



# Internetworking Concepts

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# Outline

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- Universal Service
- Internetworking
- Virtual Network



# Universal Services

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- Specific constraints
  - LAN – Fast/Local
  - WAN – Remote (large area)
- No “one size fits all”
- Universal services
  - communicate to other users
- Heterogeneous (different technologies)



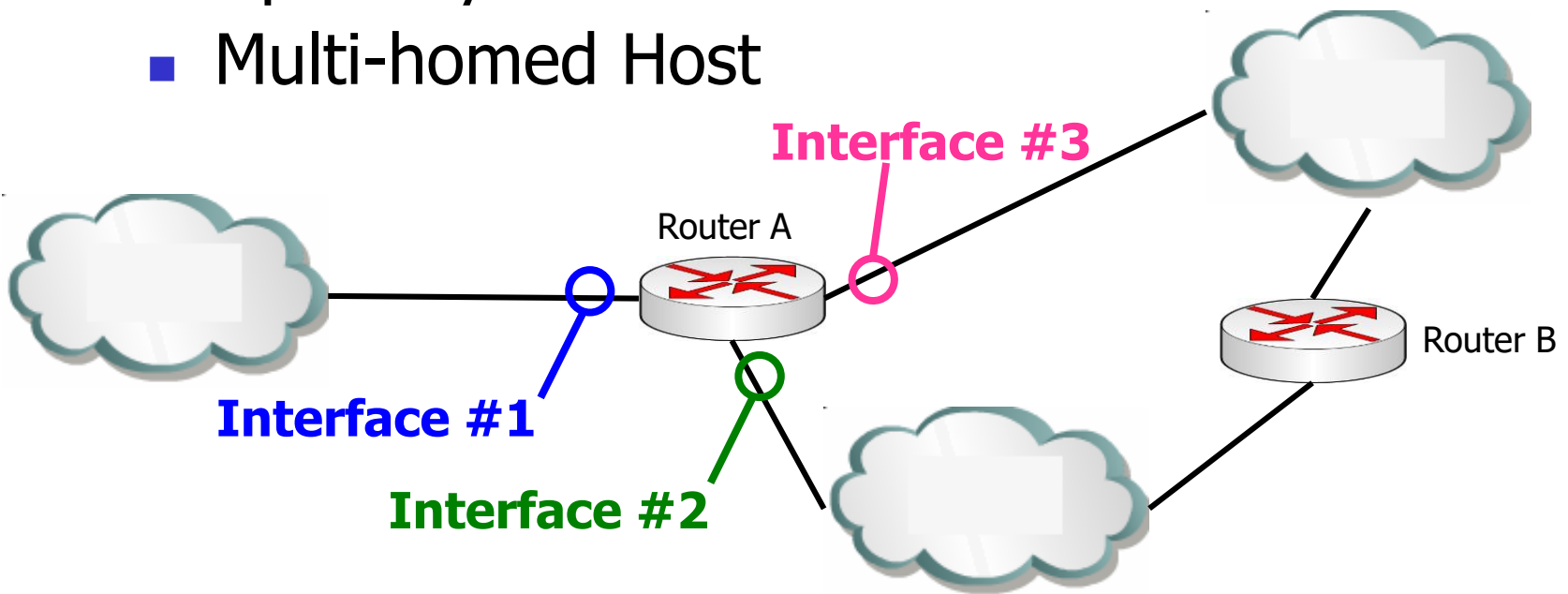
# Internetworking

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- Hardware
  - physical network interconnection
- Software
  - provides universal services
- Called “**internetwork**” or “**internet**”
- Not limited in size
- Basic hardware → Router

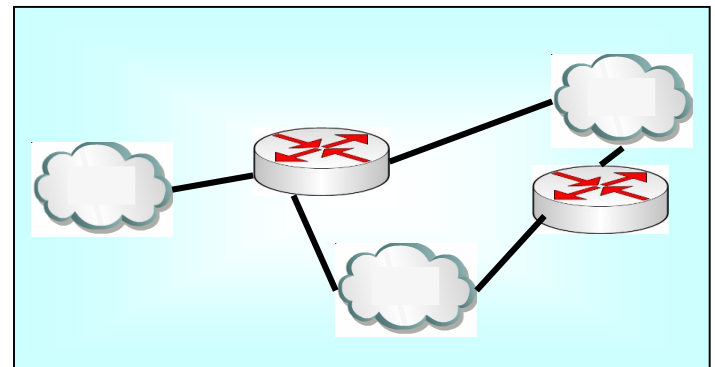
# Routers

- Special-purpose hardware for interconnecting (different) networks
- Up to layer 3
- Multi-homed Host

