Level 4 Diploma in Computing

Computer Networks

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Marker's comment:		

Expected candidate time allocation: 35 to 40 hours

Statement of confirmation of own work

Programmed /qualification name: Computer Networks.

Student declaration:

I have read and understood NCC Education's policy on Academic Dishonesty and Plagiarism.

I can confirm the following details:

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Centre Name	**: Daffodil Institute of IT**
Module Name	**: Computer Networks**
Assignment title	**: Visitor Centre**
Number of Words	**: 1446**

I confirm that this is my own and that I have not plagiarized any part of it. I have also noted the assessment criteria and pass mark for assignments.

Due Date	**: 25-07-2014.**
Student Signature	**:**
Submitted Date	**: 23-07-2014**

Contents

Introduction

It is plan a network used for engineering project. The network resolve be up to attach internally as well as too externally. The engineering project has eight Rooms. The network should be linked every Room. At present I am going to create my design network of engineering project.

Task -1

Media

Media are the storage space as well as broadcast channels or tools used to lie up and deliver information or data.

Media use:

There are many kinds of media; below I include known main of them.

Option -1:

- Coaxial Cable
- WLAN.
- Wireless media

Option-2:

- Twisted pair
- Fiber-optic cable
- Unshielded twisted pair (UTP) cable UTP categories are: cat 1, cat 2, cat 3, cat 4, cat5, cat 5e, cat 6, cat 6a, etc.
- Wi-Fi

Connector

There are many kinds of connectors also other than the majority appropriate,

Option-1

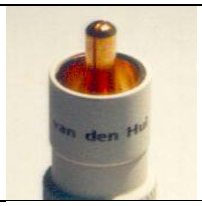
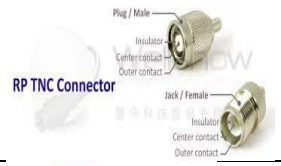
Media name	Connector name & maximum frequency	Picture of connector
Coaxial Cable	RCA(100 kHz or less), TS, TRS(10MHz), BNC(2 GHz or higher)	
WLAN	RP TNC,RP SMA	
Wireless media	Rca Plug, Red Rca, XEPA 6 ft, Db9	

Table -1: connector name of option-1

Option -2

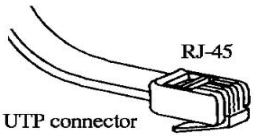
Media name	Connector name	Picture of connector
Twisted pair	RJ-45 UTP ,ScTp	
Wi-Fi	RPSMA, RJ45	
Fiber-optic cable	SC/APC ,MTRJ	

Table -2: connector name of option-2

Choose option

Option-2:

Option two is the better for my networking system. Because it's provability is very well. For that, I have selected the option-2. So, option two is the twisted pair cable and fiber-optic cable. RJ45 connector is in Twisted-pair cable. During this network RJ 45 connectors are extremely appropriate for UTP CAT 6 cables. I prefer UTP CAT 6 cables. It is 8p8c component connector. Furthermore, the major important thing is RJ 45 modular connectors by Ethernet-type cabling pin-outs. The majority of the Ethernet networks use UTP cable among registered jack 45 (RJ 45).

Price of cabling, hardware as well as installation

Device name	Quantity	Indivisutil cost	Device price	Installation price	Maintenance price(monthly)
Touch screen pc	8	£899	£7192.00	£800.00	£240.00
Switch	4	£17.39	£69.56	£60.00	£56.00
Wireless router	2	£120	£240	£120.00	£80.00
Server	2	£2999	£5998	£300.00	£200.00
Layer -3 switch	3	£57.99	£173.97	£90.00	£60.00
RJ-45 connector	100	£1.2	£120	£65.50	£86.00
Cctv camera	1	£29.00	£29.00	£20.50	£22.55
Webcam pc	8	£499.95	£3999.92	£640.00	£200.00

Table- 3: Price of cabling, hardware and installation

Data transfer rates

ISP-1

Section	Allocated bandwidth (ISp-1)	bandwidth	Total
Router	2GB		
Room-1	32mbps	4*8mbps	32mbps
Room-2	32mbps	4*8mbps	32mbps
Room-3	32mbps	4*8mbps	32mbps
Room-4	32mbps	4*8mbps	32mbps
Room-5	32mbps	4*8mbps	32mbps
Room-6	32mbps	4*8mbps	32mbps
Room-7	32mbps	4*8mbps	32mbps
Room-8	32mbps	4*8mbps	32mbps
Total bandwidth			256mbps

