

CISC 7332X T6

Switching

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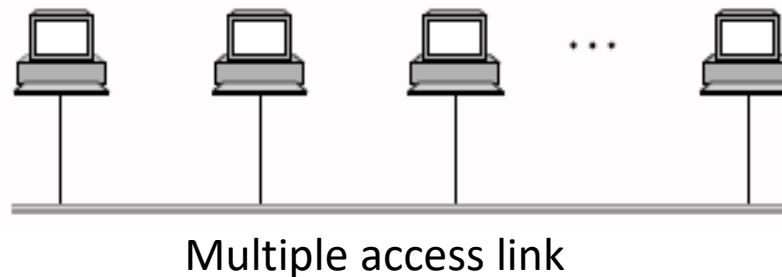
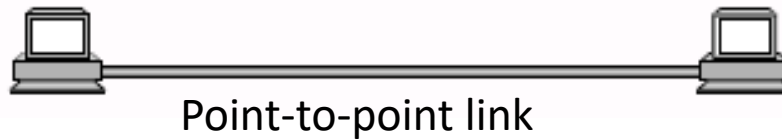
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Outline

- Switching
 - Direct link networks and switched networks
 - Circuit switching and packet switching

Direct Link Networks

- Point-to-point networks
- Multiple access networks



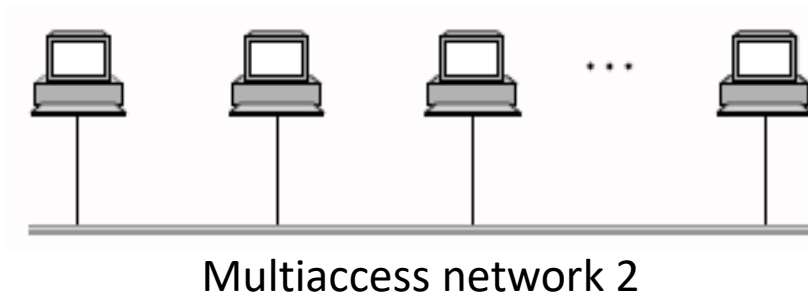
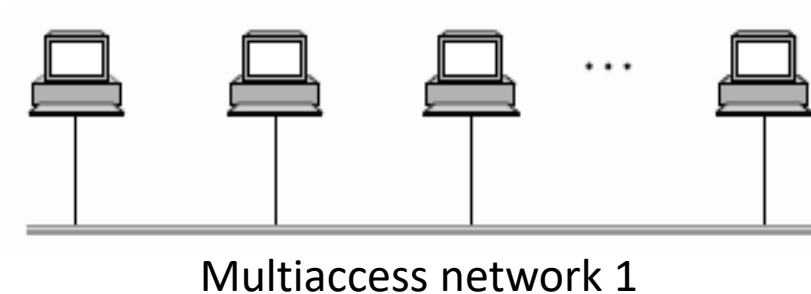
Grow Network in Size

