Proposal of Time Sync Automotive Profile as IEEE 802.1DG Amendment

Japan Automotive Software Platform and Architecture

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[Alphabetical Order]

Congratulations on completing **IEEE 802.1DG !**

Unfortunately, however, the time synchronization profile remains undefined in the 802.1DG standard.

This means that the automotive industry **CANNOT** adopt the 802.1DG standard for actual development.

The importance of TSN is currently on the rise in the automotive industry.

As a result, a standard automotive profile is needed.

Proposal

Especially since multiple units utilize a **time synchronization** system, all units must be designed based on unified implementation specifications.

Therefore, a standard profile that serves as a common language between car manufacturers and parts ones must also include a profile related to time synchronization.

Consequently, **a time synchronization profile is necessary** for the 802.1 DG standard.

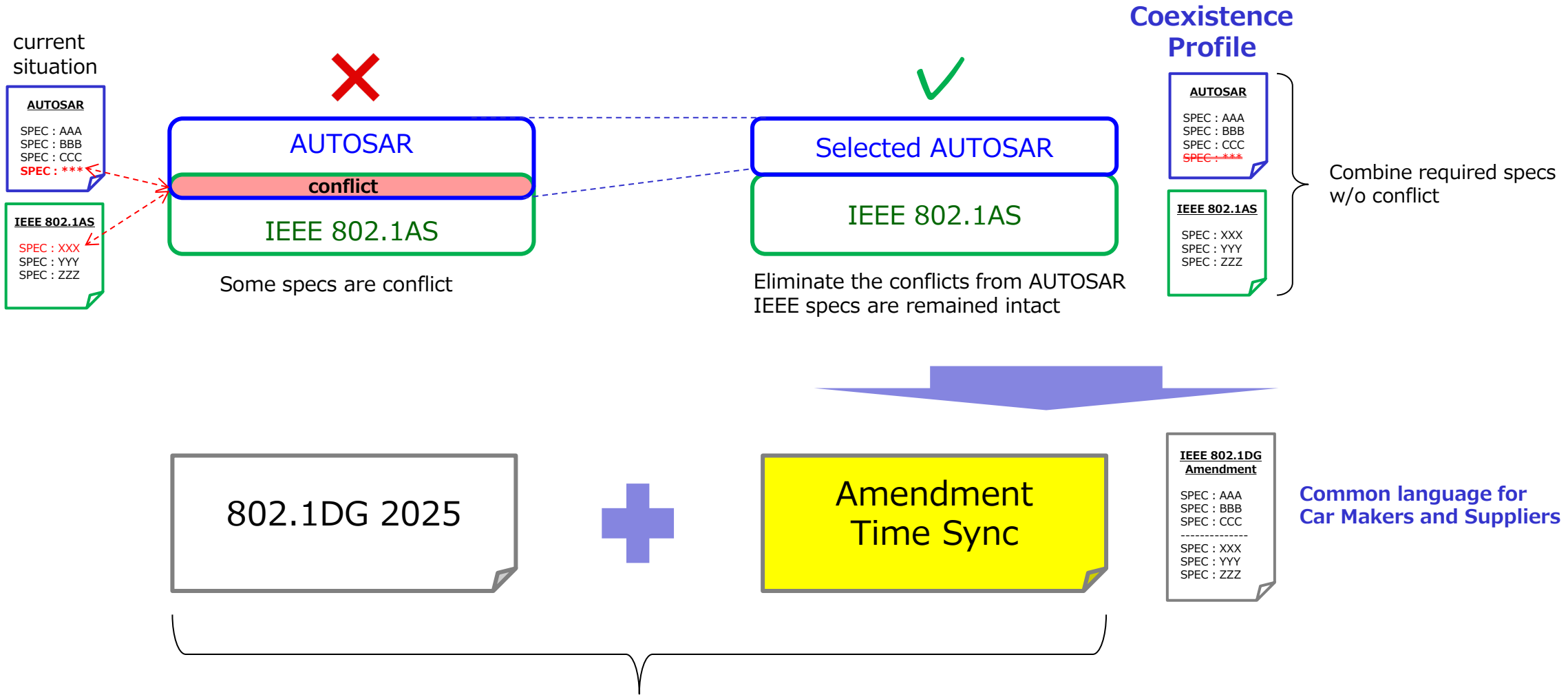
Therefore, the Japanese automotive industry proposes an **amendment to 802.1DG**.

We want to present an overview of the proposal in the form of a PAR.

