

IBM DiffServ Implementation Experience on Edge Routers

`draft-nadas-diffserv-experience-00.txt`

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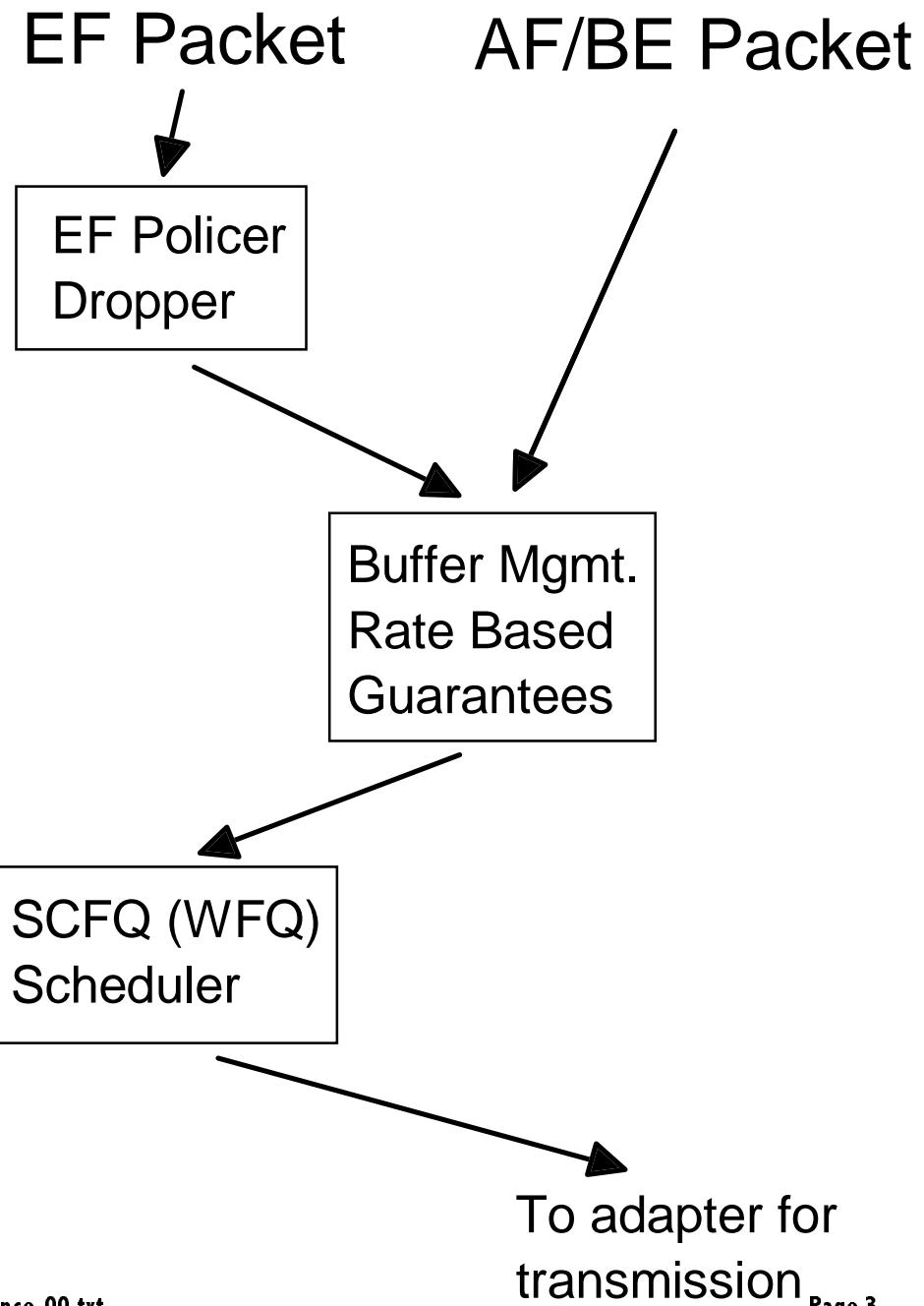
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IBM DiffServ Implementation Experience

- Agenda
 - ▶ Implementation Description
 - ▶ Experiment Description
 - ▶ Test Bed
 - ▶ Test Results
 - ▶ Conclusions