- 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



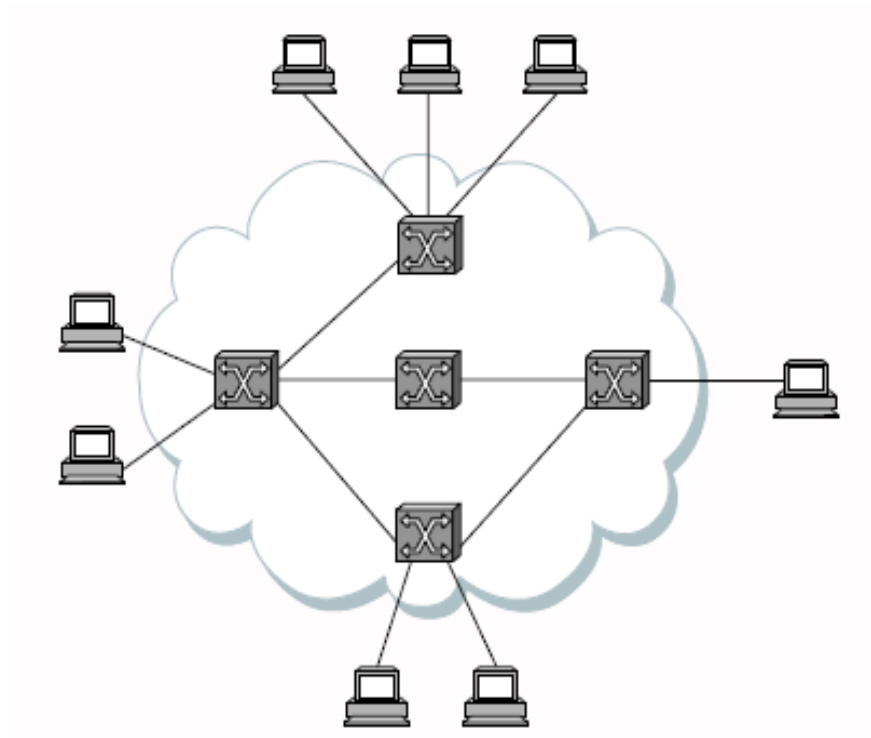
Point-to-point link

How to Connect Two Networks?



