Detail the networking structure and components the ck games case study

Technology, Computer

In this assignment I have been asked to detail the networking structure and components the CK games case study. When an appropriate topology has been chosen I must then use the Internet to find all of the components required to implement my chosen system and give the prices and calculate the total cost of the network.

I will use a client-server local area network (LAN) for this case because of the number of machines involved. A peer to peer network would be inappropriate in this case because of the amount of maintenance it would require and the amount of machines would make it far too time consuming to set a peer to peer network up.

I have decided to use star topology, as this is a very versatile network, and is very common in today's working environment. The nodes within this kind of network are connected with a central device called a hub. With the annexe being a separate building located to the side of the main offices, there would need to be a connection between the server and the annexe so that data and Internet access would be available to the users located within the annexe. This would be done with fibre-optic cabling and using a bridge to inter-connect the two LANs that I will create. (1 in the main building and the other in the annexe.) With the fibre optic connection in mind, I must make sure that the bridge and hubs for the annexe have fibre optic capabilities otherwise the connection would fail.

The main advantages of the star topology that I have chosen are that it is easy to install and wire up, if one of the computers on network fail it will not bring the whole network down with it and finally it would be easy to add

more computers to the network provided that there is enough room to accommodate them. There are a couple of possible flaws associated with the star system which are as follows, a lot of cabling is required, however the price of cable nowadays is cheap enough to not make this an issue.

If one of the switches were to fail, all the workstations attached to that switch would become disabled, however using reputable brands of switch this would become less of a worry. The finally disadvantage is cost, because of the price of the switches and the amount required, added with the use of fibre optic cable for the annexe connection would become quite expensive. However, this cost would seem to me as cost effective to have built an expensive and reliable network rather than a cheap unreliable one.

The computers within the main building would be fine to use hubs without fibre optic capability because with the distance between the machines and the server in mind, I would be able to use CAT5e cable to connect these machines. CAT5e cable is good enough to connect devices for up to 100m without any problems. This is the reason why fibre optic is being used for the annexe link with it being a much further distance.

The existing server would be utilised and would remain to found in the computer room. There would be no need to the relocate this because the computer would, we will assume, have a lockable door to prevent anyone from tampering with it.

Each computer within the company will also require a network interface card (NIC). This acts as the connection between the computer and the network cable, which in turn performs the following functions: -

* Prepare data from the computer for the network cable.

* Send data to another computer.

* Control flow of data between the computer and the cabling system.

These network cards should also be compatible with any type of cabling that will be used in conjunction with them. This is critical because if the speed of the cable used exceeds that of which the NIC can take then it will obviously not work.

The Network Implementation And Justifications: -

Cabling

The cabling required will be as follows: -

I will be using fibre optic cable to connect the annexe with the main building and will using a total of 235m from the server to the initial switch located within the annexe, but inside the main site I will be using RJ-45 twisted pair cables. These are category five and are capable of running at 100mbps. I think that this is a suitable network connection, which would give protection against EMI and RFI interference. The cost of this cable is cheaper than fibre optic, and the performance is ample for the needs of the main site of the organisation.

There will be a total of 210m of CAT5 cabling used to connect the server room with all of the internal rooms on the main site, including the secretarial office and one extra machine within the reception. Additional CAT5 cabling will be used to connect computers located within each room and will be

calculated at an extra metre per workstation, which would give enough length to for each connection to the switches in each room.

The total amount of cabling that will be used is 316m of CAT5e and 305m of Fibre Optic cable.

Protocol

The protocol I am going to use for this network will be TCP/IP. As with other communications protocol, TCP/IP is composed of layers. It is the protocol used for Internet access. It also allows users to communicate on a peer-to-peer basis. It is a standard protocol that can be used for Internet access and is a solid and reliable one. One great bonus is the fact that protocol is accepted by almost all computer systems The breakdown is detailed below..

TCP is responsible for verifying the correct delivery of data from client to server. Data can be lost in the network when it is being sent or received and TCP gives the necessary support to detect any errors or lost data and keeps transmitting it until the data is correctly sent from the host and completely received by the client.