Table -4: data transfer rate of ISP-1

ISP-2

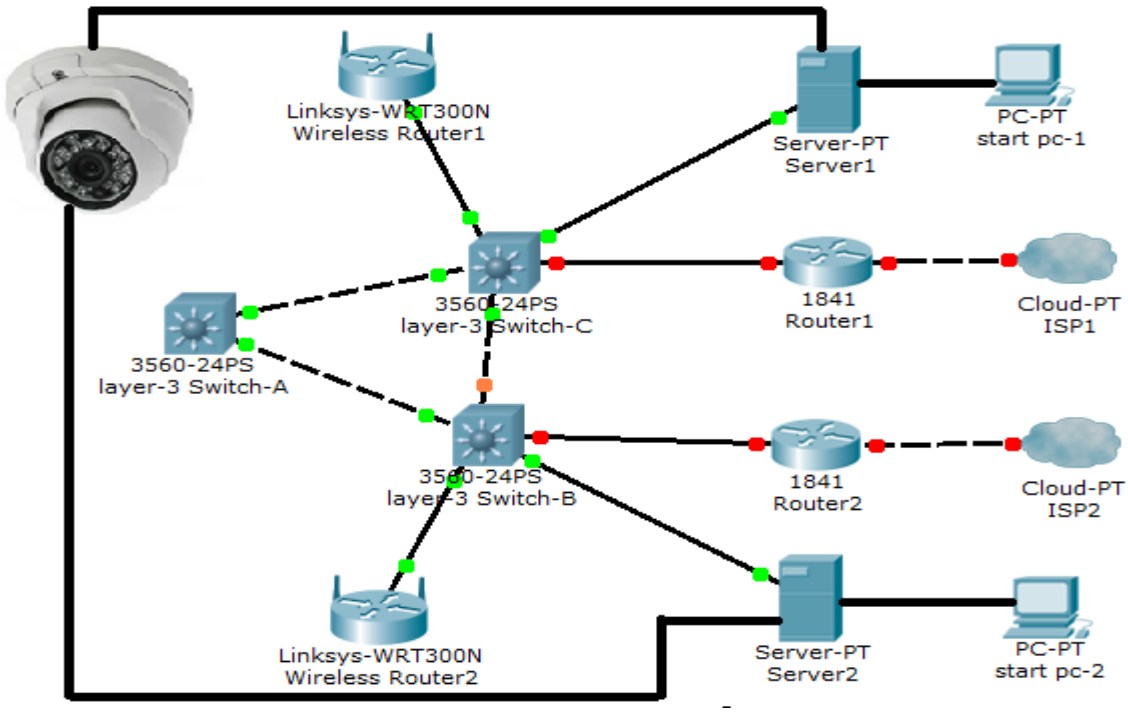
Section	Allocated bandwidth backup(ISp-2)	bandwidth	Total
Router	1GB		
Room-1	16mbps	4*4mbps	16mbps
Room-2	16mbps	4*4mbps	16mbps
Room-3	16mbps	4*4mbps	16mbps
Room-4	16mbps	4*4mbps	16mbps
Room-5	16mbps	4*4mbps	16mbps
Room-6	16mbps	4*4mbps	16mbps
Room-7	16mbps	4*4mbps	16mbps
Room-8	16mbps	4*4mbps	16mbps
Total bandwidth			128mbps

Table -5: data transfer rate of ISP-2

Recommendation

First of all ISP has a relationship with router. The router- 1 has 2GB bandwidth.router-1 will be connected with layer-3 switch A.layer-3 switch will has 128mbps bandwidth. Layer-3 switch has also relationship with switch 1, 2, 3 and 4.every switch will get 32mbps bandwidth. Four pc will get bandwidth from switch-1, so every pc will get 8mbps bandwidth. If ISP-1 is break down then ISp-2 will be connected with router-2. Router-2 also has 1GB bandwidth. Router-2 will be connected with layer-3 switch B. layer-3 switch-B has 64mbps bandwidth. Layer-3 switch-B has also relationship with switch 1, 2, 3 and 4.every switch will get 16mbps bandwidth then every pc will get 4mbps bandwidth. Though it's the secondary options.

