Introduction: I am asked to design a network for health care center. The network will be able to connect internally and also externally, three departments in the health care center; network must be connecting each department. Now I am going to create my proposed health care center.

Task 1

i visit many single site networks and investigate their networks. i will design a network for health care center based on my knowledge which i gain from our investigation.

Media used:

Many types of media used to make a network,

Option 1:

- Unshielded twisted pair (UTP) cable

UTP categories are: cat 1, cat 2, cat 3, cat 4, cat5, cat 5e, cat 6 etc.

- Shielded twisted pair (STP) cable

Option 2:

- Coaxial cable
- Fiber optic cable
- Wireless media
- Patch cable

In this network I like to use the UTP cat 6 Ethernet cables, it is flexible or suitable for 10BASE-T, 100BASE-TX, and 1000BASE-T/1000BASE-TX (gigabit Ethernet). it's performance up to 250 MHz with 200 meters cable length. "**REF[1]"**

Connector used:

many types of connectors use for network cables,

Option 1:

- RJ 45,
- BNC connectors,

Option 2:

- AUI connectors,
- ST connectors,
- MPO connectors etc.

In this network I prefer RJ 45 connectors, RJ 45 is a suitable connector for UTP CAT 6 cables, and it is 8p8c module connectors. Most of the Ethernet networks used UTP cable with registered jack 45 (RJ 45). "**REF[2,3]"**

The cost of cabling and installation:

List in the below I have shown all requirement of hardware and also included cabling and installation cost.

Table 1:

Device name	Quantity	Device cost	Installation cost	Maintenance cost
PC	24	£8000	£420	£250
Backbone switch	1	£75	£50	£20
Switch	3	£30*3	£15*3	£6*3
Printer	1	£70	£20	£15
Server	1	£550	£25	£15
Firewall	1	£190	£25	£25
Rj45 connector	50	£.7*50	£.7*50	£.7*50
UTP CAT 6 cable.	450 m	£85	£20	£20

Figure: 1.0

Data transfer rates

Table 2:

Section	Allocated bandwidth	Total
Treatment room	8*25mbps	200mbps
Medical staff office	10*20mbs	200mbps
Administration office	6*20mbs	120mbps
Total bandwidth		**=520mbps**

Figure:1.1

Recommendation:

Based on my analysis of single site building networks i choose best connectors, cable such as cat 6 cable, RJ 45 connectors. These connectors, cable are flexible, not expensive, and market feedback is very good.

I have designed the health care center networks, here it is.