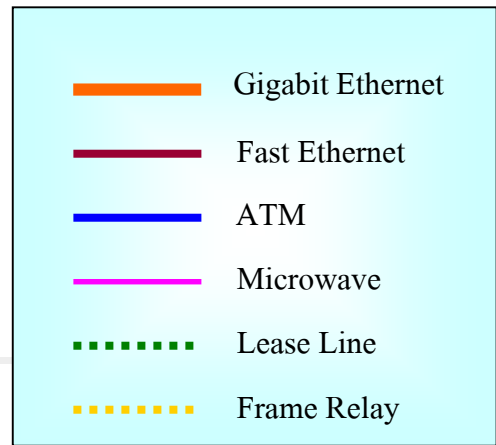


# Internet Architecture

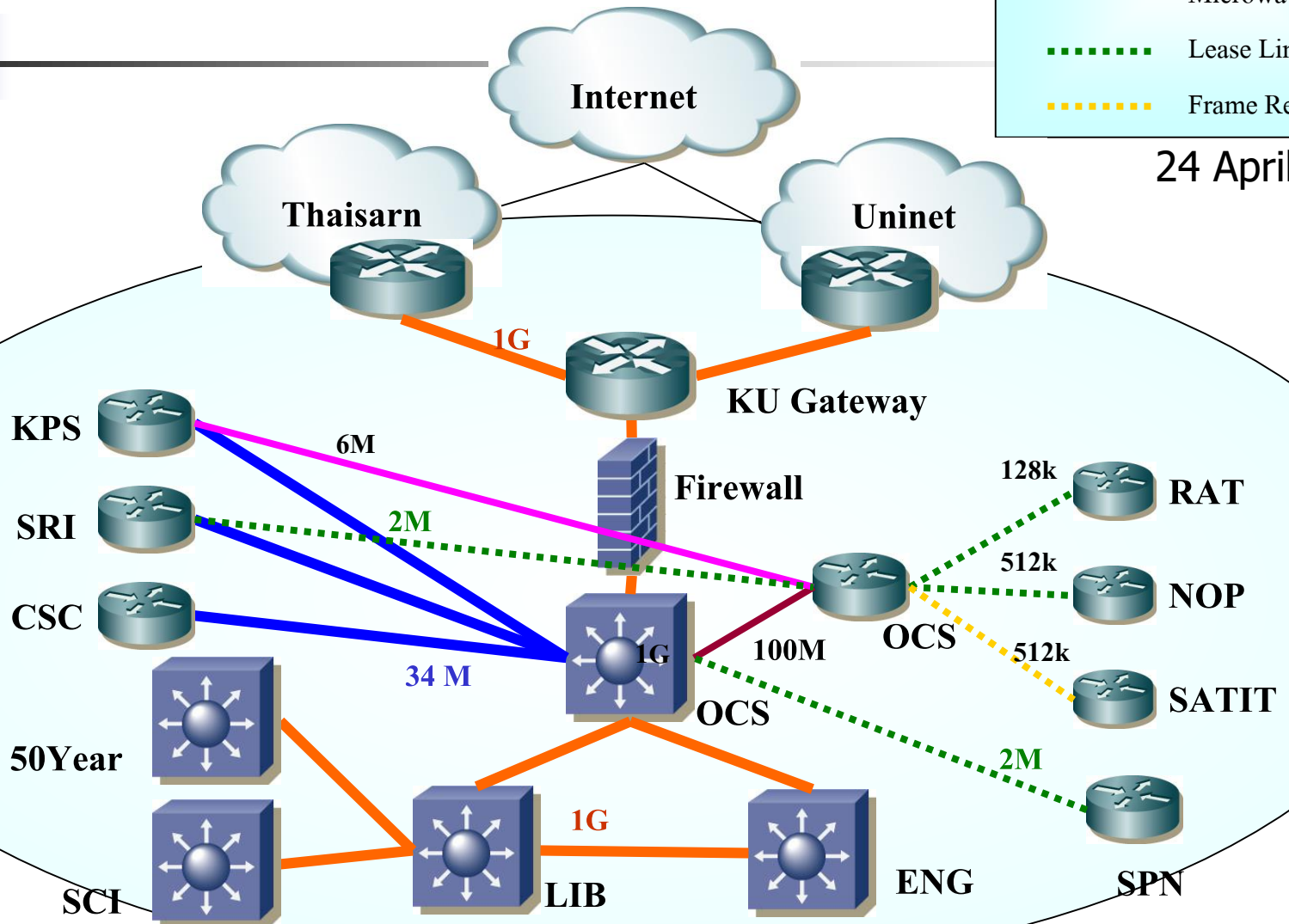
- Heterogeneous
- Connect LAN / WAN together (complex)
- Internet Topology depends on
  - bandwidth
  - traffic
  - reliability
  - hardware cost (e.g. router)



