Admission Control over DiffServ using Pre-Congestion Notification

draft-briscoe-tsvwg-cl-phb-01.pdf
draft-briscoe-tsvwg-cl-architecture-02.txt

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Summary

- Aim:
  - End-to-end Controlled Load (CL) service without flow state or signalling in the core / backbone
- Solution:
  - Pre-Congestion Notification (PCN) builds on the concepts of ECN, RFC 3168, “The addition of Explicit Congestion Notification to IP”.
  - PCN-router marks packet “earlier” than ECN-router (bulk marking, not per flow)
    - admission marking
    - pre-emption marking
  - Feedback of these markings used in a particular network framework to achieve flow admission control and flow pre-emption
  - Applied to real-time flows (such as voice, video and multimedia streaming) in DiffServ networks.
- History
    - Both drafts from BT, Cisco & Nortel - working together intensively
    - Now also with Ericsson

Drafts – re-organised for clear split

‘Pre-Congestion Notification marking’
draft-briscoe-tsvwg-cl-phb-01.pdf

‘A Framework for Admission Control over DiffServ using Pre-Congestion Notification’
draft-briscoe-tsvwg-cl-architecture-02.txt

(future work)
further deployment models using PCN
- end-to-end
- others?

Border anti-cheating
draft-briscoe-tsvwg-re-ecn-border-cheat-00
- extending CL-region across operators

Signalling extensions
- RSVP, draft-lefaucheur-rsvp-ecn-00 (not updated)
- NSIS – see RMD-NSLP

changes – to deployment model draft

A Framework for Admission Control over DiffServ using Pre-Congestion Notification
draft-briscoe-tsvwg-cl-architecture-02.txt
- using PCN marking to achieve flow admission control & flow pre-emption
- in a large DiffServ region & controlled environment

Intention: informational

- Changes: added new / improved consideration of:
  - 'Flash' crowds
  - Tunnelling (from ingress to egress gateway)
  - Failures
  - Admission of emergency / high precedence session
- Status:
  - fairly complete
  - Issue: ECMP (Equal Cost MultiPath routing)

changes – to Pre-Congestion Notification marking draft

Pre-Congestion Notification marking
draft-briscoe-tsvwg-cl-phb-01.pdf
- *When* a router should admission mark and pre-emption mark (algorithm)
- *How* to encode marking in a packet (uses ECN field)

Intention: standards track (currently informational)

- Changes:
  - Complete re-write
  - Discussed 5 possible ways of encoding adm / pre-emption marking
  - Done simulations of (candidate) adm / pre-emption marking algorithm in CL-region Framework

encoding of marking – the dilemma

The choice of how to encode the markings is non-trivial because we have 5 things we want to encode…

1.Admission Marking

2.Pre-emption Marking

3.ECT(0)

4.ECT(1)

5.Not ECT

… BUT only 4 states available in the two bits of the ECN field

Appendix C of draft-briscoe-tsvwg-cl-phb-01.txt discusses pros & cons of alternative encoding possibilities

To be discussed at Bar BOF and on list, please

Simulations - Overview

- Purpose: Proof of concept for the deployment model and algorithms described in the drafts
- Key conclusion of the initial study: algorithms for admission control & flow pre-emption perform as expected
- NB Not intended to endorse specific algorithms
  - Other algorithms consistent with the framework are possible
  - other options to be simulated
- Future work:
  - Further parameter sensitivity study
  - Multi-bottleneck networks
  - More diverse mix of traffic & more accurate video modeling
  - Other algorithms
- More details & info at Bar BOF from Anna Charny

Bar BOF
Wed 15.10-16.10 Coronado B, C, D

1. The general approach – 20 mins (3mins slides, 17mins discussion)

   Purpose: identify key concerns, get prioritisation of work (which deployment models to concentrate on earlier)

2. Encoding – 20 mins (10mins slides, 10 mins discussion)

   Purpose: start getting community input on the possibilities

3. Proof of concept / simulations – 15 mins (15 mins slides, discussion after session for those interested)

   Purpose: show “it works”

4. Standardisation approach – 5 mins (1 min slide, 4 mins discussion)

   Purpose: feedback on proposed document structure

Overall aim: get feedback