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ISY202 – Information Systems Networking Essentials Assignment

Semester 2, 2018

Assessment Weighting: 20%

Due Date: Week 11, 28/09/2018

Instructions:

This is a group assignment and all students are expected to contribute evenly. This report should be written in clear English, and be submitted in electronic format. You are expected to use references in the normal Harvard referencing style.

Late submission of assessment items or deferral of examinations

An assessment item submitted after the assessment due date, without an approved extension or without approved mitigating circumstance, will be penalised. The standard penalty is the reduction of the mark allocated to the assessment item by 5% of the total mark applicable for the assessment item, for each day or part day that the item is late.

Correct referencing techniques

A key skill expected of all students is the ability to correctly reference and cite academic works or other works referred to in student assignments using Harvard style. A failure to correctly or fully cite academic works could result in a lesser mark than may be achieved otherwise and can even result in a charge of academic misconduct. It is essential, therefore, that all students become fully familiar with the recognised methods for referencing words. Details of the key referencing methods can be found at: www.aih.nsw.edu.au moodle site.



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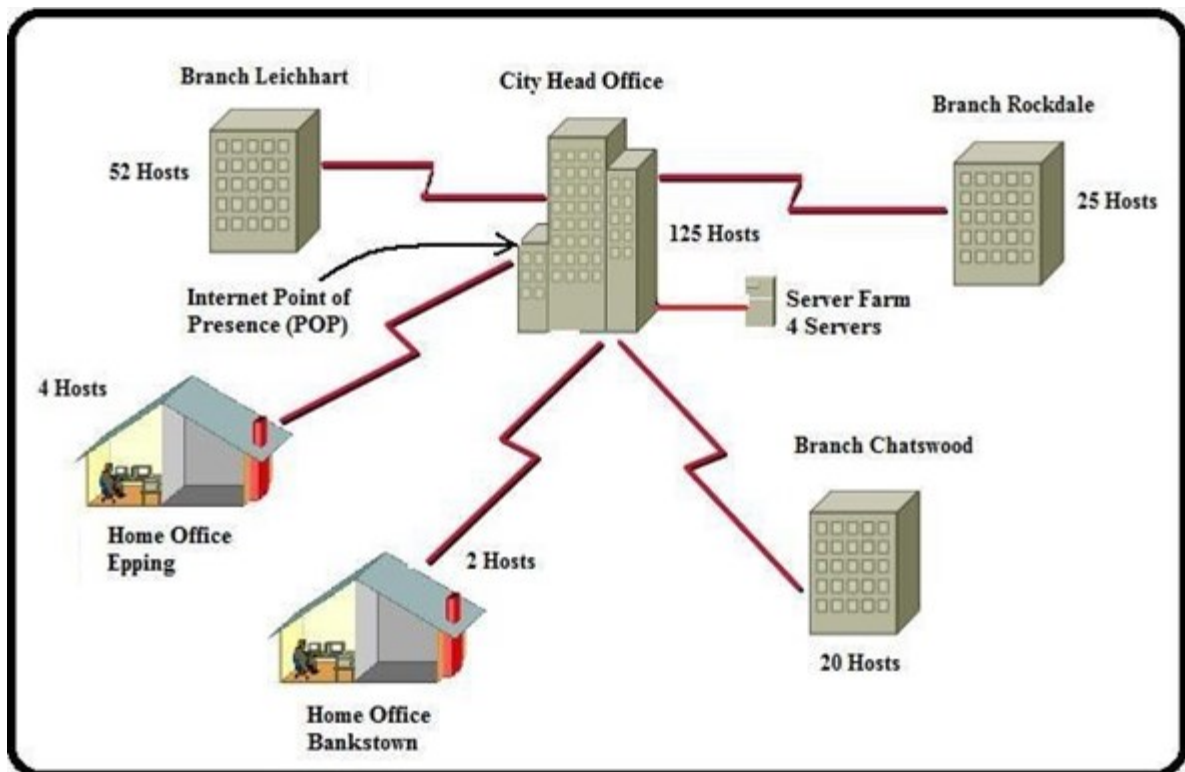
THE SCENARIO

The ABC Company is a new company with its Head Quarters building in the city, and with branches in Hornsby, Sutherland, and Parramatta. In addition there are two small home offices in Epping and Bankstown. There are WAN connections between each site and Head Office, with all Internet access through the Head Office site.

