Computer Networks
Project
April 22nd 2016

Instructions to Candidates:

You are required to submit your completed project either on Learnonline or by email to me before 1700hrs on Friday May 13th. My email address is dave.ray@gmit.ie.

There is a total of 40% of your total mark in the System and Network Technologies Module being allocated to this project.

Please Read the instruction carefully and provide your design, inventory list and any other requested information.

As a network design engineer recently employed by *We Design IT* consultants you have been assigned the task of designing, implementing and testing an IT LAN for a small business based in Galway.

The business is a small manufacturing company and has two buildings located 500M apart.

The MD of the business has decided that there will be only one internet connection, shared between both buildings. Therefore, both buildings will be serviced from a single Communications Cabinet located in the communications room beside the reception area in Building 1.
The communications room will also house the company's server which, for design purposes is treated as an additional PC.

Building 1 is the office building which houses the Reception area with one desk; a Management office with two desks; an Engineering office with three desks and an Accounts office with one desk.

Building 2 is the Production Area – there is an open plan Manufacturing and Assembly area. There is a Production and Quality Control office containing five desks, and at the back door there is a Shipping office with one desk.

Both buildings are single story. No internal cable run will be greater than 100Mtr.

Every desk must be wired for one PC and a VoIP Telephone and every office has its own printer. The Manufacturing and Assembly area has no PC's, and no telephones or printers.

All PC's must be able to communicate with each other, be able to print and have internet access. The Reception area and the Manufacturing area are to have Wireless Internet access. Your colleague has carried out a WiFi survey and has informed you that to ensure no Dead Zones exist, the Reception area requires one Wireless Access Point, Manufacturing requires two.

You are not responsible for the implementation of the VoIP Telephone System but must ensure that the infrastructure to connect all Telephones to the LAN is in place.

1. Design.

Design a LAN for the company to meet its current requirements. You have also been asked to allow for future growth – the MD expects to hire 10 additional staff in the coming year who will each require a PC's and a VoIP Telephone. As yet he is not sure which building they will be located in – possibly a mix of both.

As part of your design you are required to produce a spreadsheet outlining the complete inventory of equipment needed. This must include your recommendation for the type of cable used to connect each LAN port in each office, your recommendation for the inter-building connectivity, and a detailed, complete list of all hardware that you will provided to allow the customer to meet their current and expansion requirements.

Note: The customer will supply their own PC's, Printers and Server and their electrician will run and terminate all the cables you recommend ready for you to connect your hardware to.

2. Implementation

In advance of the implementation you must produce a topology diagram for the network.

Be sure to include all the equipment you are recommending to allow the customer to meet their current and expected requirements.

The customer is undecided if they will use Static or DHCP IP addressing and have asked you to recommend the best scheme for their business. Outline your reasons for your choice.

3. Test

Outline how you will test the installation. You need to ensure that all PC's can communicate with each other, can print and have internet access. You also need to ensure that there is Wireless Internet access at Reception and in Manufacturing.