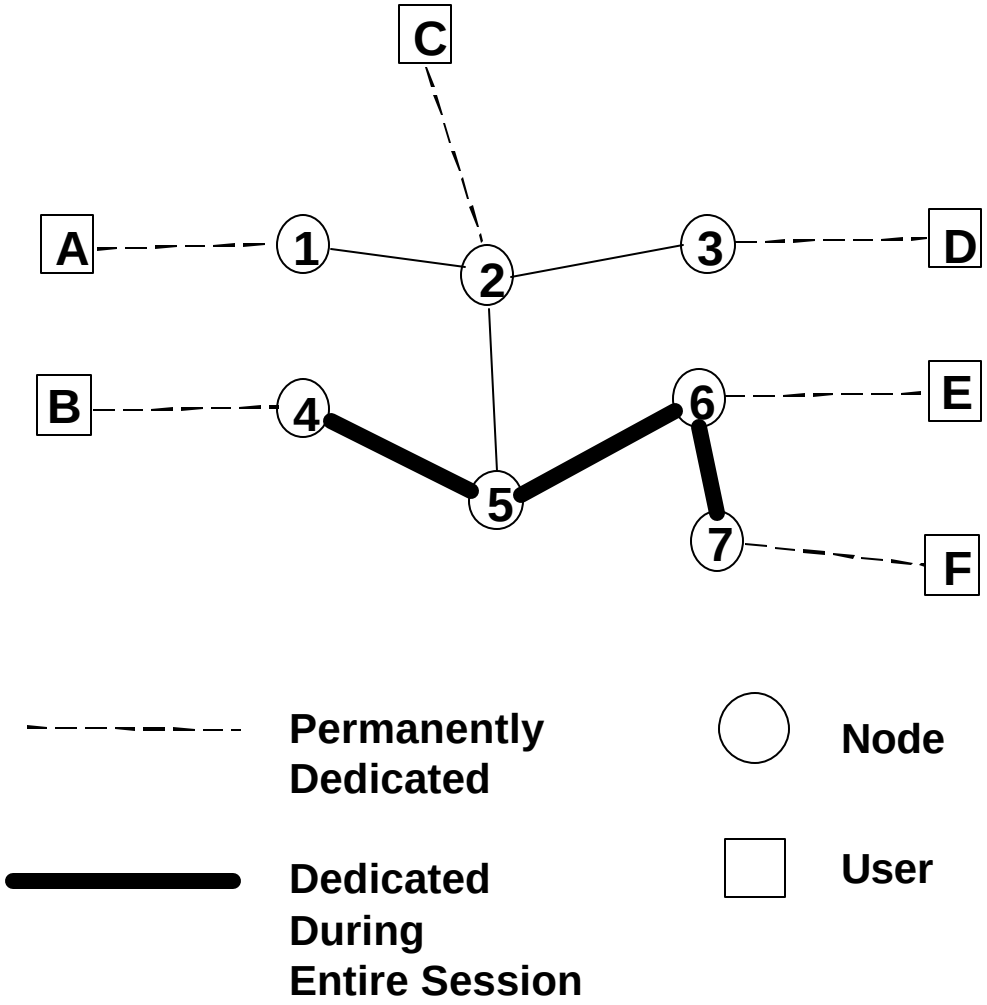
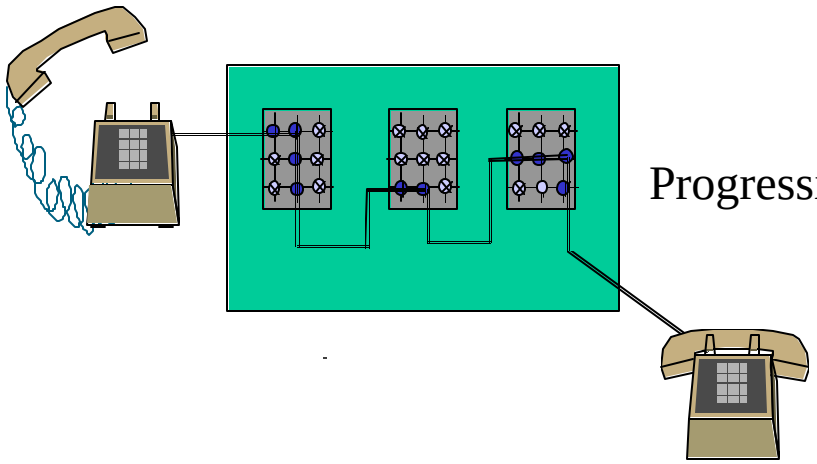
Generic Circuit Switched Network

