, IIIIII and so on. Positional number system is a system for the representation of numbers by an ordered set of numerals symbols called digit in which value is depend on position. We look at the various number system and symbols in a small part of slide. Decimal Number system has the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. The position of symbol determines the value. We did some exercise during this session of study which have various numbers for conversion. Binary system Base 2 have the symbols 0, 1. In decimal 111110012 is represented as 24910. We can calculate binary numbers to decimal numbers and other conversions as well in calculator through the programmer view in calculator. To convert an IPv4 binary address into dotted decimal convert each octet byte into decimal and put dot between them. Example. 11000000 10101000 00000010 01011101**  **192. 168. 2. 93 ie. 192.168.2.93**  **We did various questions in classroom and check it with the answers in the slides. Most important is, use ipconfig/all in command prompt.** | | | | |
| **Problems & Difficulties**  No problems at all | | | | |
| **Trouble shooting**  **No trouble shooting** | | | | |
| **Reflections**  **From this session I can write IP address in to the decimal.** | | | | |

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| **Week 10** | **Session 1 - Monday (2 hr)** | **Date – 18/09/2017** | **Present** |  |
| **Task & Activity**  **Pinging one by one**  C:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (20).pngC:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (19).pngC:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (18).pngC:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (17).pngC:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (16).pngC:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (15).pngC:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (23).pngC:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (22).pngC:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Screenshot (21).png | | | | |
| **Problems & Difficulties**  Just must ping so no problems at all | | | | |
| **Trouble shooting**  Not at all | | | | |
| **Reflections**  I learnt by pinging which IP address what will be the reply and by making change what will appear. | | | | |

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| **Week 10** | **Session 2 - Thursday (1 hr)** | **Date – 21/09/2017** | **Present** |  |
| **Task & Activity** | | | | |
| **Problems & Difficulties** | | | | |
| **Trouble shooting** | | | | |
| **Reflections** | | | | |

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| **Week 10** | **Session 3 - Friday (2 hr)** | **Date – 22/09/2017** | **Present** |  |
| **Task & Activity**  Binary to Hexadecimal:  Although IPv6 is gradually transitioning on the internet IPv4 is still predominant. In our computer lab also IPv6 is disabled. IPv6 addresses are in the range of 128(0) to 128(1). Volume of smart phone have got IPv4 is compared to IPv6 volume of planet earth. Network engineer works more easily with hexadecimal numbers. Binary IPv6 is converted to hexadecimal to make it somewhat easier for humans to remember and work with. To convert binary to hexadecimal first we should know what four-digit binary number represent which hexadecimal number or symbol. 10101001101111002 in hexadecimal is represented as  1010 1001 1011 1100  ↓ ↓ ↓ ↓  A 9 B C  We look at the various examples of binary to hexadecimal and know how it can be converted. Same like binary to decimal here also we use Windows 10 calculator programmer view for conversion. We just did short exercise on this topic and afterwards look at the answers whether they are correct or not.  We can see this all by using the command ipconfig/all in command prompt. The IPv6 address is made up of 32 hex digits. Same command is used to look at the physical address of the computer. | | | | |
| **Problems & Difficulties**  There is no any problem and difficulties in this session | | | | |
| **Trouble shooting**  No trouble shooting at all. | | | | |
| **Reflections**  I also had learnt this binary system in my home country, but it is totally different from what I had learnt. Now I can convert it with the way Stefan teaches or can use programming calculator for this conversion. | | | | |

