COMP 3331/9331: Computer Networks and Applications

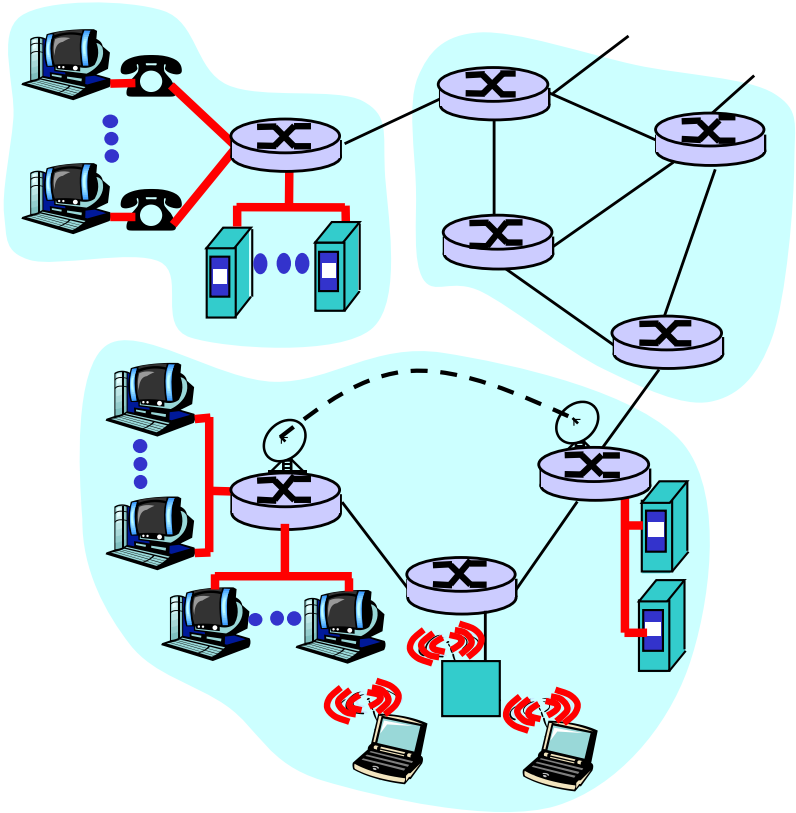
Recap

T1, 2022

Recap from Week 1: A top-down approach

We've covered networking using a top-down

- end-system applications, end-end transport
- network core: routing, hooking nets together
- link-level protocols, e.g., Ethernet
- other stuff: security, wireless networks



What you have accomplished

- Comprehensive overview of the entire protocol stack with a particular focus on the Internet
- Key principles
  - Layering, scale, hierarchy, etc.
- Key design issues
  - Application architectures, reliability, congestion control, routing, medium access, etc.
- Hands-on practical laboratory experiments using several diagnostic tools, Wireshark and ns-2
- A “real-world” assignment
  - Discussion Forum/Message Board application

Key topics (1)

- Organisation principles
  - Layering, hierarchy, encapsulation
- Application layer
  - Protocol design, P2P, socket programming
- Transport layer
  - Error detection, reliable data transfer, flow control, congestion control
  - TCP and UDP

Key topics (2)

- Network layer
  - Network addressing, scalability, hierarchical addressing
  - Fragmentation as an example to deal with heterogeneous link layer technologies
  - Routing protocols and algorithms: link state, distance vector
- Link layer
  - Addressing, ARP
  - Medium access control, especially random access
  - Interaction between link and network layers

Key topics (3)

- Wireless Networks
  - 802.11
- Security
  - Symmetric key and public key cryptography
  - Confidentiality, message integrity, authentication
  - The role of encryption in these

What next?

- COMP 9333: Advanced Computer Networks (refreshed)
- COMP 9334: System Capacity and Planning
- COMP 4336/9336: Mobile Data Networks
- COMP 6441/9441: Security Engineering and Cybersecurity (+ other security courses)
- COMP4337/9337: Wireless Network Security
- COMP6337: IoT Experimental Design Studio
- Undergraduate/Postgraduate Projects and Thesis

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