

IEEE 802.1AS Best Master Clock Selection: Robustness Study

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Robustness (computer science):



The ability of a computer system to cope with errors during execution or the ability of an algorithm to continue to operate despite abnormalities in input, calculations, etc.

The harder it is to create an error of any type or form that the computer cannot handle safely the more robust the software is.

Source: Wikipedia

The aim of this presentation...

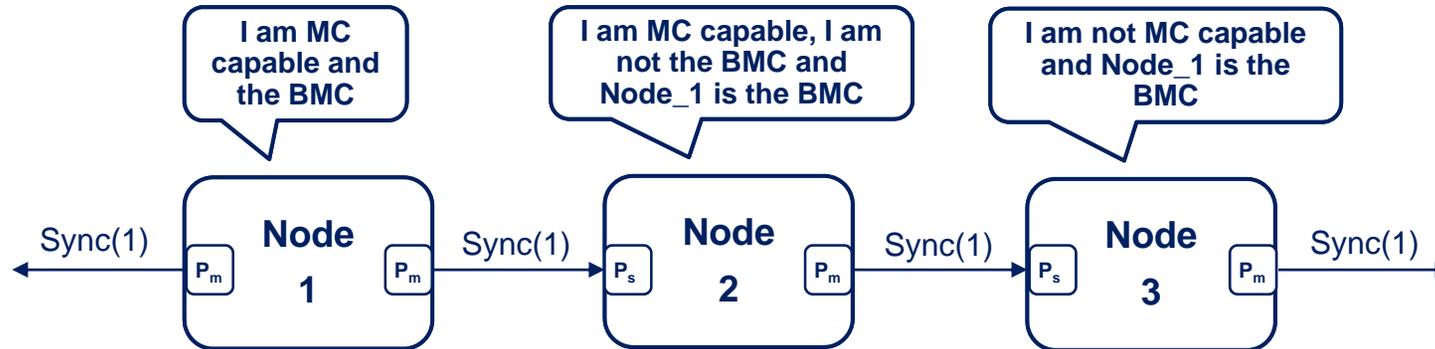


- a) Evaluate the robustness of the 802.1AS Best Master Clock selection by identifying the possible error scenarios
- b) Evaluate each error scenario:
 - What are the consequences ?
 - Could the error be detected ?
 - Should the error be detected ?
 - Should the error be reported ?
 - How should the error be reported ?
 - Should the network self-heal ?
 - Could the network self-heal ?
 - Should new assumptions be added to next rev to handle these error cases ?

802.1AS Rev 1 – Normal Case



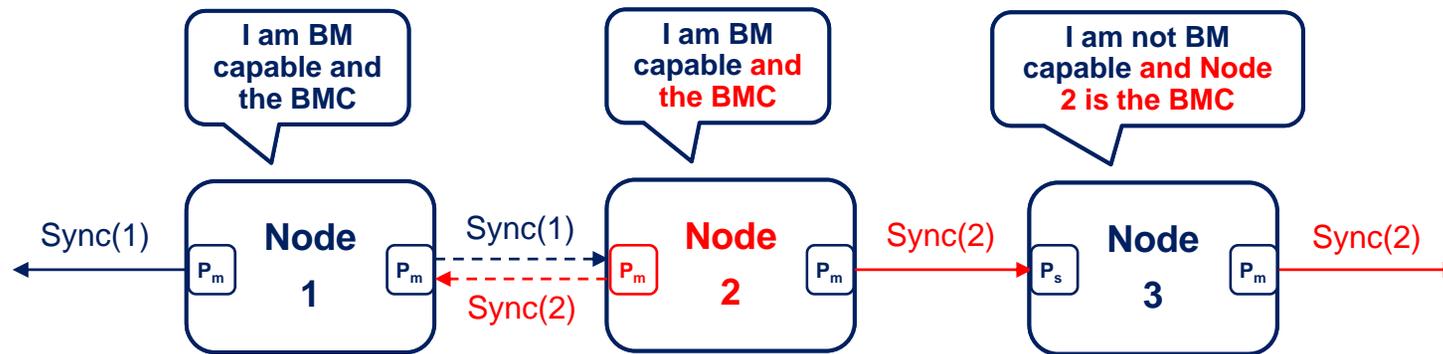
- All the nodes are “good” citizens....



802.1AS Rev 1 – Error Scenario #1



- Node_2 wrongly decides to be the BMC caused by
 - BMCA implementation error
 - failure to receive the advertise messages of the BMC

