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Campus Wide area Network

Engineering College Requirement :

Engineering College wanted to establish CAN connectivity (Campus Area Network) for 3 Remote locations and Central Location for "Data Transfer" application.

- ❑ The college wanted all the buildings to be connected through Optical fiber backbone.
- ❑ The college wanted all the nodes to be within 100m from each switch.
- ❑ The college was willing to go for Layer 3 switches in the central location for backbone connectivity and Layer 2 switches for the node connectivity.
- ❑ The college wanted 100Mbps performance level for the LAN nodes.
- ❑ There are 2 servers (Database and mail server) located in the Central location.
- ❑ The college wanted 1000Mbps connectivity between the switches.
- ❑ The college wanted 1000Mbps connectivity between switches and servers.



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Summary of ACS solution:

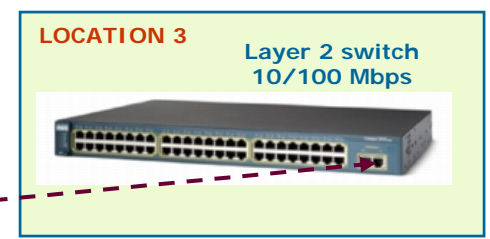
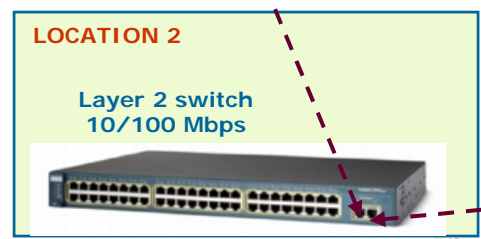
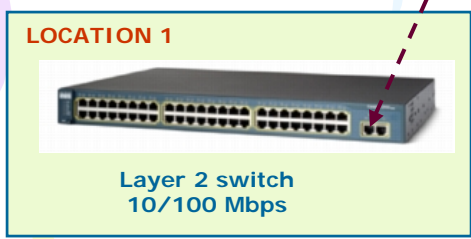
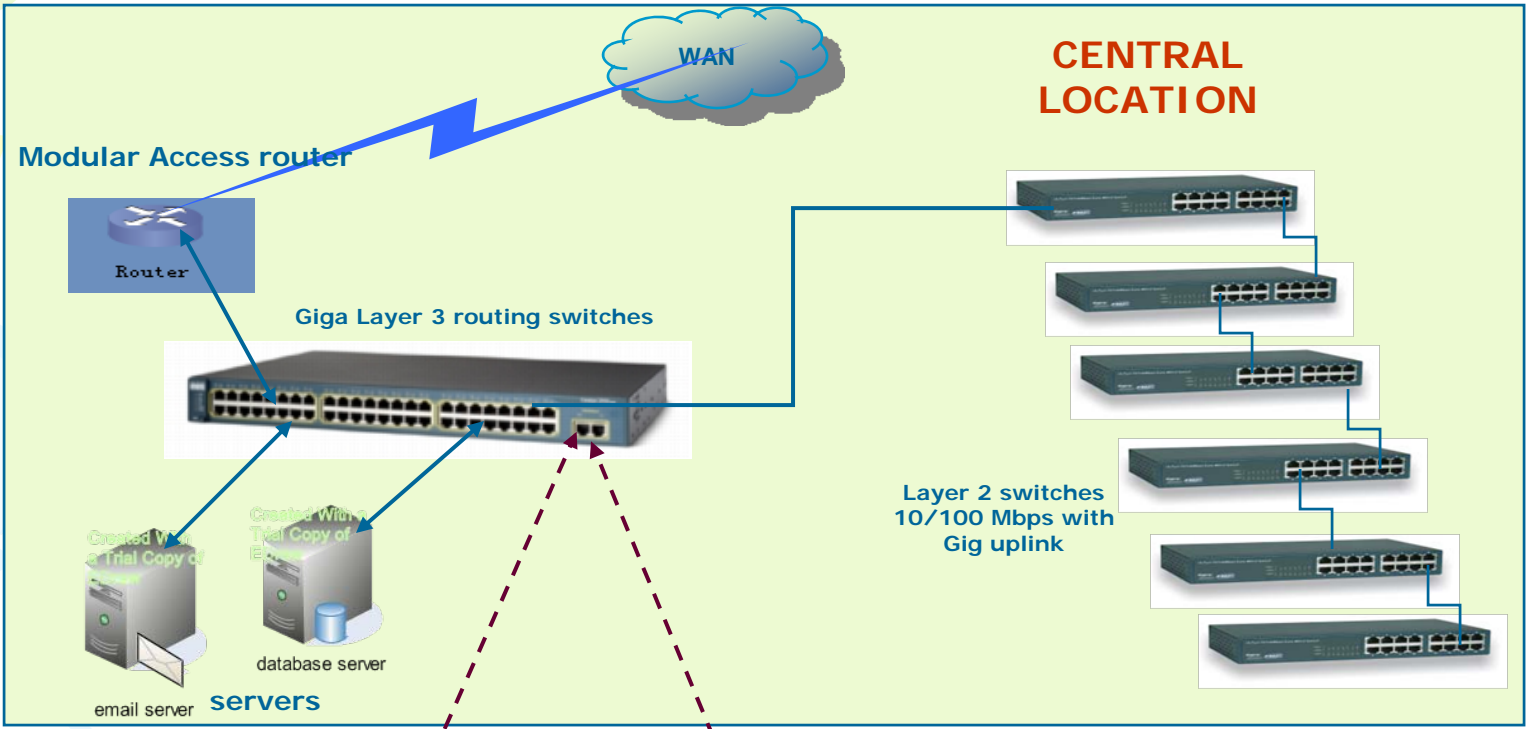
ACS recommended structured cabling network with 10/100 Mbps ports for node connectivity.