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| **Week 11** | **Session 1 - Monday (2 hr)** | **Date – 25/09/2017** | **Present** |  |
| **Task & Activity**  Networks are the system formed by links. It helps us from connecting us with friends. With the help of websites individual can link each other’s page called social networking sites. We use networks on Mail delivery system, Telephone system, Public Transportation system, Corporate computer network and the internet almost every day. Network share the resources such as Printing, scanning, photocopying, Storage spaces on devices, such as hard drives or optical drives, projectors and so on. Network can be categorised by its size, number, area and bandwidth.  Network are typically categorised as Local Area Network(LAN) and Wireless LAN(WLAN). LAN can be fixed in small geographical media. They are solely owned by an individual. Connections are typically made by copper cabling up to 100m.  WLAN is a LAN which uses radiofrequency via airways to transmit the data. In WLAN we can also share resources such as file, printer and internet access. Same wire is used for networking which is copper cabling. Its range depends on the technology that we used. Ad Hoc Mode in WLAN is used temporarily to connect the devices. A PAN is a network that connects devices such as mouse, keyboard, smartphone, and tablets within the range of individual person. Bluetooth devices can relate to next seven Bluetooth devices. MAN is used by the large college and city areas. It is a high-speed network to share the resources. WAN can connect the networks of two separate geographical areas.  In Peer to peer networks individual users are responsible for their own resources and can decide which data and devices to share or install. There are some disadvantages of peer to peer networks. There is no centralised network administration, no centralised security, complex to manage the computer as the network increases, and it doesn’t have centralised data storage. In Client Server Network each service requires separate server software. A single server can run multiple type of server software. In this type of network, resources are controlled by centralised network administration.  Firewalls are used to block the network traffic. Two types of Firewall are Border Firewalls and Host based Firewalls. Border firewalls are the hardware and software network security devices that sit at the junction between two networks. And Host Based firewalls is the software where the firewall is implemented and protect against threats. | | | | |
| **Problems & Difficulties**  No any problems | | | | |
| **Trouble shooting**  No troubleshooting at all | | | | |
| **Reflections**  From this session I came to know about the actual value of LANs and WANs and most importantly I learnt about the disadvantages of peer to peer network and the need of firewall to protect the computer against threats. | | | | |

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| **Week 11** | **Session 2 - Thursday (1 hr)** | **Date – 28/09/2017** | **Present** |  |
| **Task & Activity**  No journal required | | | | |
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| **Reflections** | | | | |

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| **Week 11** | **Session 3 - Friday (2 hr)** | **Date – 29/09M/2017** | **Present** |  |
| **Task & Activity**  No journal | | | | |
| **Problems & Difficulties** | | | | |
| **Trouble shooting** | | | | |
| **Reflections** | | | | |

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| **Week 12** | **Session 1 - Monday (2 hr)** | **Date – 02/10/2017** | **Present** |  |
| **Task & Activity**  Networks are the system that are formed by links and are the road to connect people and it can be used daily on mail delivery system, telephone system and internet. It provides the services like printing, sharing, scanning, databases, etc. A host any devices that sends and receives data. Intermediary devices ensure the data flows from one host to another host devices. Network devices are linked together using a variety of media using copper and fire optical and wireless media. We also used the icons used by Cisco and identified Network devices looking at the icons.  Modems provides a connection to the internet through internet service provider. It converts the digital data into a different format that can be transmitted onto the ISP’s network. In the network devices there are Hubs, Bridges and Switches and the switches consist of wide variety of features. Enterprise switches typically have “Spanning Tree” protocols and other features. Hubs receives data from one port and send it to another port. It can also be converted to other networking device such as switch or Router which connects to other sections of network. When one device gets connected to it then it gets connected to all other sections of network. Hubs do not segment network traffics.  Bridges are introduced to separate or divide LANs into segments to isolate local traffics and only allow certain traffic to move between the segments. Bridges use the MAC address in the frame.  Switches are the micro-segments of LAN. Switches use the MAC address in the frame and provides higher dedicated bandwidth to each device on the network. It also maintains the switching table. It consists a list of MAC address, records MAC address. If the traffic is forwarded to one port the only one port is affected but not others.  Wireless access points provide network access to wireless device such as laptops and tablets and have limited range of coverage.  Routers/Wireless Routers connect different networks and serves as the gateway to other local networks or outside networks like the internet. | | | | |
| **Problems & Difficulties**  There are some problems as I am not familiar with the terms like ISP, spanning tree. | | | | |
| **Trouble shooting**  I went through google and through the slides and found it easy. | | | | |
| **Reflections**  After this class I came to know is all about the exact meaning of hub and for what purpose bridges are used. I got the full knowledge about this topic that I didn’t know anything previously. | | | | |

