

CS252
Graduate Computer Architecture

Lecture 10:
Network 3: Clusters, Examples

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Review: Networking

- **Protocols allow heterogeneous networking**
 - Protocols allow operation in the presence of failures
 - Internetworking protocols used as LAN protocols
=> large overhead for LAN
- **Integrated circuit revolutionizing networks as well as processors**
 - Switch is a specialized computer
 - Faster networks and slow overheads violate of Amdahl's Law
- **Wireless Networking offers new challenges in bandwidth, mobility, reliability, ...**

Cluster

- LAN switches => high network bandwidth and scaling was available from off the shelf components
- 2001 Cluster = collection of independent computers using switched network to provide a common service
- Many mainframe applications run more "loosely coupled" machines than shared memory machines (next chapter/week)
 - databases, file servers, Web servers, simulations, and multiprogramming/batch processing
 - Often need to be highly available, requiring error tolerance and repairability
 - Often need to scale