Hands-on Assignment 1

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1   Network Topology

Note: Diagramming Tool Used = draw.io, or redirects to diagram.net (Free).

1.1   Using your selected tool, draw a basic bus topology with four computers attached to the backbone, or bus. Label the computers A, B, C, D.
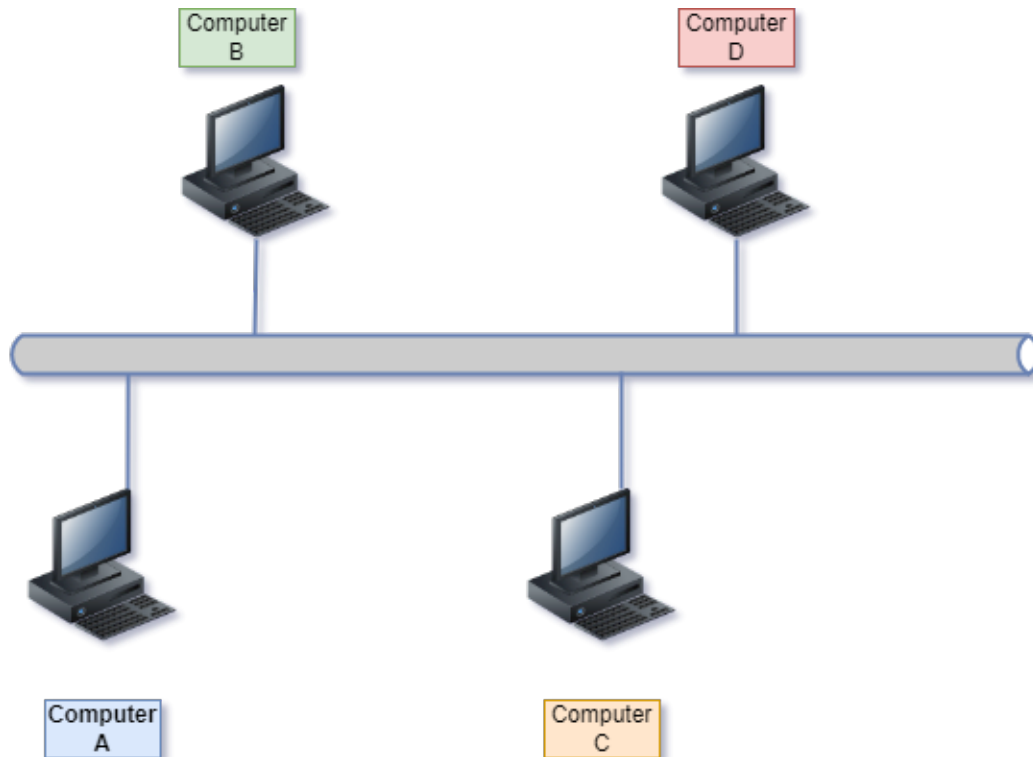

Figure 1: Basic Bus Topology

1.2 Now imagine that the user at computer A needs to open a file on computer D, in a per-to-peer fashion. What path do you think the data will follow from A to D and then from D to A? Add this path, as a dotted line, to your network diagram.

