Network Routing and Switching

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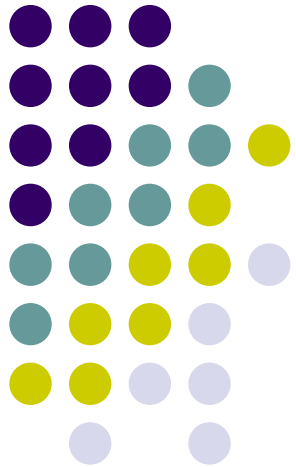
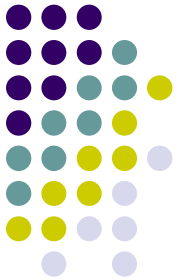


Introduction



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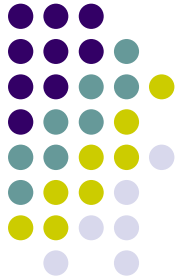
Research Area of the Group

Topics	Projects
Scheduling for best effort and QoS traffic	Networks with Extended Quality of Service (partially sponsored by National Science Foundation).
Architectures for High-Speed Switches	Integrative Instrumentation for Network Research (partially sponsored by National Science Foundation).
Hardware Design, VLSI and Reliability And more...	Practical Packet Switch Architectures (partially sponsored by NJIT).

Network Quality of Service (QoS)

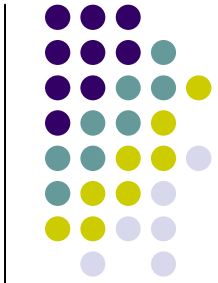
- Importance of Quality of Service

QoS Routing



- Select the path and the QoS service of each router to satisfy user's QoS requirements.
  - Such as delay, jitter, bandwidth, packet loss
- Minimize user's cost and service provider's benefit (such as maximize network utilization ratio).

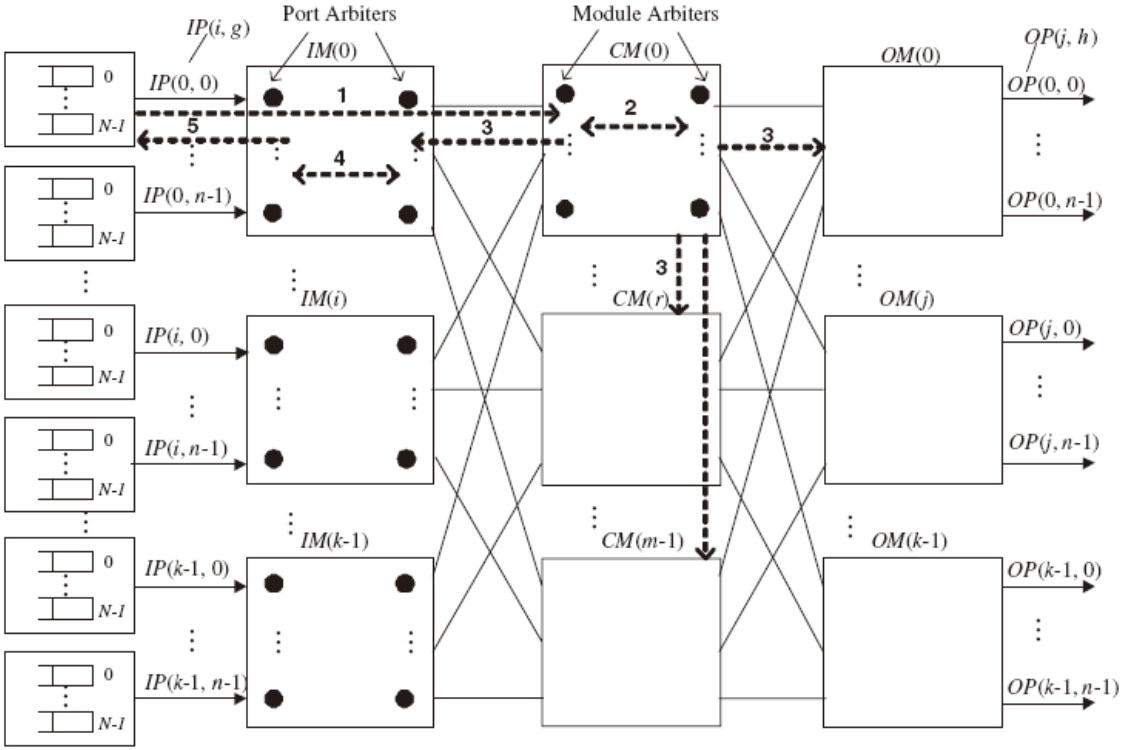
Network Active Measurement



- Routers or end hosts, as the measurement points, send probing packets to the target with precisely controlled departure time.
- The destination measures arrival time of probing packet or the source estimates the resulting delay from the feedback of the target.
- Active measurement is used to estimate the QoS performance of the network.
- QoS application and routing rely on the QoS knowledge of the network, which further rely on the network measurement results.

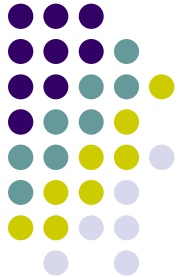
Architectures for High-Speed Switches

- Buffered crossbar packet switches
- Input queued packet switches
- Clos-network packet switches

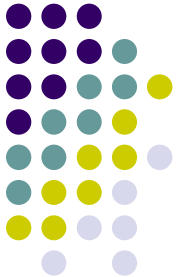


The input-queued Clos-network switch architecture

Fault Tolerance and Reliability



- Try to recovery the network and keep data transmission under some link and node links failure.
- Detect the network and switch failure.



Thank You