

CISC 7332X T6

C06c: Switching

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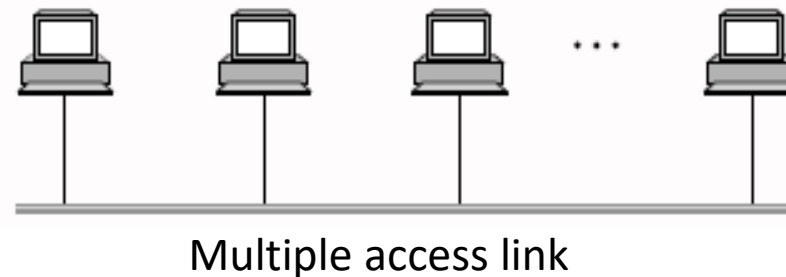
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Outline

- Discussed
 - Digital modulation
 - Baseband transmission
 - Line codes
 - Design considerations
 - Passband transmission
 - Digital modulations
 - Multiplexing
 - FDMA, TDMA, and CDMA
- Switching
 - Direct link networks and switched networks
 - Circuit switching and packet switching

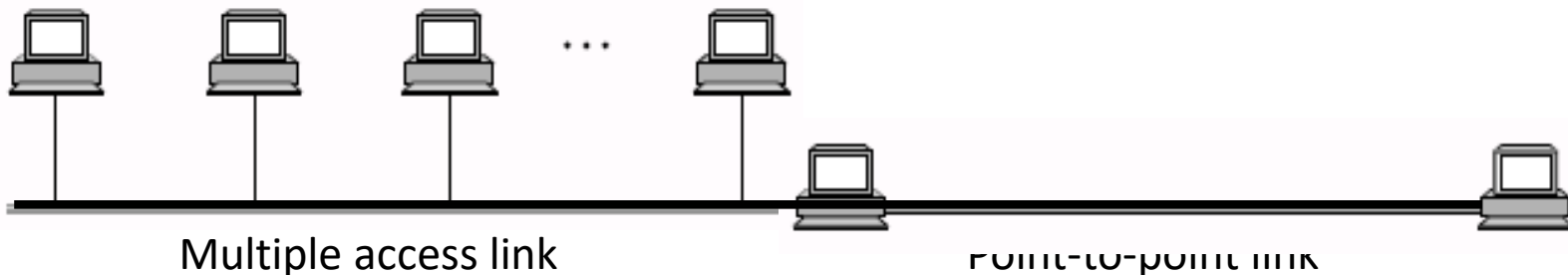
Direct Link Networks

- Point-to-point networks
- Multiple access networks



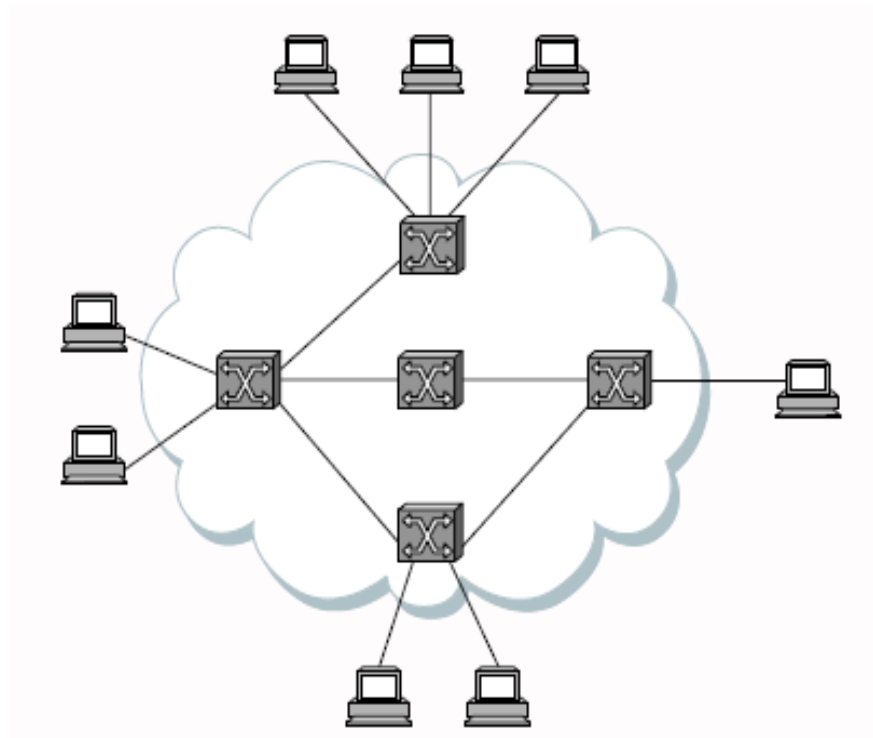
Grow Network in Size

- Direct link networks are small
- How to grow networks in size?
 - Switched networks: a network of networks connected by network switches
 - A network switch (sometimes called forwarding node) is a node with two or more links