The data will travel along the whole bus to every computer, but only intended computers should be able to process packets.
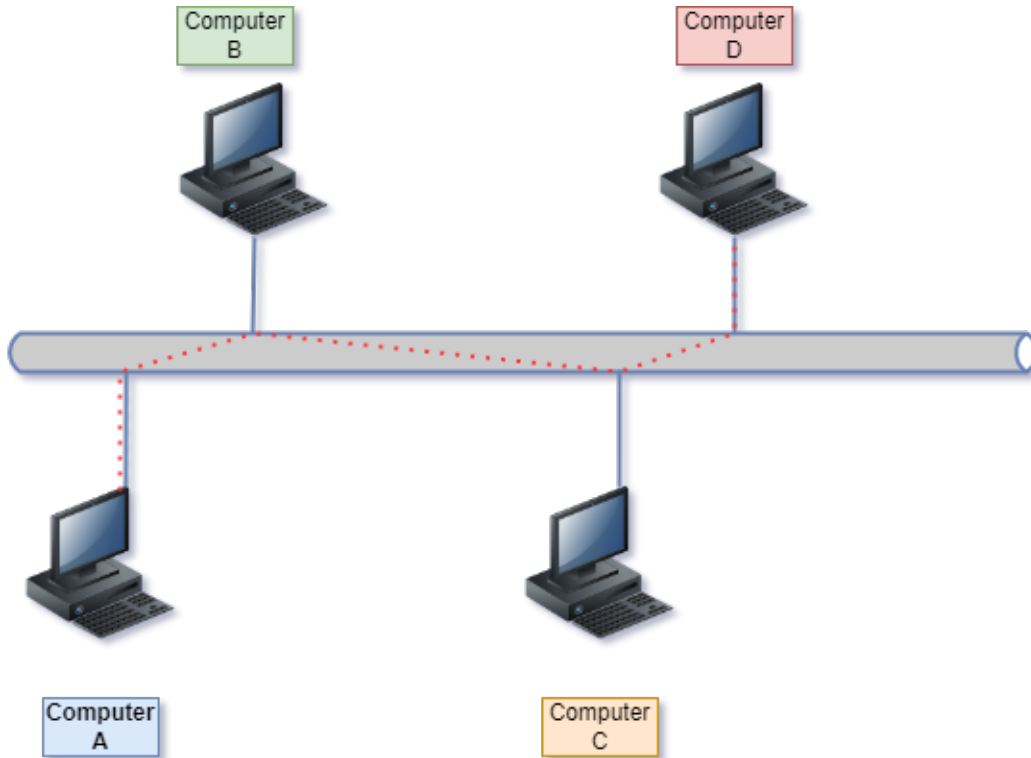

Figure 2: Bus Topology With Path From A to D

1.3 Now, draw a star topology with four computers attached to a central connectivity device. Label the workstations E, F, G, and H.
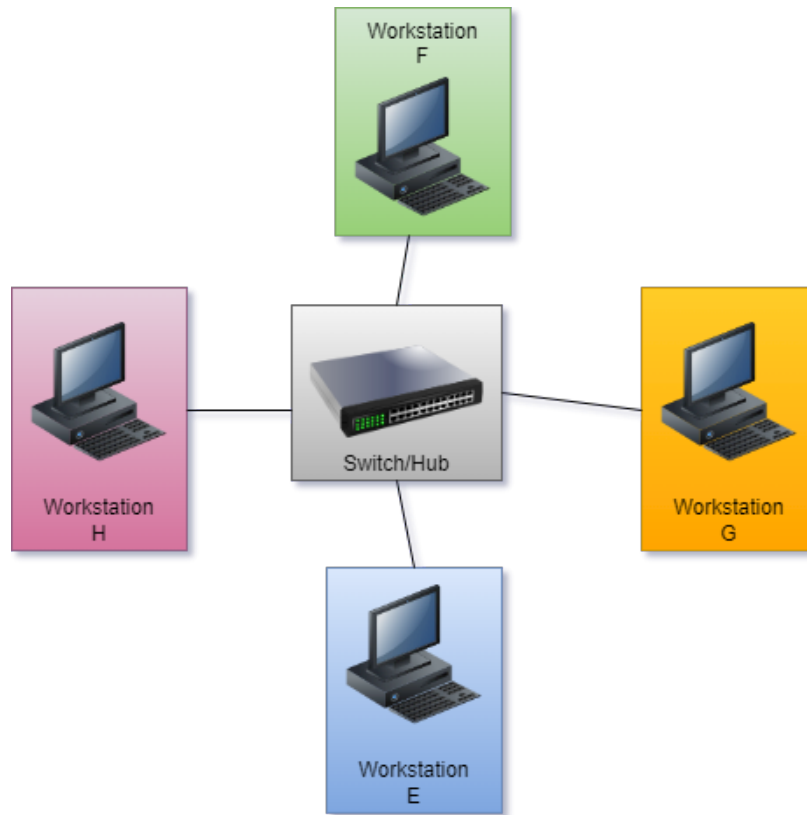