Implementation

- Edge Router Software Upgrade
- PPP and FR Link Support
- LDAP Client Fetches Policy from LDAP Server
- MF Classification (edge) including ToS
- EF - Token Bucket Policing
- AF - Buffer Management Rate Based Guarantees
- Self Clocked Fair Queueing Scheduler (WFQ Variant)
- RSVP uses a separate stream whose resource levels change as flows come and go



Test Description

- Router Policy
 - ▶ Loaded via LDAP Client from LDAP server
- Experiment
 - ▶ One Sender, Multiple Receivers
 - ▶ MGEN for UDP flows (and measure delay in AF & BE)
 - 28 Byte UDP Payload
 - ▶ NETPERF for TCP flows
 - MTU = {500, 1000, 1500}
 - ▶ One Flow per DS Class
- Very Short UDP Packets Competing With Large TCP Packets
 - ▶ So, worst case type test

Testbed & Experiment Description

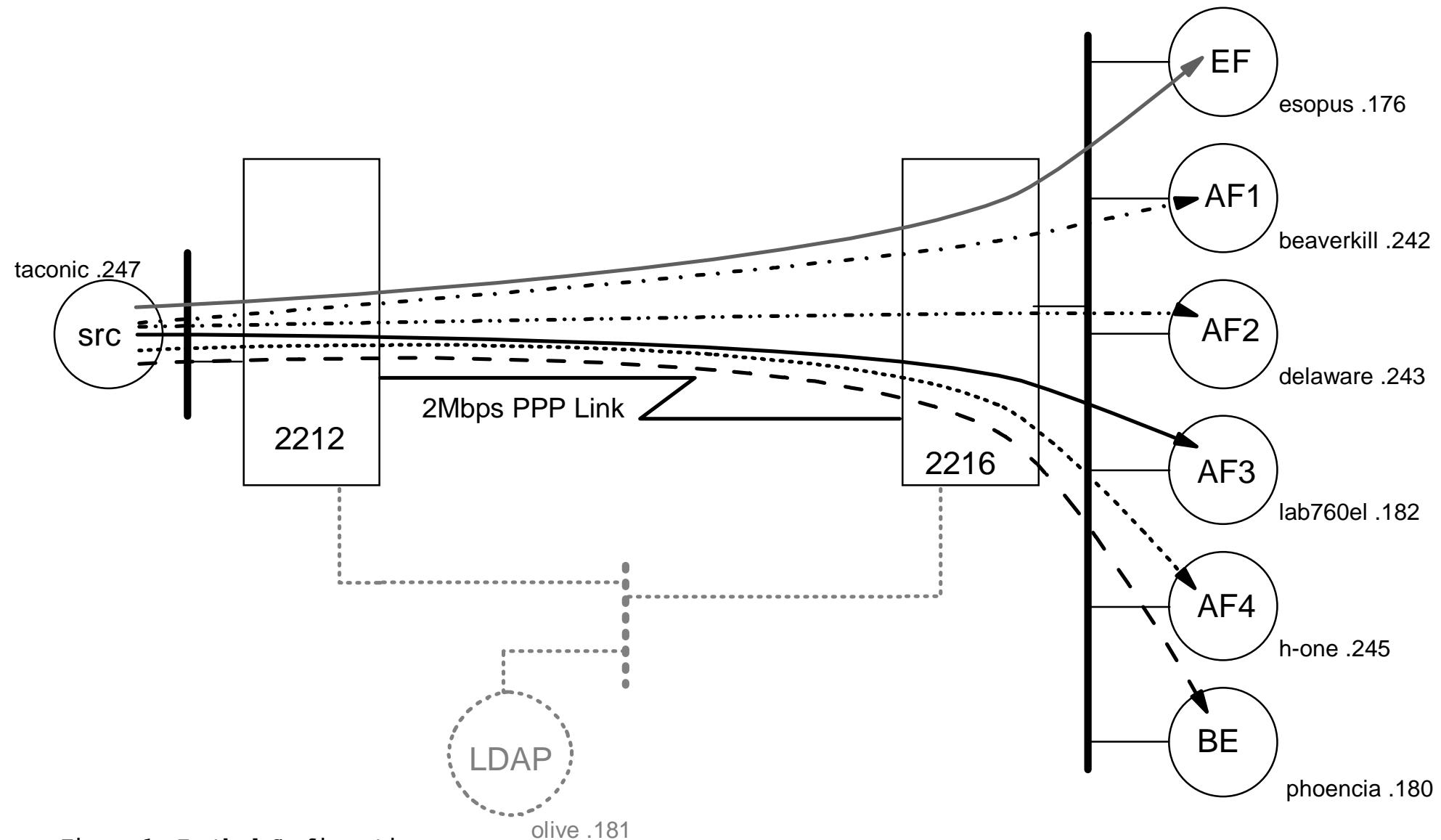


Figure 1. Testbed Configuration

Throughput Results

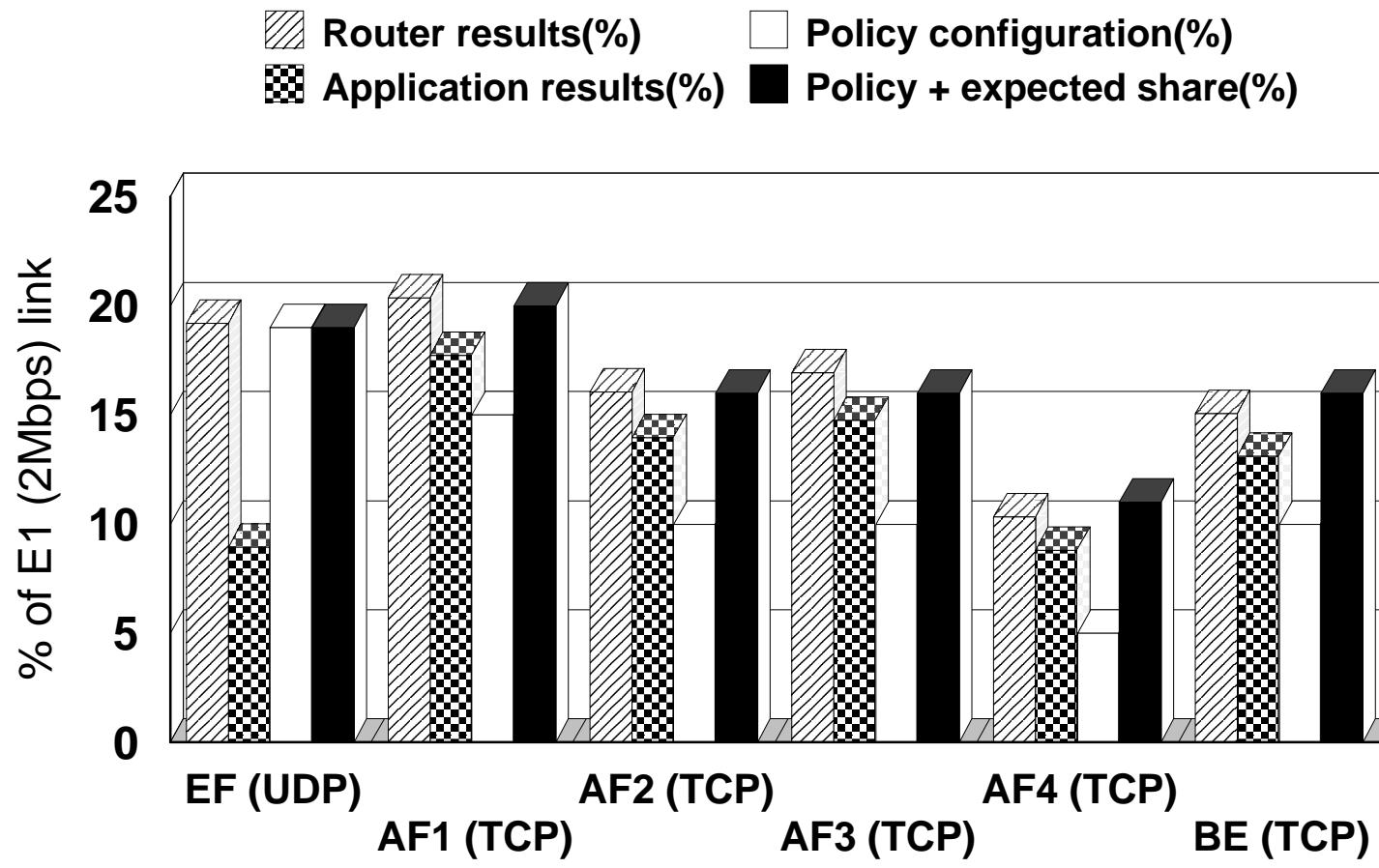


Figure 2

Delay vs. MTU Size

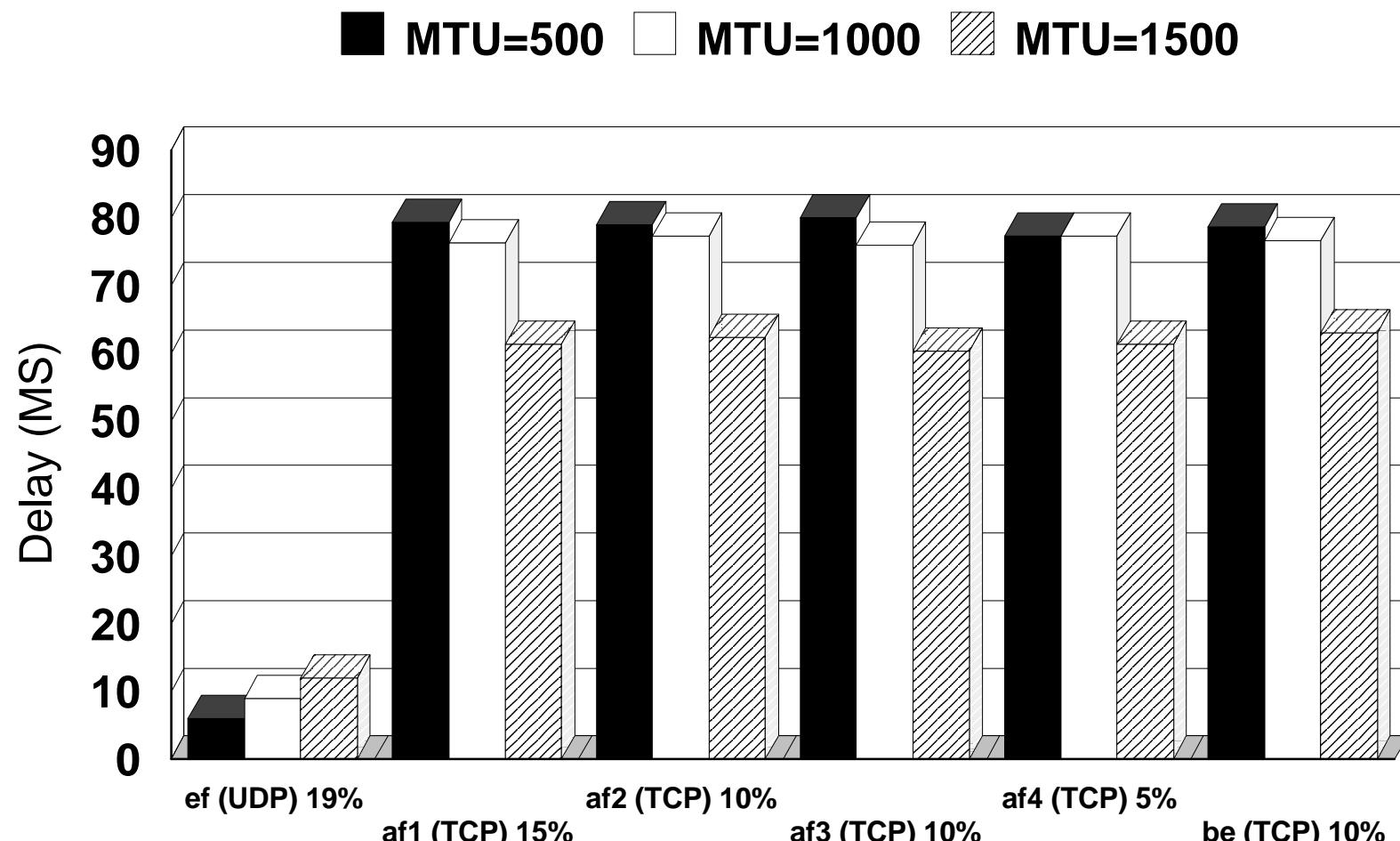


Figure 3

1. Same size UDP competes with different MTU sizes
2. Information from three measurements

Conclusions and Future Work

■ *Conclusions:*

- ▶ DiffServ QoS obtained from low cost edge routers
- ▶ EF receives better delay than AF
- ▶ AF1-AF4 receive at least policy configured amount of link
- ▶ Software Upgrade
- ▶ LDAP Client Simplifies Policy Configuration

■ *Future Work:*

- ▶ Three Color Marking for AF
- ▶ RED/WRED
- ▶ Multilink PPP/Other Link Types
- ▶ Internet2/Qbone & Dante/TEN-155 DS Testing