



Aerospace Stream Isolation options | Oct 2022

# Aerospace Stream Isolation Proposal

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# Objective



- **Review aerospace stream isolation options**
- **Propose a potential solution**

## References:

- P802.1DP Stream Isolation, May 2022  
<https://www.ieee802.org/1/files/public/docs2022/dp-jabbar-stream-isolation-0522-v01.pdf>
- P802.1DP Stream Isolation Continued  
<https://www.ieee802.org/1/files/public/docs2022/dp-jabbar-stream-isolation-continued-0622-v00.pdf>
- Summary of Aerospace Use Cases  
<https://www.ieee802.org/1/files/public/docs2021/dp-Jabbar-Aerospace-UseCase-Summary-0521-v01.pdf>
- Introduction to Aerospace Network Certification  
<https://www.ieee802.org/1/files/public/docs2021/dp-zaehring-Introduction-to-Aerospace-Network-Certification-JAR25-1309-CS25-0321-v01.pdf>

# Stream Isolation



## What is meant by stream isolation?

When multiple streams traverse a bridge, one stream's behavior should have no impact on other streams. This includes both normal operation and faulty/failure modes.

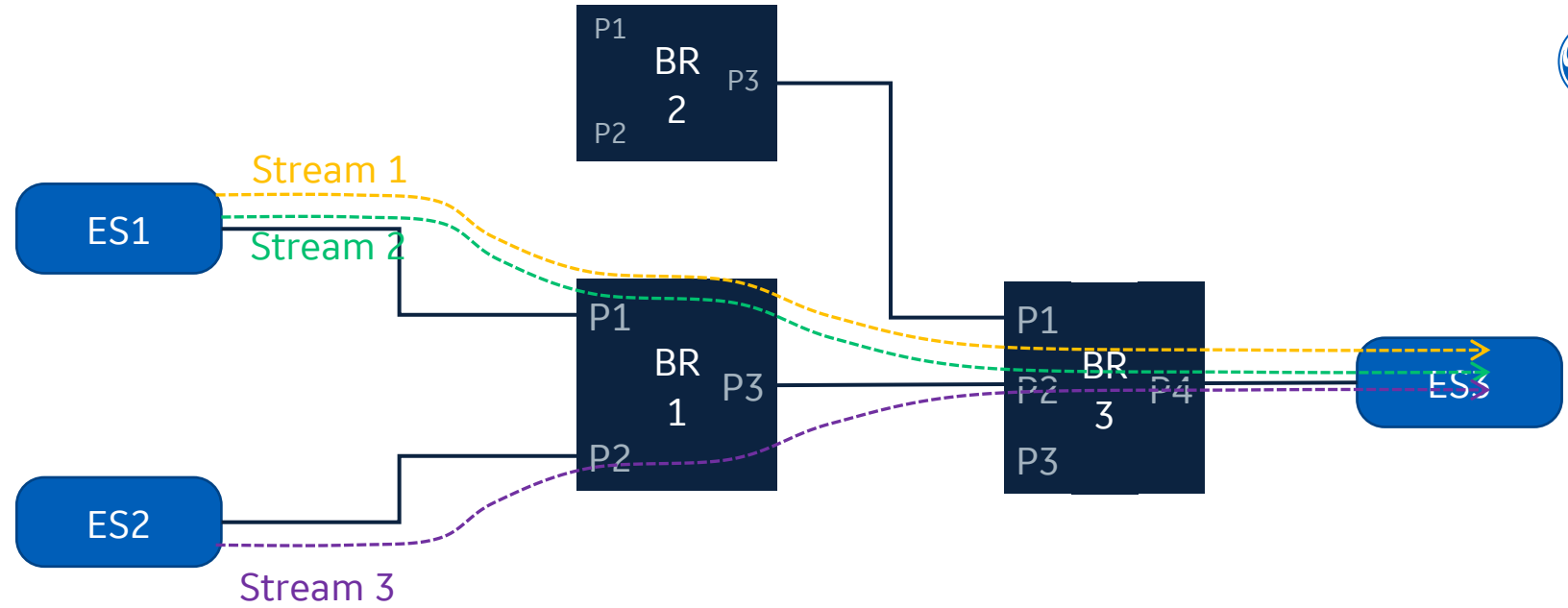
From TSN Toolset perspective, this implies that bridges primarily support **per-stream** :

1. Identification
2. Filtering and Policing
3. Queueing and Forwarding (this is supported in Pre-TSN Ethernet)

*Does not include stream performance requirements, which might also impose certain stream isolation requirement*

# Stream Isolation

## Trivial Example



### **Option 1:** Isolate every stream level at every hop

- Num of bridge entries = num streams in the network (up to 4K for aerospace scenarios)

### **Option 2:** Isolate at the device level by aggregating streams ... failure in one stream is failure of all streams

- Num of bridge entries = num of nodes (100 to 500)
- Difficult for qbv streams, does not work for partitioned systems

### **Option 3:** Per stream isolation at the edge bridges and per-port isolation (of aggregate flows) on the core network

- Difficult for Qbv streams, certification issues
- Edge bridges still need to support on average 64 streams per port for large aerospace scenarios

# Proposal



## *Number of streams supported (for identification and policing)*

Low Stream Count Use Cases		High Stream Count Use Cases	
Num ports	Num Entries	Num ports	Num Entries
<=4	128	<=4	256
5-8	256	5-8	512
9-12	256	9-12	1024
13-18	256	13-18	2048
>18	256	>18	4096

- Low stream count use cases match automotive requirements exactly
- High stream count use cases support both legacy Ethernet based avionics networks as well as future converged Ethernet networks
- Discussion topic: what to mandate for DP compliant bridges?