April 2015

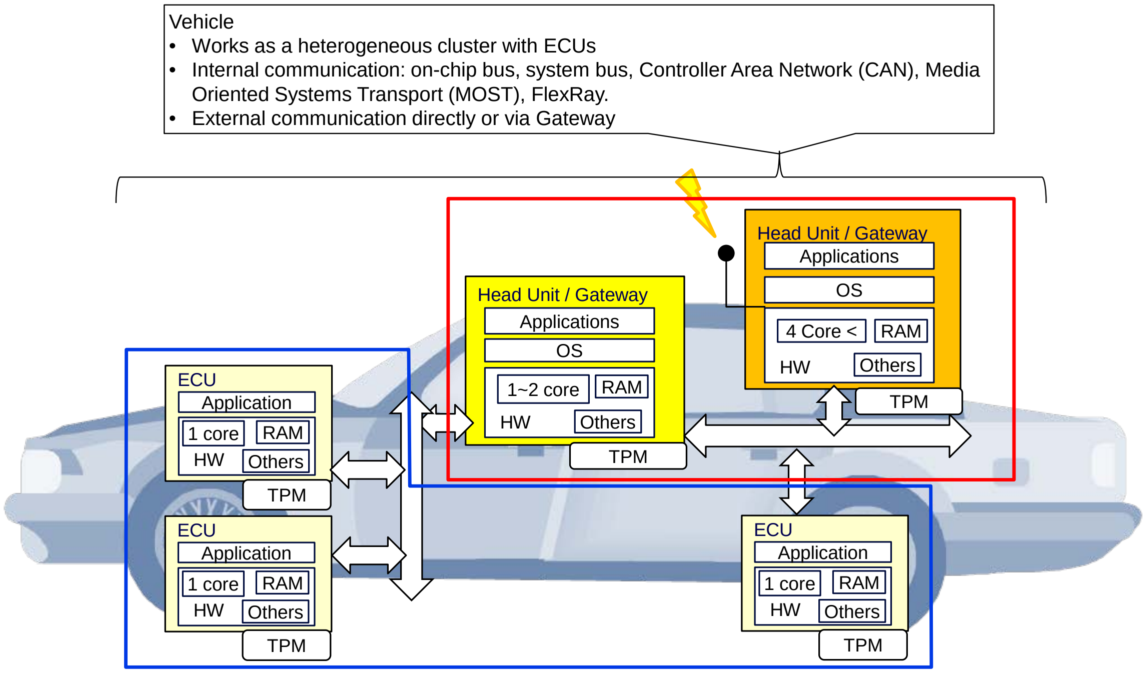
# Securing Auto Data
# A Demonstration of a Secure Remote Firmware Update with a Trust Platform Module (TPM) for the Vehicle ECU

This demonstration will show a secure remote firmware update for an ECU in a car using the Trusted Platform Module (TPM) for a secure hardware root of trust. This demo shows key concepts of the recently published TCG TPM 2.0 Automotive Thin Profile (http://www.trustedcomputinggroup.org/resources/tcg_tpm_20_library_profile_for_automotivethin).

The secure update is implemented using the following steps:

1. Accurate remote determination of in-vehicle software and hardware configuration and integrity (via measurements performed using the TPM, securely attested by the TPM itself and verifiable by third parties, and transferred by TCG Trusted Network Connect (TNC) protocols)
2. Verification and logging of successful completion of intended software updates (via measurements performed using the TPM, securely attested by the TPM itself and verifiable by third parties, and transferred by TNC protocols)
3. Secure long-term storage of audit logs (created by the TPM itself) of the related update operations and TPM measurement operations (transferred by TNC protocols or secure system logging channels to network accessible self-encrypting drives (SEDs) or other high-reliability storage)

The figure below shows the concept of message flow for each component (head unit/gateway or ECU) for remote maintenance