IP is responsible for moving data packets from computer to computer, or node to node. IP forwards each data packet based on a 4-byte destination address (the IP number). The Internet assigns ranges of numbers to different organizations. So that authorities can find out which data is sent from where - a measure of security. The organisations assign groups of their numbers to their own departments. IP operates on gateway machines that move data from department to organisation to region and then around the world.

Room Hardware/ Software

Each room is detailed below and shows what hardware and software it will host. There is a cost analysis of all devices and software outlined in spreadsheet form, which is located later in this assignment write up.

Rooms 1, 2, 3

* 1x HP Pro curve 2124, 24-port switch with fibre input capability.

* 20x D-link 10/100mbps PCI Network Cards

* 20x Norton Personal Firewall 2004 (V. 7)

* 20x Windows XP Professional Edition

Room 4

* 2x HP Pro curve 2124, 24-port switch with fibre input capability.

* 35x D-link 10/100mbps PCI Network Cards

* 35x Norton Personal Firewall 2004 (V. 7)

* 35x Windows XP Professional Edition

Room 5

* 1x HP Pro curve 2124, 24-port switch with fibre input capability.

* 15x D-link 10/100mbps PCI Network Cards

* 15x Norton Personal Firewall 2004 (V. 7)

* 15x Windows XP Professional Edition

Secretarial Room

* 1x HP Pro curve 2124, 24-port switch with fibre input capability.

* 10x D-link 10/100mbps PCI Network Cards

* 10x Norton Personal Firewall 2004 (V. 7)

* 10x Windows XP Professional Edition

Reception

The reception would not need a switch and already has a network connection located within it. This would be used to connect one computer, which would be used by the receptionist. This machine would have:

* 1x D-link 10/100mbps PCI Network Cards

* 1x Norton Personal Firewall 2004 (V. 7)

* 1x Windows XP Professional Edition

Annexe

The annexe would have the following hardware and software located within it: -

* 2x 3com SS3 4400 48-port Switches.

* 70x D-Link 10/100mbps PCI Network Cards

* 70x Norton Personal Firewall 2004 (V. 7)

* 70x Windows XP Professional Edition

The Cost Evaluation Is Detailed Below:

Price Estimation For CK games Network

Evaluation

The network that I have chosen to implement would serve the company well in all that it would need to achieve as a business. It would need regular maintenance and it would be my recommendation to the organisation to employ a designated network technician to keep an eye on the system and make sure that prevention before cure attitude was adopted. The systems speed should be easily fast enough to cope with the workload placed upon it. With the annexe connected to the main network frame by fibre optic cabling this would make it just as fast to access the network as the computers within the main building of the company.

The cabling that enables the switches to host the nodes is essential and the amount of cabling required is significant within the structure chosen. However, once this is installed it allows easy expansion of the network, which would be essential to any developing organisation. The one main advantage of this structure is that if one of the machines within the network goes down, other than the server, it will not affect any other machine on the network, which obviously will create a lot less hassle than if affected other machines within its region, as it would do if it was a linear topology.

The switches within the network are one possibility of failure within the network. This is why I have chosen reputable brands to supply ones to be used. These will need to be looked after and well maintained because if these fail then all of the workstations that they are hosting will lose their network connections. This could be fatal if people are completing important work that may not be saved. The only other possible major problem would be

if the server went down. This would again be a question of maintenance. With regular backup saving essential as would making sure the software and files saved to the individual user space all relevant to the company - this would make sure that memory was not being used up pointlessly. It would also be advisable to restrict users' to not be able to download, especially from the Internet to prevent the possibility of viruses.

Again, as mentioned before, the cost would be quite expensive. However, the cost would be justified by the fact that the network would last for quite a considerable amount of time and has plenty of room for expansion with the spare ports on the switches and the also with the backbone cabling already existing it will pave the way for network extension beyond what is already immediately possible.

The cost is massively increased by the amount of OS software that has been purchased. This would probably be greatly reduced if the company bought a 'Site License' from Microsoft, however, I could not find out any price information for these licences.

Logical Network Structure

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