# Nontrinet



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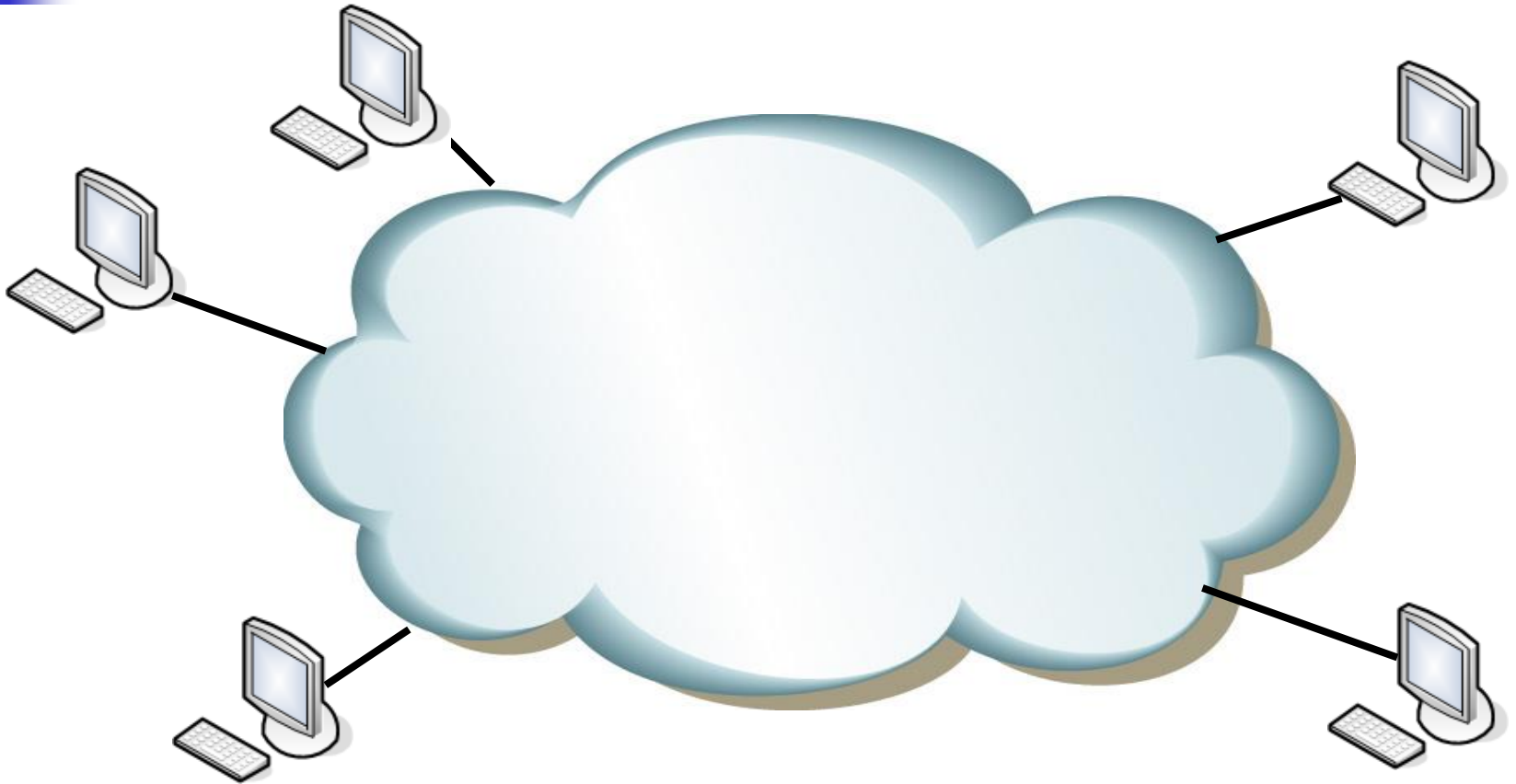
# Virtual Network

