Scalable Multimedia Information Processing
Year One Progress Report

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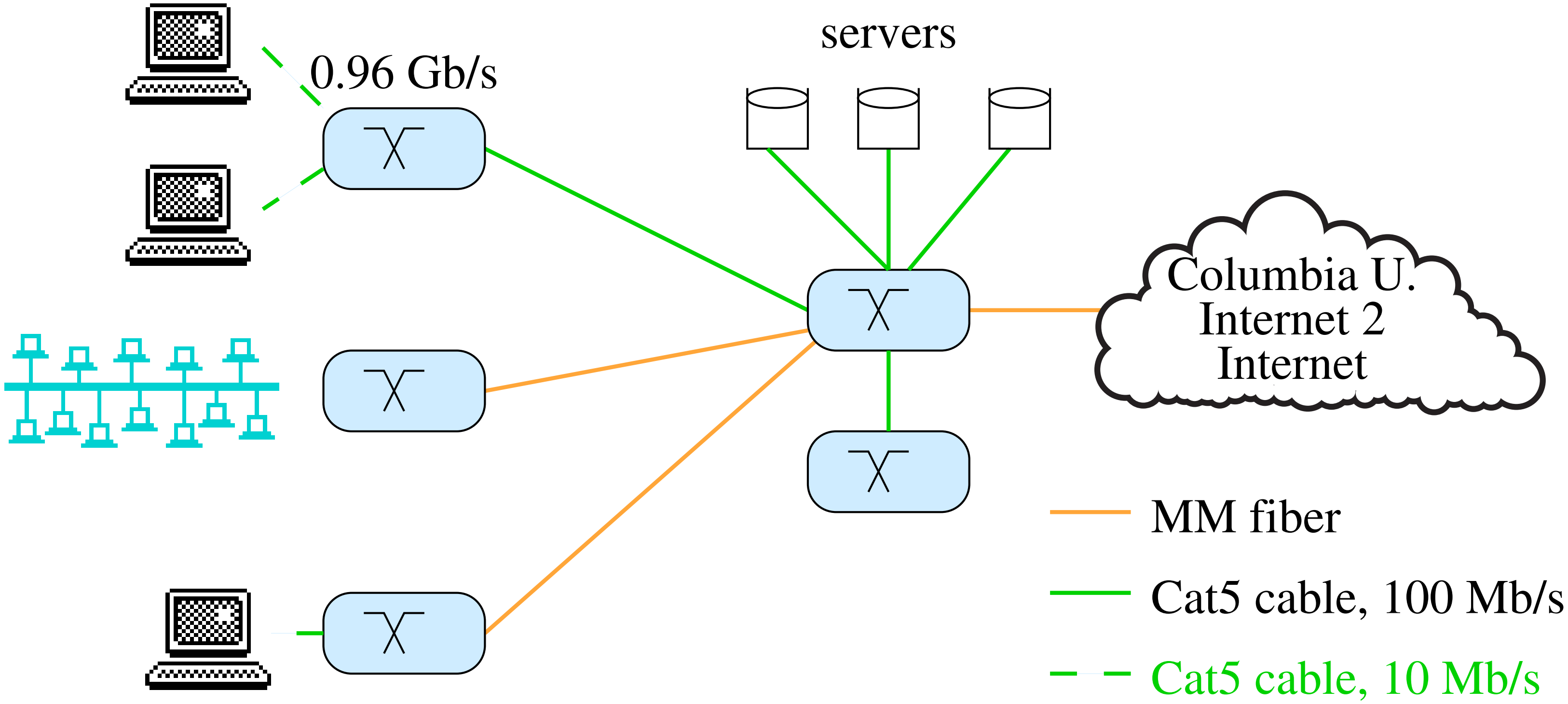
Overview

- infrastructure
- research enabler
- teaching and undergraduate research

Infrastructure



Old Infrastructure

- coax, cat3 shared 10 Mb/s Ethernet + FDDI
- lots of subnets connected by slow routers
- hard to maintain, expand
- no multicast
- bandwidth constrained (compilations, multimedia, ...)

New Infrastructure

- $\geq$ switched 10 Mb/s to each desktop
- \$ ➠ Ethernet switches (no ATM)
- scalable from cat3 shared-10 Mb/s to switched 100 Mb/s
- upgrade to gigabit Ethernet later
- integrated 30 kp/s ($\uparrow$ 120 kp/s) IP routing ➠ to campus, experimental
- single large subnet ➠ address efficiency, ease of administration
- switches with $\approx$ 1 Gb/s capacity
- connected via cat5 and fiber (across buildings)

Infrastructure as Laboratory

- applications: demo systems $\longrightarrow$ infrastructure-grade
- ➠ reliability, security, scaling, integration
- but: networking labs not large enough
- use department as laboratory ➠ hundreds of hosts
- use university as laboratory ➠ thousands of hosts

Research Enabler

- gradually replace PBX by PC/workstation-based “phones”
- gateways to POTS, ISDN
- protocol research: SIP, RTSP
- departmental media server: audio, classes, lectures
- VLANs ➠ create separate subnets for “disruptive” networking research
- student research laboratory (SRL): 20 high-end workstations with audio and video capture and rendition

Network as Catalyst

- SRL matching funds from University
- collaboration with several U.S. media, networking, software companies
- undergraduate research opportunities
- external research grants and projects

Undergraduate Research

Infrastructure enables student research projects:

- POTS and PBX interface
- integration of WWW, conferencing, email, calendars, mobile networks, media storage, …
- networked CD ROM and audio jukebox
- multicast routing

Research Impact

- new DARPA projects on network survivability, active networks
- fraud detection for financial networks
- MAGIC: coordinated multimedia briefings for surgeons
- summarizing news from multiple sources
- omnidirectional camera with no moving parts
- generating 3D CAD models from range models
- video-on-demand servers
- information management for multimedia hyperlinked collaboration environments

Impact on Teaching

- new network courses with lab emphasis:
  - Advanced Internet Services
  - Network Security
- enhanced courses
  - OS
  - multimedia systems
  - graphics
  - robotics, CAD, computer vision
  - user interface design
  - …

Student Research and Distance Education