802.1 Qat Policy Proposals

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Changes Marked with Red from last version

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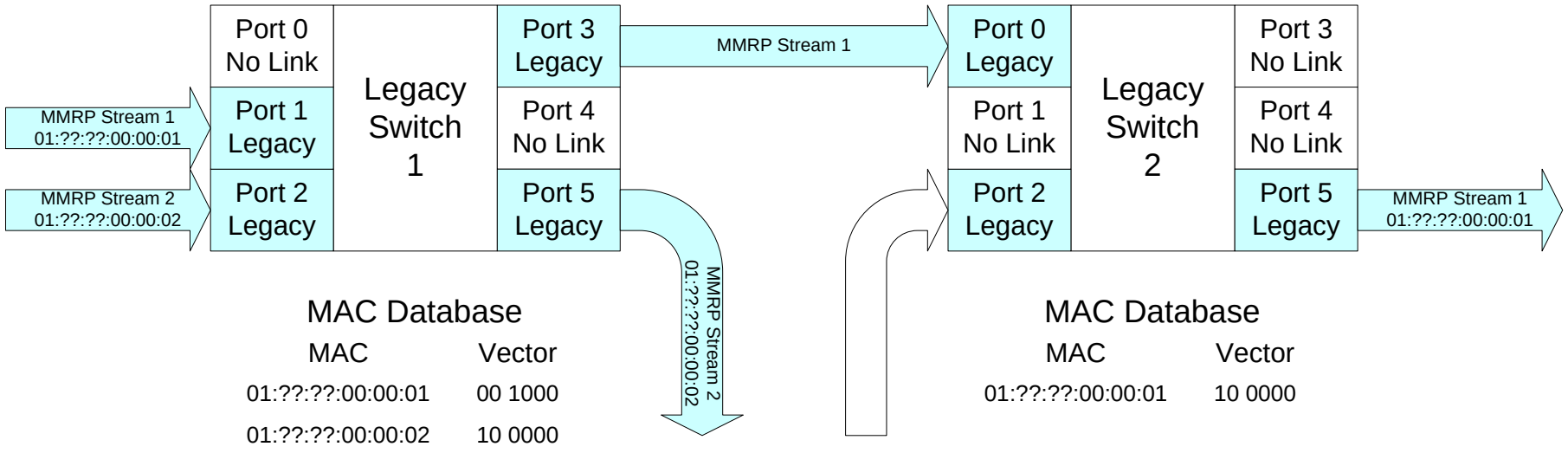
Qat Policy Goals

- Add an AVB Network on top of a Legacy Network
  - i.e. both co-exist together
- Ensure the AVB Network is not disrupted by the Legacy streams
  - Rates/Bandwidth are NOT measured or policed in Qat – Rates are handled in Qav – so not going to cover that here
  - Ensure masquerading AVB streams cannot disrupt real AVB streams
  - Ensure Legacy streams are never interpreted as a AVB stream
- Ensure the Legacy Network continues to function
  - Although most likely at a lower performance due giving preference to the AVB streams

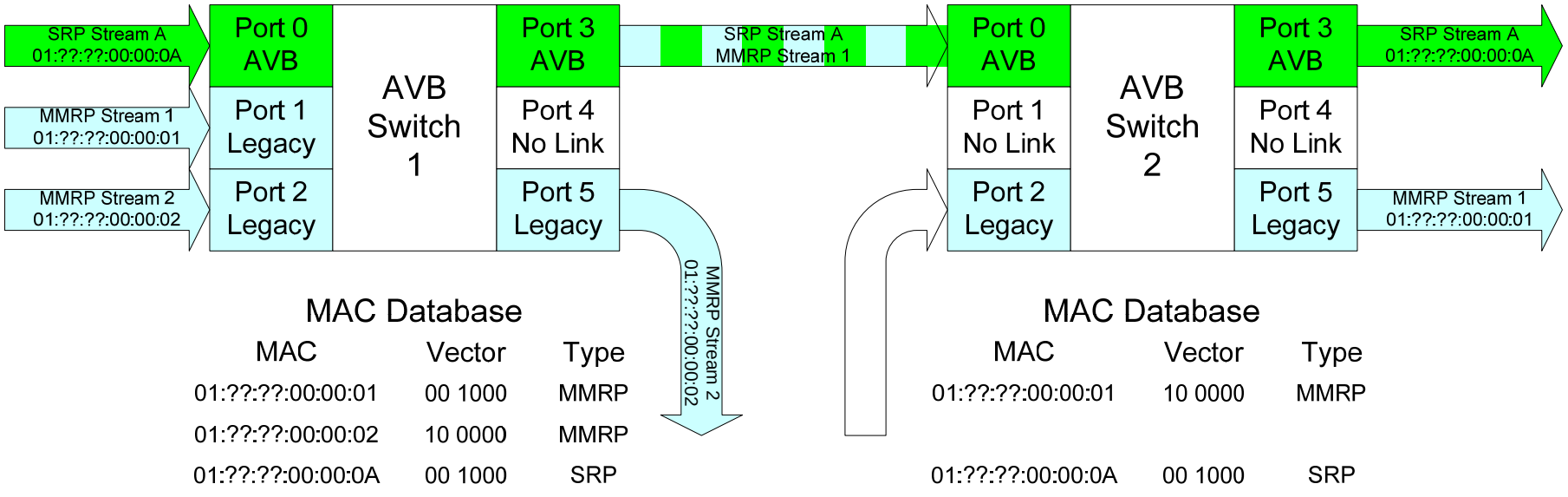
~~Hopefully without modifying any Legacy Frame content (i.e., for Vista and IP Phones)~~