Switching

- Find a path between two nodes in a switched network

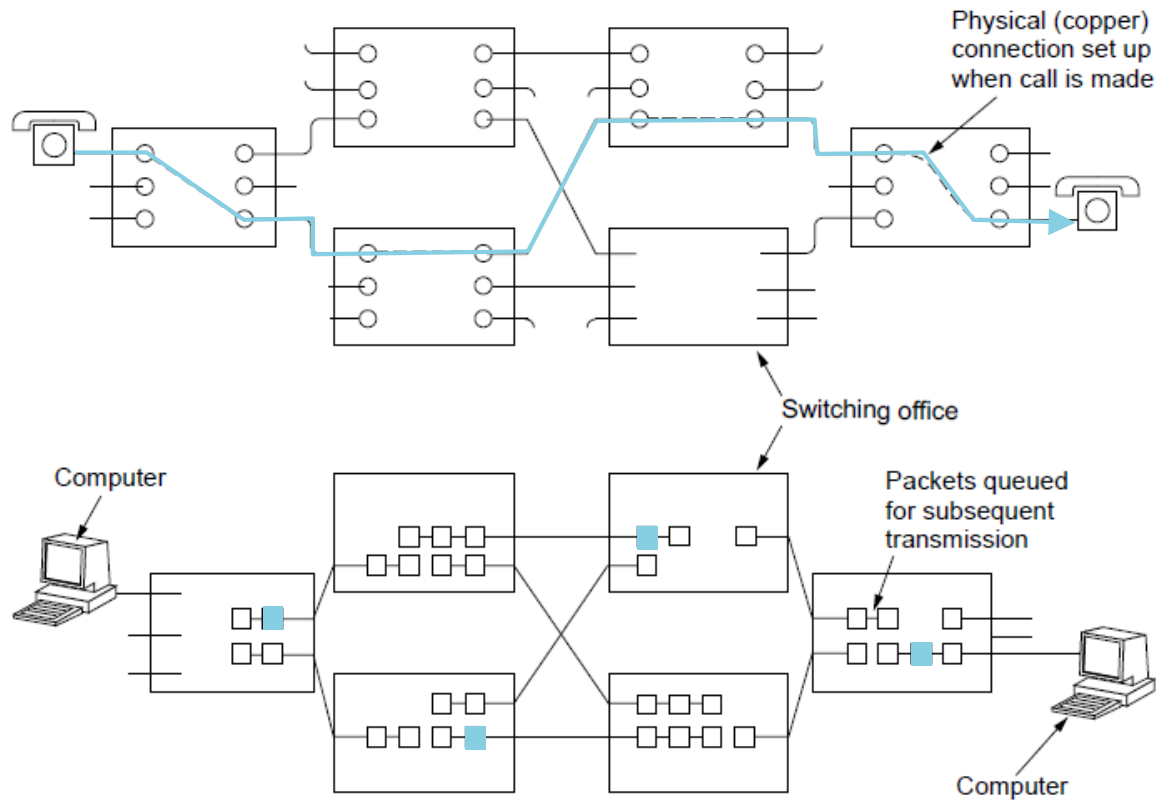


Two Types of Switching

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

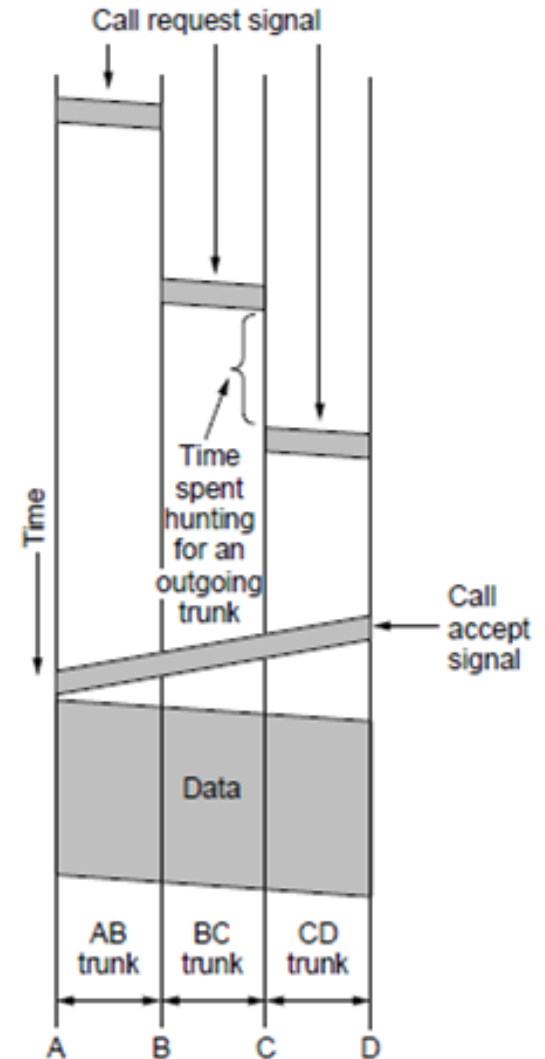
Circuit and Packet Switching

- The big picture



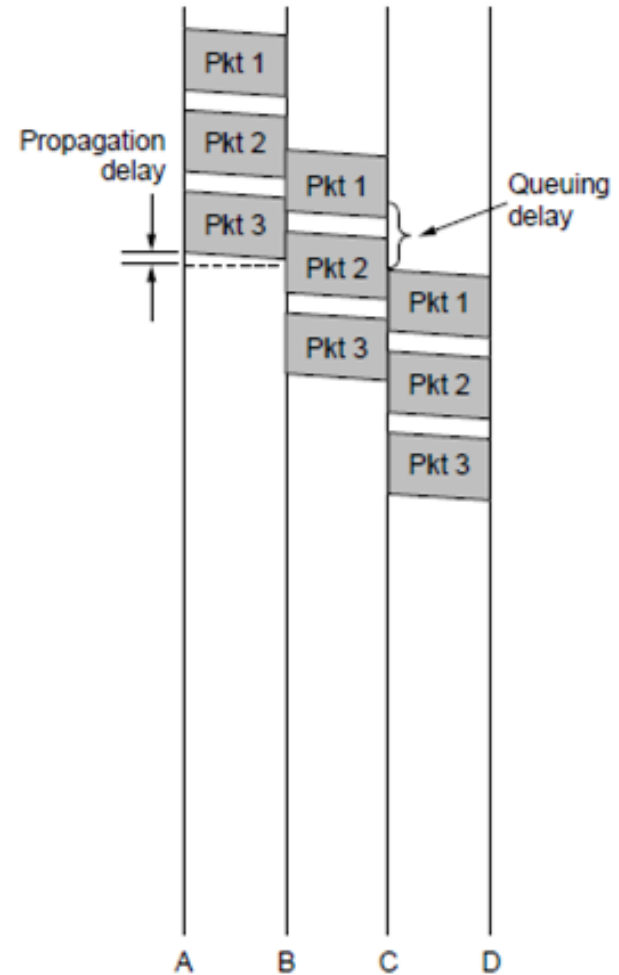
Circuit Switching

- 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