The ABC Company is a retail company for all types of computing devices. The company is planning a restructuring of its network to allow for an expected 100% expansion over the next 5 years. Whilst the numbers of sites are expected to remain the same, the number of employees, and so end computing devices, is expected to double. However, the server farm, currently 4 servers, is expected to be adequate for the foreseeable future.

The ABC Company has consulted your group to provide a detailed Networking Plan. To assist you the below diagram is supplied.

ABC Company Network Plan





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REQUIREMENTS

You must design the network requirements for the ABC Company. As the network consultant you will be required to develop a plan for the Company network, including all costs, for all of the following:

1. The type of media you propose to use. This must be adequate to allow for a 100% expansion of the Company network within 5 years, and must be sufficient for all bandwidth requirements for each Company site. It should also be sufficient for increased bandwidth needs in the future. Whilst the actual lengths of media chosen are not required, the cost of media chosen should be included as a cost per meter price. You must justify your choice of media. Remember this might include copper, fiber and wireless options. The serial links between each site will be supplied by the company's ISP and are therefore not to be included in the above media requirements.
2. You are required to subnet the Company's network IPv4 Address using VLSM as appropriate. You will be required to provide summary tables with IP Address ranges for all hosts in your network. When allocating addresses you must allow enough addresses for the 100% expected future expansion of hosts for the ABC Company. As well, you need to allocate one (1) printer for each 50 computers (or part thereof) on each subnet. If there are, for example, 70 computers required on a subnet, then two printers are required for that subnet. Printers will have the last usable address/es for the subnet to which they belong. The servers will be located in a separate subnet, and must be allocated static IPv4 Addresses within that network. The number of servers is not expected to grow.
3. The ABC Company is anticipating a move to IPv6 in the future, and so needs to use a Dual Stack environment for IPv4 and IPv6 addresses. You are required to address the network for IPv6.
4. You must detail the hardware (ONLY switches, routers) that the ABC Company will require. This must include full reasons for selecting particular hardware, which must be adequate for the ABC Company's requirements. Again, consideration must be made with regard to future expansion and bandwidth requirements. The details about **computers, servers and printers are not required**.
5. You must justify the type of network topology you propose to use at each ABC Company location. A topology diagram for each location should be included in your report.
6. Communication on the Internet is essential. Select and fully justify the type of Internet access you propose to have for this company. This must be scalable to allow for future growth and needs. The Point of Presence (POP) is located at Head Office.



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IPv4 Addressing

The ABC Company has purchased the IP Address (Given by your Instructor) from its ISP for addressing all hosts within its network. Subnet, using VLSM, this IP Address to provide addresses for all required hosts. This addressing scheme should allow for the 100% expected growth. Complete the table below.

Subnet Name	Subnet Address	Subnet Mask	Host Range of Addresses	Broadcast Address
City Head Office Accounts				
City Head Office Marketing				
City Head Office Sales				
Leichhart Branch				
Rockdale Branch				
Chatswood Branch				
Epping H.O.				
Bankstown H.O.				
Server Network				
Leichhart WAN				
Rockdale WAN				
Chatswood WAN				
Epping WAN				
Bankstown WAN				



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IPv6 Addressing

The ABC Company has purchased the IPv6 Address (Given by your Instructor) from its ISP for addressing all hosts within its network. Subnet, using VLSM, this IP Address to provide addresses for all required hosts. This addressing scheme should allow for the 100% expected growth. Complete the table below.

Subnet Name	Subnet Address and Mask (All /64)	Host Range of Addresses
City Head Office Accounts		
City Head Office Marketing		
City Head Office Sales		
Leichhart Branch		
Rockdale Branch		
Chatswood Branch		
Epping H.O.		
Bankstown H.O.		
Server Network		
Leichhart WAN		
Rockdale WAN		
Chatswood WAN		
Epping WAN		
Bankstown WAN		



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Additional Information

1. Apart from the IP Addresses, you are **not required** to supply any WAN link information. This included serial cables, VPN connections, or any security issues relating to those links.
2. Head Office employees are in three separate networks as follows:
 - a. Sales 60 Hosts
 - b. Marketing 35 hosts
 - c. Accounts 30 Hosts
3. There will be a Server Network, with 4 Servers, for the entire company. This will be situated in a separate LAN in the Head Office building. It is expected that the 4 servers will be sufficient for the next 5 years, and so will not be subject to the 100% growth requirement.
4. All branch offices and Home Offices can be considered an extension of the Head Office network, and so the IP Addresses allocated must be reflected in the overall addressing scheme for the company. The only media requirements required are those **internal** for each site.
5. Hardware (such as routers and switches) should reflect expected usage. Therefore, low usage environments such as those for the Home Offices, would require different hardware than high usage areas, such as those of the Head Office.
6. Internet Access for the entire company, the Point of Presence (POP), is through the Head Office. This connection should be sufficient for all current users, and scalable to allow for the expected increase over the next 5 years.

