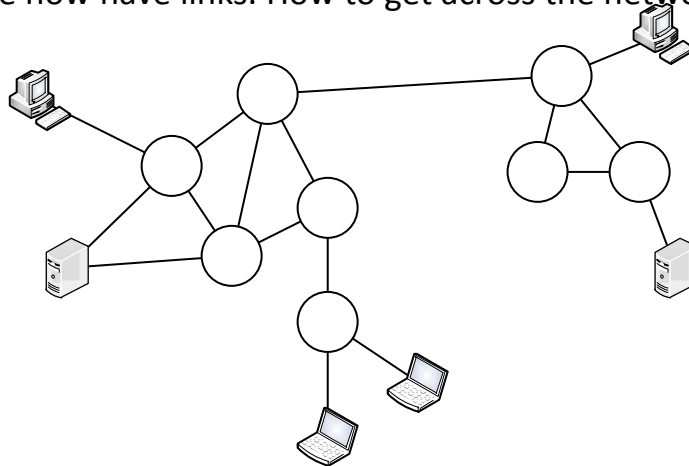


ECE 671 – Lecture 3

Review of Internet Protocols
Network Layer

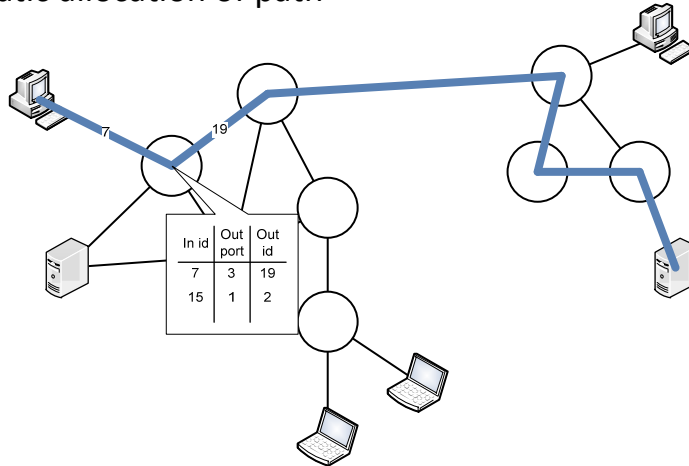
Interface-to-interface connectivity

- We now have links. How to get across the network?



Virtual circuits

- Static allocation of path



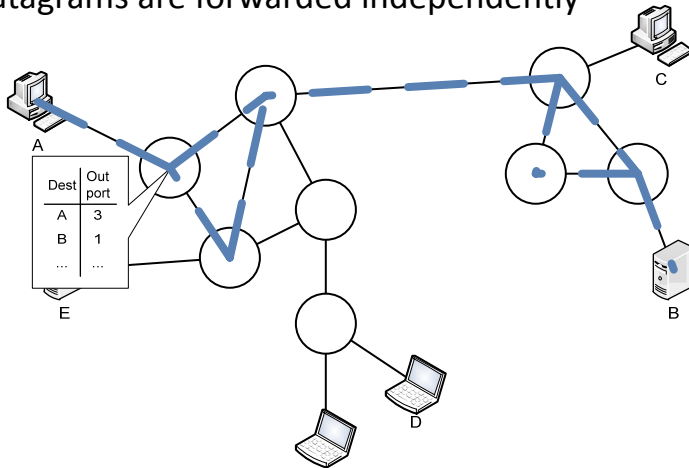
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Datagrams

- Datagrams are forwarded independently



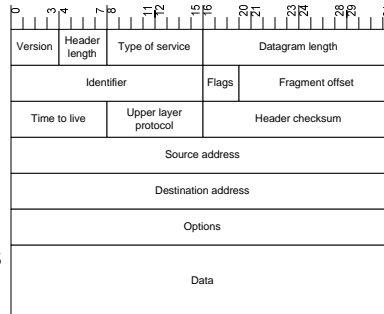
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Internet Protocol

- IP header
 - Source and destination address
 - Datagram length
 - Upper layer protocol
 - Identifies TCP, UDP, etc.
 - Time to live
 - Protection against accidental loops
 - Header checksum
 - Protection against bit errors
 - Fragmentation possible
 - Link layer limited to some datagram size (min. MTU is 576 bytes)