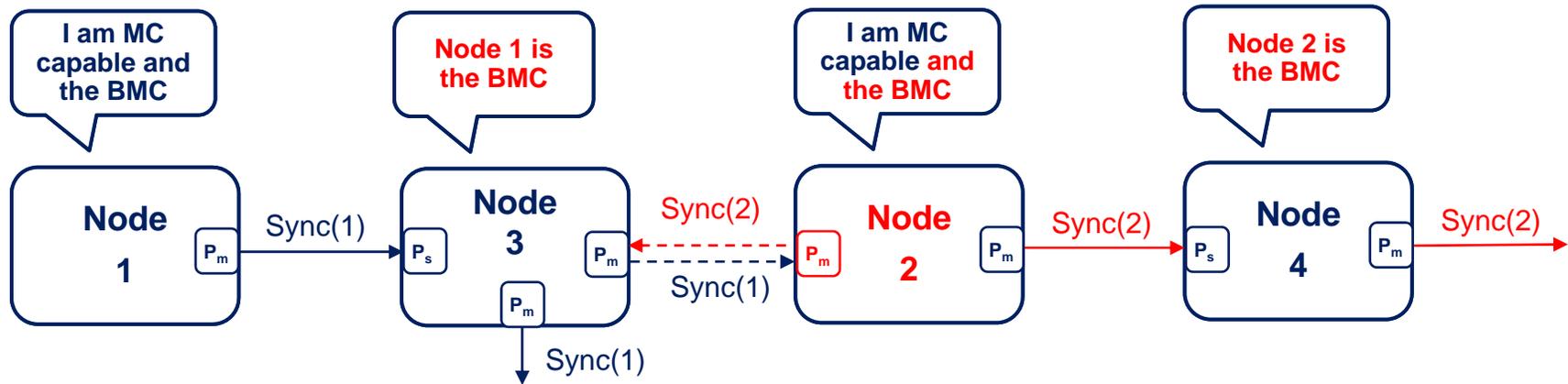


- Consequences
 - clock incoherency: 2 BMCs within the same AVB domain
- Handling
 - detectable by Node_1 and Node_2: sync message received on a port master after transient (need to define the transient interval...)

802.1AS Rev 1 – Error Scenario #2



- Node_2 wrongly decides to be the BMC

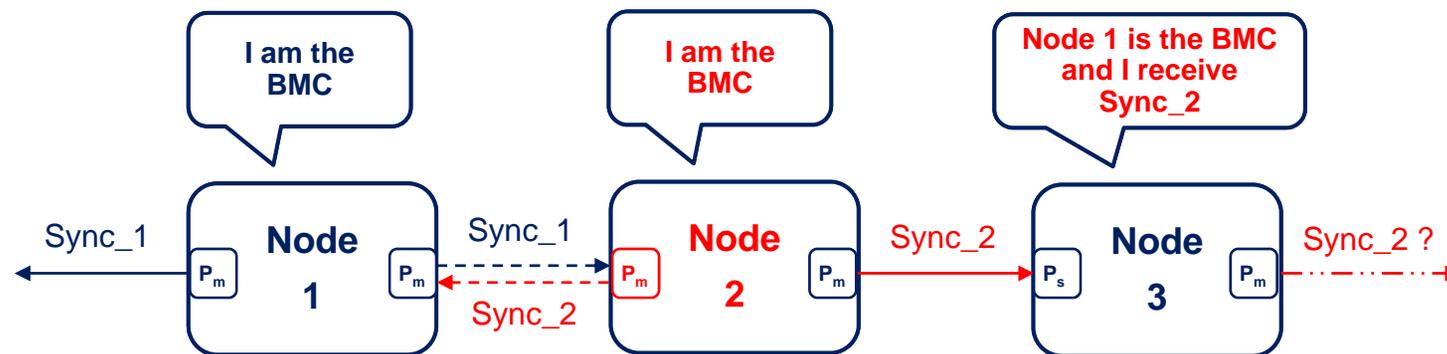


- Consequences:
 - clock incoherency : 2 BMCs within the same AVB domain
- Handling
 - detectable by Node_3 : sync message received on a port master
 - detectable by Node_4 : thru real time clock measurement only

“IS-IS Mode” – Error Scenario #1



- In the IS-IS mode, each node runs the BMCA to **locally** determine which node is the BMC, based on its own local IS-IS topology DB.
- Node_2 wrongly decides to be the BMC

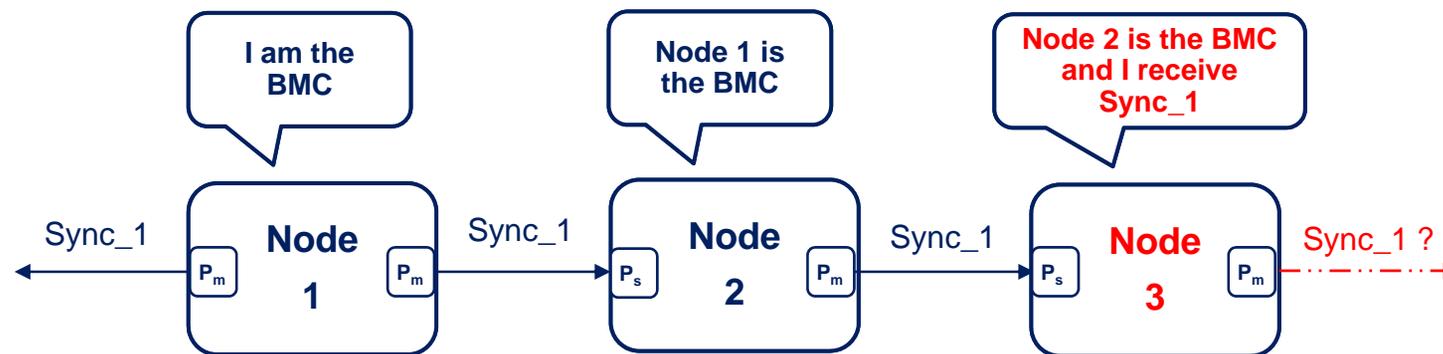


- Consequences
- Handling
 - detectable by Node_1 & Node_2
 - detectable by Node_3
 - should Node_3 propagate Sync_2 messages ?

“IS-IS Mode” – Error Scenario #2



- In the IS-IS mode, each node runs the BMCA to **locally** determine which node is the BMC, based on its own local IS-IS topology DB.
- Node_3 wrongly decides which node is the BMC



- Consequences
- Handling
 - detectable by Node_3
 - should Node_3 propagate Sync_1 messages ?

Questions



- Are there other error scenarios to consider?
- Do we need an similar error scenario study for MSRP ?

Thank You



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