Giga-bit Network Testbed at UCLA

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Planned Network Testbed @UCLA

An “in-house” network testbed:

– small-scale, easily controlled

– WUGS switches used to inter-connect “routers’ (PC’s), PVC’s setup between PC’s to act as virtual links

– reorganizable virtual topology can be realized by changing virtual links

– support research on QoS(Diff-Serv), QoS routing, multicasting and congestion control
Hardware

Hardware:
- four WUGS switches, plus a number of APIC cards and OC-3 ATM cards
- twelve Pentium II workstations donated by HP

Connection to department network, campus backbone, Calren and vBNS

Advantages of using WUGS:
- very fast
- PVC as virtual link to enable experiments on different network topology (reorganizable)
Testbed at UCLA
Implementation & Integration Work

Software to help implement virtual topology, a GUI program for VCI setup
Diff-Serv as specified by the draft QBone architecture (and in compliance with emerging IETF Diff-Serv standards)
– premium service
– bandwidth broker (another group working on design and implementation)

RSVP
QoS Networking

QOSPF, different routing algorithms, to work with Diff-Serv

QoS multicast
– utilizing premium service
– clustering routing algorithm
– PIM-SIM-like receiver-initiated multicasting

MPLS, under consideration

Cooperate with other groups (QBone participants, giga-kits participants)
Congestion Control

Experimental study of congestion control algorithms in a realistic testbed network

– algorithms proposed at UCLA: general window advertisement (GWA), bandwidth aware (BA) TCP

– a 10-node testbed network provides rich topology, comparable with simulation

– traffic generator or traffic trace can be used to simulate realistic traffic

– back-pressure congestion control for ATM ABR
Application Demonstration

High-bandwidth application demonstration

– utilize QoS provided by the testbed
– internal demonstration, cooperate with other research groups via vBNS
– high-quality streaming music and video, with QoS support
– IP-based high-fidelity video multicast, networked DVD movie playback