

ASAM CMP 1.1.0

Release Presentation

Dr. Lars Völker

Technical Fellow, Technica Engineering GmbH

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Introduction

E/E development of vehicles requires accurate data recording, including:

- In-vehicle communication (LIN, CAN, FlexRay, Ethernet)
- Sensor data (Camera, LiDAR, Radar)
- Debug data (DLT, ECU internal)
- Reference sensors

Typical restrictions of actual systems (logger) for data collection

- Low scalability (number and type of Interfaces)
- TIER1-specific interfaces reduces reuse of logger hardware
- Simultaneously use of different TIER1 measurement in system test vehicle
- Centralized system with high impact on bus physics (e.g., signal quality)
- Implement new bus types in existing loggers not possible

Motivation

ASAM CMP 1.1.0 reflects an updated usage and technology landscape:

- Support more use cases besides in-vehicle data acquisition.
- Supporting more in-vehicle technologies.

New features

Transmission support

- ASAM CMP 1.1.0 allows not only the capturing but also transmission of selected in-vehicle technologies (CAN, CAN-FD, LIN, FlexRay, Ethernet, and MIPI CSI-2 D-Phy). This allows usage of ASAM CMP for more use cases.

Support for Raw Ethernet Messages

- ASAM CMP 1.1.0 adds support to capture and transmit Ethernet including preamble and SFD. Also, the capturing and transmission of mPackets is supported. With this, advanced TSN feature like preemption and low-level analysis are enabled.

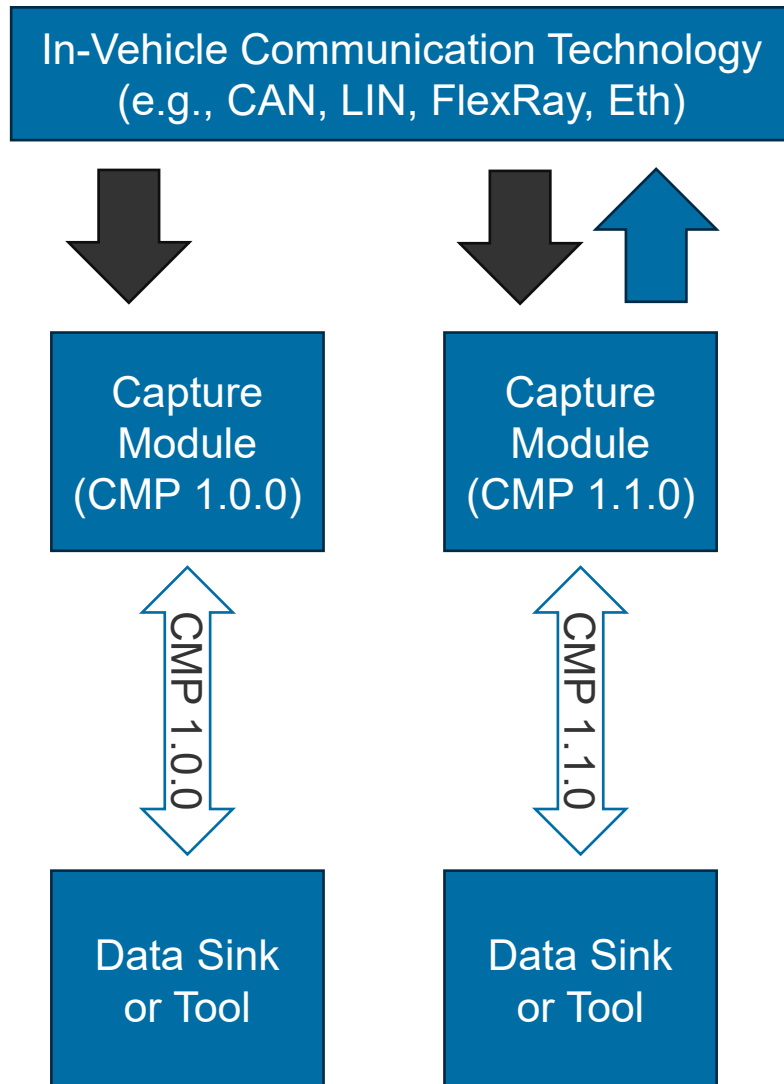
Support for new in-vehicle technology

- Support for 10BASE-T1S Ethernet and A²B™ was added.

