



Multi gPTP domain bridges | IEEE Interim, May 2023

Scheduled Traffic on Multi-gPTP domain Bridges

Abdul Jabbar
GE Research

Objective

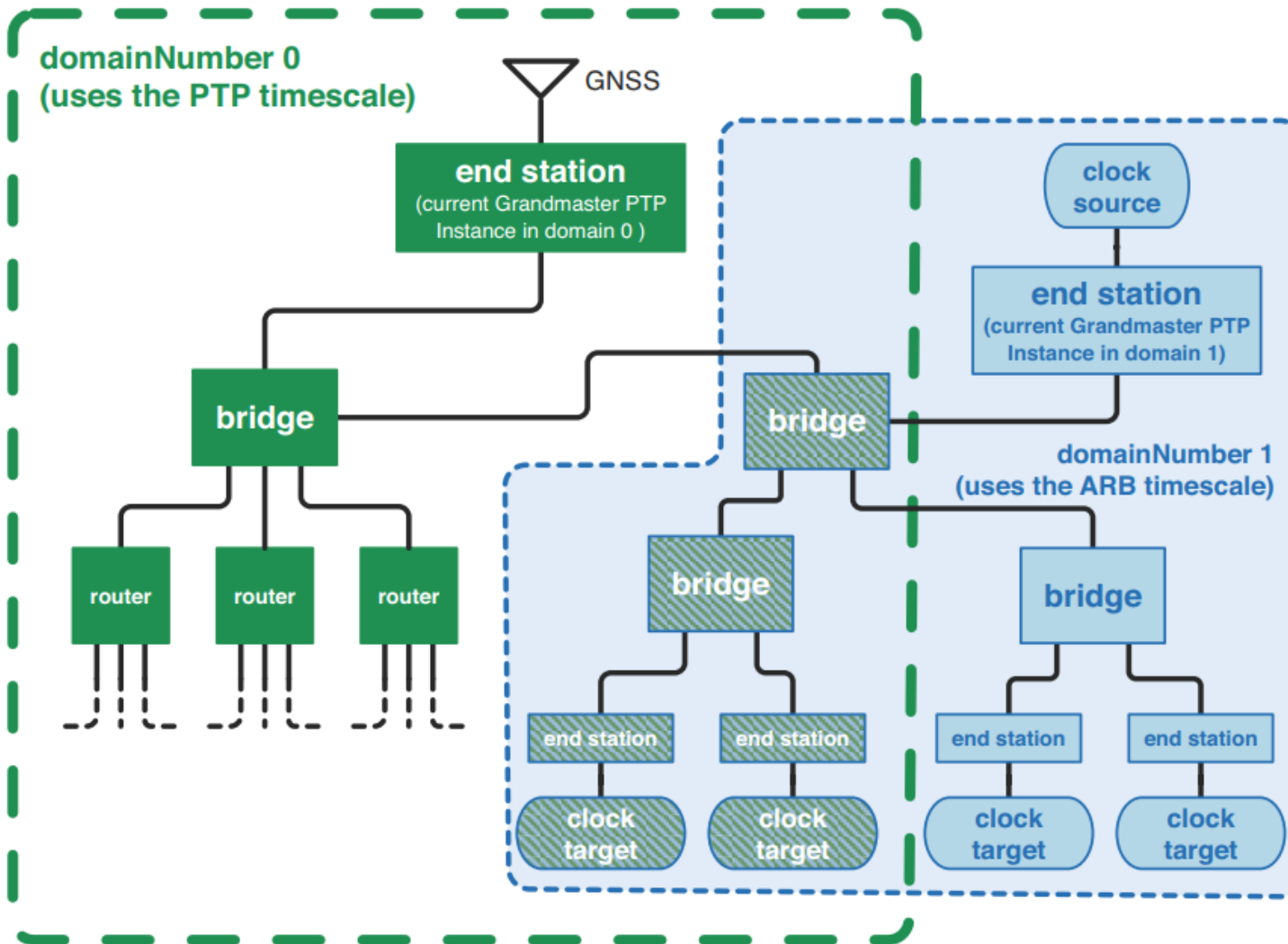


- ***Discuss Scheduled Traffic (commonly referred to as Time Aware Shaper-TAS) on Multi-gPTP domain Bridges***

References:

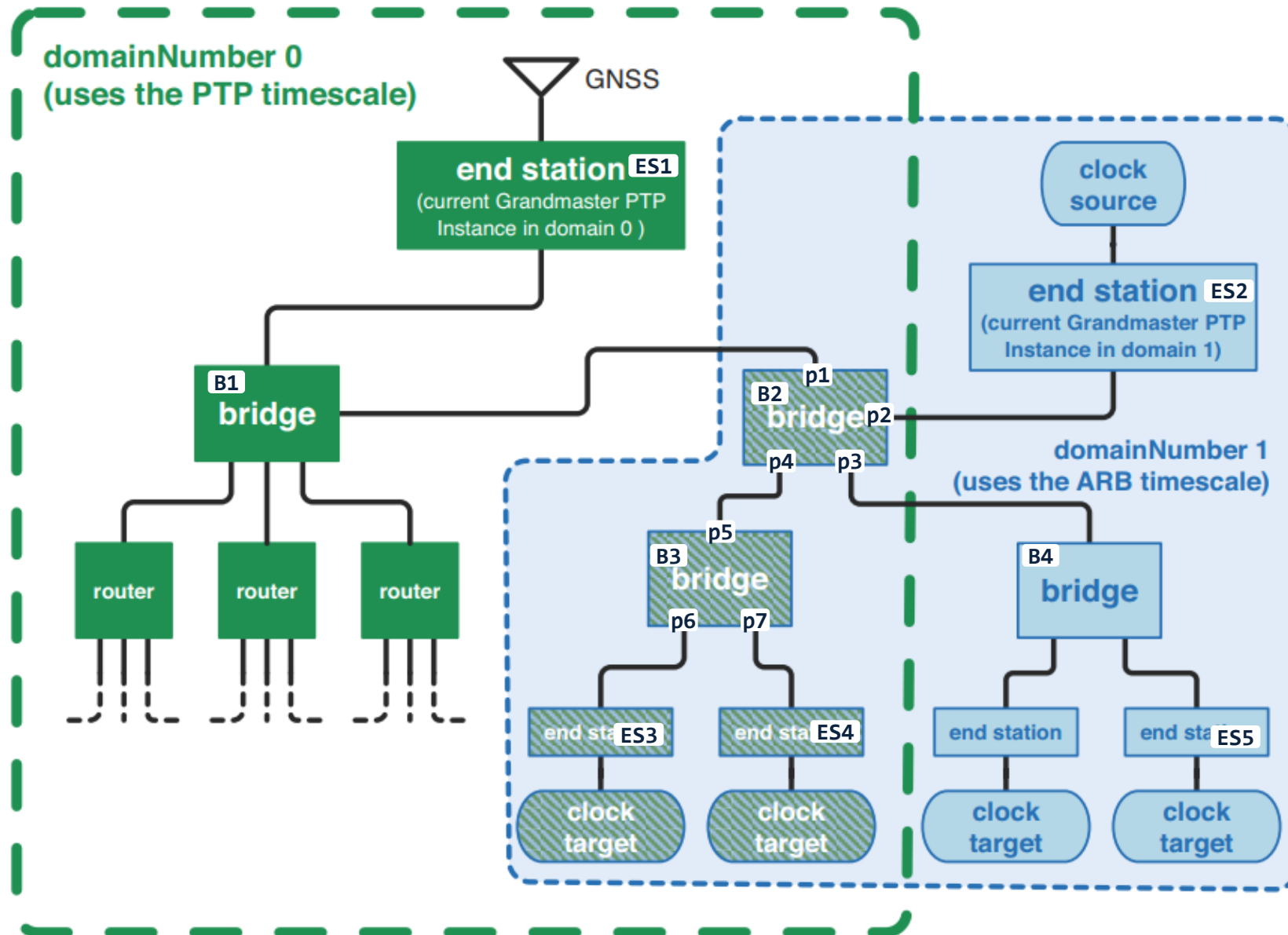
- **IEEE Std 802.1AS-2020, IEEE Standard for Local and Metropolitan Area Networks – Timing and Synchronization for Time-Sensitive Applications**
- **IEEE Std 802.1Q-2022, IEEE Standard for Local and Metropolitan Area Networks – Bridges and Bridged Networks**

Multiple gPTP Domain Support in 802.1AS-2020



Note: all the “bridges” and “routers” in this figure are examples of time-aware systems that contain at least one PTP Relay Instance, and the end stations are time-aware systems that contain at least one PTP End Instance. The PTP Links in this figure can use any of the media specified in this standard.

