Global and China Automotive Gateway Industry Report, 2019-2020

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STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

Abstract

Automotive Gateway Industry Research: Tenfold Improvement in Gateway Performance Breaks the Bottleneck of Software-defined Vehicles.

Automotive gateway chip is actually a field with scarcely ever changes in a long period of time, but since 2020, many chip vendors have rolled out new solutions for automotive gateways.

In early 2020, NXP Semiconductors unveiled its new S32G vehicle gateway processor which plays a key part in service-oriented gateways and helps OEMs be the data-driven service providers with expanded business opportunities.

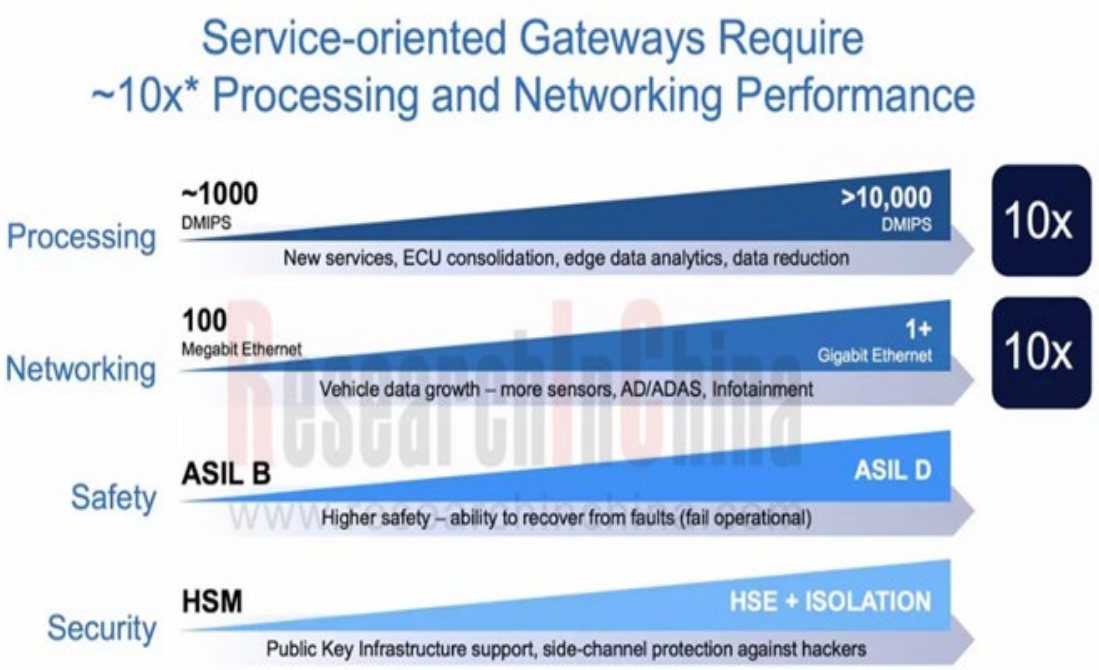
In January 2020, Texas Instruments (TI) introduced the new Jacinto? 7 processor platform on which DRA829V processor is available for gateway systems.

In March 2020, ST released the modular Smart-Gateway Platform (SGP) built on gigabit Ethernet communication between the secure and ASIL-B Telemaco3P microprocessor (MPU) and the ASIL-D SPC58/Chorus microcontroller (MCU) to provide a valuable development tool for prototyping automotive Smart-Gateway and Domain-Controller applications.

Parameter Comparison of Five Smart Gateway Chips

	Infineon	NXP	NXP	ST	TI
Chip	AURIX 2G	MPC5748G	S32G	SGP	DRA829V
Launch	End of 2018	2017	2020	2020	2020
Features	SOTA supported	Power PC Architecture	MCU and MPU integrated	Telemaco3P MPU and SPC58 (MCU) integrated	
Processor Core	300MHz, 4 lockstep cores	Two 160 MHz e200z4 cores and an 80 MHz e200z2 core	3 pairs of Cortex-M7 cores; four Cortex-A53 cores	MCU: up to 200 MHz; MPU based on the dual-core Cortex-A7 processor: 600 MHz	Dual 64-bit Cortex-A72MCU, 2.0 GHz, 24K DMIPS;Four 1.0 GHz Cortex-R5FMCU, 1.0 GHz, 8K DMIPS
Storage	16MB Flash	6 MB embedded non-volatile flash memory and 768 KB embedded SRAM		10 MB embedded flash memory, 1.28 MB embedded RAM	2MB on-chip L3 RAM, 512KB on-chip SRAM in the MAIN domain
Ethernet Interface		Max. 2X10/100 Mbps	4 Gigabit Ethernet interfaces	100BASE-T1 (5x), 1000BASE-T1 (1x)	Ethernet switch (a total of 8 external interfaces)
Other Interfaces		8 CAN interfaces, CAN FD supported	20 CAN interfaces; two PCIe3.0 interfaces	FlexRay (1x), LIN(1x), LIN CMOS(5x), CAN FD(4x), CAN FDCMOS (6x)	Four PCIe 3.0 interfaces; two USB 3.0 interfaces
Information Security	The embedded Hardware Security Module (HSM) meets the highest EVITA requirements	Embedded Hardware Security Module (HSM). HSM users can write encryption algorithms themselves. HSE has a 32-bit processor, and independent Flash / RAM. EVITA standards supported	High-performance hardware security acceleration, Public Key Infrastructure (PKI) support for trusted key management	Firewall, predictive maintenance, Firmware Over-The-Air (FOTA)	Programmable root key for customers; embedded hardware security modules
Functional Safety	ASIL-D	ASIL-B	ASIL-D	MPU: ASIL-B; MCU: ASIL-D	ASIL-D
Hardware Acceleration Unit	AMU: Support matrix operations, machine learning algorithms, signal processing and conditioning (FFT)		Network communication accelerators integrated		Crypto hardware accelerators – PKA with ECC, AES, SHA, RNG, DES and 3DES