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| **Week 12** | **Session 2 - Thursday (1 hr)** | **Date – 05/10/2017** | **Present** |  |
| **Task & Activity**  Installing the Cisco Packet Tracer in .pka version we have to work on it with different generic, switches wires connections and so on.  C:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\g paeted.jpg  C:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\g parted.jpg  C:\Users\milan humagain\AppData\Local\Microsoft\Windows\INetCache\Content.Word\gaparted20171005_120033.jpg | | | | |
| **Problems & Difficulties**  Because of language barrier I thought that Monday classes are off but college will open so that I can do it on Monday but unfortunately I came here and return back. Can’t complete this practical completely. | | | | |
| **Trouble shooting**  Upto here its easy but can’t move forward . I will try it in my free time | | | | |
| **Reflections**  From this lesson I learnt connecting generic computers using wires and switches. This is what I learnt new in this session. | | | | |

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| **Week 12** | **Session 3 - Friday (2 hr)** | **Date – 06/10/2017** | **Present** |  |
| **Task & Activity**  Physical topology of network is that which consists the nodes and hosts and are connected by cable or RF signals. Ring and bus topologies were used in the early LANs but modern LANs use Star topology. In star topology computer host and devices are connected to the central devices such as switch or a wireless access point. Too many interconnected switches in star topology has disadvantages. In Wireless star topology, the wireless access point is typically connected by cable to a switch and then to a main network. In star topology ,Hubs use MAC along with the twisted pair cable and is half duplex, switches also use MAC protocol and is full duplex, Wireless Access points is half duplex and use radio frequency.  Bus(Legacy) are daisy chained and typically use coaxial cable. It use BNC type connector and is half duplex. While in Ring(legacy) is only used IBM token ring networks from the mid 1980’.Network devices are linked together by different media that are copper, Fibre-Optic and wireless. We also had a quick look at the different signals. The new 10 GB standard for ethernet has provision for the use of STP. We also went through UTP- Unshielded Twisted Pair and STP stands for Shielded Twisted Pair. UTP doesn’t use shielding to counter the effects of EMI and RFI. Twisted pair cable are of different types they are cat3, act5 and cat5e, cat6 among which cat3 is used for the voice communication, Cat5 and cat 5e are used for data transmission and supports 1000Mb/s while cat6 supports 1000 Mb/s to 1o GB/s. Optical fibre cable consists of core cladding and jacket where core are the pure glass cladding reflects the lights pulses and jacket protects the glass from scratches and moisture. Optical fibre cable are of two types single and multimode. Single core is a small, uses lasers as the light source and is commonly used with campus while Multimode are the large core with greater dispersion and use LEDs as the light source and is commonly use in LANs.  Ethernet Cabling Standards(Fibre): There are several standards within this group that have different distances (300m to over 70Km) depending on the type of cable. We also look at the table representing Fibre vs. Copper twisted pair. Wireless Media carries electromagnetic signals that represent binary digits of data communication using radio frequencies and provides great mobility. There are some limitations on wireless media. We everybody should think about the Coverage area, Interference and security on wireless media.  Co axial cable is no longer used to connect hosts and has ability to carry electrical signals of very high frequency. It typically carries electrical RF energy to antenna where it is converted to electromagnetic radiation. | | | | |
| **Problems & Difficulties**  No problems at all | | | | |
| **Trouble shooting**  No problems. | | | | |
| **Reflections**  I found this session very interesting as I had learnt about the topologies on computer subject previously but not in detail. But from this session I came to know the modern topology is star topology and had also learnt about the catagories. | | | | |

