

SECURE FIRMWARE OVER-THE-AIR UPDATES GATEWAY BASED ON S32G2 PROCESSORS

S32G2 Safe and Secure Vehicle Network Processor

OVERVIEW

The Firmware Over-The-Air updates (FOTA) application allows firmware of ECUs on vehicle to be updated in the background. FOTA gateway is physically connected with on-vehicle networking and has ability to communicate with ECUs that are capable of FOTA updating; and it is typically the controller that performs firmware updating management for the whole vehicle.

A typical FOTA system consists of three components:

- FOTA server: responsible for the management of vehicle software release, and optionally to customize updates for every vehicle client based on OEM policies.
- FOTA client: application responsible for communication with a backend server and updating campaign management for all other ECUs on vehicle.
- FOTA agent: application that performs final updating of firmware for ECUs during run-time.

FOTA client is typically running on FOTA gateway. FOTA agent is also optional to run on FOTA gateway in order to support self-updating.

FEATURES

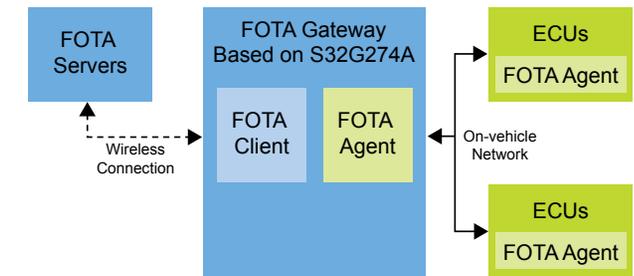
- FOTA gateway is the updating agency for all ECUs on the vehicle
- Together with FOTA server to achieve customized firmware updating
- Adopt Uptane standard to leverage security of FOTA system
- Support end-to-end security for gateway and ECU firmware updating
- Utilize "full verification" in Uptane standard to protect FOTA for all other ECUs
- Secure key management

- Utilize S32G2 hardware security engine HSE to leverage system security
- System separation and isolated for applications of FOTA client and FOTA agent
- Use UDS as protocol of on-vehicle networking
- A/B update
- Secure boot

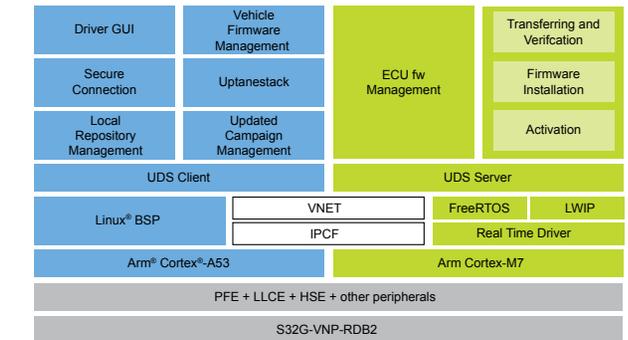
ENABLEMENT TOOLS

- S32 Design Studio for S32 platform processors with configuration tools
- S32 debugger probe enables debugging and trace for S32G2
- Real Time Drivers combining functionalities of SDK and MCAL as single software product for single S32 families
- Linux BSP software for Arm® Cortex®-A53 cores
- HSE firmware enables hardware security module integrated with S32G2
- FreeRTOS the real-time OS for Arm Cortex-M7 cores

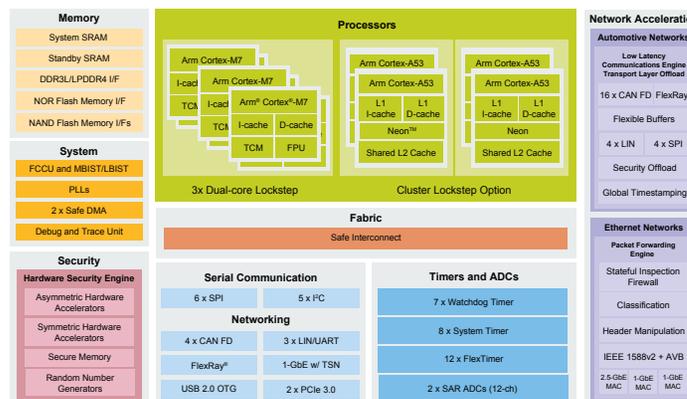
SYSTEM BLOCK DIAGRAM



APPLICATION BLOCK DIAGRAM



S32G2 BLOCK DIAGRAM (S32G274A)



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