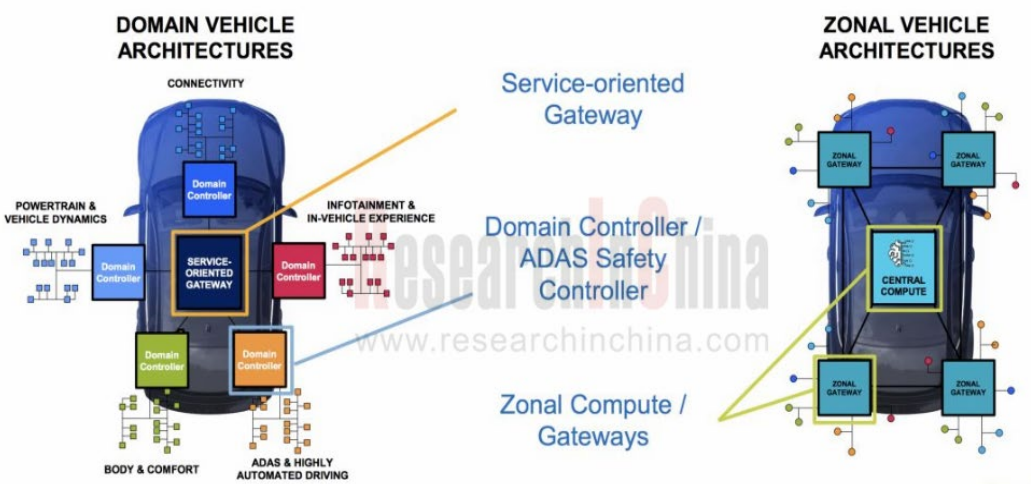
NXP believes that a gateway is a central hub that securely and reliably interconnects and processes data across heterogeneous vehicle networks. It provides physical isolation and protocol translation to route data between functional domains (powertrain, chassis and safety, body control, infotainment, telematics, ADAS) that share data to enable new features. The hardware-centric model of traditional gateways are turning to be a software-based and service-oriented model to support over-the-air (OTA) updates and vehicle analytics with secure communications to OEM servers (cloud), allowing to make adjustments according to the user's preferences, apply safety updates, address warranty and repair problems, address security vulnerabilities, and enable new features that improve the user experience.



Source: NXP

Service-oriented gateways enriches functionality of traditional gateways, getting data processing and network transmission improved by at least ten times, offering new services, integrating ECUs to be responsive to vehicle data surge. Software-defined cars, already a consensus of the industry, require changes in the automotive system architecture, SOA (service-oriented architecture), powerful gateways and domain controllers. To follow this trend, chip giants have launched smart gateways ten times better than previous products.

According to YummyCookiePuff, a WeChat public account, the chips with enhanced capabilities and access to vehicle data make gateway controllers ideal as automotive data servers. In the vehicle design of the domain-based architecture, different domain controllers register services, discover services and use services from gateways. Domain controllers and service-oriented gateways constitute a distributed system inside the vehicle. Automotive data servers with data and computing power are no longer simple route forwarders, not only providing public data storage and sharing services for vehicles but generating new data (such as cross-domain fusion data) from data processing to serve each domain upon demand. Part of telematics data services originally done over the cloud can also be deployed in vehicles, delivering real-time services for automotive HMI and autonomous driving. The design driven by signals and control is being replaced by the data- and service-driven modern vehicle E/E architecture design.



Smart gateways exist in many forms: stand alone, integrated with T-BOX, integrated with domain controllers, etc. Now, a dozen vendors offer stand-alone gateways.

Gateways needs developing in harness with software integrated such as network security and OTA. Powerful Tier1 suppliers address software problems by independent R&D and acquisitions, for instance, Continental offers cyber security solutions from Argus and Elektrobit for all connected vehicle electronics (Argus is part of Continental's subsidiary Elektrobit). However, less competitive Tier1 suppliers team up with third-party cybersecurity companies. Given the importance of gateways, some automakers work directly with software providers, e.g., GAC Motor partners with Tata Elxsi to develop smart gateway modules.

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