

Computer Network Of Bangladesh Eye Foundation

Introduction

This assignment enables you to demonstrate your knowledge and understanding of computer networks. You are required to produce a substantial document that totals 1200 words. Subsequently, you are advised to start work on the assignment at an early stage during the unit. The assignment is divided into tasks, which relate to the sequence of the module, so you do not need to wait until all the teaching is finished to start them.

Some aspects of this assignment will require you to research real components that are currently available in the marketplace. Furthermore, you will also be asked to make judgements about what is best for a particular scenario. Please note that there is not always one right answer. However, you will need to justify your reasons for any choices you make to get high marks.

You are NOT required to design a complete network. You are required to detail the specifics covered by the task list shown below.

Scenario

Bangladesh eye foundation provides specialist (private) ophthalmology services in major cities of Dhaka, Khulna and Chattogram in the Bangladesh. It offers a range of general, complex and Bangladesh eye foundation with specialists offering services to treat varying eye diseases and impairments including Cataract, Glaucoma, Strabismus and tumours.

Bangladesh eye foundation plans to open a new clinic in Rajshahi, renting a unit in a converted farm. So the farm which will be the offices will need some internal work to make it suitable for the new use. The clinic will have 2 ground floor and 4 first floor surgical consulting rooms, a patients lounge (ground floor), reception & storage room.

Bangladesh eye foundation is a high-tech company, and all consulting rooms require networking to a local server. Ophthalmologists view patient information on screens in the consulting rooms. These consist of patient records, including x-ray images, and

videos. There is also specialist equipment such as Retinal cameras and specialist lasers. The patient lounge provides open internet access through an open access PC, and also WiFi for patients' own devices.

Reception has access to an appointment system, which is Windows-based and standardized across the company and takes electronic payments, sends SMS reminders and emails to patients. The clinic will also be networked to the head office, enabling head office staff to access local server files.

The following outline requirements have been identified (excluding specialist optical diagnosis and treatment equipment that connects to the network):

Overall System Requirements

1. To provide a network solution (hardware and software) to meet the needs of the company, which ensures timely and secure access to information.
2. To provide Internet access for patients while in the lounge.
3. To provide network access to Head office.

Data and information

1. Patient information stored locally.
2. Electronic payments.
3. Corporate web email provided via the company's ISP.
4. Patient appointments/ records, including personal contact information. Payment card data are not stored.

Hardware

1. New computers to meet performance, security and storage requirements (including backup)
2. New PC workstations (total 8: 8 x desktop) running Microsoft Windows.
3. New network printers (2).
4. Network components as required.
5. Payment card equipment.

Software

1. Latest Microsoft Office Suite required.
2. Dental management software (appointments/ records) as used throughout the company.
3. Web & email Internet access
4. Suitable security software

Security requirements

1. Information security must meet the UK Government's 'Cyber Essentials' programme (<https://www.cyberstreetwise.com/cyberessentials/>).
2. Restrictions are required to be implemented to control access to the confidential patient information.
3. The system is required to be secure from internal and external threats.
4. An automated daily backup policy and procedure, for all of the information stored within the business.

Task 1: Network Infrastructure and Protocols (8 Marks)

The building has an existing Token ring infrastructure. The CEO has asked you to provide a report to clarify the following:

- a) It has been suggested that there are three major options for providing the clinic network: Use the existing Token Ring infrastructure, Replace it with Ethernet and structured cabling or Use Wi-Fi. Explain the difference between Ethernet, Token Ring and Wi-Fi and make a recommendation about the technology he should use. A good answer will relate your recommendation to the business requirements. **3 marks**
- b) Network architecture is frequently described in terms of the OSI 7-layer model. Explain the purpose of each of the 7 layers. **3 marks**

d) Given the applications that will be used, and making any suitable assumptions, identify and briefly explain the purpose of four (4) protocols used. For each protocol, identify the layer at which they operate. **2 marks**

This task requires around 300 words.

Task 2: Addressing (7 Marks)

Bangladesh Eye Foundation wants you to provide a clear explanation about network addressing.

a) Explain the difference between IPv4 and IPv6 and which type of address will be used in Clear Thinking's network. **3 marks**

b) Define the term Default Gateway and ARP. Explain why it is needed. **2 marks**

c) Define the terms Subnet Mask and briefly explain why it is required in this project. **2 marks**

This task requires around 300 words.

Task 3: Security (7 Marks)

a) Explain the THREE (3) main security concepts. One of Clear vision's clinics suffered a virus infection which meant that no patient records could be viewed. Which of the concepts was / were violated? Explain your answer. **2 marks**

c) How would you ensure that users of the open access PC or the WiFi can't access the local server? **1 marks**

d) Provide a list of three (3) measures that you recommend should be taken to keep the network secure. This should include hardware, software, policies and ways of checking them. **3 marks**

e) What do you think is the biggest threat for this system? Justify your answer. **1 marks**

This task requires around 300 words.

Task 4: Diagram and explanation (7 Marks)

Bangladesh Eye Foundation wants a clear diagram to show how the components of the new system will be connected. You should provide the following:

- a) Draw a logical network diagram (topology) that shows the main components of the network. Allocate suitable IP addresses and add them in the diagram. **5 marks**
- b) Give local prices and specification of any of the four suitable hardware/ software you recommend. **2 marks**

This task requires around 100 words.

Task 5 Remote access– 6 Marks

Bangladesh Eye Foundation's staffs need to access email, client records and intranet via laptops and smartphones.

- a) Explain how your solution incorporates secure remote access into the system, and identify the components and actions you would need to take to get it to work. **6 marks**

This task requires around 200 words.