Switching

- Find a path between two nodes in a switched network

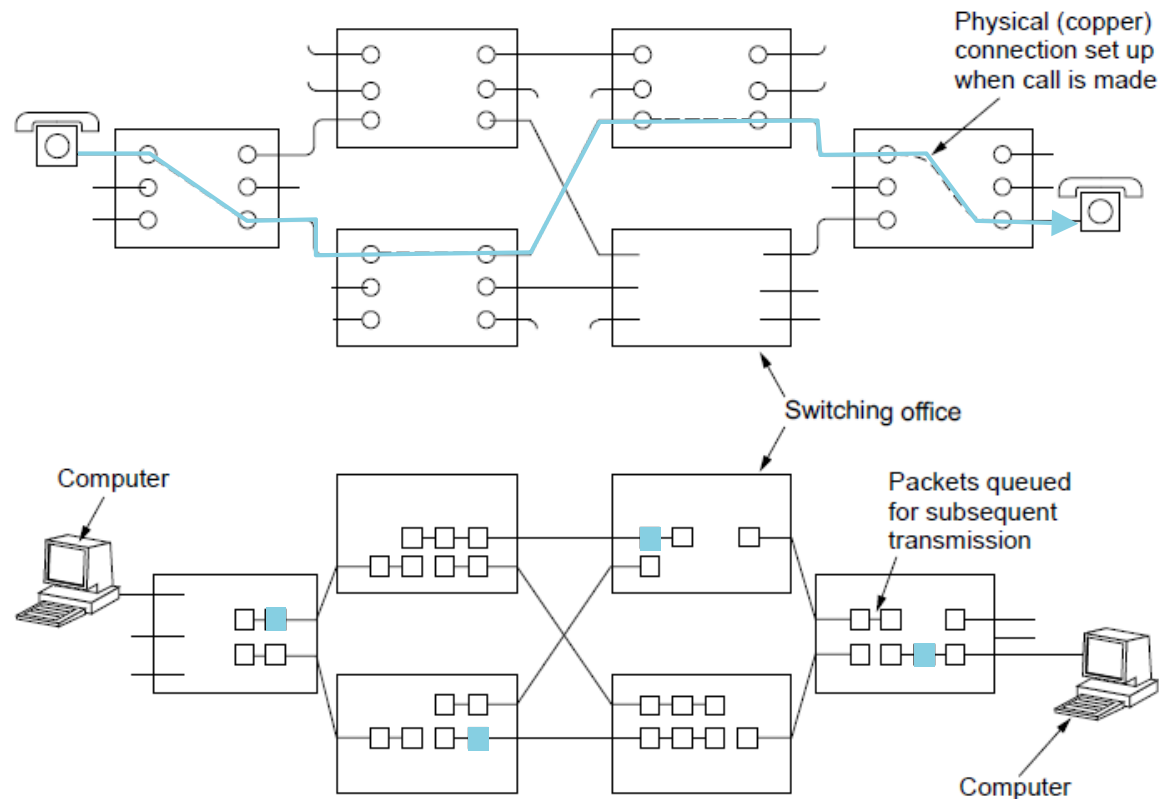


Two Types of Switching

- Circuit switching
 - Example: the public switched telephone network (PTSN)
- Packet switching
 - Example: internet uses packet switching