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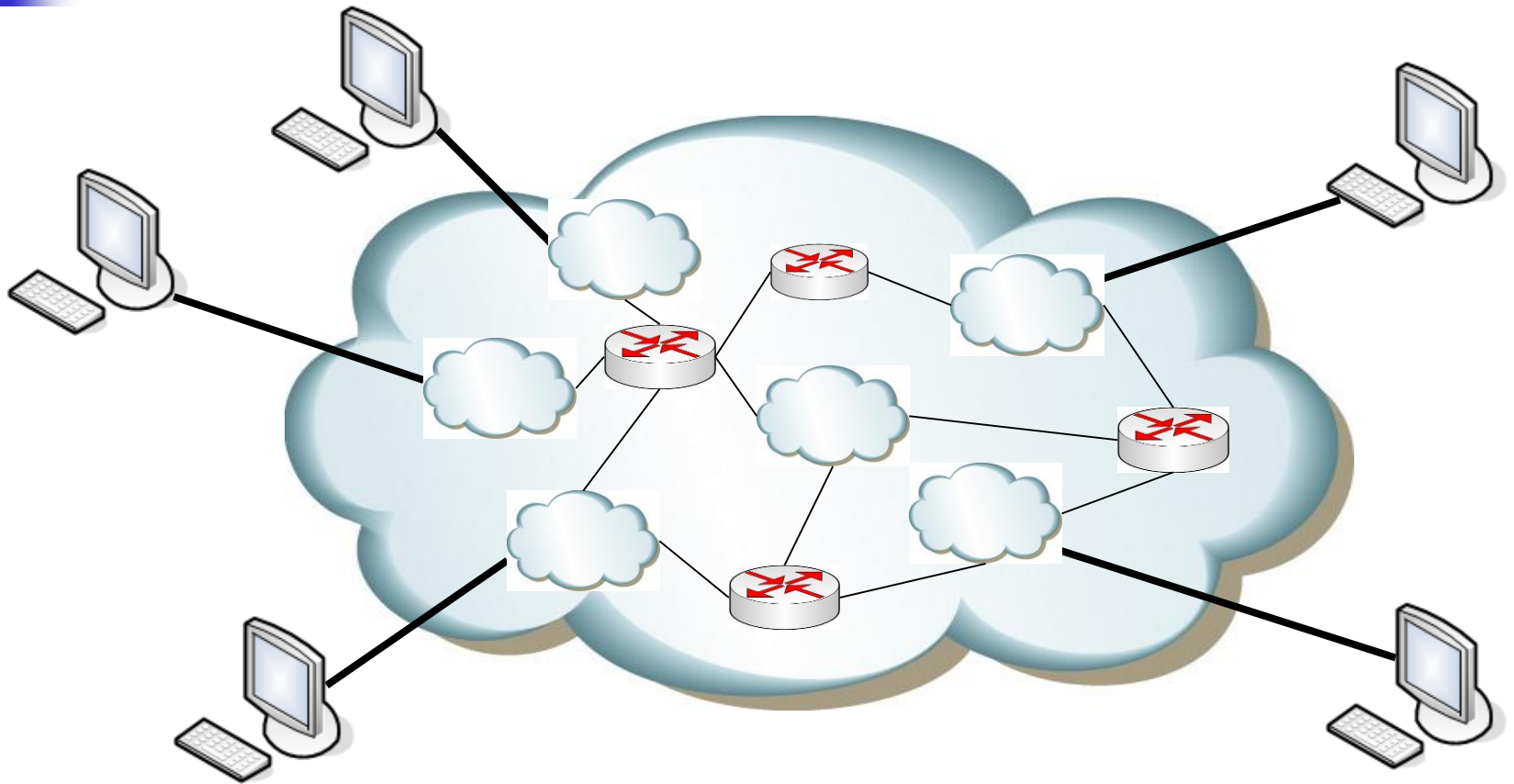
- Internet protocol software
  - hides physical details including physical address
  - routing information
- Application doesn't care about physical
- View communication as **abstraction**
  - called **Virtual Network**



# Internet concept (Virtual)



# Internet concept (Physical)



# Protocols for Internetworking

- De facto standard → TCP/IP
- The **TCP/IP Internet Protocols**