Figure 3: Star Topology with Central Hub/Switch

1.4   Imagine that the user at computer E wants to open a file that is on computer H's hard disk, in a peer-to-peer fashion. With a dotted line, draw the path you think data would take between these two computers.
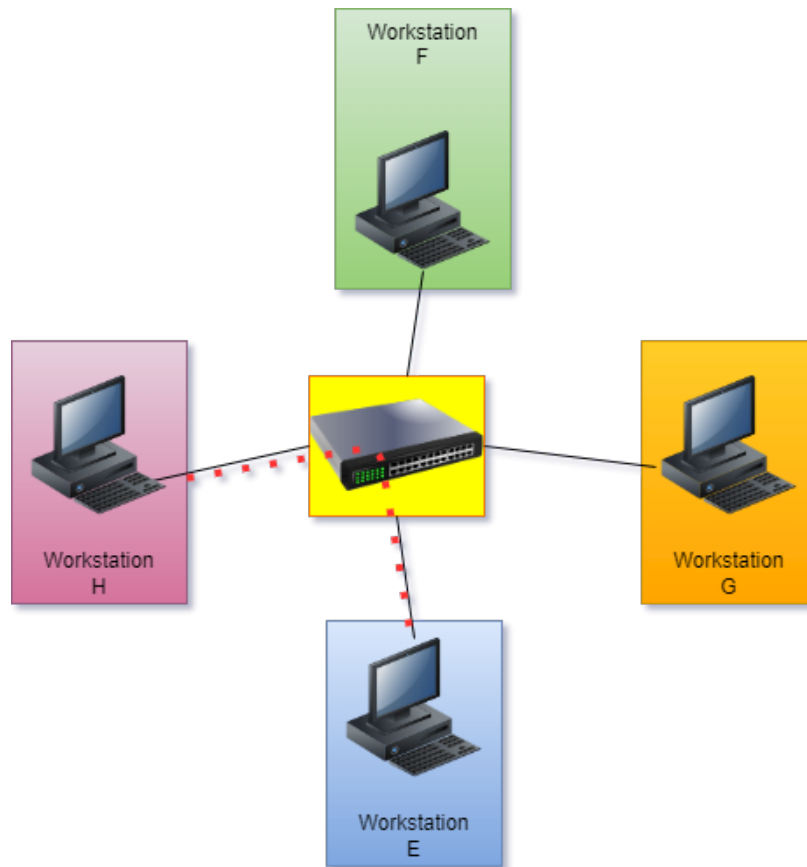

Figure 4: Star Topology with Path From E to H

1.5 Now add a printer and a server to your star-topology network drawing. With the addition of a server you have changed the network from a peer-to-peer network to a client/server network. The printer has become a resource that all the workstation users can share.
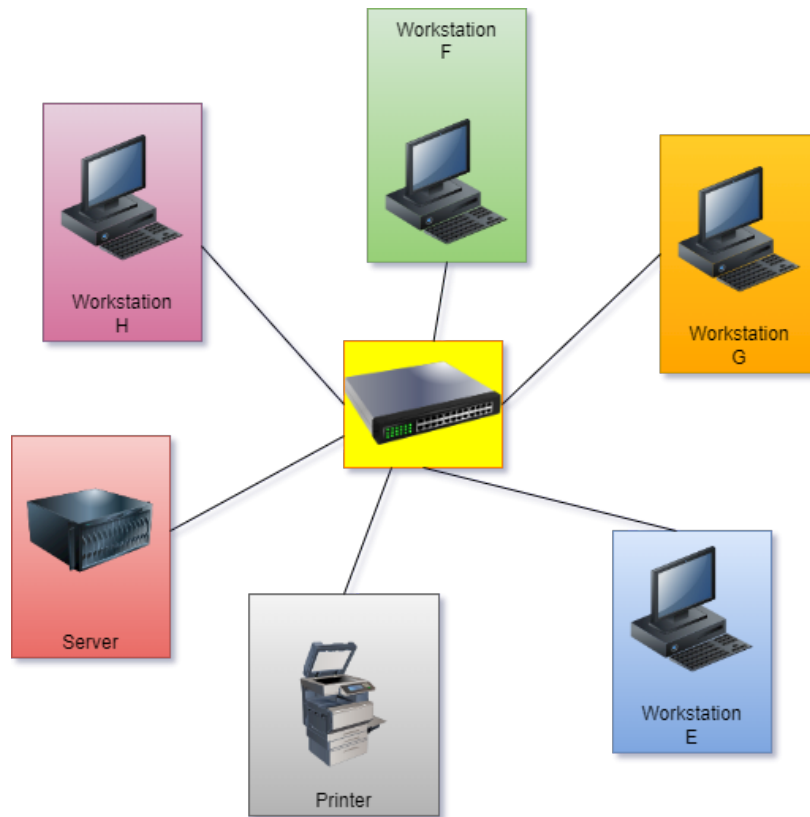

