

# Towards a Solution to the VLAN Issue of gPTP



***Japan  
Automotive  
Software  
Platform  
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# A situation we should share.

## [Background & Facts]

- 802.1AS prohibits the use of VLANs.
- 802.1DG does not specify the profile regarding time synchronization.
- AUTOSAR permits VLANs as an option.
- Whatever the standard, there will be products that perform time synchronization over VLANs.

## [Situation to be resolved]

- Mixing the above can cause problems.
- It is too late to eliminate VLAN from the automotive industry.
- There are no guidelines for handling VLAN in time synchronization.

**As SDV is gaining attention and TSN is becoming inevitable, Time Synchronization must be available and easy for OEMs.**

# We have a good precedent.

When we first proposed making “Announce Message” optional, we were criticized.[\*]

**Background**

JASPAR has already shown the differences in the profiles between AUTOSAR and IEEE P802.1DG from the neutral viewpoint and the problems caused by them. (2022 July and November plenary)

Based on the above discussion, we present a concrete amendment to be added to the draft. Moreover, we will also show one of the problems if the differences still need to be resolved.

| Item                     | 802.1AS       | P802.1DG  | AUTOSAR                 |
|--------------------------|---------------|-----------|-------------------------|
| Use of BMCA              | Yes           | Not used  | Not used                |
| Use of Announce message  | Yes           | Yes       | Not used                |
| Use of Signaling message | Yes           | Undefined | Not used                |
| Use of Pdelay message    | Yes           | Yes       | Measurement is optional |
| Sync message format      | 2-Step/1-Step | 2-Step    | 2-Step                  |
| Multiple time domains    | Yes           | Yes       | Yes (non-Std.)          |
| Use of VLAN and priority | Not used      | Undefined | Optional                |

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**The problems cannot be overlooked for OEMs**

While AUTOSAR specification CANNOT use Announce Message, OEMs are urged to select one bridge specification among AUTOSAR or 802.1DG. ⇒ OEMs choose only AUTOSAR if the 802.1DG bridge is not off the shelf.

When profiles of AUTOSAR and 802.1DG are mixed in the same system, the below problem occurs for example. ⇒ OEMs have no choice but to unite into AUTOSAR. (This means 802.1DG will be prohibited.)

Announce Message is not propagated since the AUTOSAR-based Tsync bridge does not support it. Even if 802.1DG makes Announce Message mandatory, it will be ignored by the AUTOSAR-based bridge. The feature which 802.1DG wanted can not be achieved.

Because of the AUTOSAR-based bridge, the 802.1DG compliance slave never receives Announce Message. The behavior after receiving Sync Message without Announce Message in advance is not investigated.

When Sync Message is received, AUTOSAR based Slave will work properly.

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## P802.1ASeb – Optional Use of Announce

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This amendment provides additions and modifications to enable the Announce message functionality to be optional on new implementations, while maintaining the ability for implementations to support backward compatibility, interoperability, and full conformance with IEEE Std 1588™-2019. Protocols, procedures, and managed objects are updated if and as required to reflect the availability and use of Announce. This amendment also includes technical and editorial corrections in the description of existing IEEE Std 802.1AS functionality.

Thanks to Don Pannel,  
“Optional Use of Announce” was allowed.



The optional use of VLAN can also be discussed.

[\*] dg-Nomura-JASPAR-Use-Cases-0314-v05, 06, 07

# Conclusion

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The purpose of this presentation is to make people aware of the existence of the problem.

For OEM engineers, this VLAN issue of gPTP is a **trap**.

I would like to ask for your open-mindedness in helping to solve the problem so that TSN can be used without worries.

AUTOSAR and JASPAR support the harmonization of the specifications. If necessary, we will make an additional presentation in March Plenary.