PRECONGESTION-BASED ADMISSION CONTROL IN BROADBAND BACKHAUL

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Terminology

- Entrance Bridge
  - AVB bridge closest to the Talker
- Exit Bridge
  - AVB bridge closest to the Listener
- E-E Aggregate
  - The total set of AVB streams entering at a given Entrance Bridge and exiting at a given Exit Bridge
    - In general, can be between multiple talkers and listeners

Terminology (2)

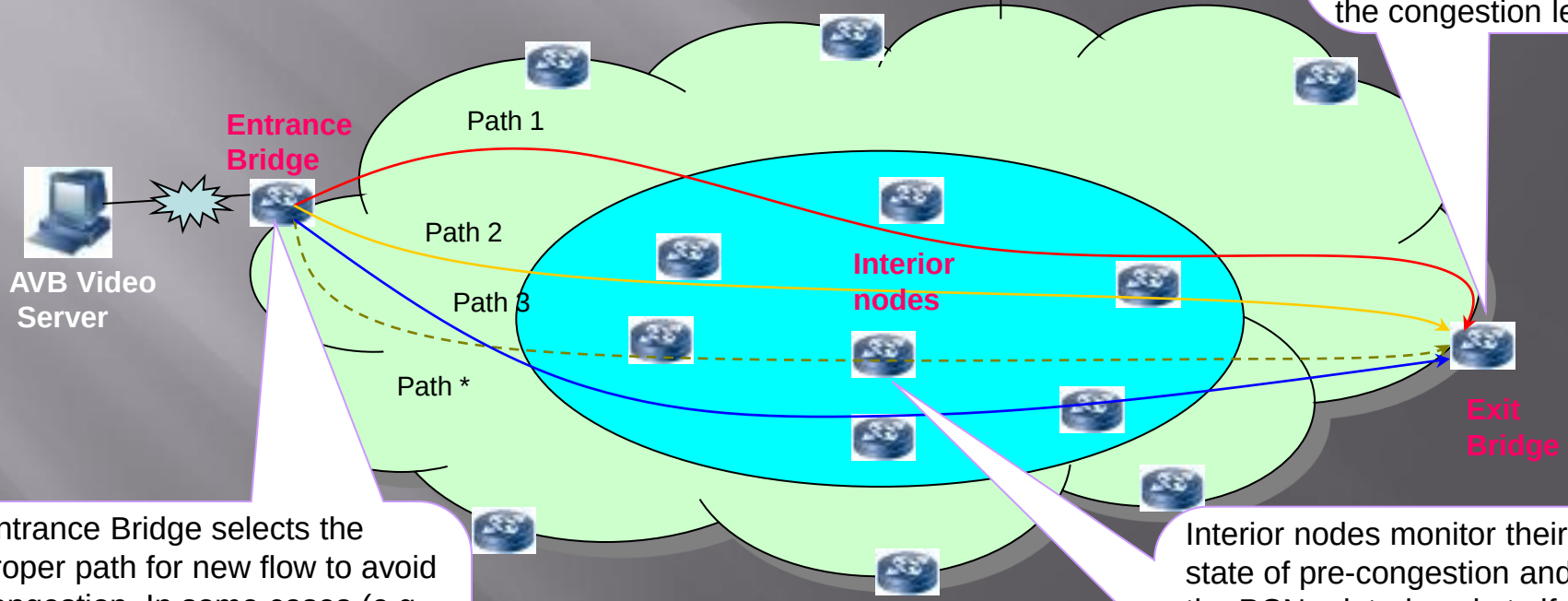
- PCN
  - Precongestion Notification
- PCN-traffic
  - Frames containing PCN markings

Precongestion-based Admission Control

Whether Policy Server is deployed is based on operator configuration

Management System (e.g. Policy Server)

- Multiple paths between Entrance Bridge and Exit Bridge
- Path selection based on relative congestion level of the paths
- Exit Bridge measures the packets indicating pre-congestion and feeds back the congestion level



Entrance Bridge selects the proper path for new flow to avoid congestion. In some cases (e.g. all the paths are busy), the Entrance Bridge should refuse admission to new flow or terminate some existing flow to avoid congestion

Interior nodes monitor their own state of pre-congestion and mark the PCN related packets if appropriate. They are not flow-aware, nor aware of E-E Aggregates. This functionality can also be provided by outgoing interfaces of the Entrance Bridge.

Current work in AVB - 802.1Qat

- Assures resource availability for high-quality, time-sensitive data streams
- SRP signalling to determine resource availability
  - Between talker and listener
  - Processed by each bridge on the path
  - Determines whether capacity available for stream
  - Capacity requirements provided by TSpec
- Stream identification carried in frame header

Potential Overload Issues

- Topology changes could result in overloads at bottlenecks
- Need to drop streams to realign with new path capacity
  - To do so, need estimate of how much load to shed

Comparison with 802.1at Admission Control

- Not stream-based
- Admission of the stream depends on the precongestion status

Benefits

- If path is known in advance to be fully loaded, no need to carry SRP signalling beyond first AVB bridge encountered
- The PCN metering/marking behaviours only operate on the overall PCN-traffic on the link, not per stream.

Benefits (2)

- Some existing flows on a path may be terminated by the Entrance Bridges when the path's congestion level too high
- Measurements are signaled to the Exit Bridges by PCN markings in the existing 802.1 packet headers (e.g. SRP)
  - No additional signaling protocol required for transporting the PCN markings

Benefits (3)

- Exit Bridges make separate measurements, operating on the aggregate PCN-traffic from each Entrance Bridge
  - not per stream
- Operator can be less conservative when deploying network capacity by virtue of dynamically controlled flow admission and termination