# Assessment Task 1

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| **Assessment Title:** | Written task– Networking background knowledge |
| **Assessment Instructions:** | This assessment is a written task to check your knowledge of small networks.    Specification:  In this assessment, you must provide written responses to all questions below. You can either write or type in your answers in the spaces provided. You may be required to research your answers. Referencing should be used when using information from other sources. This assessment is open book.  This assessment will be conducted in class or online.  You must complete all tasks to a satisfactory level to receive a satisfactory result. |
| **Duration of the Assessment:** | 2 hours |
| **Required Knowledge** | The candidate must be able to demonstrate knowledge of:   * industry-accepted hardware and software products, including those used for networks * building requirements that may be used in installing, configuring and securing an office * data and voice transmission technologies and protocols * hardware and software installation procedures * organisational procedures including: * software and hardware testing methods * network setting testing methods * software, hardware and network setting problem resolution procedures * local area network (LAN) capabilities and characteristics, including: * network types * internet protocol addressing * switch and hub operation * network connections, both wired and wireless * networking technologies, including network operating systems and cabling standards * network tools, set-up and configuration procedures * security implications and methods for a home office network * software packages supported by the organisation * industry standards applicable to small networks * installation and configuration tools |
| **Resources required for this Assessment:** | |
| **Supplied by Institute/workplace** | Standard computer room –Networked PCs, MS Office (include, Visio and Project).  Technical documentation and installation manuals.  Case profile **“**Small office home office case study**”** |
| **Supplied by student** | N/A |

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| **Assessment Task 1: Written task– Networking background knowledge** |

1. Identify two (2) building requirements for each of the following areas in a small office and home office context. You may need to research this question.

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| 1.1 | Electrical installation: |
| Answer: | Organisations undertaking any electrical installation works should ensure   * Electrical installation (Lighting, Air-conditioning, Outlets, etc) should be carried out by a licensed electrician. * Electrical installation rules and standards ( AS/NZS 3000:2018 Wiring Rules) are understood and adhered to. |
| Satisfactory  Not Satisfactory | |

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| 1.2 | cabling and connection: |
| Answer: | Organisations undertaking any Cabling and connection installation works should ensure   * Cabling and connection Should be carried out by a licensed Cabler. * They understand and comply with the relevant standards associated with cable connection and installation.   Relevant standards include but not limited to;   * AS/CAS009 (Installation requirements for customer cabling) * AS/NZS3080:2013 (Balanced & Optical Fibre Cabling) * ISO/IEC11801 (Generic cabling for customer premises) |
| Satisfactory  Not Satisfactory | |

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| 1.3 | physical and building security: |
| Answer: | Organisations undertaking any work or installations on the buildings physical and security aspects should ensure   * Inspections relating to some of the following examples (Emergency lights, Fire extinguisher, Alarm System, Door locks, etc) are conducted by the relevant and qualified inspectors. * They understand and comply with all relevant codes associated with installations or changes.   Relevant codes include but are not limited to;   * AS 4349.0 inspection of buildings – General requirements |
| Satisfactory  Not Satisfactory | |

1. Data technologies and protocols:

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| 2.1 | Describe the two (2) data transmission technologies: Ethernet and Wi-Fi.  Identify one protocol for each of them. |
| Answer: | Ethernet:   * Ethernet is a wired networking technology that connects devices with cabling * IEEE 802.3   WIFI:   * WIFI is a wireless networking technology that connects devices using radio waves. * IEEE 802.11 |
| Satisfactory  Not Satisfactory | |

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| 1. 2 | What is VoIP? What is H.323? |
| Answer: | VoIP:   * VoIP stands for Voice over Internet Protocol. * VoIP is a technology is used to provide communication services over the internet these services include; SMS and voice messaging rather than using a public switched telephone network.   H.323:   * H.323 is a protocol that is part of International Telecommunication Union Telecommunication Standardization Sector (ITU-T) series of H.32x protocols. * H.323 can be used to establish, maintain, and terminate multimedia sessions over IP networks. |
| Satisfactory  Not Satisfactory | |

You are working as an IT specialist for XYZ. Review the “Small home office case study”, and answer the following questions:

1. Referring to the Hardware, software, and network installation procedures:

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| 1. 1 | Summarise four typical actions you should include during the installation of hardware, software, and networks. |
| Answer: | * **Identifying, understanding and planning** is a key process when working within an IT environment. An important part of this process also includes obtaining the correct permissions and approvals from your client. * Once identifying a clients need it is important to asses and **prepare the site environment** and ensure the site is clean and free of any hazards that could damage the equipment. * After planning and preparation, as an IT specialist it is important to adhere to and follow any manufacturers instruction for installation of equipment as well as **complying with any organizational policies, procedures or guidelines.** * As an IT specialist it is important to **configure and then test** any components you have installed to ensure they are working correctly. |
| Satisfactory  Not Satisfactory | |
| 3.2 | Where should you source software for your installation? Specify four (4) sources. |
| Answer: | 1. **Manufacturer Websites**: Most manufacturers will provide software downloads for their products via their website this can be a useful tool when looking for software that is compatible with your network. 2. **Online retailers**: Online retailers can provide a large number of options when looking for software for a home network. 3. **Open-Source software**: Open-source software is free to use and can be downloaded form different websites provided the appropriate security measures and training is in place. 4. **OS Software**: If you are using a computer as part of your home network you can often use the operating systems built-in software to setup and manage your network. |
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| 3.3 | Provide one example of a standard that you need to refer to when installing each of hardware, software, and a network. |
| Answer: | Hardware   * ISM (information security manual) * The ISM provides guidelines for installing and managing IT equipment it has been designed to assist organizations in protecting their information and assets from cyber threats.   Software   * ISO/IEC 19770-1 * This standard provides guidelines for software asset management, including software installation and acceptance testing.   Network   * ISO/IEC 27001 * This standard provides guidelines for information security management systems, including network security. |
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1. Referring to the Testing and solving issues procedure:

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| 4.1 | Summarise the methods that you are required to use for testing software, hardware, and networks. |
| Answer: | **Black Box testing**  Black box testing is a testing technique that examines the functionality of an application without looking into its internal structure.  **White Box testing**  White box testing is a testing technique that looks at the internal structure of an application.  **Grey Box Testing**  Grey box testing technique combines the benefits of white box and black box testing. It tests a software product or application with the partial knowledge of its internal structure. |
| Satisfactory  Not Satisfactory | |

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| 4.2 | Summarise four tasks that you are required to conduct in troubleshooting hardware, software, and network configuration. |
| Answer: | * **Identifying, understanding and planning** is a key process when working within an IT environment. An important part of this process also includes obtaining the correct permissions and approvals from your client. * Once identifying a clients need it is important to asses and **prepare the site environment** and ensure the site is clean and free of any hazards that could damage the equipment. * After planning and preparation, as an IT specialist it is important to adhere to and follow any manufacturers instruction for installation of equipment as well as **complying with any organizational policies, procedures or guidelines.** * As an IT specialist it is important to **configure and then test** any components you have installed to ensure they are working correctly. |
| Satisfactory  Not Satisfactory | |

1. Answer the following questions on local area networks (LAN) and wide area networks (WAN).

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| 5.1 | Complete the following table to compare technologies and protocols for LANs and WANs. |
| Answer: | |  |  |  | | --- | --- | --- | | Network Types | Local area network | Wide area network | | Geographical spread (same/different) | LAN is used to cover small areas; | WAN is used to cover Large  areas | | Typical bandwidth level (Gbps or Mbps) | LAN is faster than WAN and can reach speeds of up to 1000 MBPS | WAN is significantly slower  and can reach speeds up to  150mbps | | Congestion (high/low) | Low | High | | Example technology (Ethernet / frame-relay etc.) | Ethernet is used in LANs to connect devices within a single location such as a small office or home office. | Ethernet can be used with a  WAN to connect LANs spread over a large area. | | Example protocol (IEEE802.3/X.25 etc.) | IEEE802 | TCP/IP, Frame relay, PPP, X.25 | | Main node devices (switch/router) | Switch | Router | |
| Satisfactory  Not Satisfactory | |

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| 5.2 | How can you determine whether two IP addresses belong to the same network? |
| Answer: | To determine two IP addresses, belong to the same network you need to know the subnet mask of the network. |
| Satisfactory  Not Satisfactory | |
| 5.3 | Complete the table below to compare the main differences between the following network hardware: switch, hub and router. |
| Answer: | |  |  |  |  | | --- | --- | --- | --- | |  | Router | Switch (single layer) | Hub | | OSI layer (choose the main one) | Layer 3 | Layer 2 | Layer 1 | | Forwarding database or table | IP Routing table | MAC address table | N/A | | Sample protocols (IEEE, RFC, etc.) | RFC 1812  RFC 1256 | IEEE 802.1Q | *CSMA/CD* | | Features and unique functions (list 2) | **Feature**  Routers can assign IP addresses to devices on a network. **Function**  Routers have a NAT function that allows multiple devices within a LAN to share a single public IP address | **Feature**  Switches can be used to create a VLAN, this allows a network admin to segment a network into smaller and more manageable subnetworks. **Function** Switches have a MAC table. This function maps MAC addresses to ports. | **Feature** Hubs work with  broadcasting and shared bandwidth. **Function** Hubs do not offer the option  to control or exclude  individual receivers. | | Forwarding broadcast (Yes/No) | No | Yes | Yes | |
| Satisfactory  Not Satisfactory | |