Legacy Streams - Baseline



- Two MMRP streams are shown using Legacy Switches
- QoS can be used in this case following existing Standards
  - Congestion and QoS rates are not covered in this presentation as that is part of other work (i.e., Qav)
- We want this still to work when we add AVB!

Add AVB on top of Legacy Flows



MAC Database

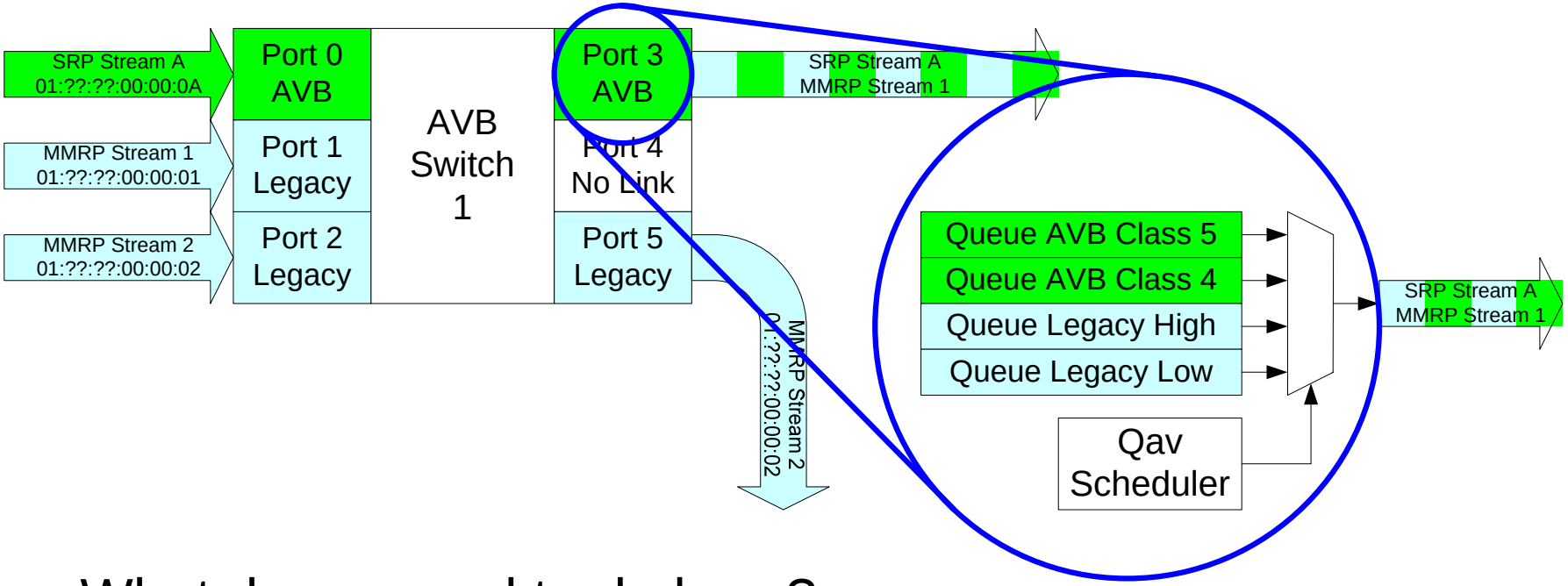
MAC	Vector	Type
01:??:??:00:00:01	00 1000	MMRP
01:??:??:00:00:02	10 0000	MMRP
01:??:??:00:00:0A	00 1000	SRP