Multiple gPTP Domain Support in 802.1AS-2020



Multiple gPTP Domain Support in 802.1AS-2020: Shared Port



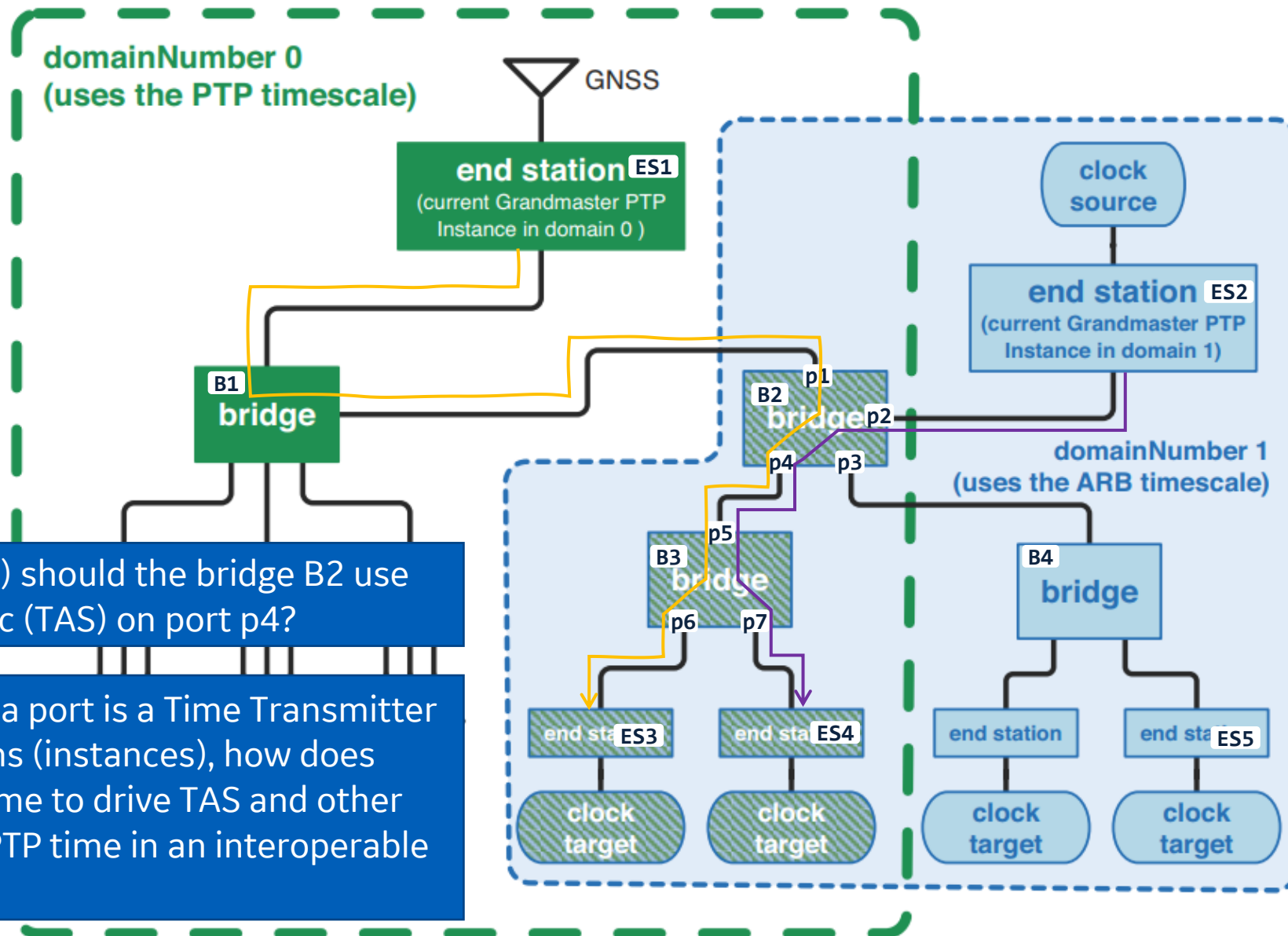
TAS Streams:

Stream 1: ES1 to ES3

Stream 2: ES2 to ES4

Q1: What time (domain) should the bridge B2 use for the Scheduled Traffic (TAS) on port p4?

Q2: Generalized: When a port is a Time Transmitter for multiple PTP domains (instances), how does bridge determine the time to drive TAS and other functions that require PTP time in an interoperable way?



