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Information Technology Lachlan IT Online

Diploma 19016
IT (Networking)

Project 4

19016 Project 4. Basic Network Client Installation

This project is used in the assessment of modules **ICAI5045A**, **ICAA5045A** and **ICAI5100A**.

In this project, you have been asked to design and model and test a business network configuration, prior to its implementation on site. The network in question has a range of business requirements. It is vital that the major network design issues and hardware configuration be fully resolved and tested prior to implementation in the work place.

Important: Due to the significant hardware requirements of this project, the practical tasks can be completed as a 2 day workshop. Due to hardware availability and lab time, these workshops must be booked. Please contact your teacher to discuss this. In order to maximise your time during the workshop, you should complete task 1 prior to attending the workshop as well as creating a simple 5 page sample company website (used in task 2) for implementation within the project.

You will need:

- 2 Computers capable of running a Mail server (eg. Microsoft Exchange 2003) and a http server (eg. Microsoft Server 2003 with IIS).
- 1 computer capable of running as a network client (eg. Microsoft XP Professional).
- You may use any current operating system on these computers. Current operating systems can include any of Microsoft's Windows XP or Vista, Novell's Suse Linux, Ubuntu Linux (or any other Linux variety) or Apple Mac OS X.
- Two routers (Layer 3) and one switch capable of running 2 VLAN segments.
- Norton's ghost (or similar product) to enable you to regularly backup your system. (Not available from TAFE)
- TFTP Server software for backing up router/switch configurations
- Norton's Antivirus or other personal virus software.
- Microsoft Visio (or similar product) technical drawing program (Available on loan from Parkes TAFE Library).

You will need to complete the following tasks:

Task 1. Network Topology [ICAA5045A: Element 1, 2 and 3; ICAI5100A Element 1]

This task allows you to demonstrate that you are able to research and design an appropriate network topology for a business network. To assist you in your work you will need to use a Word Processor (eg. Microsoft Word) and a drawing package (eg. Microsoft Visio) to assist you.

Deliverables:

To complete this task you are to write a report titled "*TASK 1 Network Topology design*", defining your preferred network layout. Your report should include the following information:

Overview: A brief one paragraph introduction main features of your network design.

Network components: Identify each of the devices you have included in your design with a paragraph summary of the role each device has within the network and the network interfaces that the device has. Actual brands and models are not required at this stage.

Network Topology diagram: Using Visio (or similar product), produce a network design diagram that will provide the functionality required by the business. The diagram should clearly label the segments and connecting devices. Also indicate the media type and network protocol to be used in each segment.

IP Addressing Scheme: Using Visio (or similar product), produce a network design diagram that identifies the IP addresses used in the network. This diagram would be best produced as an overlay to the network topology diagram previously created. The IP addressing must follow a pattern for the placement of routers, printers, workstations etc. DHCP should be used for all non essential devices. Port access for each segment must be specified.

Capacity Planning: For each segment on the network, identify the type and volume of traffic that could be expected. Show the calculations used in your estimates.

Benchmarking: Design a benchmarking procedure to be run when the segment is implemented. This procedure should also be repeated over the life of the network.

Equipment list: Produce a list of equipment which will be needed to implement this network (excluding computers). This list should include all communications equipment and cabling material.

The Business requirements for the network are contained in the document "Network Design Requirements". See Appendix 1. A floor plan for the building can be found in Appendix 2.

Task 2. Create servers. [ICAI 5098A Element 1; ; ICAI5100A Element 3]

This task allows you to demonstrate your knowledge of server configurations.

Deliverables:

To complete this task you are to configure 2 separate servers:

- HTTP/FTP/DNS server with sample data allowing the unit to be tested. The devices must be secure and tested to be so using third-party security evaluation software. A sample http site using 5 linked pages should be implemented. An FTP requiring user authentication should also be configured. DNS should be functional.
- Terminal services server/NAS server. This device should be configured to allow users to log in and run a sample application as well as being able to provide network storage to work grouped computers.

Each server should be configured to allow remote administration from a host computer within the internal business network segment.

Task 3. Practical – Create Network Infrastructure. [ICAI 5098A Element 2; ICAI5100A Element 2]

This task allows you to demonstrate that you are able to configure a network infrastructure based on a network topology plan. In consultation with your teacher, who will advise you of available equipment, implement the main features of the topology design.

Deliverables:

To complete this task you are to configure 3 separate network configurations. It should be implemented where possible with 3-4 routers and one switch configured with 3 VLANS (one for each segment):

- Connect and configure network devices to act as the Internet services segment based on your network topology design. You may use an existing ADSL gateway to the internet if available. This segment should cater for the computer devices listed in your topology design. The internet gateway should include appropriate filtering based upon the packet types and port needs of the proposed internet servers and desktop computers.

- Connect and configure network devices to act as the internal business network segment with a gateway to the Internet services segment. This segment should allow for all the server devices of the internal business network and at least their required services.
- Connect and configure network devices to act as the remote office network segment, VPN connection to the Terminal Services Server.
- Record any changes to the original network topology and document all configurations made to the network devices for later use.

Task 4. Implement servers into network segments [ICAI5098A Element 3 and 4; ICAI5100A Element 5]

This task allows you to demonstrate your knowledge of configuring a host computer to connect to a network service.

Deliverables:

To complete this task you are to implement your servers within the appropriate network configuration and test its functionality using your desktop computer. In specific you must be able to demonstrate:

- That a desktop computer within the business segment can access the http and ftp services found on the internet segment
- That a desktop computer within the remote office segment can run software on the terminal services server found on the internet segment.
- Ensure that the boundaries between network segments have appropriate security/filters etc.
- Each user account has appropriate levels of access for the type of service they access.

Task 5. Network management [ICAI5098A Element 5; ICAI5100A Element 6]

This task allows you to demonstrate your knowledge in remote network management.

In this task you are asked to prepare your desktop computer to act as a management PC to the various servers within your network.

Deliverables:

- Using your desktop computer, located within the internal business network segment, load management utilities that will allow you to administer each server and the services they provide.

This can be demonstrated by:

Http/Ftp server: Being able to manage the server's devices, view its security logs and have tools in place to be able to maintain the content of the sample website.

Terminal Services Server: Be able to install software on the terminal server and configure an individual user's profile to allow them to access that software from their terminal services desktop when they log in.

- Using your desktop computer, demonstrate how you are able to monitor network traffic on each of the segments.

Appendix 1. Network Design Requirements

It is important that any network design provide the business with a secure and functional network. In particular, any network design must provide:

1. A secure gateway to the internet that allows staff to use email, browsing and ftp facilities on the internet.
2. A section of the network to house the company's public internet services such as the Http, DNS and Email servers.
3. A section of the network to house the internal services of the network which includes a Network Access Storage (NAS) device, DHCP server and a Terminal Services Server.
4. From the internal services segment, a VPN gateway using an ADSL link the company's remote office. The remote office contains 5 PC's running terminal services client software.
5. An Internal network capable of housing desktop computers, 3 servers and printers.
6. A Remote office housing desktop computers and a printer.
7. An Internet service area housing a minimum of 3 servers.

The Network ISP has allocated the following network resources to be used as part of the Internet gateway segment:

Gateway: 203.14.171.65

Domain name: proj4.lachlanitonline.edu.au

DNS: 203.14.171.67

Leased subnet: 203.14.171.88 to 203.51.121.95

Appendix 2. Floor Plan