Figure 5: Star Topology with Central Hub/Switch With Server and Printer Added

1.6 Suppose the new server is configured to provide all necessary services to the entire star topology network, including print and file services. Now if computer G sends a document to the printer, what path do you think the document's data will take to the printer? Draw this path as a dotted line on your network.
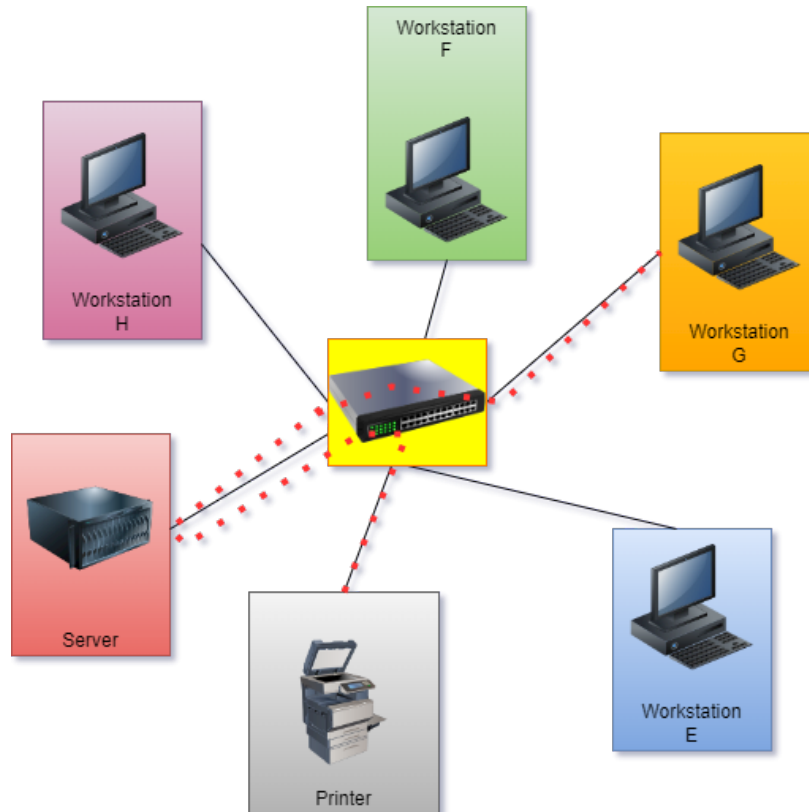

Figure 6: Star Topology with Path From G Printer Via the Server

1.7 Often, modern networks are not simple star, bus, or ring topologies. Sometimes two or more star-shaped networks are connected via a bus to create a star-bus topology. On the same sheet of paper, draw a second star topology network that consists of three workstations, labeled I, J, and K, and is linked to a central connectivity device.
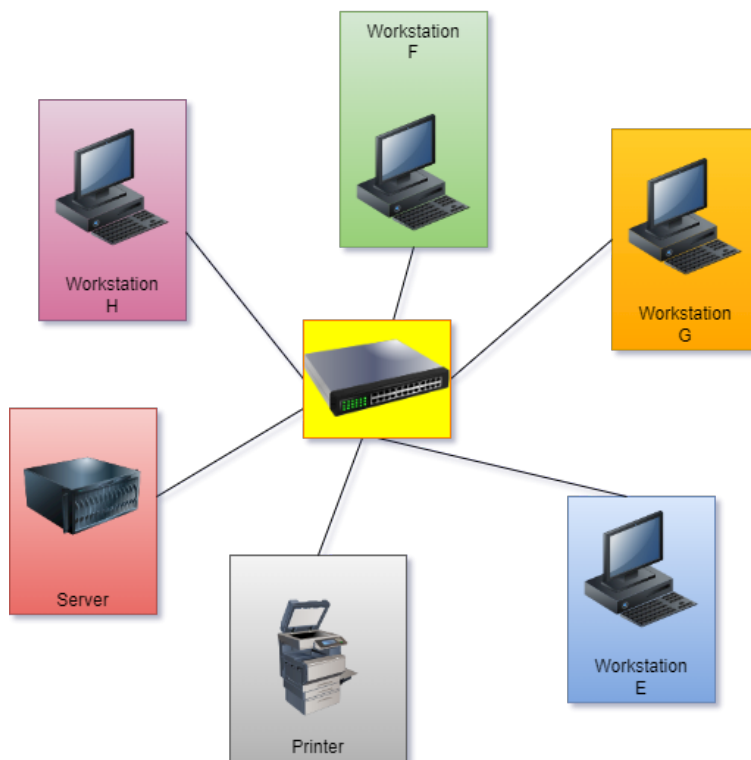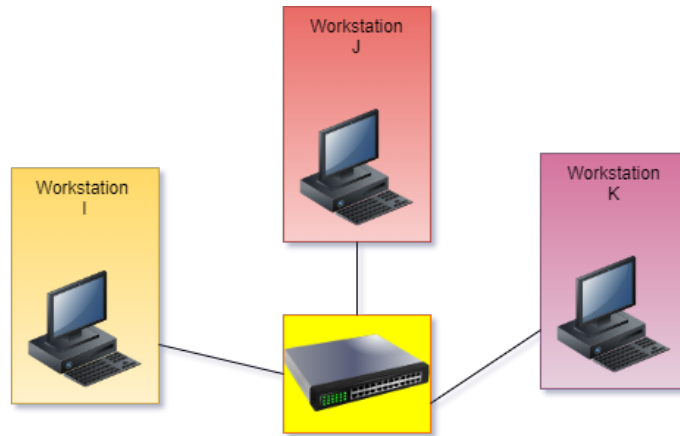