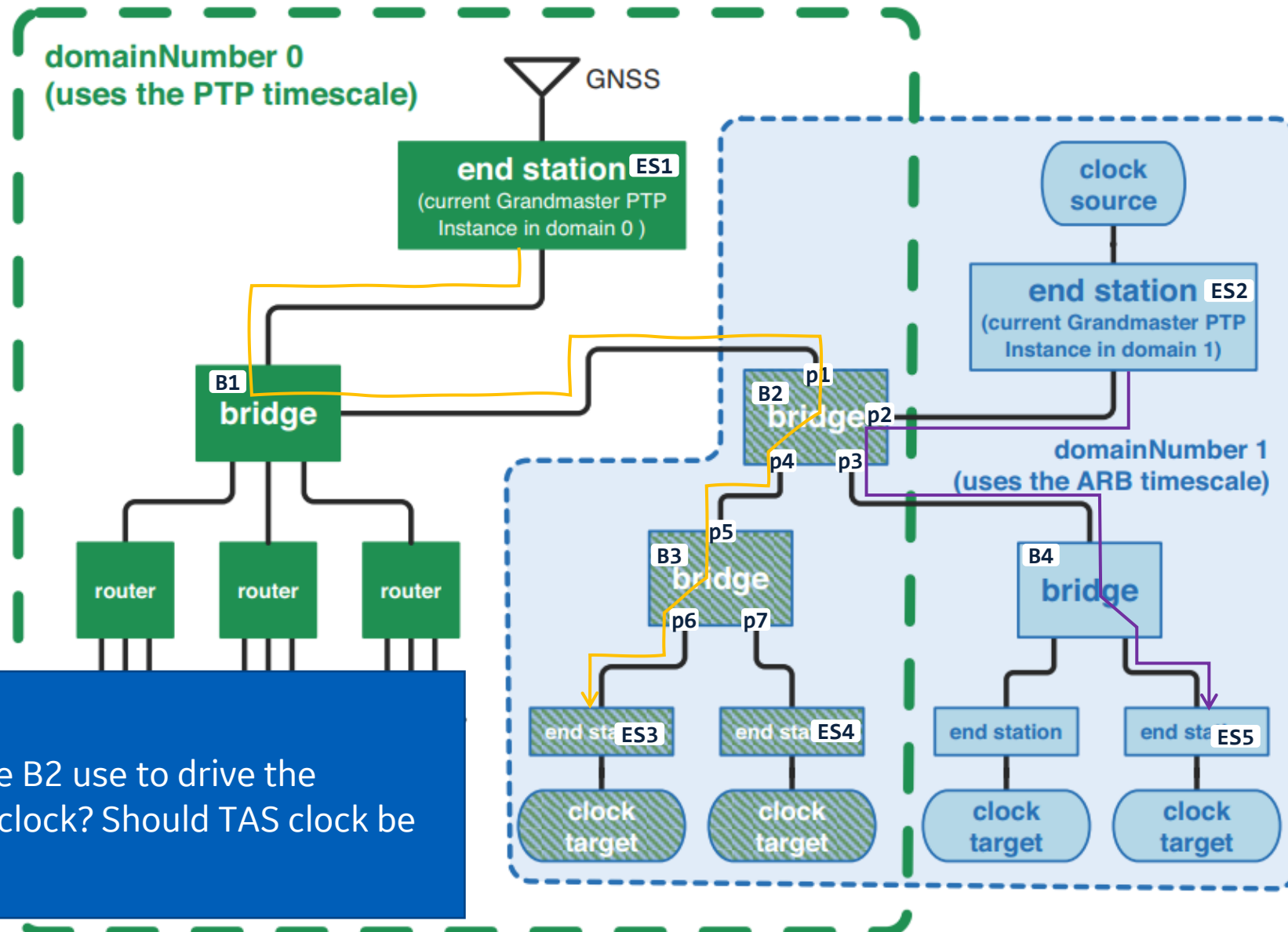
Multiple gPTP Domain Support in 802.1AS-2020: Shared Bridge



TAS Streams:

Stream 1: ES1 to ES3

Stream 2: ES2 to ES5



Simpler problem:
What time should bridge B2 use to drive the Scheduled Traffic (TAS) clock? Should TAS clock be port specific?

Types of Multiple gPTP domains



- 1. Unrelated domains using different timescales but sharing a port**
- 2. Unrelated domains using different timescales with isolated ports on a common bridge.**
3. Unrelated domains, wherein one is for network operation (say ARB timescale) and another is for event logging (say UTC)
4. Related domains used to improve availability (e.g. Hot Standby)
5. Related domains use to improve integrity and availability (e.g. DP Fault Tolerance)

Q1. How does bridge know about the use case and drive Scheduled Traffic (a.k.a) TAS clock in the above scenarios?

Q2. How to attain interoperability between bridges?

Summary



- Discussed Time Aware Shaping on bridges supporting multiple gPTP domains
- Does this issue need further consideration?



Building a world that works