
Spanning Tree Protocol Operations for AVB networks

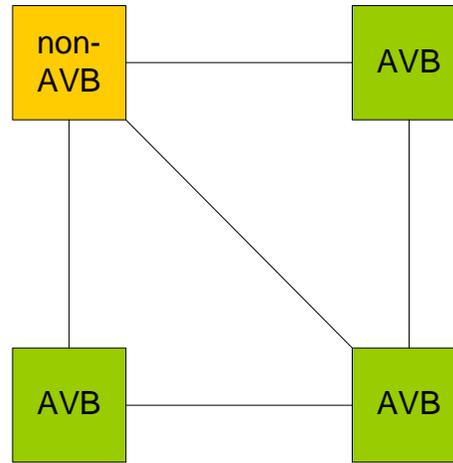
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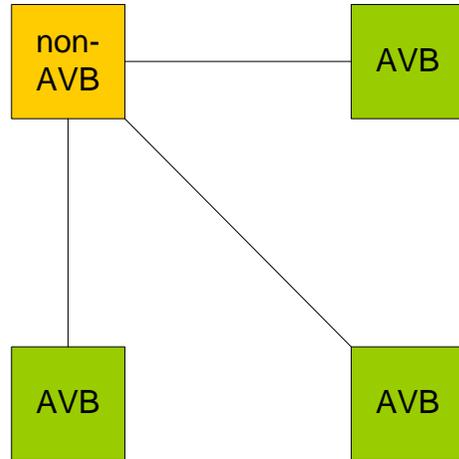
Problem statement

- ❑ In a home network, there will be both AVB bridges and legacy (non-AVB) bridges.
- ❑ According to current consensus, the AVB protocols (.1AS, .1Qat, .1Qav) should only work within an AVB cloud, where all bridges are AVB bridges.
 - LLDP will be used to detect the links between an AVB port and a non-AVB port.
- ❑ Spanning tree protocol should take the AVB cloud requirement into consideration
 - Preferably, STP should form a tree topology with minimum number of separated AVB clouds.

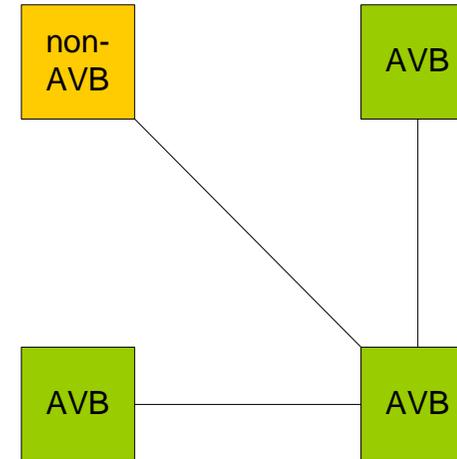
Example



Network setup



Tree1: Three AVB clouds



Tree2: One AVB cloud

Method 1: by controlling the cost parameters

□ Method:

- Select an AVB bridge as the Root bridge
- Set the cost of each port such that the links between two AVB ports are absolutely more preferable than the links between a AVB port and a non-AVB port, or between two non-AVB ports.