Assignment Submission

The assignment submission should take the form of a **report that thoroughly details the reasons for decisions made**, as well as the actual decisions made. You should ascertain actual costs by searching the internet. Base all your costing in Australian dollars. (**Note:** Take care not to quote prices in US dollars, as many web sites are US based.)

The total length of the report is 2000 - 2500 words. You should include a Title Page, Index Page, the full report and all references. All information sources must be appropriately acknowledged and a full bibliography is required.



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Note:

It is expected that this will be completely your own work. Therefore using the 'cut and paste' technique is not accepted. You should read relevant material, and then write your report in your own words.

GENERAL REQUIREMENTS

This assignment is to be done in a group. Much of the work can be based on research carried out on the Internet. All information obtained **must** be fully referenced using the referencing method, as per the subject outline.

The assignment is due on Friday (28/09/18). Late assignments will incur a penalty of 5% per day, as per the subject outline.

This case study will assess all objectives from the course outline. There is no minimum mark required for this Assignment. Students who fail to attain 50% for it will need to work harder in other assessment items to make up the deficit.

The Case Study must have a title page with the following information:

Course Name – Information Systems Networking Essentials

Course Number – ISY202/ISY2002

Case Study Title – Assignment 1

Case Study due date – Week 11, 28th September 2018

Word Count – 2000 - 2500

DO NOT include copies of referenced material or other documents (such as pamphlets) with this assignment. However, proper referencing of all sources is essential. Referencing should follow the style as per the subject outline.

ASSESSMENT Criteria

This Assignment is marked out of 100 marks and is worth 20 percent (20%) of the overall assessment. The length of the report for this case study should be a maximum of 2500 words. Diagrams, tables and figures can be an addition to this length. Text should be formatting as 10pt/11pt A4 with double line spacing or 12pt with single line spacing. Remember, this assignment will be written as a report. Marks for this assignment will be allocated as follows:



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Executive Summary (/5 marks)

- Concise nature of the summary
- Inclusion of essential points from the report document
- Any conclusions clearly stated

Quality of the Report (/80 marks) You must include the following in the written report:

1. The document's inclusions (..../25)

- Proper definitions of the technical terms
- High level of detail
- Problems/issues clearly identified
- Good discussions on the topic (pros/cons, future perspectives.)
- Clear and Precise Diagrams
- Acronyms explained

Note: Definitions and acronyms should be included in the body of the report when first used. DO NOT ADD them as a table at the end of the Case Study document.

2. Subnetting (...../10)

3. Logical structure (...../45 detailed below)

Introduction that details

Context and topic well introduced (/5) * **(See Note 2 below)**

Logical structure of the report (/5) * **(See Note 3 below)**

The **body** of the report that logically follows the introduction, with alternatives and recommendations, as well as justified reasons for conclusions reached.

(/20)

The **conclusion** that provides

- Good short summary of what has been written in the body. (/10)
- Presentation of your vision for the future based on the conclusions reached.(/5)

Correct referencing of information (/10 marks)

Correctly using the Harvard system.(/5)

Quality of Reference Material. (/5)

Correct formatting of the report (/5 marks)

Using 10pt/11pt A4 with double line spacing or 12pt with single line spacing.



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Note 1:

Students who exceed the word limit will be penalised 10% for every 250 words in excess of the 2500 permitted.

Note 2:

Context and topic well introduced:

For this section, your group **will need to make some assumptions** and document these. The assumptions should include:

1. The philosophy of the ABC Company.
2. A statement indicating the expected requirements for the ABC Company's Network.
3. The ABC Company's Network requirements as your group sees them – **Do not simply re-state the requirements written in this Case Study document as these will receive zero marks.**
4. Using the information you make in items 1, 2 & 3 above, you should have a basis for the needs of the company that you will develop in the body of the report.

Note 3:

Logical Structure of the report: After reading this section, the reader (***and marker of your Case Study***) should have a clear understanding of the written content in the body of your report.

Copying another student's work is prohibited. Duplicate material will result in zero marks for **all** students involved. Information on proper practice in assessments is available on the web site referred to in the subject outline.