History to date

2024		
June	**(AOC2024)**	JASPAR raised the issue and reached an agreement with AUTOSAR to lobby the IEEE jointly.
July	**(IEEE 802 Plenary)**	JASPAR had a preliminary discussion with Max Turner, the P802.1DG Editor, to explore whether the differences could be resolved by extending the IEEE specifications.
November	**(IEEE 802 Plenary)**	The AUTOSAR-JASPAR joint proposal was implemented.
2025		
January	**(IEEE 802.1 Interim)**	IEEE explained its view that it would be difficult to extend the specifications.
		After discussing what the ideal situation should be, JASPAR concluded that, since Linux systems, similar to those used by IEEE, were already being used in vehicles, changing the basic IEEE specifications would be a bad move; that is, JASPAR revised its policy.
March	**(IEEE 802 Plenary)**	JASPAR has announced that it will develop a new automotive profile based on IEEE standards, which can coexist with AUTOSAR.
May	**(AOC2025)**	JASPAR proposes collaboration on the creation of the IEEE-AUTOSAR Coexistence Profile, which combines IEEE and appropriate AUTOSAR specifications.
July	**(IEEE 802 Plenary)**	**JASPAR proposes an IEEE and AUTOSAR coexistence automotive profile, intended as an amendment to the IEEE 802.1DG standard.**

The concept of JASPAR Profile



Ideal Profile for Automotive Industry

Type of Project : Amendment to an existing standard

IEEE 802.1DG 2025
IEEE Standard for Local and Metropolitan Area Networks
Time-Sensitive Networking Profile for Automotive In-Vehicle Ethernet Communications

Amendment: Time Sync Profile for Automotive In-Vehicle Ethernet Communications

Expected Date of submission of draft to the IEEE SA for Initial Standards Association Ballot: Nov. 2026
Projected Completion Date for Submittal to RevCom : Nov. 2027

5.2 Scope of proposed standard:

This standard specifies a time synchronization profile for automotive in-vehicle bridged IEEE 802.3 Ethernet networks based on IEEE 802.1 Time-Sensitive Networking (TSN) standards, especially the IEEE 802.1AS standard.

This standard does not address technologies other than time synchronization,
nor does it cover standard modifications or new technologies;
it does not conflict with IEEE 802.3, IEEE 802.11, IEEE 802.15, etc.

5.3 **Is the completion of this standard dependent upon the completion of another standard?** Yes

5.3.1 **Explanation:** This project will utilize the following specifications:
* IEEE 802.1AS-2020 Standard for Local and Metropolitan Area Networks--Timing and Synchronization for Time-Sensitive Applications

* IEEE 802.1DG-2025 Standard for Local and metropolitan area networks
- Time-Sensitive Networking Profile for Automotive In-Vehicle Ethernet Communications

The IEEE 802.1DG-2025 standard does not define a profile for time synchronization; therefore, this amendment will complement it.

The scope of application for this standard is in-vehicle networks (excluding any use outside of in-vehicle networks).

5.4 **Purpose:**

This standard provides a time synchronization profile for designers and implementers of deterministic IEEE 802.3 Ethernet networks that support the entire range of in-vehicle applications that require time synchronization.

PAR format proposal

5.5 Need for the Project:

5.5.1 Problem to be solved:

IEEE 802.1DG 2025 does not define a standard profile for time synchronization; therefore, car manufacturers and parts manufacturers will define implementation specifications based on their own interpretations, resulting in non-interoperable implementation specifications being released on the market. In the worst case, there is a risk that time synchronization will not be established when car manufacturers assemble systems using various parts.

5.5.2 Goals to be achieved:

By defining a standard in-vehicle time synchronization profile, the understanding of implementation specifications between car manufacturers and parts manufacturers will be unique, reducing risks when building systems and improving the reusability of development assets.

5.5.3 Market needs:

The Japanese automotive industry, which is listed as a supporter, requires.

5.5.4 Contribution to IEEE 802.1 strategy:

By expanding the scope of Ethernet applications, strengthening standards in the in-vehicle network area, where Ethernet is currently lagging, and making it an easy-to-use technology, the Ethernet market can be further expanded.

PAR format proposal

6.1 **Intellectual Property:**

6.1.1 **Is the Standards Committee aware of any copyright permissions needed for this project?** No

6.1.2 **Is the Standards Committee aware of possible registration activity related to this project?** No

6.1.3 **Explanation:**

The IEEE 802.1AS standard and additional AUTOSAR specifications achieve in-vehicle time synchronization.
However, when considering an in-vehicle profile, it may be necessary to take into account AUTOSAR's intellectual property.

6.1.4 **Copyright:**

There are liaison relationships between IEEE and AUTOSAR, between IEEE and JASPAR, and between AUTOSAR and JASPAR, respectively. We hope that copyright issues will be resolved based on these liaison relationships.

6.1.5 **Patent:**

Since this is a selection of existing protocol implementation specifications, we believe there will be no infringement of patents.

Conclusions

In the Automotive Industry,
it is becoming increasingly important to master Ethernet TSN.

If there is a Time Synchronization Profile, it will be Extremely Useful.

The Automotive Profile will be created by **JASPAR**.

Please help with the process of making it an **Amendment to IEEE 802.1DG**.

The biggest challenge may be that we need an **Editor** that can act as our avatar.