

Bandwidth Management Strategies and Methodologies

Internet2 Spring 2002 Member Meeting
Bandwidth Management

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Bandwidth Management Methodology

- Analyze
 - Identify applications
 - Identify user classes
 - Identify scarce resources
- Implement
 - Mark early
 - Police as needed
 - Condition traffic on egress
- Assess
 - NetFlow
 - Guzzinas vs Guzzoutas
 - Application-layer performance monitoring

Two Traffic Classes

- Those you want to protect from others
- Those you want to protect others from

How to protect?

- Police certain classes
 - Aggregate or individual?
- Guarantee bandwidth
 - Any need for very low latency?
- Leave room for bursts

How to protect

- There's no point in playing "whack-a-mole" ... unless you have lots of moles
- The aspirin is not the most effective prophylactic
- Determine how much you are willing to tolerate the things you don't want to

Traffic Classes I

- Those to protect others from:
 - Top-uploaders (and repeat-offenders)
 - Peer-to-peer applications

Traffic Classes II

- Those to protect from each other
 - Control Plane
 - Voice/video
 - Academic TCP
 - Residual residential TCP
 - Non-TCP (ICMP? UDP?)

What we do (policing)

- No policing for on-campus traffic
 - No congestion (yet?)
- Those who source over 650MB/day are nominated to top-uploader status
 - 1.5Mbps (aggregate) for the top-uploaders
 - 256kbps for repeat offenders
- Nuisance applications are updated as necessary
 - 10Mbps for nuisance applications

What we do (queuing)

- Academic TCP and Residential TCP are “equal”
 - 40% each for Academic and Residential TCP
- Non-TCP and TCP don't necessarily play well together
 - 10% for non-TCP
- Leave 10% unallocated (burst, control plane)

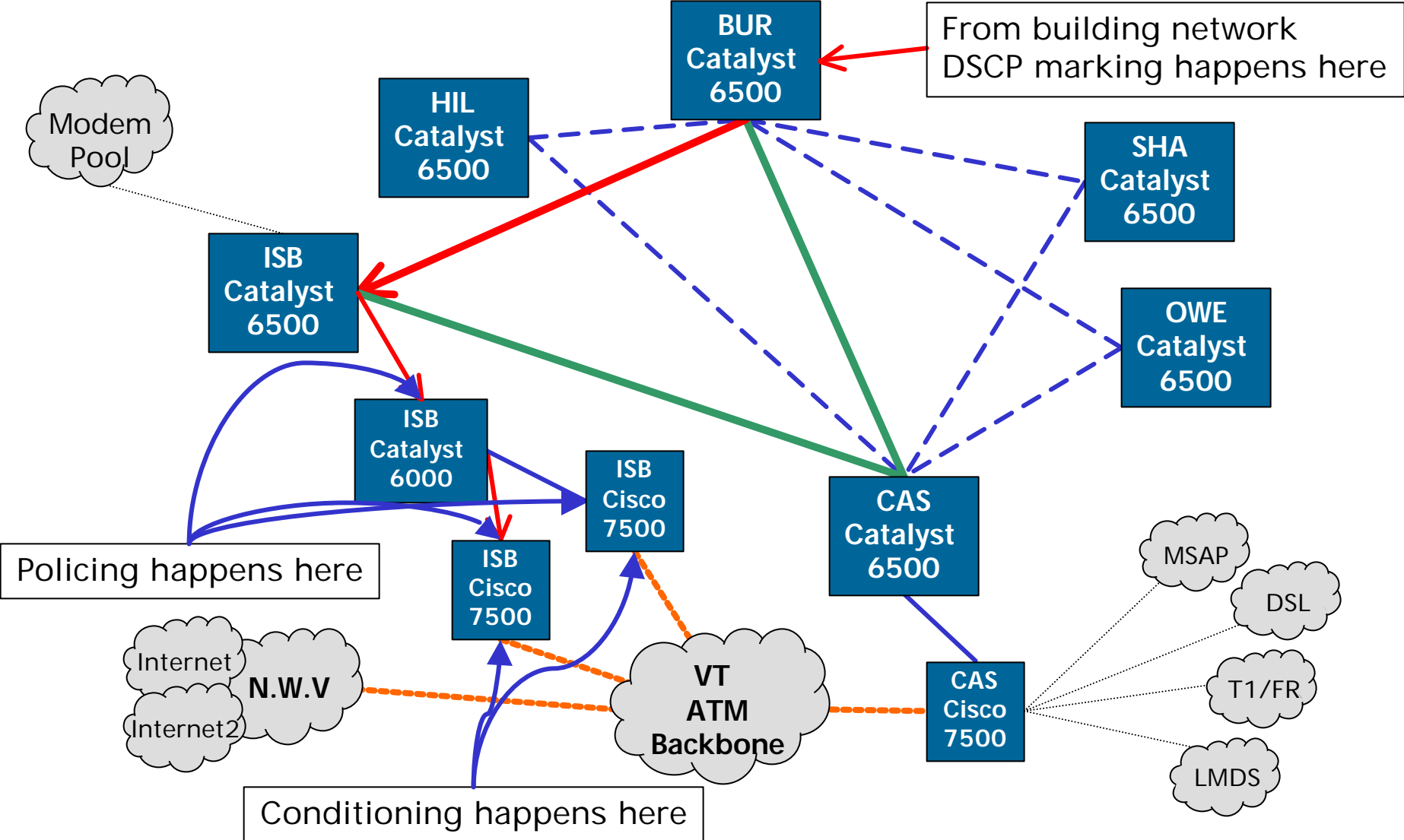
What don't we do?

- Individual flow or user policing (only aggregates)
- Priority queuing

Comments and suggestions

- Use the tools you have
- Make your job interesting
- Classify with a broad brush
- Try not to play whack-a-mole
- The job is to move packets, not censor users

Path of a packet



How well does it work?