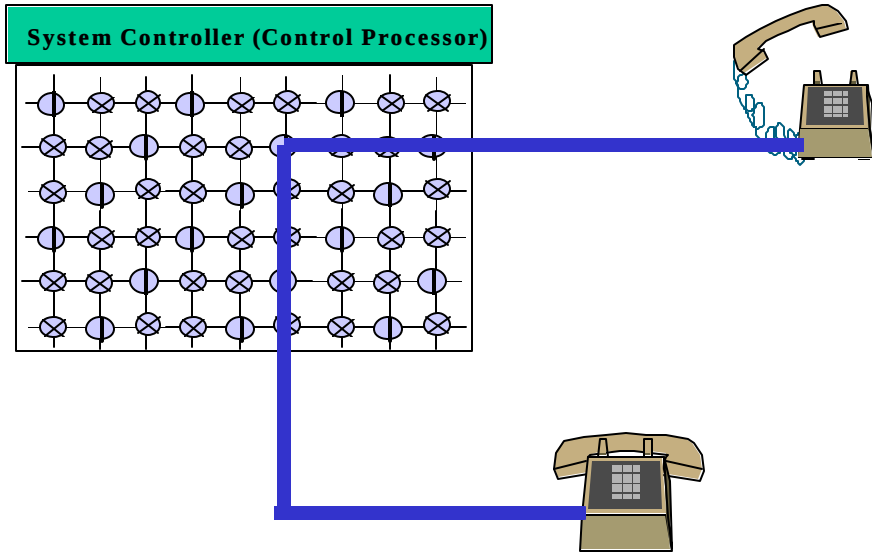


Switching Technology

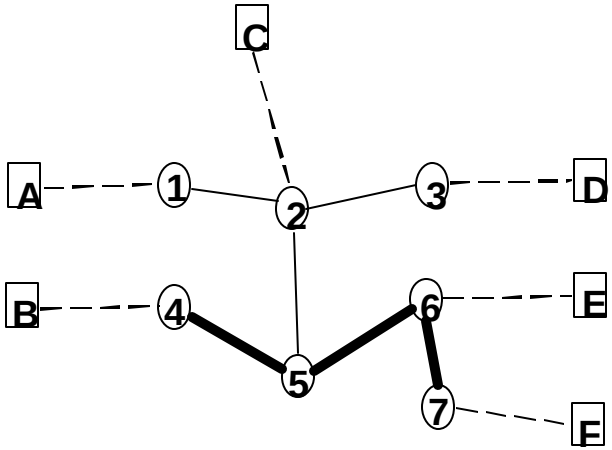


Progressive Control

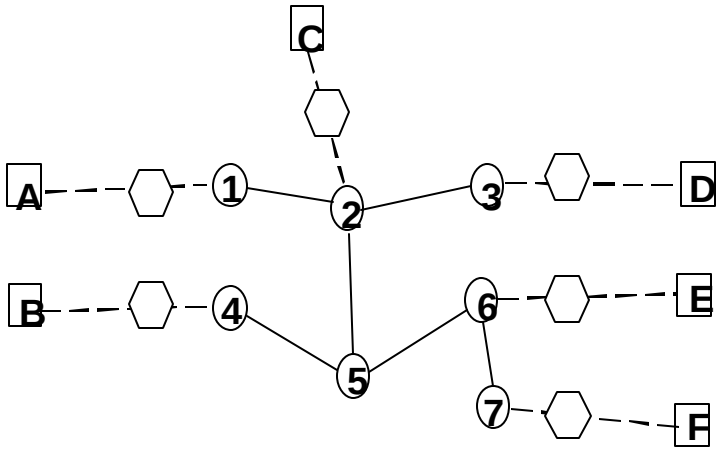
Common Control

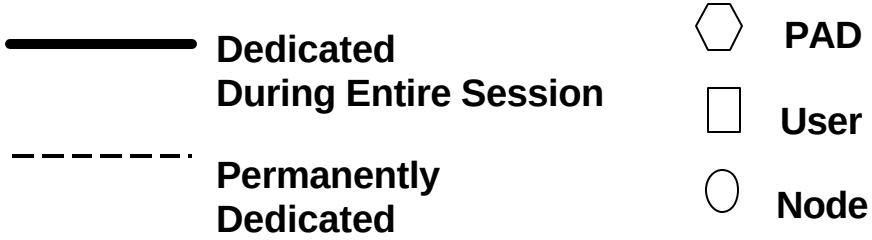


Circuit Switched Network

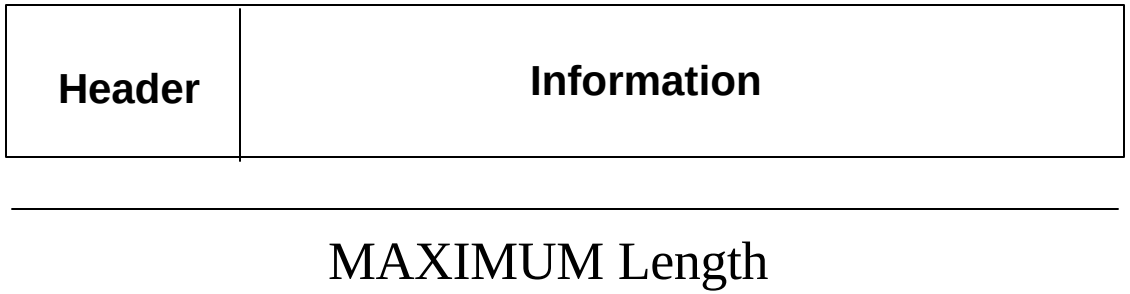


Packet Switched Network





Packet Format



Exercise

Break into groups of 9 individuals.
Pick a person to be "Network manager". This person will report how the exercise proceeded, and distribute the index cards

You will be given 6 index cards for switches, and one for destination. You will also be given a small envelope labeled source.
Network Manager: Give these to 8 people, who are to act as a switch with a particular number and source and destination.

Source has an envelope with an original message, cut into packets.
Each packet has a route through the network. Source starts the distribution,
After that, the switches route to the next location.
Destination must reassemble the message.

Each ring of the bell is one clock cycle. The source releases one message, in alphabetical order, per clock cycle.

Switches can route only one message to the next switch per clock cycle. You must keep all the others until the next cycle. Route the lowest alphabetical message first. (A before B, etc.)

Keep track of how information flows through your network of switches.
Note any problems/challenges.

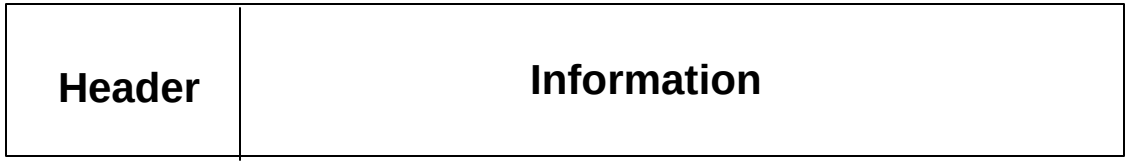
You have 10 Minutes!