Internal diagram:



Digram-1: Internal diagram of networking

Task-2

Name of device protocol

Device name	Protocols
Switch	STP
Wireless router	TCP/IP
Server	UDP,POP3,TCP/IP,DNS,SMTP,FTP, HTTP,HTTPS,
Layer-3 switch	STP/VTP

Table 6: table of hardware protocol

Media use

Media use	Specification	Picture
Twisted- pair cable	• High work capacity • Completely tested • Power efficiency	
Fiber optic cable	Fiber Optic Cables are ideal for applications that require simultaneous and bi-directional data transfer. These cables have 62.5-µm core and 125-µm cladding. Duplex cable is in a zip cord (side by side) style for easy separation. Fiber optic cable has Ceramic ferrules for long-lasting reliability and precision.	
Wireless router	TP Link WR2543ND	

Table 7: table of media use

Required hardware

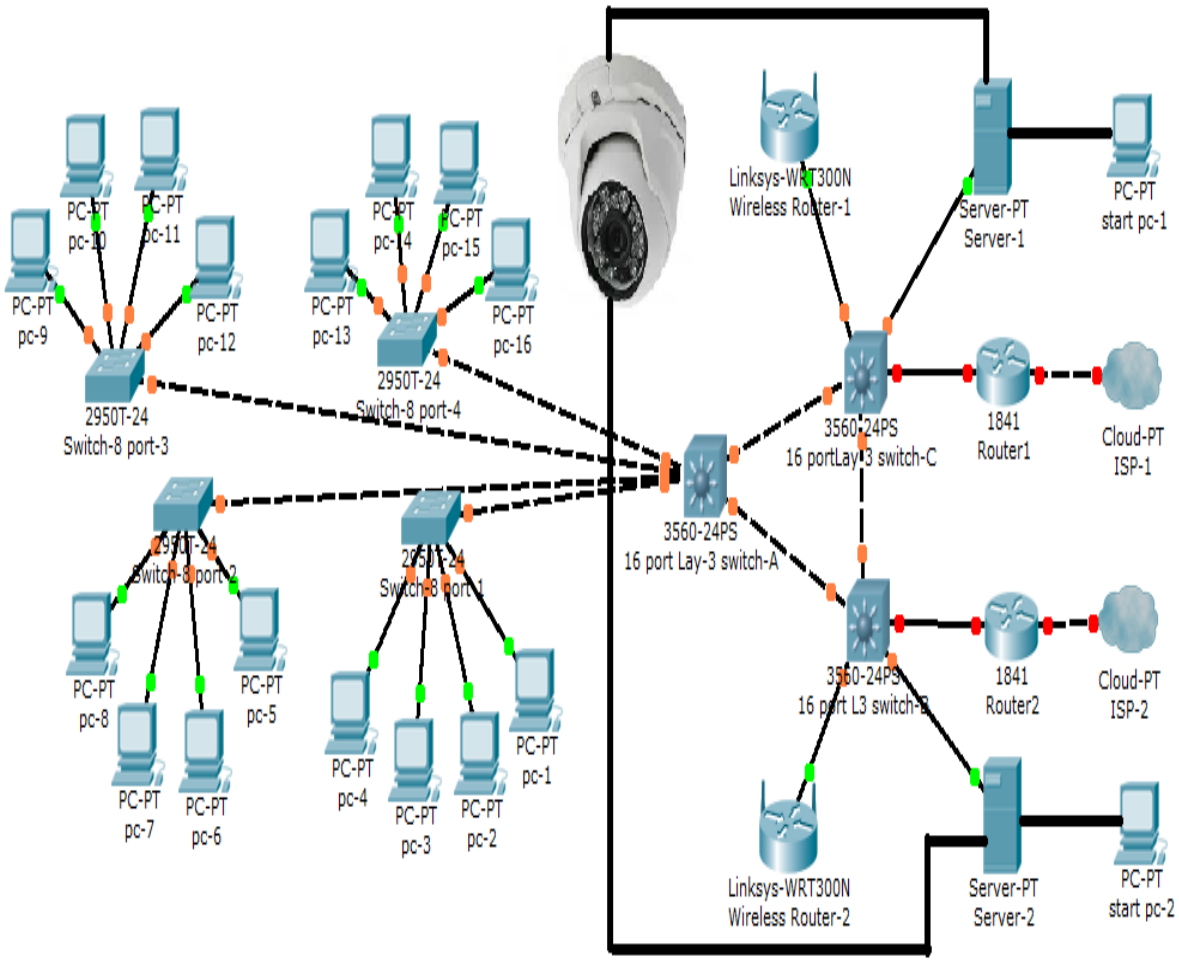
Device name	Device picture	Specification
Touch screen pc		New Apple iMac MF883B/A All-in-One Desktop Computer, Intel Core i5, 8GB RAM, 500GB, 21.5"
Switch		8 port
Wireless router		TP Link WR2543ND
Server		2CPU x E5-2620v2
Layer -3 switch		TP-Link TL-SG1016D 16-Port Gigabit Desktop Switch
Cc TV camera		800 TV lines (960H) day/night vandal dome cctv camera Model: EYE-140CMOSQ-WH