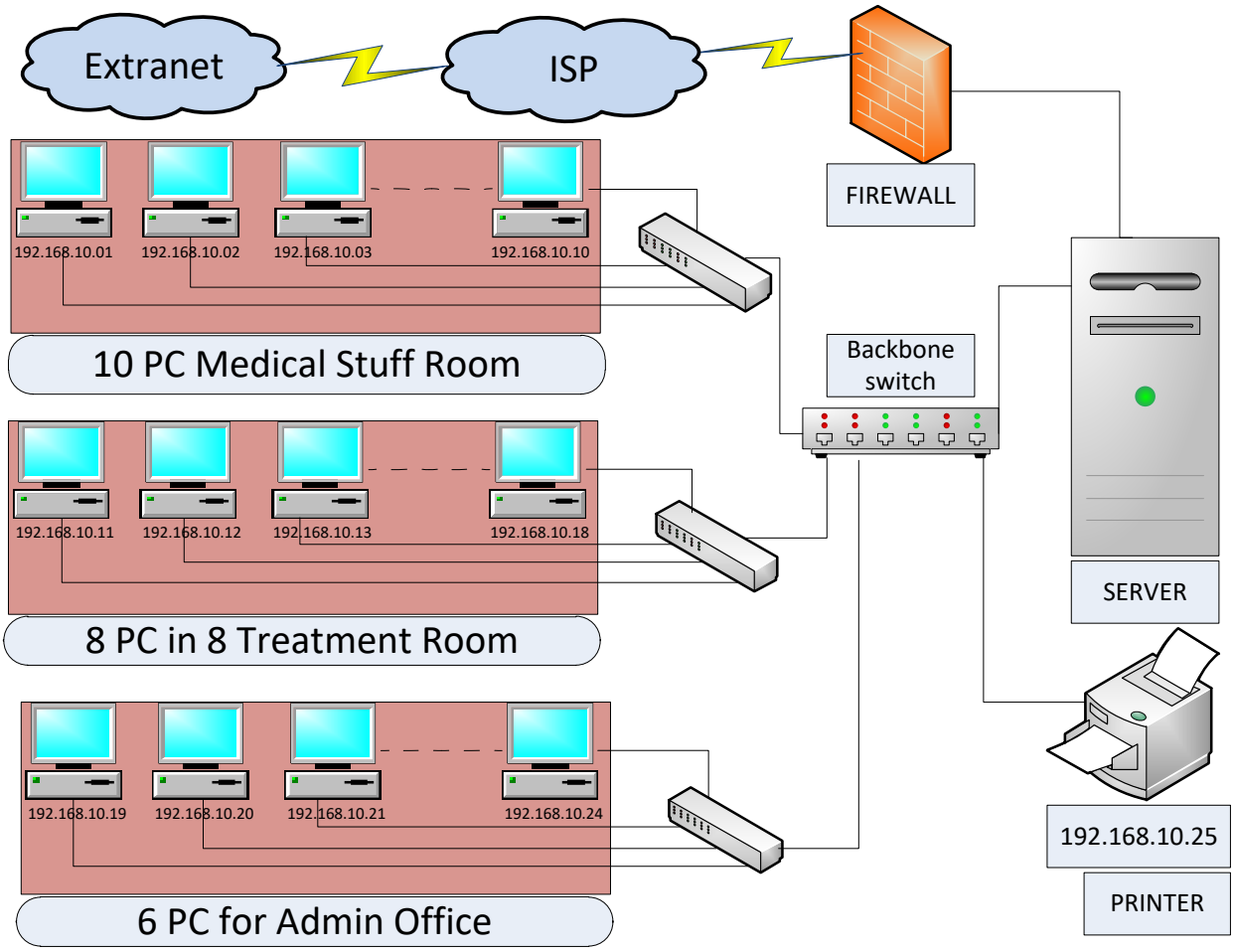

Figure: 1.2

Task 2:

i designed a diagram of my network in task 1. if we want to complete the network we must need some reqiurement hardware which is given below.

table 3:

Device		Specification
PC		Processor **core**: i3 **2.10** GHz, Ram: 4 GB, Storage: 320 GB
backbone switch		8 port
switch		16 port
server		Processor: Dual Intel XEON or AMD Dual core processor, RAM: 8 GB Storage: 3 TB
printer		Printing regulation: UFR II, PCL 5c/6, PostScript 3: 600 x 600 dpi, 9600 dpi equivalent x 600 dpi Capacity: 500 Sheets (20 lb. Bond) Printing Process Type: Desktop Colour Laser Printer
firewall		Rj-45 serial console port where has 4 dual channel port with 2 HIM Slot

Table 4:

Device name	Advantage	disadvantage	protocol
pc	It's cheaper and provides better performance	It is not too much powerful.	TCP/IP, DNS, SMTP, FTP, HTTP, HTTPS, POP3
server	Data backup in secure, it has large storage	It's too much expensive.	TCP/IP, DNS, SMTP, FTP, HTTP, HTTPS, UDP, POP3
Backbone switch	Not expensive but gives better performance.	If something wrong in the switch the whole does not network.	STP
Switch	It's cheaper and performance quite good.	If something wrong in the switch of specific department, it will fail to connect to the networks.	STP
printer	The printer cost is quite normal, and well performance, it's a colour printer, and also prints blank and white.	Sometime the printer prints slowly.	IPP
Firewall	It is advance firewall security, it trapper rate up to 1000BASE-T	If anything wrongs during configuration the firewall then whole network slows down.	TCP/IP
Peripherals device	It gives better performance.	Sometimes it doesn't work if not set up correctly.	