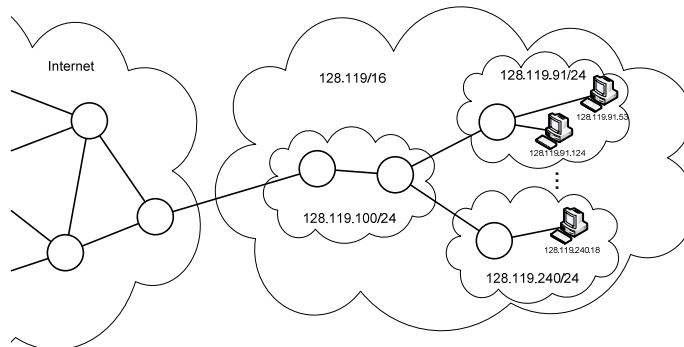


IP addresses

- IP address is 32-bit field
 - Uses dotted decimal notation:
- How should addresses be allocated?

Address aggregation

- IP addresses aggregated into subnets
 - Each subnet represented by “prefix”
 - Notation indicates length of prefix
- Example:



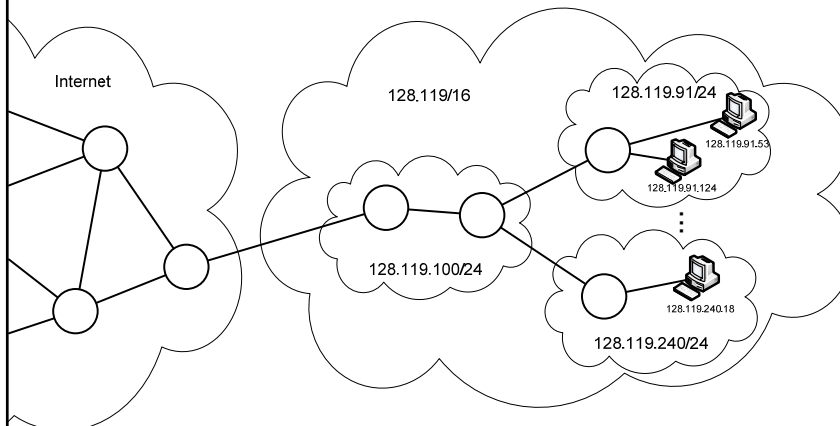
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Address aggregation

- What are potential problems?



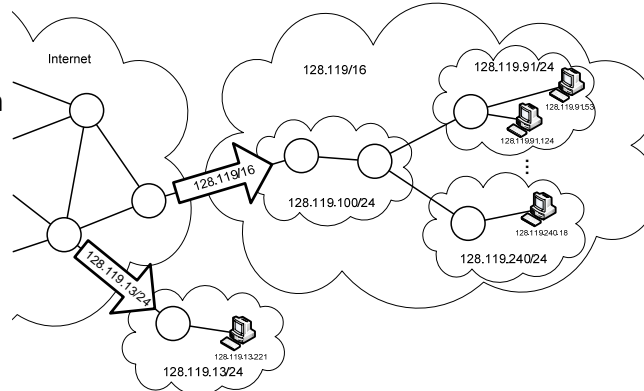
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Address aggregation

- IP addresses may “move”
- Routers perform “longest prefix match”
 - Most specific information



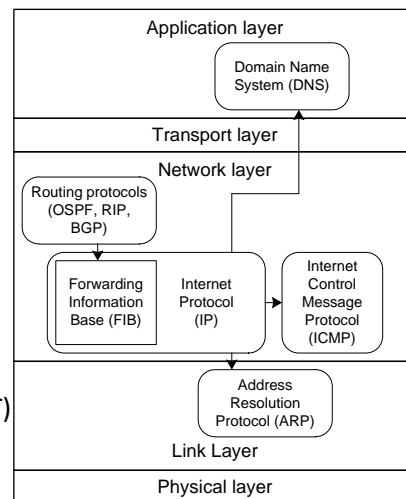
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Other IP aspects

- Routing
 - Determines forwarding
- ICMP
 - Error handling
- Link layer
 - Address resolution (ARP)
 - Dynamic IP addresses (DHCP)
- Application layer
 - Domain names (DNS)
- Transport layer
 - Network address translation (NAT)
- New IP version: IPv6



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