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SRP Domain Boundary Discovery

SRP learning vs. LLDP announce

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Concepts to understand

- SRP Domain Boundary
- Talker Pruning
- Qav Priority Regeneration

SRP Domain Boundary definition

Clause 35.2.1.4

SRPdomainBoundaryPort: A per-port, per-SR class, boolean parameter that contains the value TRUE if the port is an SRP Domain Boundary Port, otherwise it contains the value FALSE. The parameter for a given SR class and Port shall be set to TRUE if either of the following conditions are met:

1) The port is *declaring* at least one MSRP attribute for that SR class, and the port has no MSRP attribute registrations for that SR class, or;

2) One or more ports which support that SR class are declaring one or more MSRP attributes for that SR class, and this port does not support that SR class.

In all other cases the parameter shall be set to FALSE.

SRP Domain Boundary definition - paraphrased

A port is an SRP Domain Boundary for an SR class if:

1) I'm currently speaking MSRP to my neighbor, but my neighbor is not currently speaking MSRP to me, or;

2) At least one port of the bridge is speaking MSRP to it's neighbor, but I don't support that SR class.

Talker pruning

A Listener issues a request to receive Talker Advertisements by registering the StreamDA via MMRP. Talker Advertisements only propagate on ports that have these MMRP registrations.

Qav priority regeneration

What happens at an SRP Domain Boundary? Table 6-6 in Qav specifies that incoming non-SR traffic that is using an SR class priority will be remapped as follows:

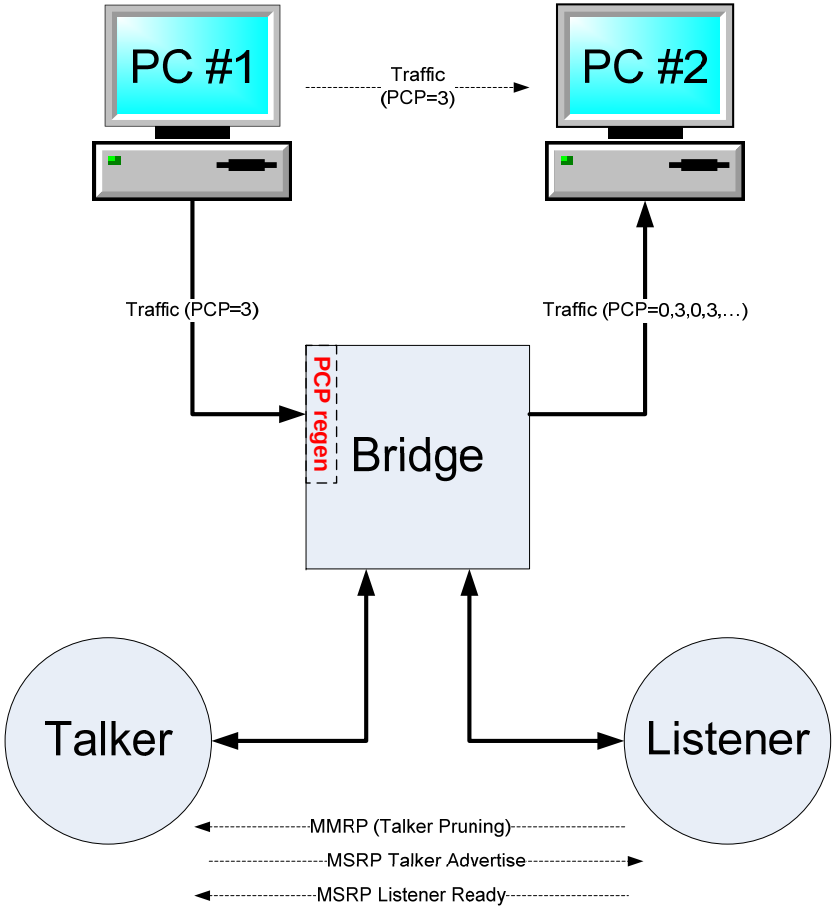
Incoming non-SR priority 3 traffic (SR class A default) is remapped to priority 0.

Incoming non-SR priority 2 traffic (SR class B default) is remapped to priority 0.