Recommendation:

This hardware is flexible and available in our country, and less expensive. I have investigate that these hardware market feedback also good in our country.

Task 3:

Security issue:

- If firewall and server not properly configure then data can be attacked by the virus such as DOS, phishing, DDOS, Trojan horse, viruses.
- If we don't regularly backup the data then data can be lost by server crash
- If we are not aware to keeping the password then data can be stolen by someone else.
- Data can be stolen by Lack of employable physical security.
- If we are not properly able to use the health care center software's then data can be hacked, because all data control by these software's and it stored the data into the server.

Protection:

- We must properly configure the firewall, antivirus software as well as the server. Always switch off the unnecessary option. Must be installing the latest patch and latest updates.
- Always important data keep in the backup server, and regular update the data in the backup server, and also most important data can be kept in the cloud.
- Every user must be aware of keeping the password. Every user must be using the password secretly, don't share or write it anywhere.
- There is some option to keep the password safe such as password length should be 8 characters, must be change the passwords after 3 months. don't share it to anyone
- Biometric authentication system must be developed by card punch, security camera, finger prints etc.

Recomendation: Properly configure the software and use it by respective people such as doctors.

properly configure the server and firewall.and should be maintained the security rules.

Task 4:

I complete my network, now checking the whole network For ensure that the network is fully operational, i have test plane to test all aspect of this network. for this test i divided the whole network into several section.

cabling and instalation: In this network i used cable and connectors,for ensure that the cable and connection work properly i have to take a step to check the cable and connertors,i”ll check it with the cable tester.

Hardware and network device testing: In this network i will test the every devics of hardware as well as network device.if any problem i found phisicaly i try to solve it,and check the configuration ,if it’s not configure perfectly i try to solve it.

software check up: I will test the software of this network which I have used. Test that is the software performance well? is the software work properly? I have to check can the software access from all computers? If any error found I try to fix it. And also check the software up to date.

Power supply checkup: Power supply is important things of this network, which help the network to run perfectly, if the power supply damages the whole network go down. I will check the power supply and solve the problem if found.

Security system checkup: I will check the security system such as punch card, Security camera, finger print machine, is these security work properly? if any problem found I try to fix it.

Conclusion: At last, I finished my proposed health care center network by the experienced of visiting single building network. I chose the best devices or peripherals with my cost limitation. I carefully check every device as well as cable and connectors, now the health care center network is completely operational.

Reference:

1. https://en.wikipedia.org/wiki/Category_6_cable
2. http://pinouts.ru/Net/Ethernet10BaseT_pinout.shtml
3. http://en.wikipedia.org/wiki/Modular_connector

Task 5:

In this task I will review my whole work, what I have done in task 1 to task 4.now I write a summary of my whole work.

Creating health care center i had to visit many single sites network in our country, and gain some experience through the visiting. I analysis that what hardware and network device they used, I want to know what cable or connector they used their network. And I also investigate these items market feedback which was good. I chose the best option for my network.in task 1 I wrote the cost of cabling and installation and also data transfer rate.

Task 2 complete with specification of the hardware and peripherals device. And also discuss advantage and disadvantage of every hardware or peripheral device. And also shown what type of protocol used in these devices?

Third step I mean in task 3 I described the security issues of my health care center network, and described that how to fix or remove it, and also provided that how to protect the networks from virous, DDOS, DOS etc.

In task 4 finally I checked the whole networks. Whole network divided into many sections and I check the network section to section.

Assumption: I analysis some single building network and enhance my knowledge. I had designed the health care center network through the experienced. I design the network in my limitation, it's could be best if I had enough time to visit more single site network.,

Further development: My network can be extended network, it can be converting LAN to other large network such as WAN, MAN etc. if my cost limitation enhanced, I could be choosing more powerful device or peripherals for my network