MAC Database

MAC	Vector	Type
01:??:??:00:00:01	10 0000	MMRP
01:??:??:00:00:0A	00 1000	SRP

- The same two MMRP streams are shown using AVB switches
- Ports 0 & 3 of both Switches are part of the AVB Cloud
- An added SRP stream is shown between the two switches

Closer Look at Port 3's Egress



- What do we need to do here?
  - AVB streams need to be separated from Legacy streams in each AVB port's Egress Queues
- Assumption:
  - Only SRP Reserved AVB streams can use the Green AVB Queues

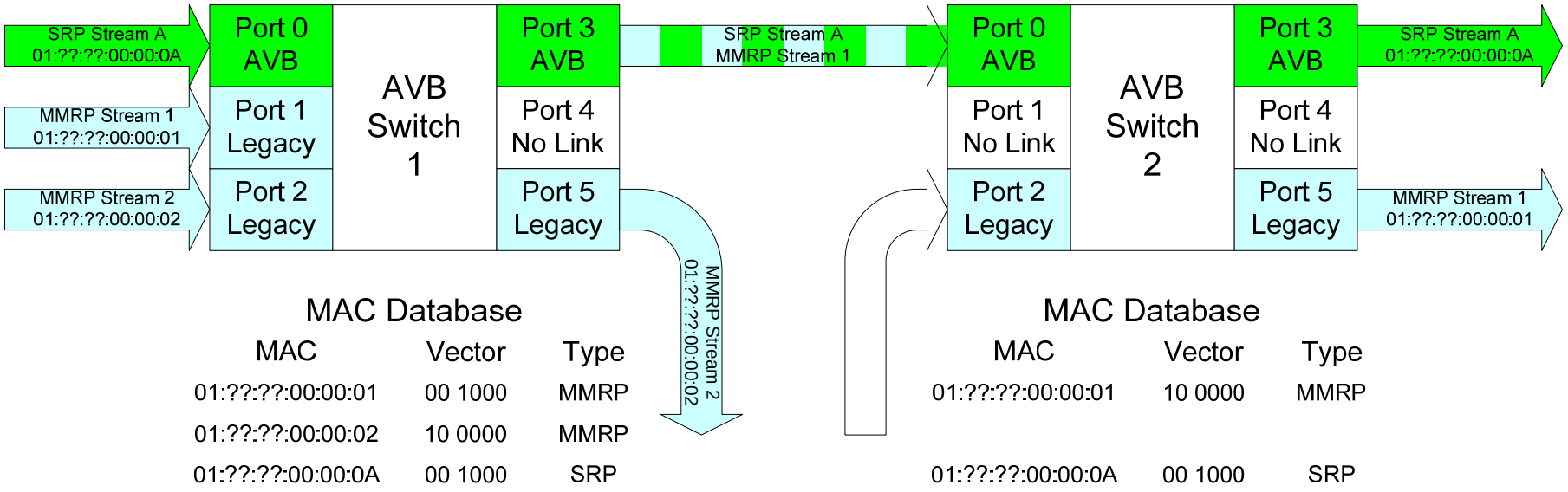
Stream Identification – New Proposal

- In order to separate AVB streams from Legacy streams we need to define how to identify AVB streams!
- Previous Considerations from at-pannell-policies-0607-v3:
  - Allow a stream to use the Green AVB Queues if and only if:
    - A: Frame entered an AVB port
    - B: The frame's DA is in the Filtering Database and Reserved by SRP
    - C: The frame's Q Tag priority is 4 or 5 (Defaults)
  - Frames must meet ALL three to use the Green AVB Queues
- New Proposal is:
  - Allow a stream to use the Green AVB Queues if and only if:
    - A: Frame entered an AVB port, and
    - B: The frame's Q Tag priority is 4 or 5 (Defaults)
  - Frames must meet Both to use the Green AVB Queues

AVB Stream Identification - Proposal

- There are 4 possibilities of A & B. What do each of these mean?
- A+B: Good AVB stream – Its OK to use the Green AVB Queues
- A only: AVB port with non-AVB PRI
  - Place frame in Legacy Queues
    - If unicast DA, this is the legacy traffic to the end station
- Neither A nor B: Legacy port with non-AVB PRI
  - Place frame in Legacy Queues
- B only: Legacy port with AVB PRI
  - Something MUST be done here as these Legacy streams must stay in the Legacy Queues so these streams do not disrupt any AVB streams (assuming these streams enter the AVB cloud)
  - Proposal is to re-mark the streams PRI away from an AVB PRI.
    - Default is: PRI 5 is re-marked to PRI 3 and PRI 4 is re-marked to PRI 2