Network Manager's History Table

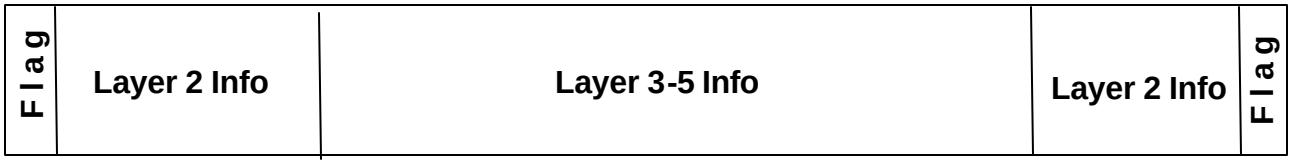
	Location of Packets by Source, Switch, or Destination							
Clock Cycle	Source	1	2	3	4	5	6	Destination
0	A							
1	B							
2	C							
3	D							
4	E							
5	F							
6	G							
7	H							
8	I							
9								
10								
11								
12								
13								
14								
15								

Types of Protocol Data Unit Being Sent Through a Packet Switched Network

Packet Format



Message Format



Packet Switched Network Routing

ROUTING CONSIDERATION	**WHAT'S INCLUDED**
Performance	Number of hops Cost Delay Throughput
Decision Time	Packet (Datagram) Session (Virtual Circuit)
Decision Place	Each node (Distributed) Central node (Centralized) Originating node
Source of Information on Network Status	None Local Adjacent Nodes Nodes along route All nodes
Routing Strategy	Fixed Flooding Random Adaptive
Adaptive Routing Update Time	Continuous Periodic Major load change Topology change

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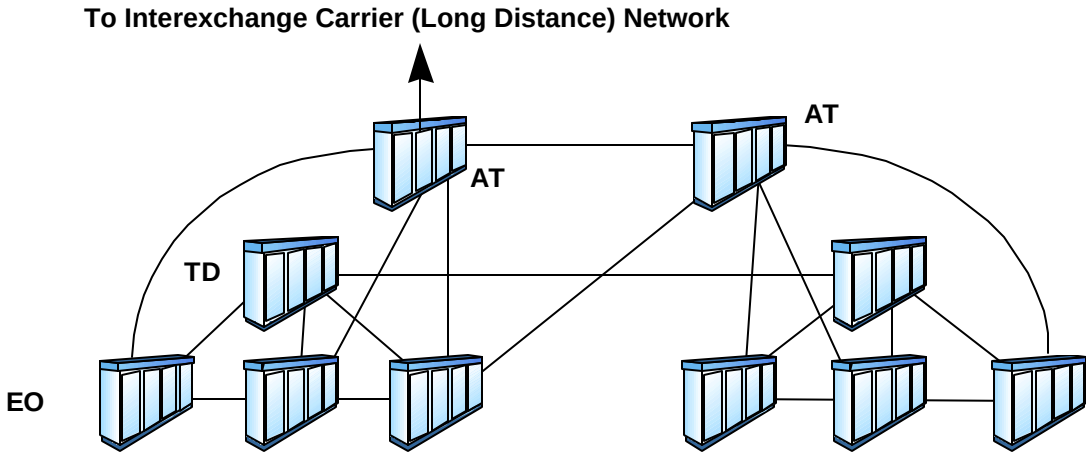
Network Architecture Examples