Figure 7: Second Star Topology

1.8 Now draw a line between the two connectivity devices to indicate a bus-style connection between the star-based networks. You have now designed a hybrid star-bus topology network.
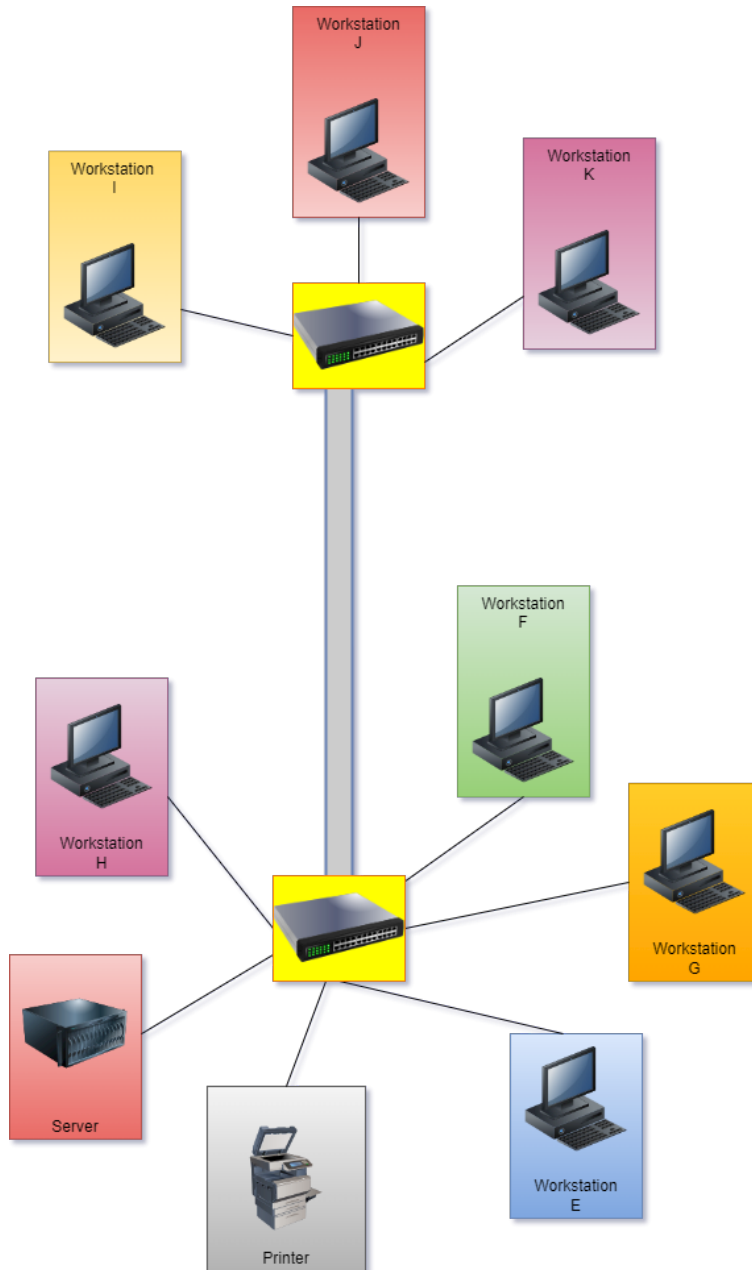