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| **Week 13** | **Session 1 - Monday (2 hr)** | **Date – 09/10/2017** | **Present** |  |
| **Task & Activity**  In this session we had discussed about the Networks-Media access Control(MAC) Protocols. Here we had a short discussion on Ethernet(wired) and Wireless LANs. Simply, A protocol is a set of rules that specify the interactions between the communicating devices. TCP, IP, HTTP, HTTPS, ICMP etc. are the communication protocols related to the internet.  MAC protocols are needed to share the common media by regulating the placement of data frames onto the media.  Frame Addressing and Forwarding: Here we look at the diagrams showing four computers H1, H2, H3 and H4. If H1 wants to communicate with H3 a frame is constructed with source and destination physical addresses. In the case of Ethernet and WiFi the physical address is a 42 bit and 12 hex digit representation.  MAC protocols - CSMA/CD: There are three types of MAC protocols – CSMA/CD. MA: Multiple Access- More than one device contends to the media. CS: Carrier sense – Device will transmit in the free media and will waits a random amount of time if the barrier occurs. CD: Collision Detect: if two devices transmit at the same time the collision occurs then the both devices will back off and try again after some random time. MAC protocols – CSMA/CA: It uses wireless network and CSMA is same as the previous one and CA (Collision Avoidance) is required to prevent collisions. RTS/CTS mechanism is used in this Wireless network. Both CSMA/CD and CSMA/CA are contention based that is random access protocols. MAC Protocol – Token Passing Legacy is a special type of packet called Token which circulate around a cable ring from computer to computer to send data across the network. This is controlled access method providing fair access for all stations. There are no collisions in this random method.  MAC Protocol – polling legacy is a method initially used in mainframe network for communication to “dumb” terminals. It uses a master/slave configuration. If the slave answers yes then the device is permitted to transmit data, if no then master move on and polls the next slave device. The method is controlled access method and is repeated continuously.  Logical Topology determines how hosts on network view and process frames sent and received on the network. We also look at the Combination of Logical Topology and MAC protocols and how it operates the method of sending and receiving data on the network. The Logical Topology of an ethernet network is a multi-access bus in which devices all share access to the same medium while physical topology of an ethernet network can be a bus or star.  Token passing: Logical vs. Physical Topology. The Logical Topology of a Token passing network is ring in which a token is passed from one device to another. The physical Topology of an Ethernet network can be a ring or a star. | | | | |
| **Problems & Difficulties**  Protocols are fully new topic for me so I get confused on MAC CSMA/CD and CSMA/CA. | | | | |
| **Trouble shooting**  I recover these things by going through the slides orally. | | | | |
| **Reflections**  I learnt the things that I didn’t know previously so these things are very important for my future. | | | | |

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| **Week 13** | **Session 2 - Thursday (1 hr)** | **Date – 12/10/2017** | **Present** |  |
| **Task & Activity**  Computer and network security is the protection afforded to an automated system to attain the applicable objectives of preserving the confidentiality, integrity and availability of information system resources. Under the CIA Triad there are three key objectives that are the heart of computer security which are Confidentiality, Integrity and Availability. It is designed to guide policies for information securities within an organization. Confidentiality covers two concepts that are Data Confidentiality which assumes that the private information are unavailable to unauthorised individuals and Privacy is the second which assumes that individual control what information related to them may be collected and stored and by information may be disclosed. Integrity also covers two concepts that are Data Integrity which assures that the information may be changed only in a specified and authorised manner and System Integrity assures that a system is free from deliberate. Availability check the system properly and give access to the service to the authorised users. Authenticity and Accountability are the two additional concepts to define security objectives.  System like Hardware, Software, Data, Communication facilities and networks are the assets of computer system and they need the better protection. Cyber-attacks are of various kinds. Each person or companies are being targeted for reason. example: Breach of Privacy- Stealing financial, medical and personal information. Threats represent a harmful factor to an asset. There are two types of attacks which are Active and passive attack. Attackers had already proved their abilities and their main aim is to steal sensitive or valuable information for financial gain. Firewall, strong passwords and antivirus software are the countermeasure to the problems of hacking. Cyber Warfare can describe attacks by the terrorist groups looking at the success of various nation.  Physical security should also be maintained by locking, monitoring, setting smoke and fire alarms, etc. Accidents, Fire, Flood and Natural Disasters includes BC plan and DR plan which includes comprehensive planning for long term challenges and the recovery actions that takes place after the incident. Malware are the malicious software refers to a variety of forms of hostile or intrusive software including computer viruses, Worms, Trojan Horses, Ransomware, Spyware, Adware, Scareware and other malicious programs. Spyware is the program that gathers user’s information and send it to third party where Adware displays advertisements. Viruses infect the computer without user’s information and worms are self-contained program that takes the functional copies of computer system. Trojan Horses are applied with code and unknowingly it results in the theft of data. Ransomware prevent from accessing their system by locking the System’s screen. Malware use the network resources and antivirus software protects our computer. SPAM are the vectors for malware and phishing attempts and use antivirus to get rid of it. Wifi is not secured everywhere, so we all should know what are the safe networks and which are not as 38% of New Zealanders didn’t know about the secure and unsecure Wifi. | | | | |
| **Problems & Difficulties**  No problems at all | | | | |
| **Trouble shooting**  No trouble shooting | | | | |
| **Reflections**  These are the topics that I had investigated during the Ray’s Assignment so nothing seems new. And the thing I came to know is about the safe networks and unsecured networks. | | | | |