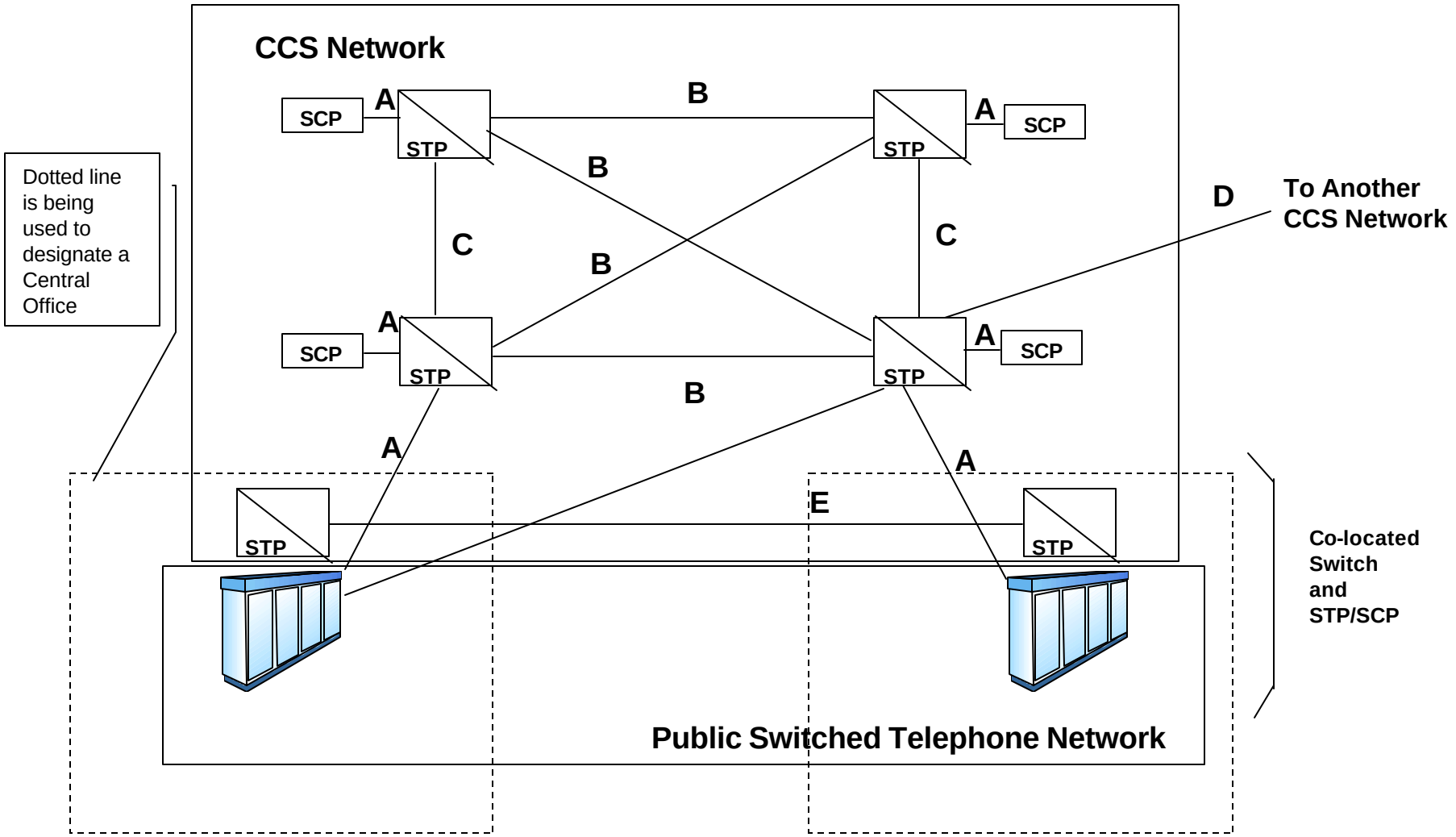
APPLICATION	TYPE OF SWITCHING	INDUSTRY
Public Switched Telephone Network (PSTN)	Circuit	Telephony
Common Channel Signaling	Packet	Telephony
Wide Area and Metropolitan Area Networks	Packet	Data
Multi-Service Network	Hybrid	Cable Telecommunications

