AVB (TSN) Domain Detection

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What is an AVB(TSN) Domain?

- IEEE 802.1BA-2011 defines as:
  - **AVB domain**: The intersection of an SRP domain and a gPTP domain.
    NOTE—The term “SRP domain” is defined in IEEE Std 802.1Q. The term “gPTP domain” is defined in IEEE Std 802.1AS

Why do we care?

- Devices can only stream media to each other if they are both in the same AVB Domain
- ADP is a flooded multicast and crosses domain boundaries
  - This is actually desired behaviour

Tools AVDECC Already Provides

- AVDECC already tells you
  - What gPTP Domain an Entity is in
    - ADP
    - GET_AVB_INFO AECP command
  - The path from the gPTP grandmaster to the entity
    - GET_AS_PATH AECP command
  - SRP Domain attributes
    - GET_AVB_INFO AECP command

Network Topology (from 802.1BA-2011)

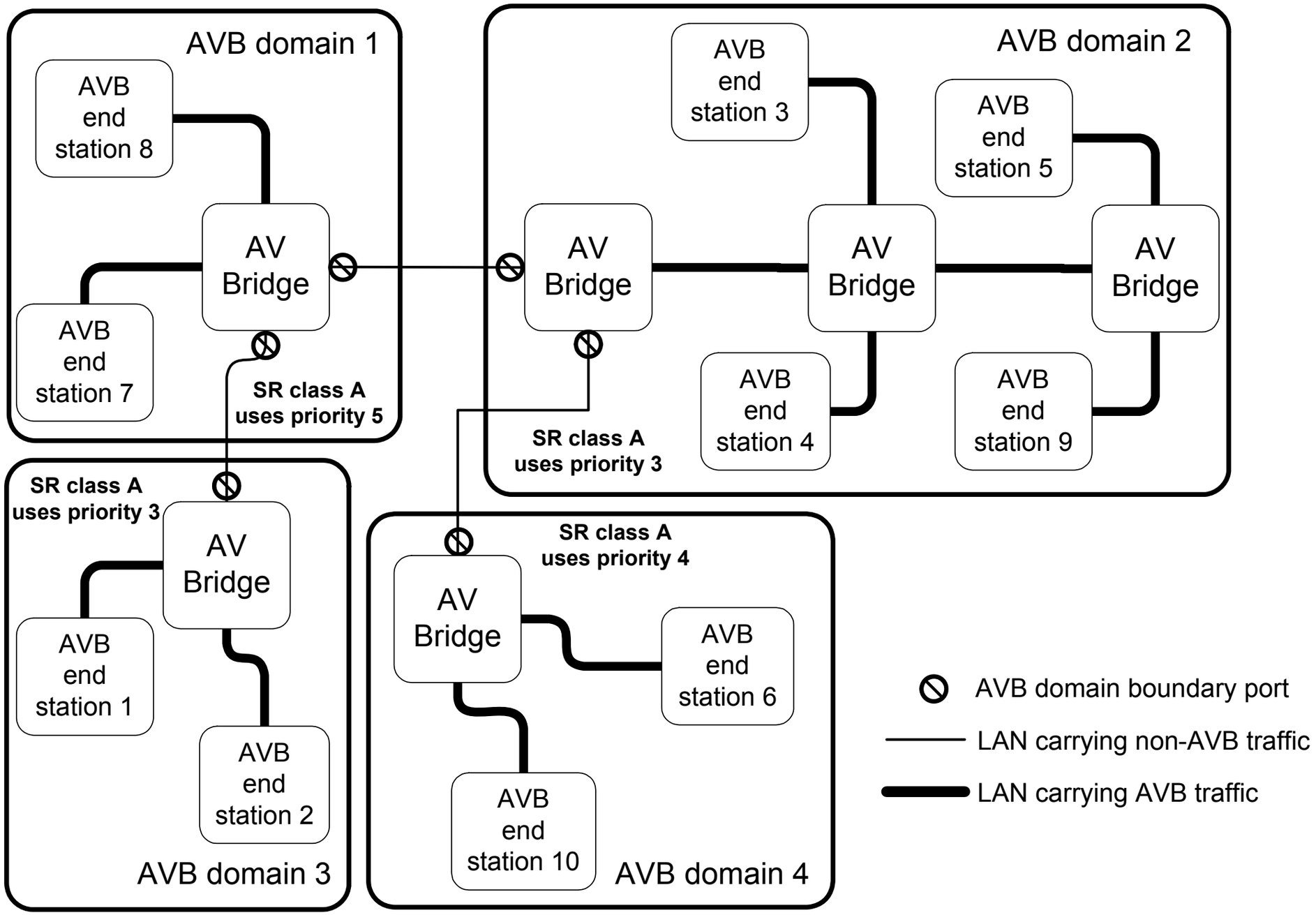


Figure 5-3—AVB domain boundaries created by different SR class A priorities

Example 1: Multiple gPTP Domains

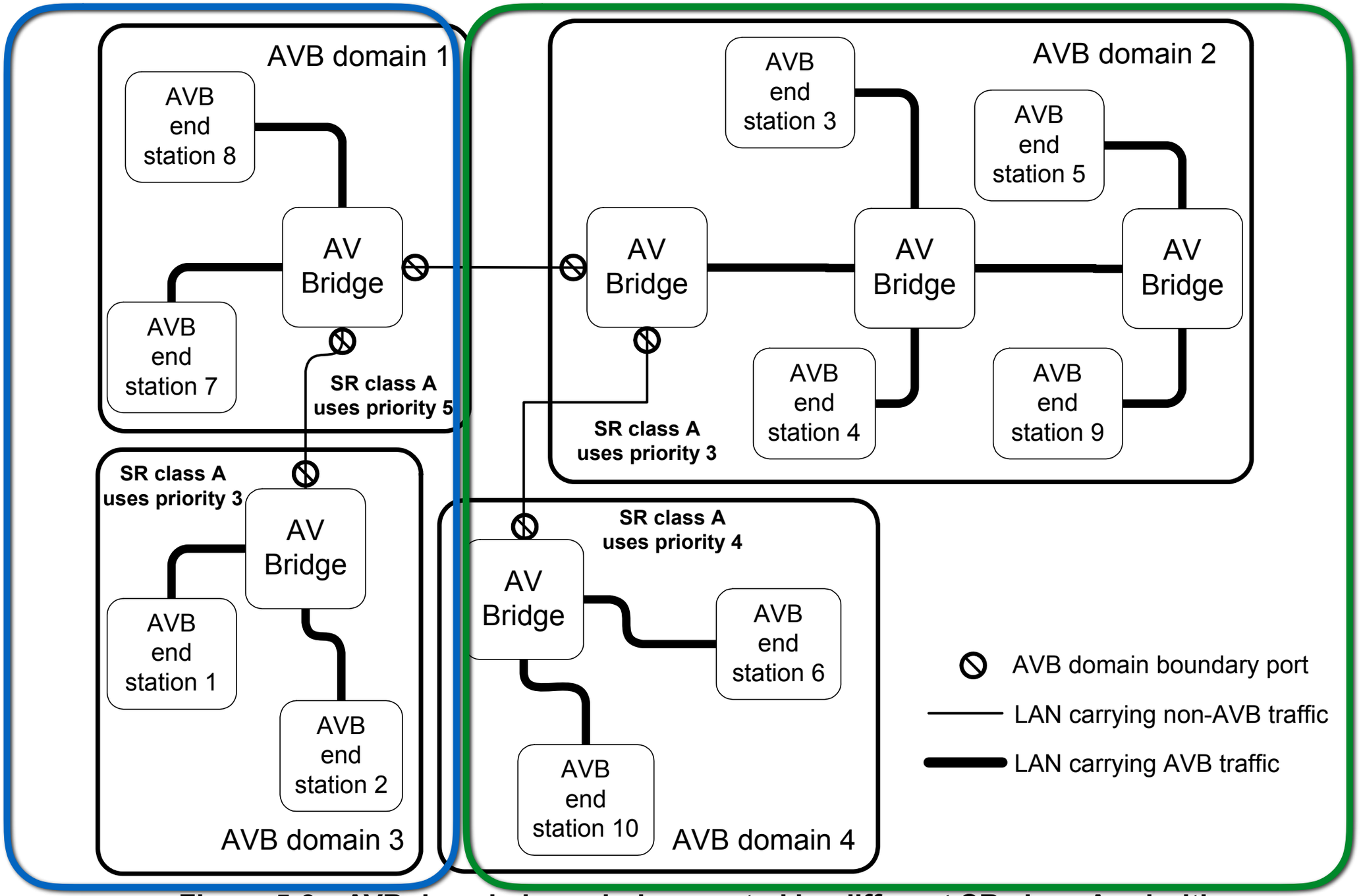


Figure 5-3—AVB domain boundaries created by different SR class A priorities

Example 2: Multiple gPTP Domains

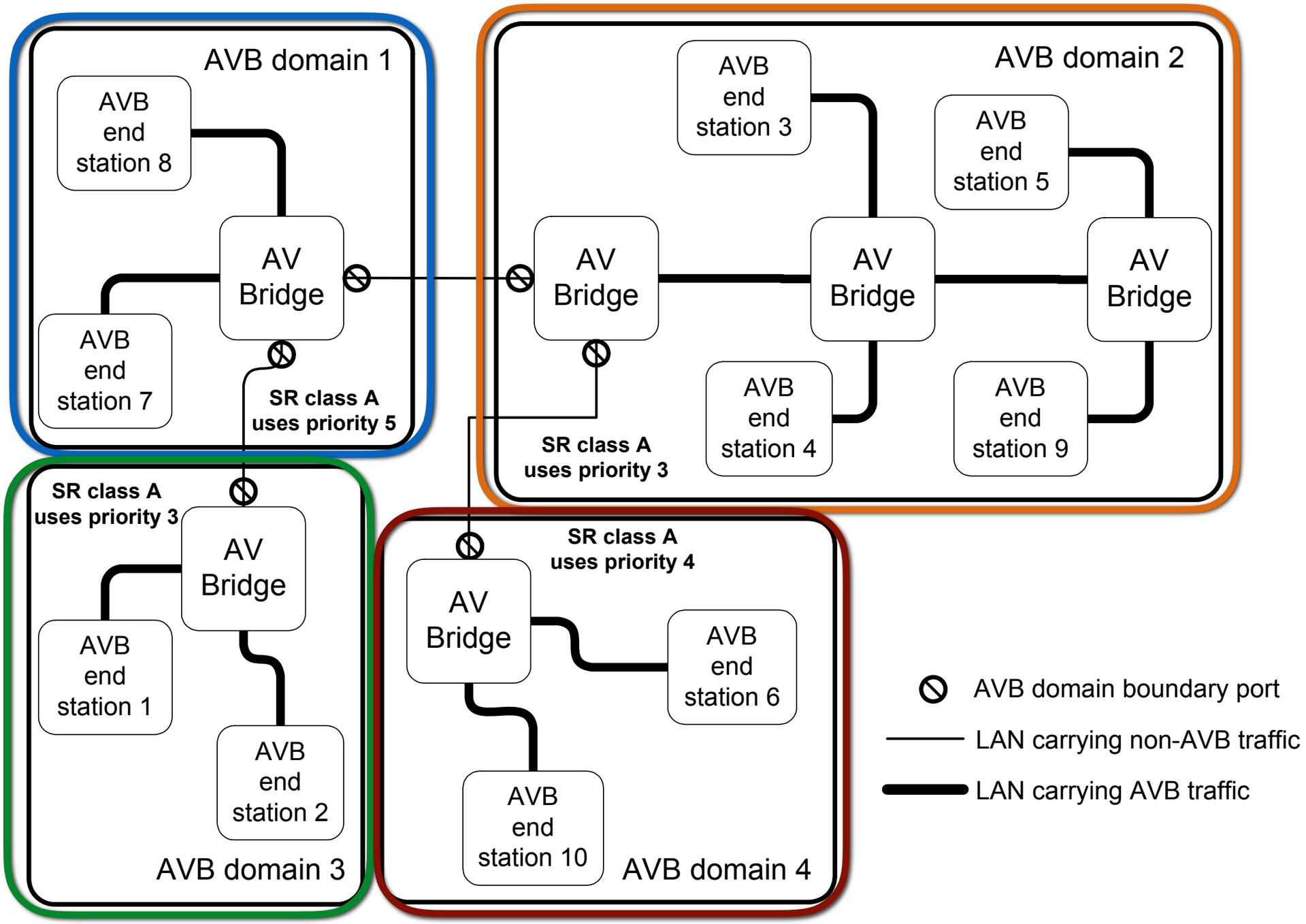


Figure 5-3—AVB domain boundaries created by different SR class A priorities

