NANOG 26
October 27-29, 2002
Eugene, OR

Services, Complexity, and the Internet: What Direction?

QoS/CoS in Backbone Networks?

Global Crossing

Thomas Telkamp
Director Network Architecture
Global Crossing Telecommunications, Inc.
telkamp@gblx.net

QoS/CoS Deployment

- Drivers:
  - Application requirements
    - VoIP, Video, PBX, etc.
  - Economical
    - Revenue/Margin per service
- Concerns:
  - Scalability
    - Could the network keep per session state?
  - Manageability
    - E.g. troubleshooting

Edge vs. Core

- Assumptions:
  - Core is congestion free
    - Unless failures…
  - Edge could be congested
    - E.g. Access links
- QoS/CoS at the Edge has a purpose:
  - Enable Loss/Delay/Jitter sensitive apps.
- But why in Core?

Backbone/Core Network

- QoS provided by overprovisioning:
  - High link speeds
  - High utilization without queuing
- But, failures do happen…
- All traffic in one class:
  - Protection/resilience need to be based on the traffic/service with the *highest requirements*
- Isolation of traffic: *Availability*

Backbone/Core Network

- Example
  - Traffic: 20% VoIP, 80% Internet
  - 50% upgrade rule
- Without CoS:
  - VoIP Traffic is protected for single link failure
- With CoS (2 class DiffServ):
  - VoIP Traffic is protected for multiple link failures (up to 5?)

CoS: DiffServ

- Only deploy what you need:
  - Are there applications for each class?
  - Can you distinguish between classes?
- Example:
  - Class 1: VoIP, Strict Priority Queue (EF)
  - Class 2: Internet (BE)

What about complexity?

- Queuing functionality is available in all core routers these days
  - And it works
- Differentiation mechanisms are unused most of the time
- Marking at the edge of the network
- No interaction, layering or protocols
- Take care of buffer allocation

QoS/CoS in Backbone Networks

- Yes, if needed to increase/guarantee availability for certain traffic
- But:
  - Only aggregate traffic (CoS)
  - Limited amount of classes (max. 3/4)
  - No complex marking policies
- More extensive differentiation and policies on the edge only