

CSC 4992 Exam Review

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Foundation

- Connectivity and cost-effective resource sharing
 - *Packet switching vs. circuit switching*
 - *FDM, (S)TDM, Statistical Multiplexing*
- Inter-Process Communication
 - Request/reply
 - Stream-based
- Network Architecture
 - TCP/IP
 - OSI
- Implementation Issues
 - Process model
 - Buffer model
- *Performance Metrics*
 - Bandwidth, Latency
 - *Single-hop vs. multi-hop path/network*

Direct link networks

- Point-to-point links
 - Encoding
 - Framing
 - Error detection
 - *Reliable transmission*
 - *Detailed sender-receiver interaction, e.g., via timeline diagram at senders and receivers (data, ack, retransmit, etc.)*
- Shared access networks
 - Channel access control
 - Ethernet, Token Ring
 - *Wireless: hidden terminal, exposed terminal, MACAW & RTS-CTS*

Packet switching

- Switching and Forwarding
 - Source routing
 - Virtual circuit switching
 - Datagram switching
- Bridges and Extended LANs
 - Learning bridges
 - *Spanning tree algorithm*
 - *Non-determinism due to the randomized selection of equal-hop-length path*
- Cell Switching
 - Fixed-length, short packets

Internetworking

- IP
 - Deal with "heterogeneity"
 - Best-effort service: minimum assumption about underlying networks
 - A global, common address space
 - A common IP packet format
 - Deal with "scale"
 - Hierarchical (network + host) address: reduces information maintained at routers (*scale in control state*)
 - Automatic configuration: DHCP, etc. (*scale in management*)
- Routing and algorithms
 - Algorithms: *D-V*, *L-S*, metrics, Mobile IP
 - *D-V*: *bouncing-effect*, *count-to-infinity*
 - *L-S*: *LSP flooding => termination*, *version control*
 - Scalability: subnetting, *supernetting (CIDR)*, *BGP (P-V)*, IPv6
- Group communication
 - Multicast routing: L-S, D-V (RPB, RPM), PIM-SM

Questions

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Good luck!