Example 3: Multiple gPTP Domains

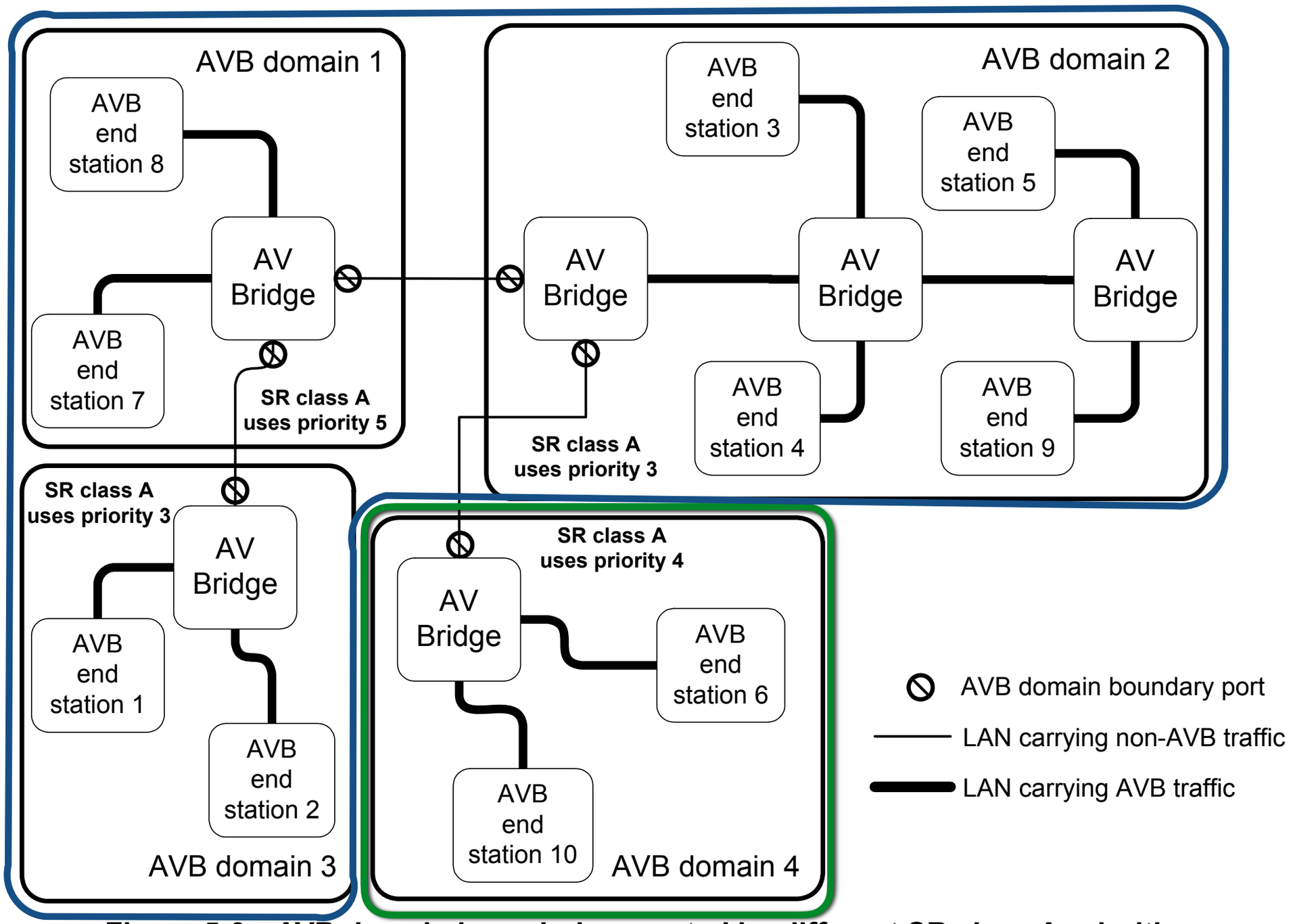


Figure 5-3—AVB domain boundaries created by different SR class A priorities

Example 4: Single gPTP Domain

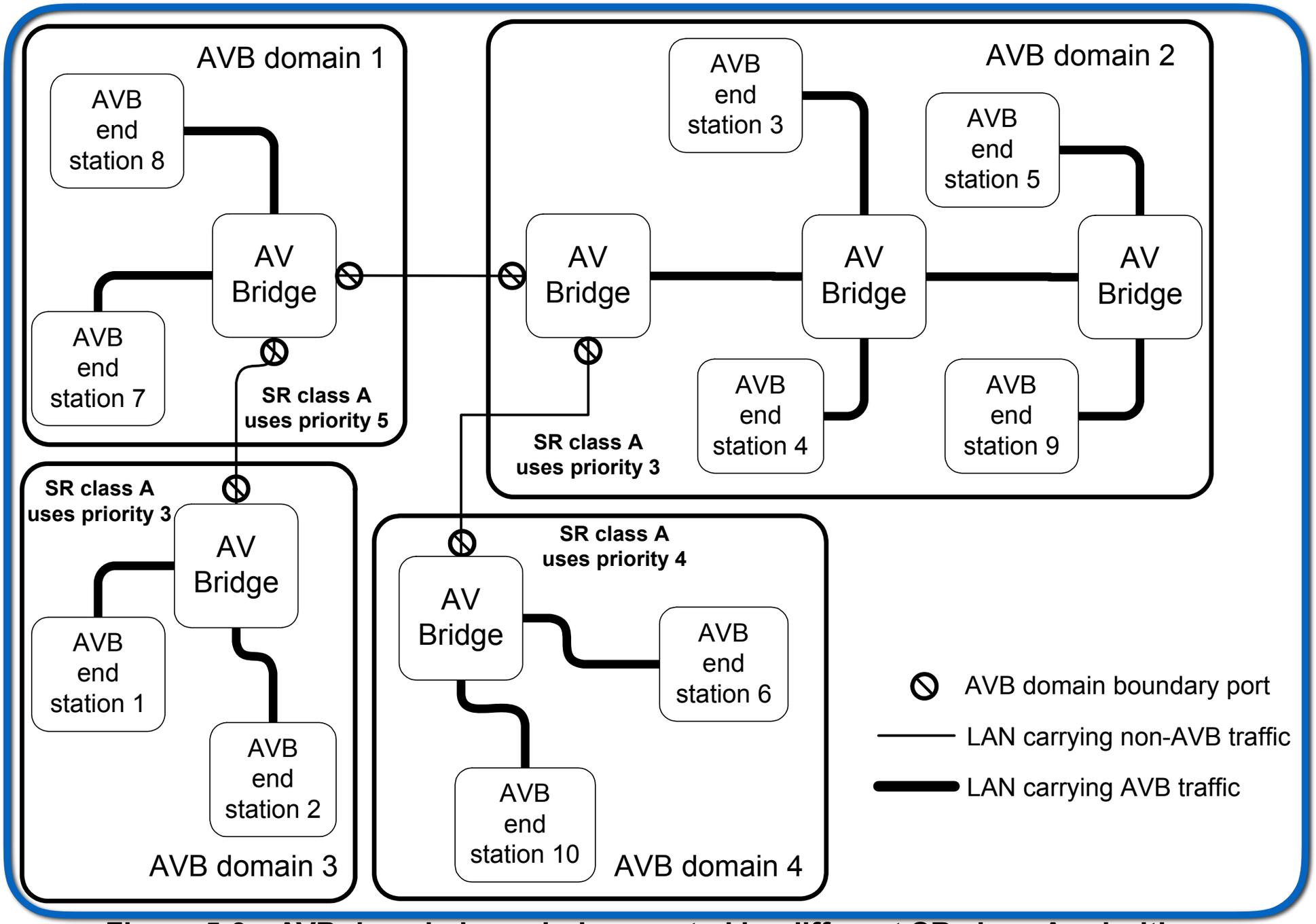
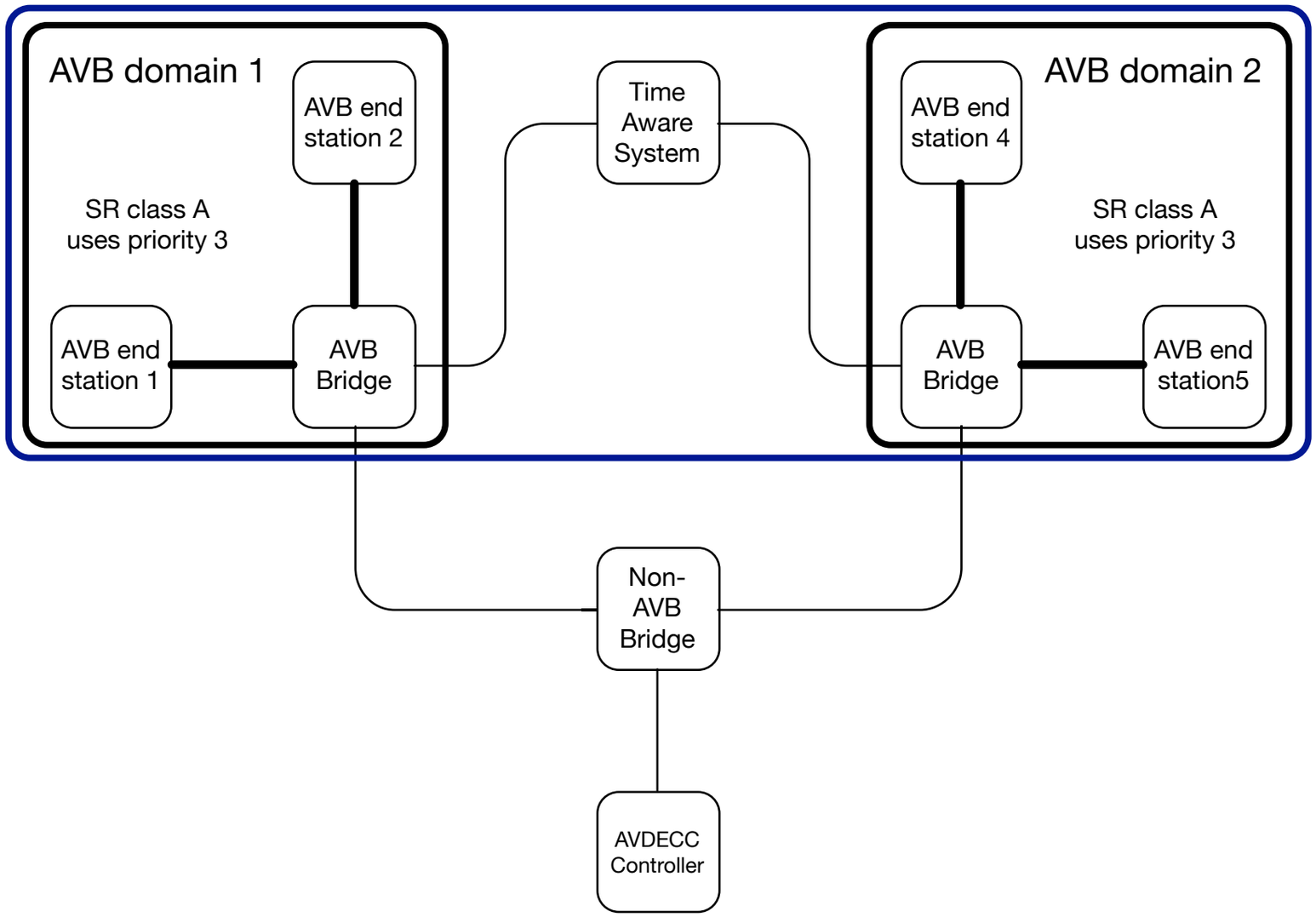


Figure 5-3—AVB domain boundaries created by different SR class A priorities

Domain Identification

- Domain 1 and Domain 4 are never a problem because they use different priorities for the SR Class
- Domain 2 and Domain 3 are the issue
  - In Example 1 and Example 2 there isn’t a problem since they are in different gPTP domains
  - In Example 3 and Example 4 they are both in the same gPTP domain and both use the same priority for the SR Class

Example 5: Single gPTP Domain



Domain Identification

- Example 5 is a little more contrived, but is a possibility
  - In this case a Time Aware System (something that is using gPTP to bridge time between it's ports but isn't a network bridge) causes both AVB domains to be the same gPTP domain
- We are back to the same problem as Example 3 and 4

Domain Detection

- How do we detect the boundaries so that the controller can classify devices into groups that can connect media streams to each other
- Is there anything in the 802.1Qcc work that already helps with this?