Legacy Flows through AVB Links



MAC Database

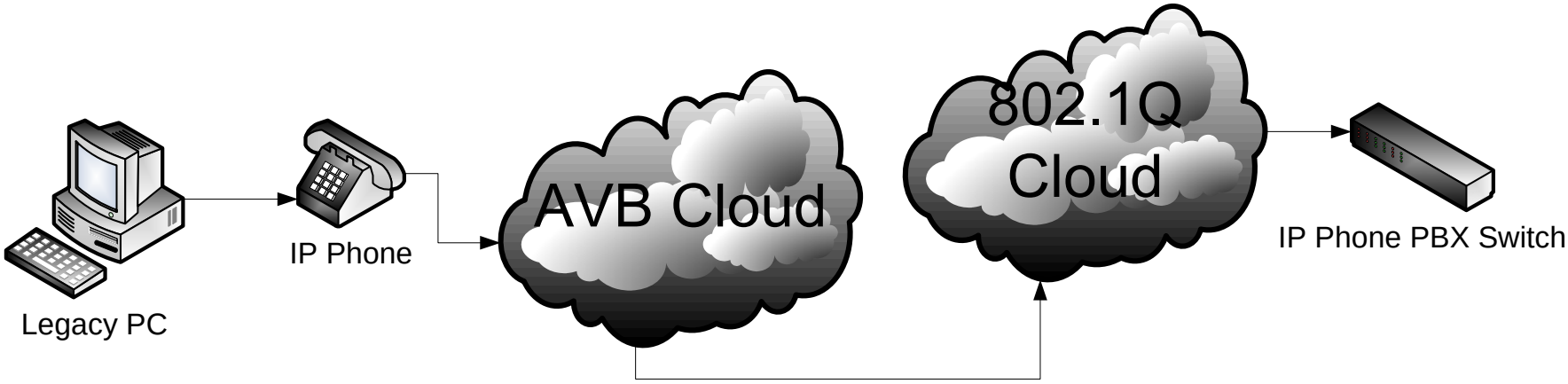
MAC	Vector	Type
01:??:??:00:00:01	00 1000	MMRP
01:??:??:00:00:02	10 0000	MMRP
01:??:??:00:00:0A	00 1000	SRP

MAC Database

MAC	Vector	Type
01:??:??:00:00:01	10 0000	MMRP
01:??:??:00:00:0A	00 1000	SRP

- In this proposal, MMRP stream 1 and stream 2 must be re-marked if they are Q Tagged using an AVB PRI
- 802.1D's already defined per ingress port User Priority Regeneration Table can be used for this
- Legacy ports remap streams away from the AVB PRI's while the AVB ports allow streams to use the AVB PRI's

IP Phone Issue



- Many IP Phones use 802.1Q Tagged frames with PRI 5 for Voice frames and some other PRI for Legacy PC data (that passes thru the phone)
- They may also use a specific VID for voice, but AVB Clouds will ignore the frame's VID (when determining if the frame is an AVB stream or not)
- If these Phones are connected through an AVB Cloud and if the AVB Clouds Re-Mark the Legacy Frame PRI's away from PRI 4 & 5 then the voice frames may not get treated correctly in the legacy 802.1Q Cloud on their way to the IP Phone PBX Switch (which used PRI 5 to insure voice QoS)
- Do we care about this case? Yes, but it is assumed that the network engineer will either move the IP Phone traffic away from PRI 5 or to define some other PRI for the low latency AVB streams (PRI 6 for example)

AVB Stream Identification Summary

- In Summary, the Proposal is to allow a frame to use the AVB Queues if and only if:
  - It Enters an AVB port, and
  - It is 802.1Q Tagged with a PRI of 4 or 5 (Defaults)
    - The only difference between an AVB port and a Legacy port is the values contained in the ingress port's User Priority Regeneration Table
- All other frames must use the Legacy Queues
- 802.1Q Tagged frames entering a Legacy port with PRI 4 or 5 must be re-marked to PRI 2 or 3 respectively
  - Must be done to insure that the only frames in the AVB cloud that are 802.1Q Tagged with PRI 4 or 5 (Defaults) are compliant AVB streams and not Legacy streams