PCN Flow Admission and Termination Architecture

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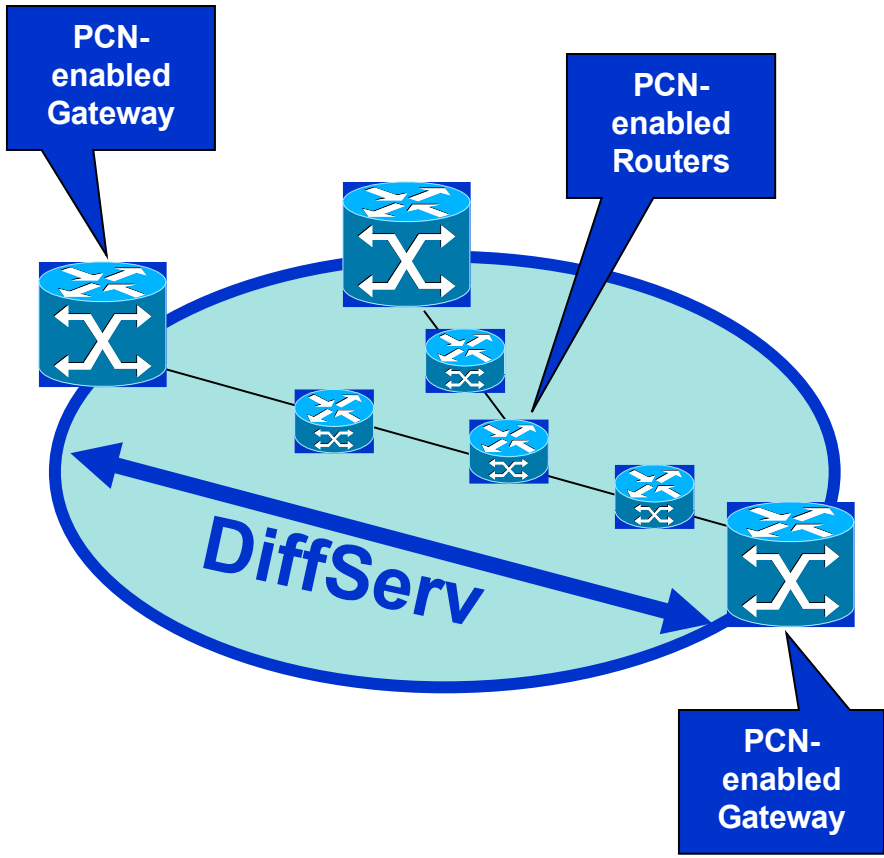
Goals

- 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:

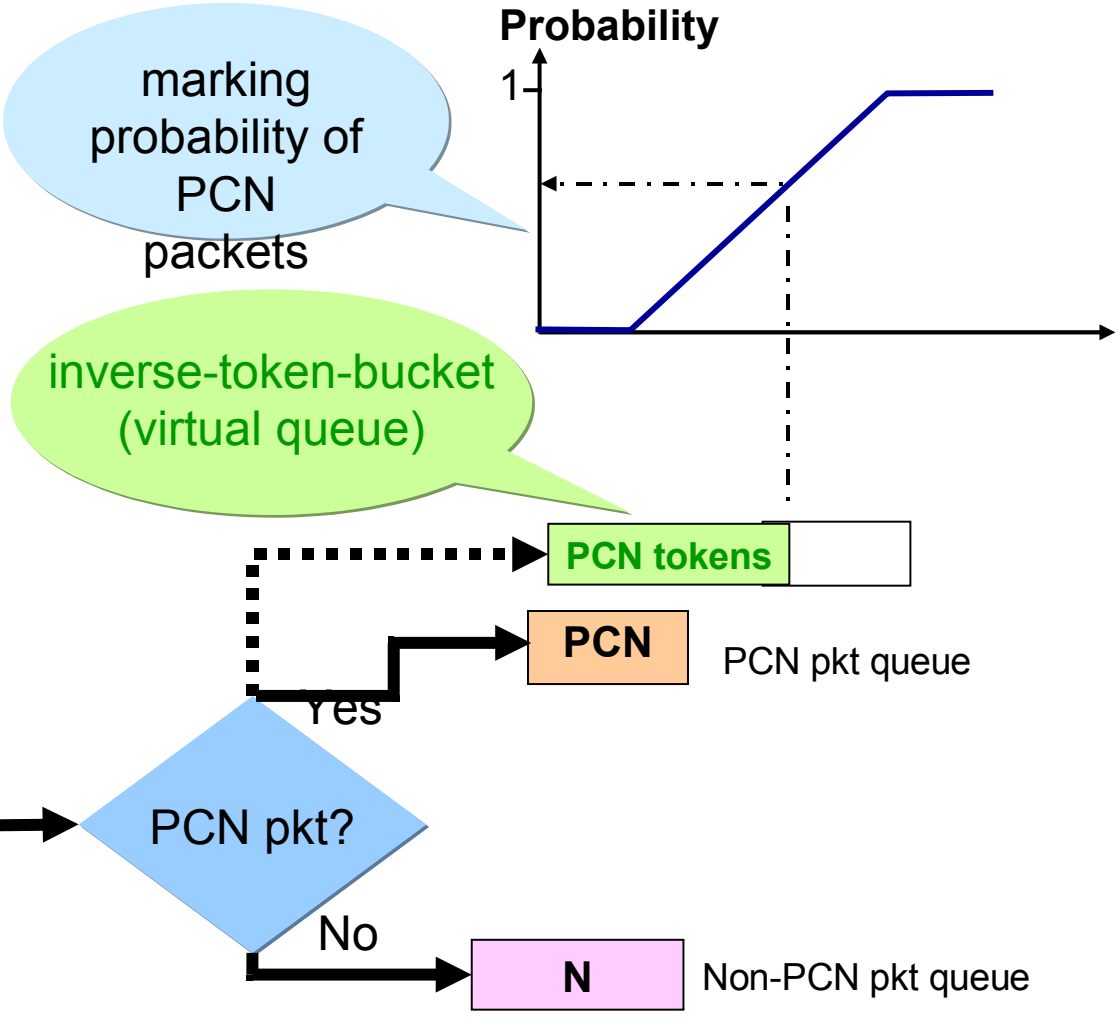
- Interior Nodes provide via packet marking network resource utilization information based on their local measurement.
- Edge Nodes use information from Interior Nodes for making Flow Admission and Termination decisions.
- Usage of signaling between Edge Nodes for communicating Flow Admission and Termination 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 Terminlogy? 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

ECN field	**Alt-1**	**Alt-2**	**Alt-3**	**Alt-4**	**Alt-5**
00	AM	Not-ECT	AM	Not-ECT	Not-ECT
01	ECT(1)	ECT(1/A)	ECT(1/A)	ECT(1)	PCN-capable
10	ECT(0)	ECT(0/P)	ECT(0/P)	ECT(0)	AM
11	PM	AM or PM	PM	AM	PM
Other DSCP(s)	Not-ECT	-	Not-ECT	PM	-

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