Differentiated Services (Diffserv): Background and Context

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Diffserv Topics

• Background: Important RFCs
• History: How we got here
• Topics: Today’s discussion

• Disclaimer: May contain my opinions 😊
Important Diffserv RFCs

• Diffserv Architecture: RFC 2475
  – QoS treatment: Per-Hop Behavior (PHB)
• Diffserv field in IP Header: RFC 2474
  – Also class selector codepoints (CSn DSCPs)
• Expedited Forwarding (EF PHB): RFC 3246
• Assured Forwarding (AF PHB): RFC 3260
• Diffserv Service Classes: RFC 4594
• Diffserv Service Class Aggregation: RFC 5127
Diffserv History

• Originally a “toolkit” (RFC 2474, 2475)
  – Network operators decide what to use and how

• Problem: How to use the “toolkit”?  
  – RFC 4594: Service Classes and configuration guidelines
    • Map traffic to service classes (12 service classes defined)
    • Apply diffserv (PHBs, DSCPs) to each service class
  – Expected deployment: Subset of service classes

• What about MPLS? Not enough bits available!  
  – RFC 5127: Service Class aggregation (RFC 5127)
  – Four treatment aggregates defined
Topics: Why are we here?

Proposed work

1. Service Class Update (4594bis)
   - RFC 4594: August 2006
   - Network usage has changed since then

2. Treatment Aggregate Update (5127bis)
   - Update RFC 5127 to match RFC 4594 update

3. New: Diffserv Interconnection (next slide)
   - ITU-T SG12 liaison (response due: March 1 2013)
   - draft-geib-tsvwg-diffserv-intercon-00
Diffserv Interconnection: Problem Description

- **Diffserv Architecture**: Receiver makes right
  - Inbound traffic: Receiving domain edge classifies, marks (DSCP values) and shapes/drops (as needed)

- **Scaling concern**: Many sending domains
  - Inbound traffic: Sending domain’s DSCP usage
  - Receiving edge: Converts to its domain’s DSCP usage
  - Hence receiving edge config depends on sending domain

- **Proposal**: Standard interconnect PHBs/DSCPs
  - Sending domain marks to these PHBs/DSCPs
  - Receiving domain: Single edge config
  - Result may resemble treatment aggregates (RFC 5127)
What should the IETF do?

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• In discussion: please identify relevant topic(s)