The problem created by D4.2 changes

PCP Regeneration toggles on and off when MSRP registers are fluctuating

- When an MSRP registration appears on any port, all non-SRP ports will remap AVB priorities via Qav (see: **PCP regen** in diagram at right)
- Talker pruning stops MSRP declarations from Talker unless Listener registers via MMRP
- If Listener “comes and goes” the priority remapping will turn on and off
- PC #1 sends priority 3 traffic, which PC #2 sometimes receives as priority 3 and other times as priority 0, depending on Talker and/or Listener registrations (note: Listener registrations are not sufficient by themselves since they do not contain the PCP value)



SRP Domain Boundary Port definitions

- **Qat D4.1:**

  A per-port, per-SR class, boolean parameter that contains the value TRUE if one or more MSRPDUs have been transmitted on the port for any SR class, but no MSRPDUs have been received on the port for any SR class. This parameter is initialized to the value FALSE, and is also reset to FALSE if the port is removed from the active topology.

- **Qat D5.0 (a.k.a. D4.2):**

  A per-port, per-SR class, boolean parameter that contains the value TRUE if the port is an SRP Domain Boundary Port, otherwise it contains the value FALSE. The parameter for a given SR class and Port shall be set to TRUE if either of the following conditions are met:

  1) The port is declaring at least one MSRP attribute for that SR class, and the port has no MSRP attribute registrations for that SR class, or;

  2) One or more ports which support that SR class are declaring one or more MSRP attributes for that SR class, and this port does not support that SR class.

  In all other cases the parameter shall be set to FALSE.

D5.0 changes came from these comments:

- D3.2 #5: There doesn't seem to be any normative text on how *SRPdomainBoundaryPort* gets its value. There is some informative text in 802.1Qav and even that doesn't cover how it transitions from false to true. As far as it is described there, once a registration has been received, the port is forever an interior port. One can not assume that the configuration of devices in the network is unchanging and it is possible for a port that was not on the boundary to become on the boundary.
- D3.2 #6: The mechanism defined in Qav for determining a domain boundary is different from the LLDP based method used in 802.1Qau and Qaz. While the mechanism may determine the boundary in time to carry the traffic, it requires Listeners and Talkers to be present to do so which may be a problem when trying to debug paths during installation. An LLDP based mechanism will determine the boundary of the domain without requiring Listeners and Talkers on end stations to be active. Also, the mechanism doesn't determine whether peers on links that are currently not in use due to spanning tree are capable of participating in the SRP domain. An LLDP based mechanism can easily detect that the peer is no longer configured for SRP for detection of the transition of a port from domain interior to domain boundary mentioned in another of my comments.
- D4.1 #31: Once one reservation has been received on the port, it will remain false as long as the port is in the active topology. *It is possible that a change to the configuration of the link partner could cause a port to be on the domain boundary without the port being removed from the active topology*.

Solution 1: Don't let boundary shrink unless an active topology change occurs.

A per-port, per-SR class, boolean parameter that contains the value TRUE if the port is an SRP Domain Boundary Port, otherwise it contains the value FALSE. The parameter for a given SR class and Port shall be set to TRUE if either of the following conditions are met:

~~1) The port is declaring at least one MSRP attribute for that SR class, and the port has no MSRP attribute registrations for that SR class, or;~~

~~2) One or more ports which support that SR class are declaring one or more MSRP attributes for that SR class, and this port does not support that SR class.~~

1) At least one MSRPDU for that SR class has been transmitted on that port, but no MSRPDUs for that SR class have been received on that port, or;

2) At least one MSRPDU for that SR class has been transmitted by one or more ports, and this port does not support that SR class.

In all other cases the parameter shall be set to FALSE. It is also set to FALSE if the port is removed from the active topology.

Solution 2: Use LLDP for SRP Domain Boundary Discovery

- Introduce a new LLDP TLV:
  - SR class A, B supported (perhaps a bitmask)
  - Priority for SR class A (defaults to 3)
  - Priority for SR class B (defaults to 2)
- This is also a step towards an SRPv2 goal of configurable SR class priorities. We could use this new LLDP TLV to let our neighbor know our SR class-to-PCP mapping.
- What happens when a port stops receiving LLDP from its neighbor?

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