AEROSPACE BRIDGE POLICING AND STREAM ISOLATION REQUIREMENTS

DERIVED FROM ARINC 664 PART 7 NETWORKS
P802.1DP / AS 6675

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OVERVIEW

- Following slides provide overview of ARINC 664p7 Policing and Isolation in Bridges. Goal is to provide a starting point for Filtering and Stream Isolation discussion

- A664p7 Approach has been certified

- If 802.1DP / AS6675 follows a ***similar*** approach, it should be acceptable as well
  - Not trying to say “Shall be A664p7 equivalent”

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ARINC 664P7 BACKGROUND CONCEPTS

- Virtual Link – defines a logical unidirectional connection from one source end-system to one or more destination end-systems.

- Mapping ARINC 664p7 Constructs to 802.1Q
  - ***A664p7 Construct to 802.1 Construct***
  - A664p7 Virtual Link ~ 802.1Q Stream
  - A664p7 End-system ~ 802.1Q End Station
  - A664p7 Switch ~ 802.1Q Bridge

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ARINC 664P7 FILTERING AND POLICING

ARINC 664 Part 7 Filtering and Policing ensures deterministic behavior per Virtual Link (VL):

- Independent of other VLs
- Thru Failures (silent or erroneous) of End Systems or Switches in LAN
  - But not on data path…

ARINC 664p7 Filtering Checks

- Frame Size > 1518
- Frame Size < 64
- Frame Size > Configuration Max per VL
- Frame Size < Configuration Min per VL
- Frame Integrity (CRC Check)
- Frame Arrival Port against Configuration

ARINC 664p7 Policing

- Per Virtual Link (Typically)
  - Policing Account sharing for VLs allowed
- Typical Token Bucket
- Frame Based or Byte Based
  - Depending on determinism approach

Quantity of Virtual Links per Switch: 4096

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802.1QCI PSFP FEATURES VS A664P7

Classification	COLUMN B	802.1Q Feature	Comment
Filtering	Size > Protocol	Basic Function	
Filtering	Size < Protocol	Basic Function	
Filtering	Size > Config	Maximum SDU Size Filter	
Filtering	Size < Config		Does not appear to exist
Filtering	Frame Arrival Port		802.1Qci PSFP does not appear to provide VLAN Filtering may, depending on how Stream IDs are defined
Filtering	Frame Integrity (CRC)	Basic Function	
Policing	Byte Based	PSFP Flow Meter	
Policing	Frame Based		Does not appear to exist
Resources	4096 VLs		# of Streams not specified by 802.1Q

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802.1QCI PSFP FEATURES VS A664P7

DISCUSSIONS

- Minimum Frame Size Check and Frame Based Policing Impacts
  - If 802.1Qci Policing appropriately protects resources for stream / bridge (queue space, bandwidth, etc), this should not be a problem
- Frame Arrival Port Impacts
  - How to handle?
    - Use VLAN Filtering and constrain Stream Identification Functions / VLAN ID Assignments?
    - Extension to 802.1Qci to supporting Stream Filtering Per Input Port?
  - Requirement: Frames arriving on wrong ports should be discarded
- # of Streams
  - Should this be a P802.1DP/AS6675 Profile requirement?

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P802.1DP / AS6675 EXPECTED REQUIREMENTS

- Expect filtering and policing for all streams of deterministic traffic class
  - Details might vary by traffic shapers used (e.g. TAS vs ATS vs CBS)
- Expect filtering and policing is required between switches for fault containment
- Default rule for PSFP likely will be to discard frames for most Aircraft Control Domain configurations
- Need equivalent of filtering of streams based on arrival port

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