DLT Protocol Update Proposal
Outline

• Introduction
• Maintainer Change
• DLT on Non Linux Platforms
• DLT Protocol
• Summary
Introduction

• Advanced Driver Information Technology (ADIT)
  - Joint Venture between BOSCH and DENSO
  - Platform development for In-Vehicle Infotainment Systems

• Saya Sugiura
  - Joined ADIT in 2017
  - Working on development of Debug and Monitoring tools to be used in IVI systems
    - Includes DLT development
    - Maintainer of GENIVI dlt-daemon since March 2019
Maintainer Change

• ADIT maintains GENIVI dlt-daemon from 2015
  - We will continue to maintain!

• Contact person
  - Saya Sugiura (ssugiura@jp.adit-jv.com)
  - Quynh Le Hoang Ngoc (Quynh.LeHoangNgoc@vn.bosch.com)
DLT on Non Linux Platforms

• How to run DLT on Non Linux Platforms and how to fulfill various use cases?

- POSIX compliance
- DLT Protocol Update
- Other improvements

ADIT is taking a role to drive these activities!
POSIX Compliance

• Done in 2.18 and 2.18.1 version
• Remove Linux specific design and implementation
  - IPC between DLT user application and DLT Daemon
    - Both FIFO (default) and Unix socket are supported for Linux Platform
    - Unix socket is supported for Non Linux Platforms
  - How to switch IPC? – Change by cmake option: DLT_IPC
  - System calls
    - Follow POSIX.1-2017
      - e.g. epoll to poll, hash table to list, etc.
    - Others
      - DLT API usage in forked process etc.
DLT Protocol Update

- GENIVI DLT is based on the protocol in AUTOSAR standard 4.0
- There are several opinions about the current protocol
Drawback of Current Protocol

Vendor A  
**System Monitor**

Vendor B  
**System Manager**

ECU  
- **SYSM**
- **SYSM**
- **DLT Daemon**

4 bytes limitation  

**CLASH!**
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• Limitation of Application and Context Identifiers
  - Sometimes name clashes
  - It could be confusing if the IDs from different ECUs are the same
  - Solutions
    - Extend the upper limitation
      - Provides the possibility to specify prefixes for ID within standardized components
      - Breaks backward compatibility, increases the payload
    - 4 bytes as identifier numbers
      - Send another log message to map the application and context names, or add new control message
      - Able to recover the name, reserve specific range
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- Control messages
  - New control messages should be added
  - e.g. Set all log level, set all trace status, offline logstorage, passive node connect, etc.

- Timestamp mechanism
  - Is current mechanism suitable where several ECUs are integrated?

- Bit and byte order
  - Byte order can be mixed within a single message
  - Bit order sometimes gets reversed in a single byte
Technical Consideration Points

- Backwards compatibility
  - Components with different protocol version should be able to interoperate
  - Use cases must be described and collected
  - Need to determine all compatibility between DLT library, daemon, and client

- Security
  - Is there any demand?
    - Encrypting log messages
    - Cryptographically authenticating senders of log messages

- Safety
  - Is there any demand?
    - Logging from ASIL certified component
Other Improvements

• Several proposal from AUTOSAR
  - Standardized log level
    - Already defined in documentation in GENIVI, but not part of AUTOSAR specification
  - Network bandwidth and load balancing
    - Add possibility to adjust upper limit of bandwidth while running – Is there any request from GENIVI?
  - Initial log level
    - Specify/recommend an initial (boot time) log level
Summary

- There are some drawbacks within current protocol specification which hinder a broader usage
- To introduce new protocol, we have some technical points we should consider
- Next steps
  - May 2019: Collect feedback
  - Jun 2019: Final agreement on the improvement proposal
  - Nov 2019: AUTOSAR specification updated
  - Mar 2020: GENIVI implementation finalized

Requests are welcome!
Thank you!

Visit GENIVI:
http://www.genivi.org
http://projects.genivi.org

Contact us:
help@genivi.org