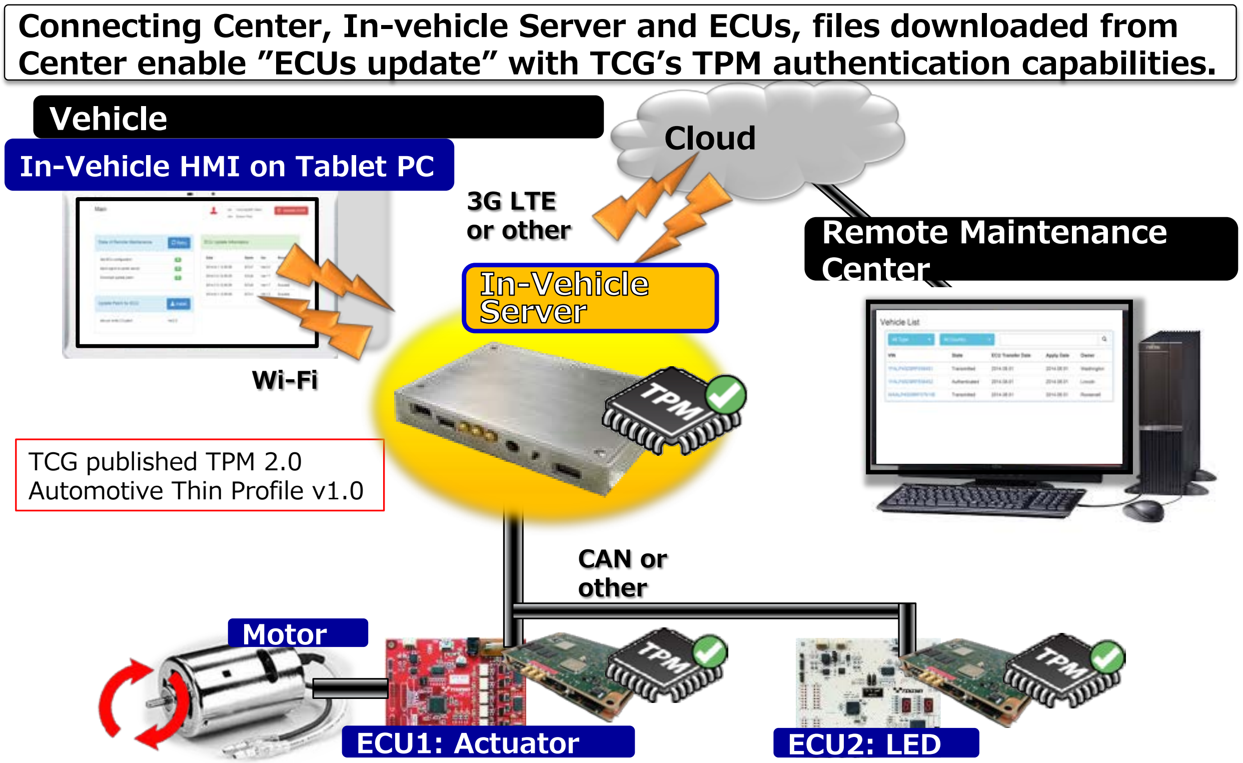
Vehicle
- Works as a heterogeneous cluster with ECUs
- Internal communication: on-chip bus, system bus, Controller Area Network (CAN), Media Oriented Systems Transport (MOST), FlexRay.
- External communication directly or via Gateway

April 2015

The demo system includes:

- A notebook computer representing the remote maintenance center
- Representation of a vehicle that requires remote update of firmware
- Several connected communications modules

The figure below shows the demo system diagram.  The demo flow/procedure follows the three steps described above.



**Connecting Center, In-vehicle Server and ECUs, files downloaded from Center enable "ECUs update" with TCG's TPM authentication capabilities.**

For more information, go to:

http://www.trustedcomputinggroup.org/resources/tcg_tpm_20_library_profile_for_automotivethin