PCN Flow Admission and Termination Architecture

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Kwok Ho Chan, Jozef Babiarz, Philip Eardley, Bob Briscoe, Anna Charny, Georgios Karagiannis
Goals

• Providing a start for the initial work items of the PCN Working Group, based on prior work:
  – Flow Admission and Termination Architecture (within a DiffServ Domain)
  – (Pre-)Congestion Detection within a DiffServ Domain
  – Survey of Encoding and Transport Choices of (Pre-)Congestion Information within a DiffServ Domain
PCN Architecture Overview

Within a single DiffServ Domain:

• Interior Nodes provide via packet marking network resource utilization information based on their local measurement.

• Edge Nodes use information from Interior Nodes for making Flow Admission and Termination decisions.

• Usage of signaling between Edge Nodes for communicating Flow Admission and Termination information.

- draft-briscoe-tsvwg-cl-architecture-04.txt
- draft-chan-pcn-problem-statement-00.txt
Measurement at Interior Nodes

• Current work in draft-briscoe-tsvwg-cl-phb-03.txt
  – Traffic measurement method
    • Measures aggregated traffic
    • For admission control and termination

• Corresponding Simulation Work
  – draft-zhang-pcn-performance-evaluation-01.txt
Interior Node’s Data Plane Function for Adm Ctrl

• Inverse-token-bucket:
  – Add token when pkt arrives
  – Remove tokens somewhat slower than the rate configured for adm ctrl of PCN traffic
  – therefore excess of tokens is ‘early warning’ that the amount of PCN traffic is getting close to the engineered capacity
  – mean number of pkts in real PCN-queue is still very small
Proposal for Moving Forward

• Proposal for Delivery of the new drafts for first 3 milestones, start getting volunteers:
  – Flow Admission and Termination Architecture (within a DiffServ Domain), November 2007
    • Suggested starting point: draft-briscoe-tsvwg-cl-architecture-04 and draft-chan-pcn-problem-statement-00
  – Survey of Encoding and Transport Choices of (Pre-)Congestion Information within a DiffServ Domain, November 2007
    • Suggested starting point: draft-brisco-tsvwg-cl-phb-03 Appendix C
  – (Pre-)Congestion Detection within a DiffServ Domain, March 2008
    • Suggested starting point: draft-brisco-tsvwg-cl-phb-03, draft-charny-pcn-single-marking-01, draft-babiarz-pcn-explicit-marking-00
Flow Admission and Termination Architecture

- Duties of Interior Nodes
- Duties of Edge Nodes
- Important Points from Problem Statement
- Important Points from CL Architecture
- Should this be general architecture and have single PCN DiffServ domain as a subset or should this be just single DiffServ domain and the general architecture be a superset?
Duties of Interior Node

• Detection of Interior Node’s Local Pre-Congestion Conditions via Measurement
• Indication/Marking of measured condition
  – Inter-Operable, Trustable, Deterministic
• Goal: Interior Node Simplicity+Scalability
Duties of Edge Node

• Interpret the received PCN Marking from the Interior Nodes.
• Make flow admission and termination decision based on marking interpretation.
• Communicate with the flow source for effective flow admission and termination.
• Goal: Duties of Edge Node as functionalities for flexible deployment.
Terminology

- We need common terminology.
- Should there be a separate draft on Terminology? Or let it be a section in the architecture draft?
- Volunteers?
Things to Consider

• Possible impact on current architecture by future work on:
  – Flow Rate Adaptation
  – Cheating Detection
  – Multi Domain
  – Application Control
Survey of Encoding

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AM = Admission Marking; PM = Pre-emption Marking

Comparison topics in draft-briscoe-tsvwg-cl-phb-03 (Appendix C):

- Compatibility with RFC3168 (ECN) (See RFC 4774, ECN Alternate Semantics)
  - What happens if ECN pkt encounters PCN-enabled router? (eg mis-configured gateway)
  - What happens if PCN pkt encounters ECN-enabled router?
  - What happens if PCN-flow wants to use RFC3168 end-to-end?
- Does it allow ECN nonce?
- Does it need new DSCP(s)?
New Interior Node PCN Detection Methods

• Single marking
  – draft-charny-pcn-single-marking-01

• Explicit marking
  – draft-babiarz-pcn-explicit-marking-00

• May need to be considered by Architecture
draft