Figure 8: Star-Bus Topology

1.9 Suppose that workstation J wants to print to the printer you added in Step 5. Using a dotted line, draw the path you think workstation J's document will take to the printer. Remember that the server still controls all print functions for that network.
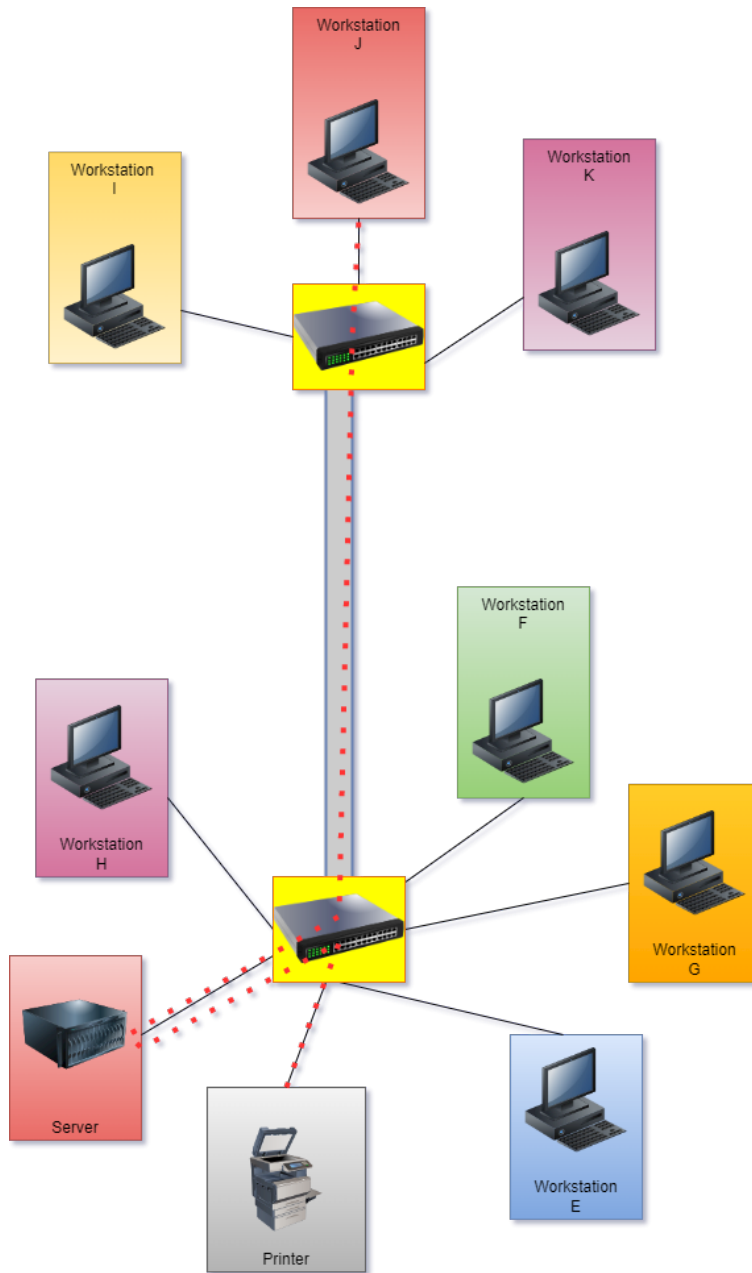

Figure 9: Star-Bus Topology With Path From J to Printer Via the Server

1.10   Of the three different kinds of networks you worked on in this project, which one do you think would allow for the easiest expansion?

In terms of expansion, the easiest would probably be the star topology. This way you could just use a hub to attach conference monitors, additional workstations, more and specialized servers, etc. Then it could easily be expanded into a star-bus topology or any other hybrid.

1.11   Considering the amount of hardware and cabling involved, which of the three networks would be least expensive to implement.

The least expensive would be to just have peer to peer on a bus topology.Just add a new device to the bus.