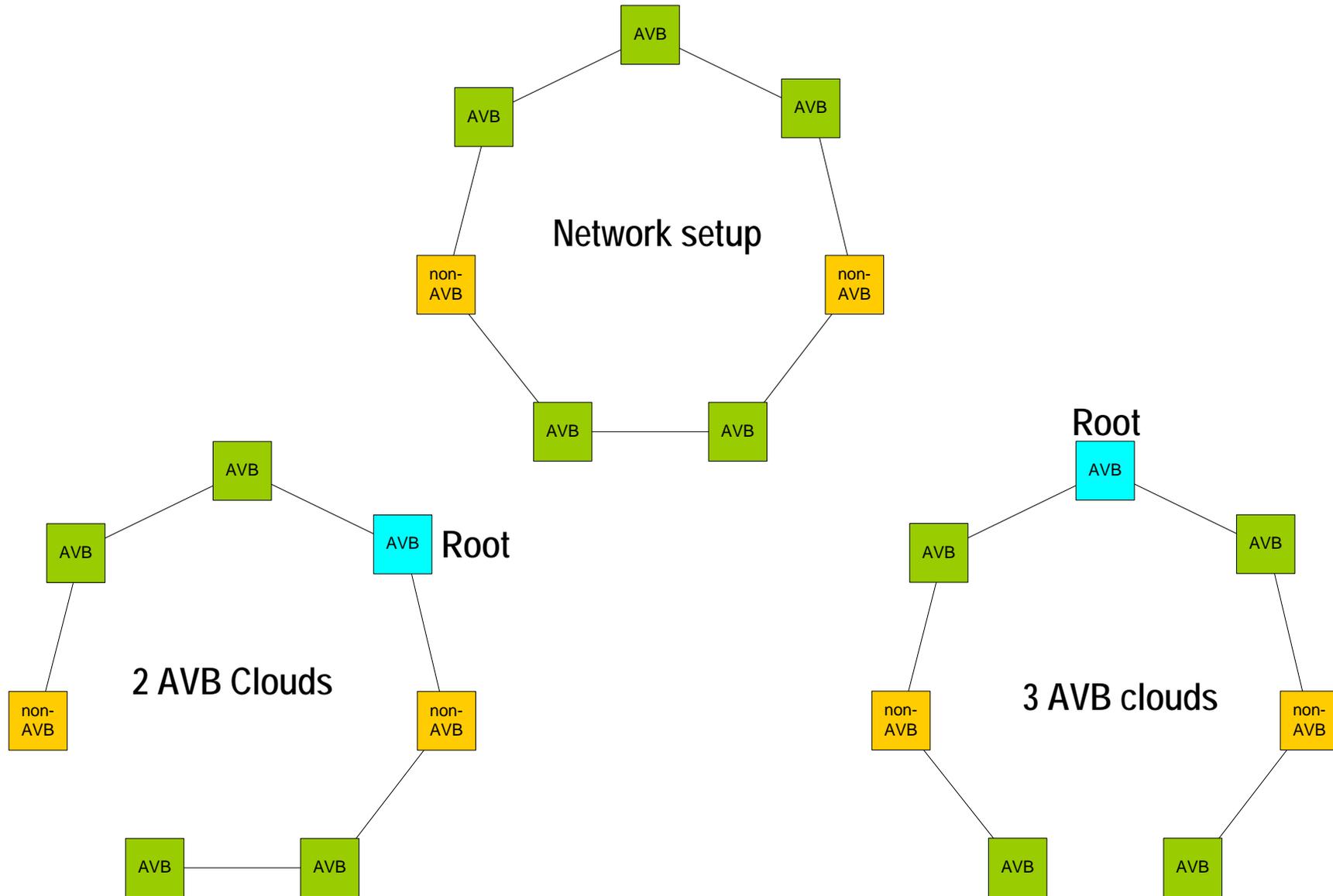
□ Advantage:

- Very simple

□ Problem

- May not generate the most optimal result
 - See the example on next slide

Example

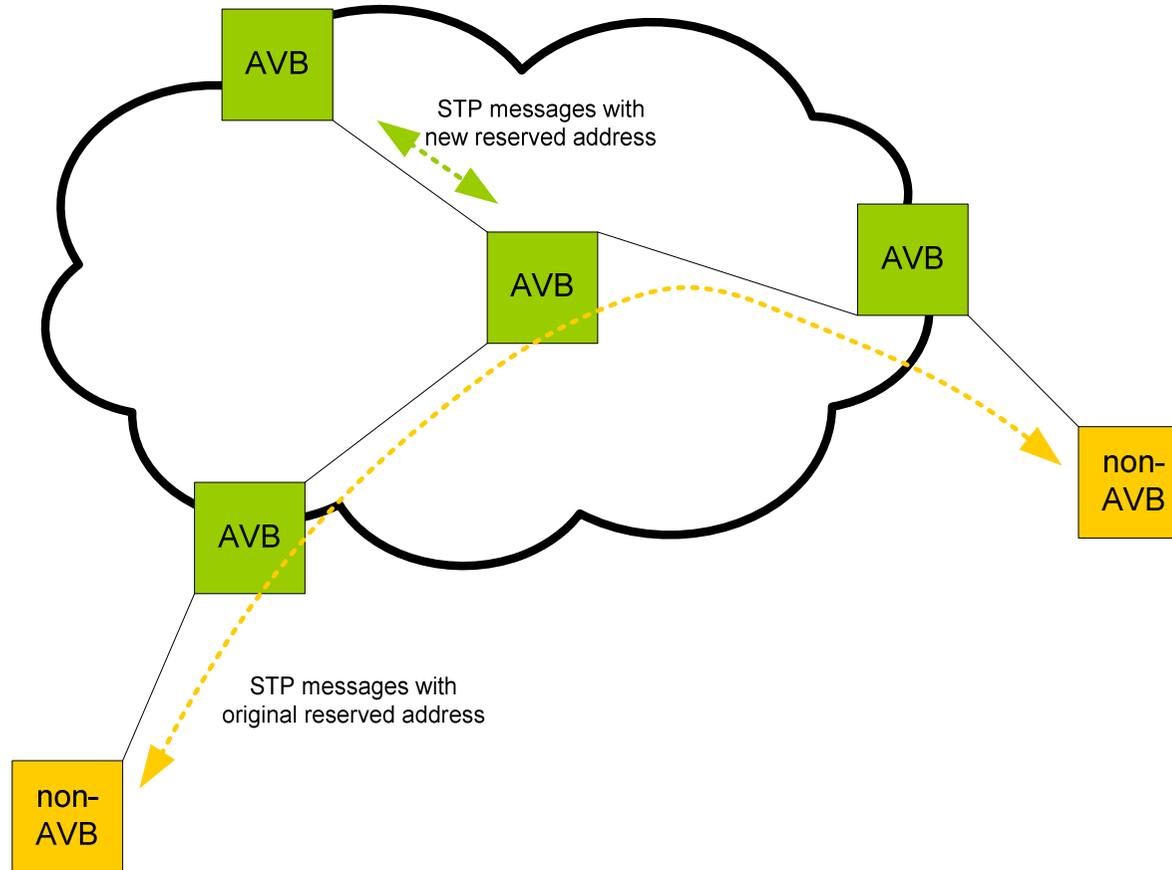


Method 2: by using separated STP instances

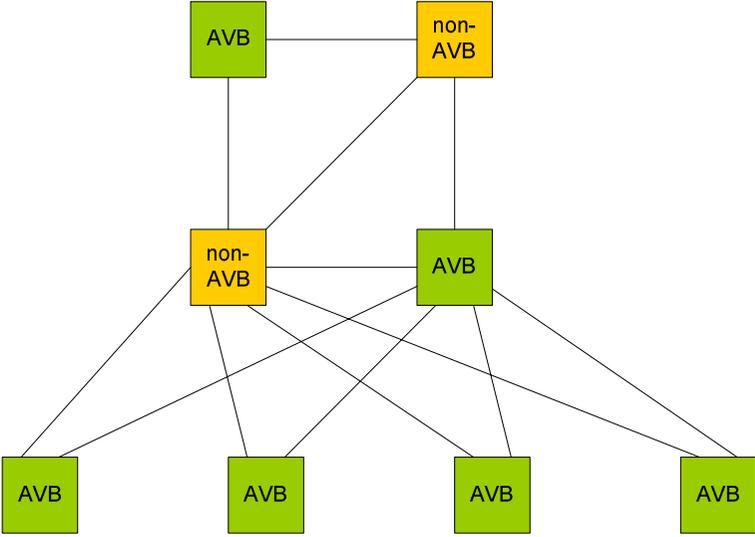
□ Method

- Use a separate STP instance between the connected AVB ports therefore to form the maximum size AVB clouds. These clouds are then treated as transparent LANs for non-AVB clouds.
- AVB bridges should use a new reserved bridge group MAC address for the STP message exchanges within the AVB clouds
 - These STP messages will not be transmitted out of non-AVB ports
- Non-AVB bridges use the regular reserved bridge group MAC address for the STP message exchanges between all non-AVB bridges in the network
 - AVB bridges transparently forward these STP messages out of the AVB cloud edge ports
- Same as the mechanism in IEEE802.1ad Provider Bridge, which provides spanning tree topologies for both the provider network and custom network