At the Central Location, ACS recommended 24 # 10/100 Layer 3 routing switches for the backbone connectivity for terminating the fiber connection from the remote locations and for connecting the servers.

ACS recommended Modular Access router with Multi WAN slot in the central location for the Internet access.

At each building, ACS recommended 24 or 48 Port 10/100 Mbps switch with 1 or 2 uplink ports as per the node requirement for terminating the nodes and fiber connection.

Network diagram for the Engineering College



Fiber Backbone

Details of the solution offered: ACS recommended structured cabling network with 10/100 Mbps ports for node connectivity and 1000 Mbps for all uplinks and Server connectivity.

Central Location:

At the central location for the backbone connectivity, ACS recommended One 24 # 10/100 Layer 3 routing switch with 2 10/100/1000BaseT/Tx uplinks, 2 additional unpopulated mini GBIC (SFP) modules.

Two servers were connected in the 1000T ports available in the recommended switch. 2 # 1000LX fiber modules were loaded in the 2 # SFP to terminate the remote locations (Location 1 & 2) in the central location.

To connect the nodes in the central location, ACS recommended 6 # 48 port switch with 2 combo Giga ports for Gigabit uplink and 2 Giga stacking.

For the internet Access in the central location, ACS recommended Router with 4 # WAN slot. First slot was loaded with 1 port serial module (Leased line) of 2Mbps speed and the second slot was loaded with ISDN module, which acts as the back up when the primary link fails. Two slots were left free for future up gradation



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Remote Locations: For connecting the nodes and terminating the fiber connection to the central location ACS recommended the college to opt for 24 port or 48 port switch as per the requirement.

Location 1: At Location 1 for connecting the nodes, ACS recommended 1# 48 port switch with 2 # Combo Giga ports for Gigabit uplink and 2 # Giga stacking ports.

For terminating the fiber link from the central location, 1 # 1000LX module was loaded in the uplink slot .

Location 2: At Location 2 for connection the nodes, ACS recommended 1# DX-5025MG which is a 24 port switch with 1 # slot which can handle a maximum of 2 # Giga connection at a time.

For terminating the fiber link from the central location and location3, 2 # 1000LX module were loaded in the uplink slot.

Location 2: At Location 3 for connecting the nodes, ACS recommended 1# 24 port switch with 1 # slot which can handle a maximum of 2 # Giga connection at a time.

For terminating the fiber link from location2, 1 # 1000LX module was uploaded in the uplink slot.



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Highlights of the Solution:

Scalability on the connection speed at no extra cost

The backbone switch proposed for the college has 24 in-built 10/100 ports with 2 # unpopulated miniGBIC (SFP) uplinks and 2 # 1000T (none shared).

Thus after loading all the modules, there were approximately 12 # 10/100 ports which could be used for the Future node connection.

The recommended router has 4 # WAN slots out of which only 2 slots were loaded with Leased line and the ISDN module. Hence 2 free WAN slots were available which could be used for the future up gradation.

Thus the solution recommended is highly scalable without much additional investment

High availability of network through Fail-safe redundant links:

Apart from standard IEEE 802.1d Spanning tree protocol, the switches offers rapid spanning tree algorithm (802.1w) and Multiple spanning tree (802.1S) .These ensure per VLAN fail-safe link between switches as well as rapid convergence of links in the network.

Managed solution: All Network components including the block switch is manageable. The managed switches, helps integrate a degree of intelligence in the network which can be highly responsive to link failure and enables automatic recovery of the network from link failures.

Flexibility: The offered backbone switch allow flexibility in choosing various optical transceivers. The offered switch has 2 uplink ports and 24 10/100 BaseT Ethernet fixed ports .The college can choose any transceiver (1000SX or 1000SX) as per the requirement. Thus the solution is available for flexibility enhancement.

High Network Availability: Wherever the primary link is established over "always-on" leased line, an auto ISDN back-up option is provided. If the leased line fails, the back up would automatically initiate the connection and maintain the uptime. When the leased line is restored, the auto ISDN back-up connection will disconnect automatically. Thus, the solution ensures 100% redundancy



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