

Lecture 14

CS625: Advanced Computer Networks
Fall 2004

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Bhaskaran Raman
CSE, IIT-Kanpur

<http://www.cse.iitk.ac.in/users/braman/courses/cs625-fall2004/outline.html>

Topic for Today

- Differentiated Services (diff-serv)
- *Scribe for today?*

Premium Service

- Allocated a portion of the network bandwidth
 - “Virtual leased line”
 - What happens to excess capacity?
 - Used by best-effort traffic
- Flow specification:
 - Specify peak bit-rate
 - User has to stick to this, n/w has to provide this

Premium Service: Implementation

- First-hop router will shape and police, and set a *Premium-bit*
- Forwarding path:
 - Simple priority queue based on premium bit
 - Works within “trust” boundary
 - Border routers must implement policing
- What is complicated about this?
 - Admission control and Routing

Assured Service

- Provides a “statistical” rate guarantee
 - Depends on how well individual links are provisioned for bursts
- Lower packet drop probability than best-effort
 - Implemented using RED
 - Two thresholds: one for “assured” packets, one for all packets
- Lots of mathematics in admission control...

Two-bit Differentiated Services

- Premium and Assured services
 - Advantage: Assured service can use excess bandwidth from Premium service
- Premium-bit, and Assured-bit
 - P-bit and A-bit in packet
 - Set by first router
- Priority queuing to implement this

Two-bit: Implementation

- Leaf-router architecture: clear bits and use “markers” to mark
- Markers for P-bit and A-bit: use token-bucket based implementation
- Priority queuing while sending out packets
- Border routers need “profile metres” for policing

Diff-Serv Architecture

- Allocation architecture based on bilateral agreements
- Bandwidth Broker (BB)
 - One per organizational boundary
 - Has knowledge of policies
 - Keeps track of marked traffic allocation
 - Interprets new requests for allocation
- BB establishes limited trust with peer-BB
- BB functionality: within and across domain

Diff-Serv Architecture

- Admission control: talk to BB in each domain along the path
 - Example, from Internet-Draft
- RSVP can be used for the signaling

Further topics...

- Next week:
 - No classes Tue, Wed (mid-semester exams)
 - Wireless TCP (assigned reading)