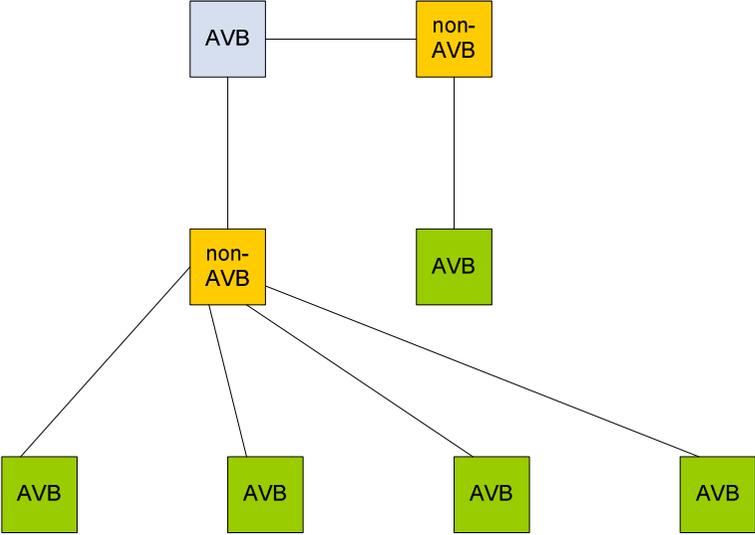
Separated STP instances



Examples

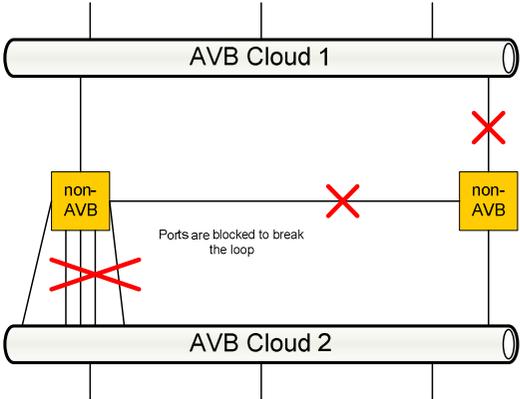
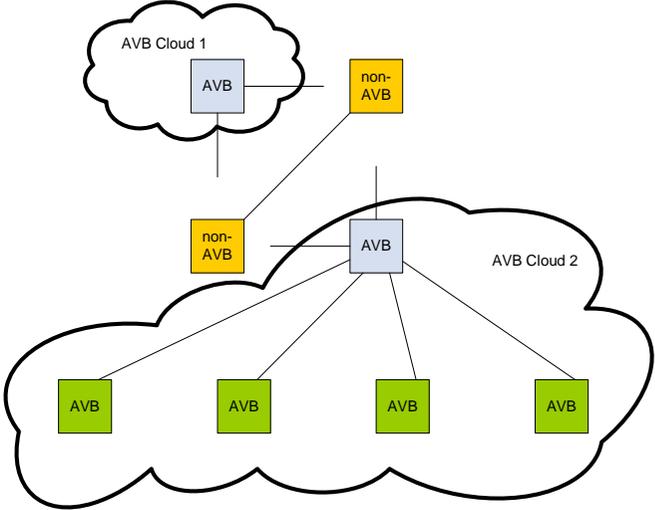


Network setup
(Physical topology)



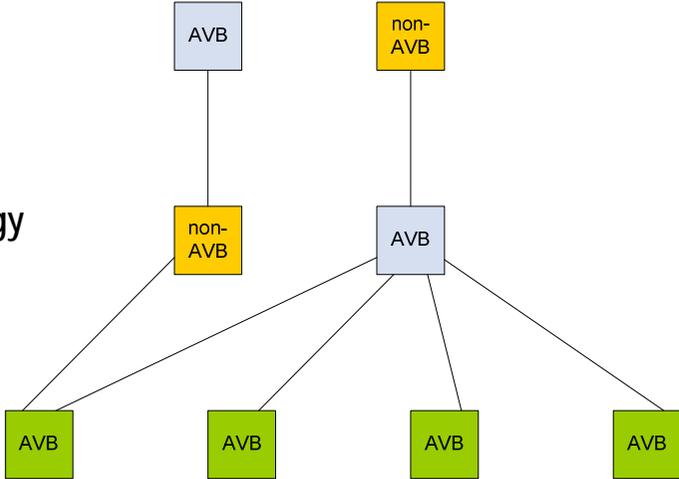
Method-1 may generate a sub-optimal
result (with 6 separated AVB clouds)

Examples (cont.)



Final topology

Method-2 will generate the tree topology with 2 separated AVB clouds.



Summary

- ❑ Using separated STP instances to form the tree topology for networks with both AVB bridges and non-AVB bridges could be a feasible solution
 - This solution is being used in provider bridge networks.
- ❑ Suggested action item
 - Assign a new reserved STP address for AVB bridges