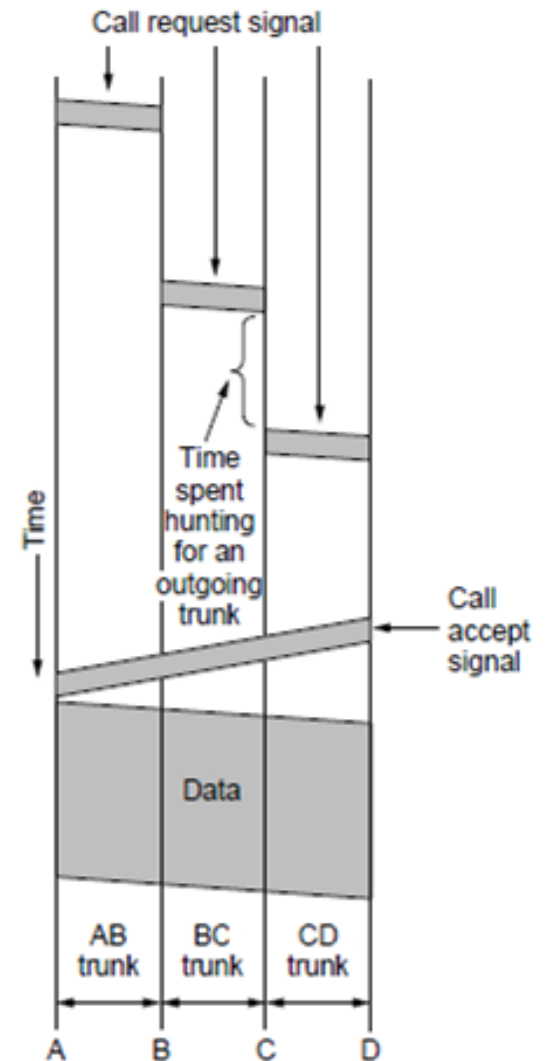
Circuit and Packet Switching

- The big picture



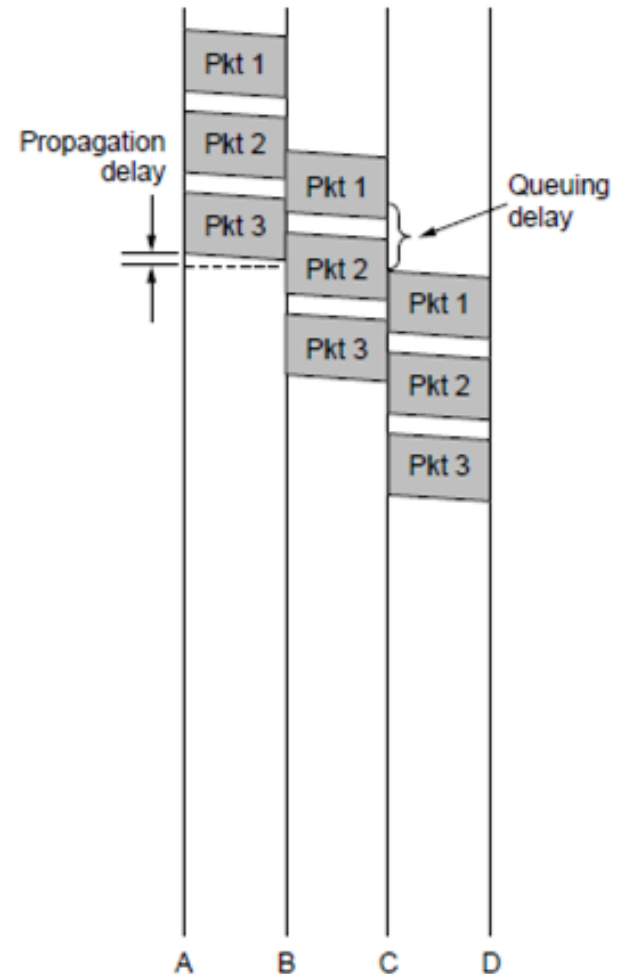
Circuit Switching

- Circuit switching requires call setup (connection) before data flows smoothly
- Also teardown at end (not shown)



Packet Switching

- Packet switching treats messages independently
 - Store-and-forward
- No setup, but variable queuing delay at routers



Comparison

Item	Circuit switched	Packet switched
Call setup	Required	Not needed
Dedicated physical path	Yes	No
Each packet follows the same route	Yes	No
Packets arrive in order	Yes	No
Is a switch crash fatal	Yes	No
Bandwidth available	Fixed	Dynamic
Time of possible congestion	At setup time	On every packet
Potentially wasted bandwidth	Yes	No
Store-and-forward transmission	No	Yes
Charging	Per minute	Per packet

Questions?

- Concept of switching