PSTN



EO: End Office - Connection to End User
TD: Tandem Office
AT: Access Tandem

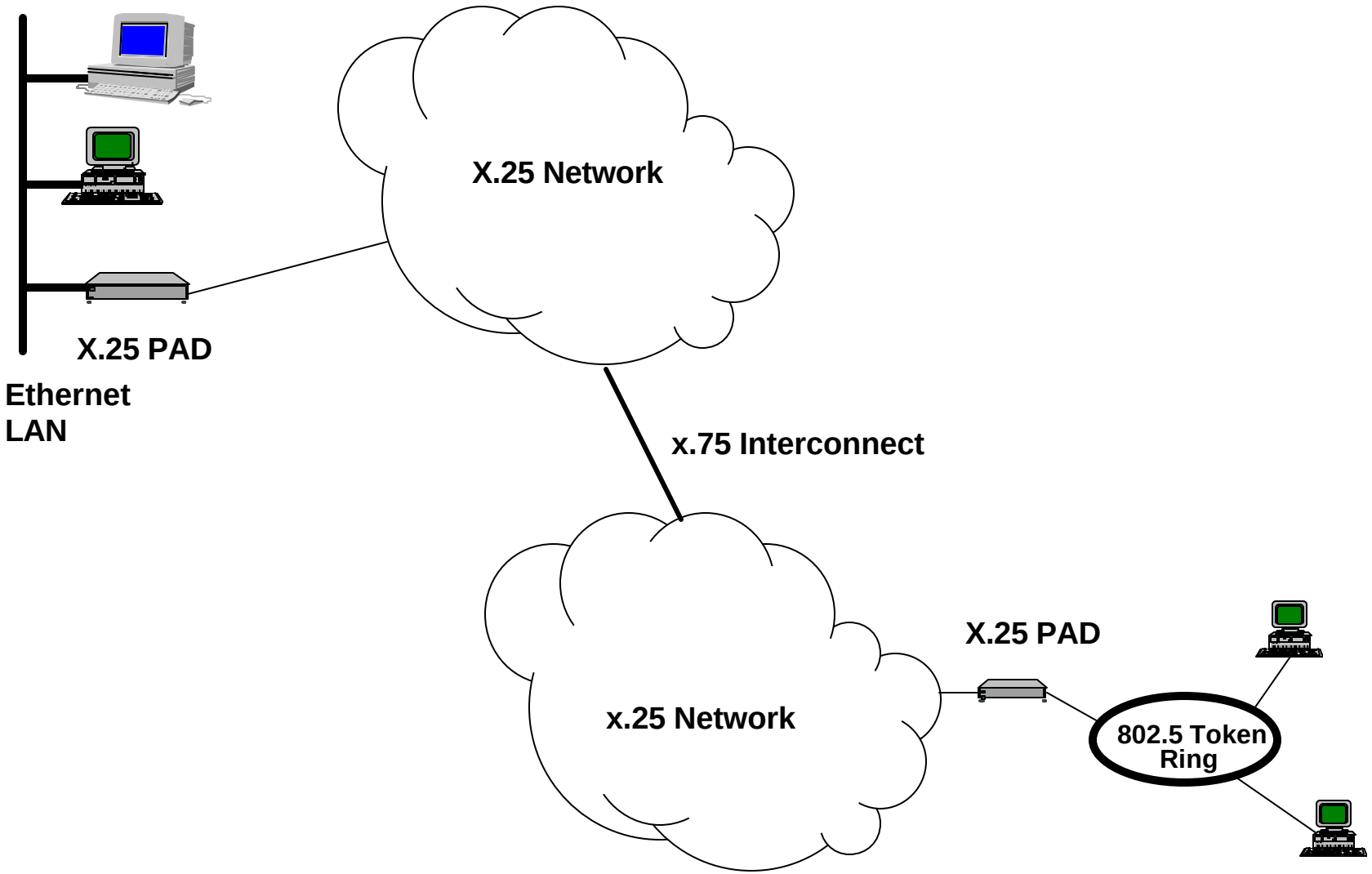
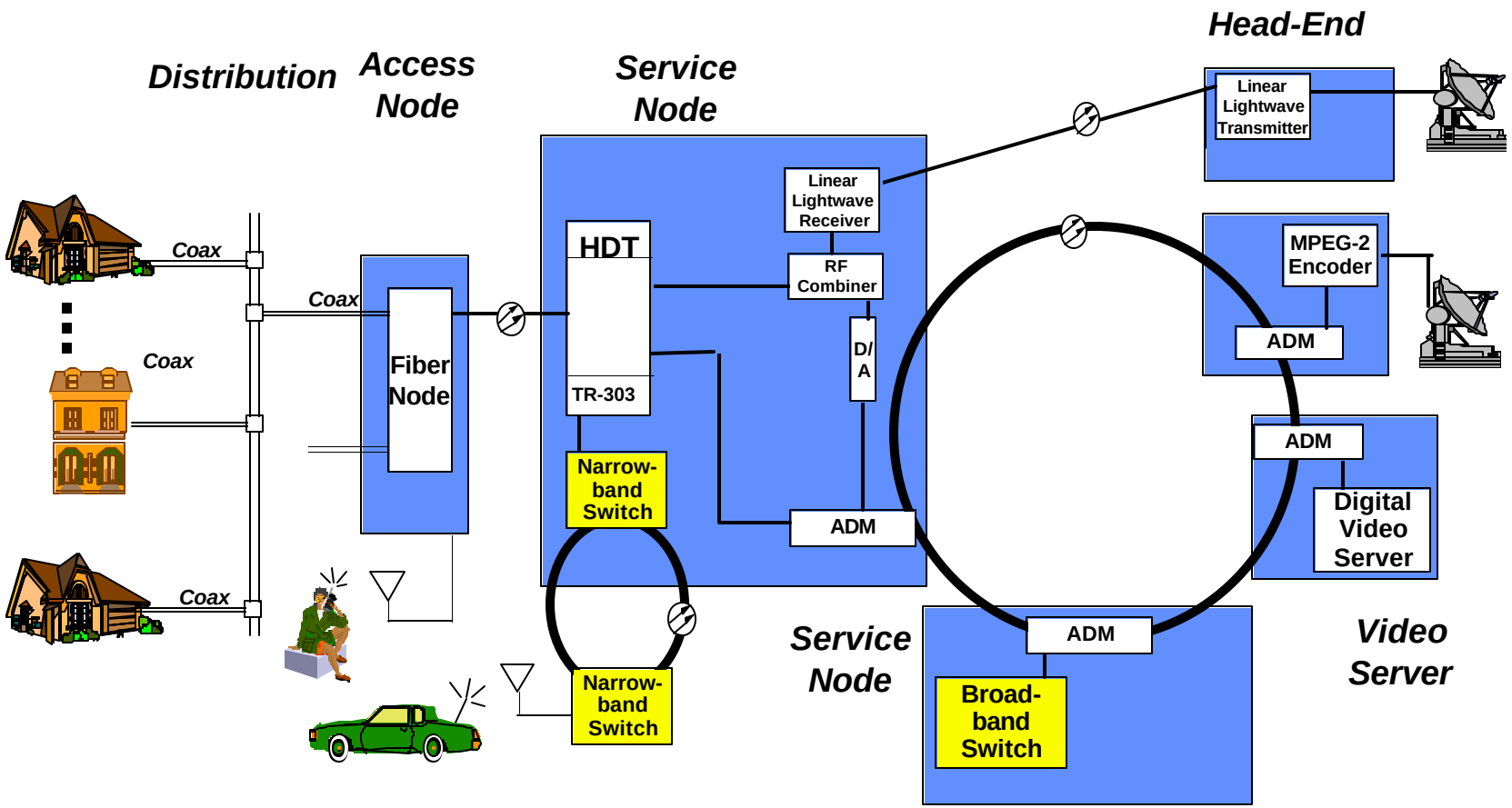
CCS Network Links



CCS Links

Link Designation	**Link Function**
A-Link	Access Link - Switch or Database access to STP
B-Link	Bridge Link - Interconnection of STP pairs in different regions (redundancy for reliability)
C-Link	Cross Link - Interconnection of pairs of STPs in the same region
D-Link	Network Interconnect - Interconnects STPs of different carriers
E-Link	Extended Link - Connects switch to STP in another region
F-Link	Facilities Link - Name for the CCS link between switches when the packet switch functionality is built into the telecommunications switch itself, and no STP is involved in the message routing

WANs and MANs



Multi-Service Network