Table 8: table of hardware

Recommendation of start pc

The job of start pc is to share bandwidth. Starting pc is safe for networking system. Because start pc records every detail. Start pc is connected with the server-1 and server-2. Everything will be recorded in server-1 and 2.if server-1 is to crash then we shall be able to collect information from server-2.it is the job of start pc.

Complete diagram:



Digram-2: Complete diagram of networking

Task 3

The robustness of the hardware

I have used many hardware. Such as touch screen pc of Core i5, 8GB RAM, 500GB, 21.5", switch 8 port, layer-3 switch 16 port, CCTV camera, server, router as well as RJ45 connector. I think these are the best hardware for networking system. So I have chosen these hardware for my networking plan.

The ability to maintain 100% network uptime

The ability to maintain 100% network uptime, because I have used 2 servers, three layers -3 switch, two routers. When layer-3 switch A is to break down then layer-3 switches B automatically continued. Similarly server 1 is to break down then server 2 is automatically continued. And router will also be connected the same ways. Thus the network will remain 100% active.

Recommendation

I have agreed with every achievable latest system. I think it is real and safe system. It will be more protected if we use this network.

Task -4

I have finished my network design as well as all other tasks. In order to ensure that how much effected my designed network in an Engineering project, I shall test it.

Cabling and Installation

The best cable and connector have been used in this network. I have tested it with a power meter for cable to make sure that either it works properly or not.

Hardware and Device testing

I have tested device and hardware for 2 days as initial testing. With a view to observing its effectiveness, I ran it many times.

Software Checking

Software is most important thing for every system. I tested every pc.Every pc has windows and start pc also has windows. Also server pc has server windows. I have tested and run every software whether it works properly or not.

Power Supply

In the whole system power supply is the most important matter. If it does not work, the system will collapse.

Security system checkup

I have used cctv camera for maintaining security. If any problem is seen then every details will be recorded.

Conclusion

At last, I have finished my network testing as well as it is completely ready for use. Now I shall run it to engineering project. I have selected the latest device, cable, hardware, connectors, system, software to provide a good network.

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Task-5

My plan was created a network for engineering project. I visited a lot of network site in our country. I received many information .I analyzed them what they used of networking devices. There were many kinds of things such as, device, hardware, cable and connector etc. In the tasks one to four I discussed about media. In these tasks I have used many things such as, hardware, wireless router, connectors, hardware and installation, cost of cabling, data transfer rate, etc. I provided every information based my investigation, analysis as well as marketplace.

Assumption:

I think in the way this network has come from ISP will be the best. If this network is used for an engineering project, it may bring a good result.

Weak point:

If any cable is to break down, in that case I have kept more than one backup hardware, switch, layer-3 switch, and connector.

More development:

There are great deals of things to improve in future. It is an exclusive network. It can transform LAN to immense network. If budget enhances then the network will be well-built new by dominating hardware as well as device.