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| 5.4 | Identify IEEE or RFC protocols for the following wired connection and wireless connection.   * Ethernet: * Packet switching: * Wi-Fi: |
| Answer: | * Ethernet:   IEEE 802.3  RFC 894   * Packet switching: IEEE 802.1   RFC 791 * Wi-Fi: IEEE 802.11  RFC 5416 |
| Satisfactory  Not Satisfactory | |

1. Answer the following questions on networking technologies

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| 6.1 | List two popular network operating systems and their providers. |
| Answer: | Microsoft Windows  Operating system  Apple   Mac operating system |
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| 6.2 | List two international or Australian standards for cabling. |
| Answer: | * AS/CA 009: These standard covers installation and maintenance practices that must be followed. * AS/CA 008: This standard covers the cable and cabling products connecting the hardware from the customers perspective. |
| Satisfactory  Not Satisfactory | |

1. Answer the following questions on network tools, software, and configuration procedures.

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| 7.1 | Describe the following software: ZOOM, Teams and TeamViewer that the organisation approved? |
| Answer: | Zoom   * **Zoom** is a video conference software. It allows its users to connect with each other or in groups and offers both audio and video through its platform. It has quickly become one of the biggest video conferencing platforms used today.   Teams (Microsoft)   * **Teams** is Microsoft’s video conferencing platform it connects users with video and audio. Teams can be a great collaborative tool for business’ and gives users the advantage of file sharing, organised meetings and app sharing. However, teams does require a paid subscription and is included in a Microsoft 365 subscription.   Team Viewer   * **Team viewer** is a remote access software, it is used for remote access and online collaboration to connect to connect users. |
| Satisfactory  Not Satisfactory | |
| 7.2 | What are PuTTY and IP Config? |
| Answer: | PuTTY   * PuTTY is a free and open-source terminal emulator that supports many networks protocol with a wide variety of uses. It is available for use on many operating systems. PuTTY is commonly used to gain remote access to networks and in this case allows users to provide support and online collaboration.   IP Config   * IP config is a command line tool that assists users in checking the settings of their computer’s internet connection. IP config displays helpful information such as your computers IP address, IPv4 address, IPv6 address, subnet mask and default gateway. |
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| 7.3 | What can you use (a) an UPT/STP wire Stripper and (b) a Plug Crimper for? |
| Answer: | **UTP (unshielded twisted pair), STP (shielded twisted pair) wire stripper** is a tool designed to remove the cable jacket without damaging the internal wires.  **Plug Crimper** is a tool that helps connect wires by squeezing the metal collar of a connector around the wire conductor. |
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| 7.4 | Outline the procedure for using PuTTY to access a router’s CLI. |
| Answer: | Connect to Router via your device >Install PuTTY  >Launch PuTTY  > Enter routers IP Address  > Login when prompted  >type command “show version”  >configure a password  > configure a host name for your device  > configure IP Addresses for router interfaces |
| Satisfactory  Not Satisfactory | |

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| 7.5 | Summarise three actions you are required to conduct for configuring IP networks. |
| Answer: | **Network Design and Configuration**   * Network Design and configuration isa the planning, designing and maintenance of a computer network.   **Network Encryption**   * Network encryption Is the process of encoding data transmitted over a network to protect from unauthorised access.   **Network segmentation**   * Network segmentation is a method used to divide a computer network into smaller parts known as subnets or segments to improve network performance and security. |
| Satisfactory  Not Satisfactory | |

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| 8 | Outline the similarity and differences between Wireless Protected Access 2 (WPA2) Personal and WPA2 Enterprise when they are applied to address the security needs for home office networks. |
| Answer: | Similarity  Differences   * WPA2-personal is designed for home use. * WPA2- Enterprise is designed for use in organizations. * WPA2-personal is suitable for small networks with few users. * WPA2-enterprise is suitable for larger networks with many users. * WPA2- Enterprise provides a higher level of security than WPA2 Personal. |
| Satisfactory  Not Satisfactory | |