Support for Link State messaging

- Link State messaging allows better monitoring and control of interfaces (e.g., for Sleep / Wake).

New features: Transmission Support



Transmission support

- ASAM CMP 1.1.0 allows a Data Sink or Tool to send in-vehicle communication to the Capture Module via ASAM CMP (and Ethernet).
- The Capture Module transmits these message using in-vehicle technologies (CAN, CAN-FD, LIN, FlexRay, Ethernet, and MIPI CSI-2 D-Phy).
- ASAM CMP Transmission benefits:
 - Hardware-in-the-Loop (HiL) testbenches become more flexible and scalable with Ethernet scaling.
 - Component development and testing becomes more flexible as Capture Modules do not need to be directly connected to a notebook or PC.
 - In-vehicle data acquisition can be enhanced with more detailed interaction with ECUs in vehicles (e.g., for debug messages, etc.).

Other changes

Timestamping locations

- A more precise description of timestamping locations of different technologies was added. This serves as guidance for developers and users of ASAM CMP.

PTPv2 profile

- ASAM CMP 1.1.0 adds optional support for a PTPv2 profile as an alternative to the gPTP profile of ASAM CMP 1.0.0.
- This improves interoperability with legacy measurement equipment.

Backward compatibility

ASAM CMP 1.1.0 is backwards compatible to ASAM CMP 1.0.0

A Capture Module based on ASAM CMP 1.1.0 can support newer Data Message Payload Types which are ignored by older Data Sinks and tools. If a tool based on ASAM CMP 1.1.0 wants to use a Capture Module based on ASAM CMP 1.0.0, it can detect the supported ASAM CMP standard and features via the REST Configuration Interface.

Recommendation

As ASAM CMP 1.0.0 and ASAM CMP 1.1.0 devices can be used in combination, existing ASAM CMP 1.0.0 Capture Modules can be still used without an update. However, it is recommended to update to ASAM CMP 1.1.0 to allow adding transmission. For new developments ASAM CMP 1.1.0 should be used.

Data Sinks and Tools are recommended to update to ASAM CMP 1.1.0 to support newer features and technologies.

Relation to other standards

MIPI Alliance, Inc.; Specification for Camera Serial Interface 2 (CSI-2), Version 4.0

- MIPI CSI-2 is the intellectual property of the MIPI Alliance, Inc.
- The access to the MIPI CSI-2 specification or an implementation requires a MIPI membership.

Referenced IEEE Standards

- IEEE 802.3, Ethernet
- IEEE 802.1AS, Timing and Synchronization for Time-Sensitive Applications (gPTP)
- IEEE 1588-2008, Precision Clock Synchronization Protocol for Networked Measurement and Control Systems (PTP)

Referenced IETF Standards

- Domain Names (RFC 1035), DHCP (RFC 2131), IPv4 Link-Local-Address (RFC 3927), mDNS (RFC 6762), DNS-SD (RFC 6763), HTTP/1.1 (RFC 7231), IPv6 (RFC 8200), JSON (RFC 8259)

Referenced ISO Standards

- CAN Data link layer and physical coding sublayer (11898-1:2024), LIN Protocol specification (17981-3:2025)

ASAM MCD-1 XCP

CiA 603 CAN Frame time-stamping

Deliverables

Documents

- ASAM-CMP_Capture-Module-Protocol_BS_Protocol-Layer-Specification_V1-1-0.pdf

Supplementary Files

- Sample Files in PCAPNG format