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| **Week 13** | **Session 3 - Friday (2 hr)** | **Date – 13/10/2017** | **Present** |  |
| **Task & Activity**  This session is related to the protection of windows 10 computers. Windows update, Windows Firewall, Windows Defender, User Account Types, File and folder permissions, Backups, Passwords, Encryption, Other Policies are the basic security items for your computer. Windows Update is important as the security issues in OS need to be addressed as they may be exploited by malware or hackers while other updates addresses bugs and patch known issues in windows even though they are not responsible for security vulnerabilities they might impact the stability of OS or just be annoying. Some updates provide new features. Windows 10 detect update every 22 hours. When a update is required it automatically download and installed. Firewall protects the internal network and computer from potential intrusion. Computers should have antivirus software that offers Real-Time Protection. Protection update generally automatically occur once a day from the Microsoft Update Website. Windows Defender also uses Cloud-delivered protection called Microsoft advanced protection service. It requires monthly updates known as engine updates and will release major features updates alongside windows 10 releases. After the internet explore SmartScreen get turned on it shows the warning and block download. Windows defender has Quarantined the file and you have the option of permanently removing it.  User Accounts Types are known as the membership of a group that will give the user certain privileges on the system. Groups are of two types; Administrator and Users. Administrator group have unrestricted access to computer and Users group is security protected. We can also log in through Standard user. UAC- User Account Control helps to prevent computer from viruses and protect it from malware. Also blocks the unauthorised apps and automatic installation to prevent the system setting from being changed.  File and folder permissions security protects the C:\ user folders files by NTFS security permissions. NTFS file system maintains access control lists(ACLs) which allows limited Access to the files and folders. By Auditing you can track when user access a file or a folder and what changes they make on that folder. In windows 10 backup utility called File history is provided which enables you to back up your data on USB drive or other external devices. Strong password is the requirement of strong security on computers. File encryption can be another choice for security to encrypt individual files or folders. BitLocker is a good example for it. Can protect files by running gpedit.msc . None of the networks and computer are 100% secure but win 10 tried its best to make us safe and we shouldn’t open email from unknown sources and watch out for social engineering attacks like phishing. | | | | |
| **Problems & Difficulties**  No problems at all | | | | |
| **Trouble shooting**  No troubleshooting | | | | |
| **Reflections**  These are the things that we carried out during our practical. Firewall comes first when we are talking about securities. We should be secure ourselves but none of the network are 100% secure. | | | | |

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| **Week 14** | **Session 1 - Monday (2 hr)** | **Date – 16/10/2017** | **Present** | **Absent** |
| **Task & Activity** | | | | |
| **Problems & Difficulties** | | | | |
| **Trouble shooting** | | | | |
| **Reflections** | | | | |

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| **Week 14** | **Session 2 - Thursday (1 hr)** | **Date – 19/10/2017** | **Present** | **Absent** |
| **Task & Activity** | | | | |
| **Problems & Difficulties** | | | | |
| **Trouble shooting** | | | | |
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| **Week 14** | **Session 3 - Friday (2 hr)** | **Date – 20/10/2017** | **Present** | **Absent** |
| **Task & Activity** | | | | |
| **Problems & Difficulties** | | | | |
| **Trouble shooting** | | | | |
| **Reflections** | | | | |

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