Get to Know the S32G Vehicle Network Processor

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NXP

SECURE CONNECTIONS FOR A SMARTER WORLD

NXP Introduced the S32 Family of Processors

Performance

Optimized for functional domains

Real-time and high-performance

Scalable

Processors

Arm® cores across portfolio

Arm Cortex® -A, -R, and -M cores

Safe

ASIL D Functional Safety

Process certified to ISO 26262:2018

Secure

Powerful hardware security engine (HSE)

Firmware-upgradable public key encryption

OTA Updates

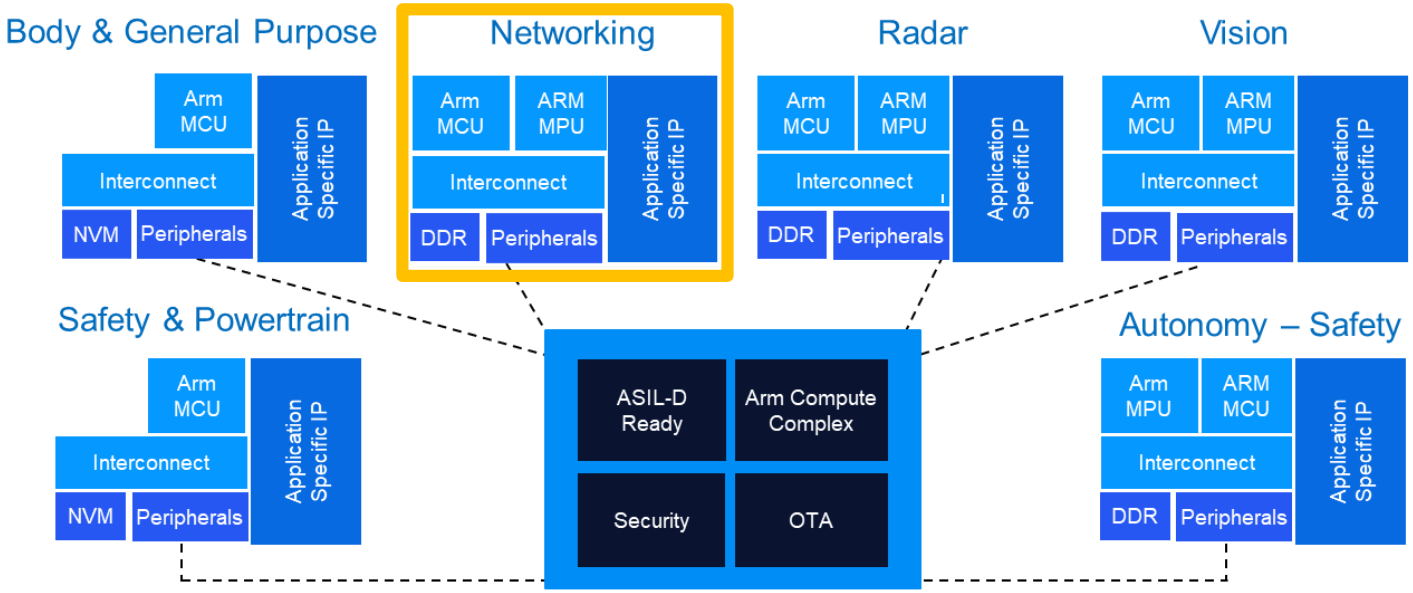
OTA updates while driving

Fault recovery rollbacks

SW Reuse

Maximizes software re-use within and across application domains

Cost savings for customers



The World's First Fully Scalable Safe Auto Compute Platform

Introducing the S32G

Vehicle Network Processor optimized for gateway, domain controller and safety controller applications

S32G introduces network acceleration to automotive with new levels of functional safety and security

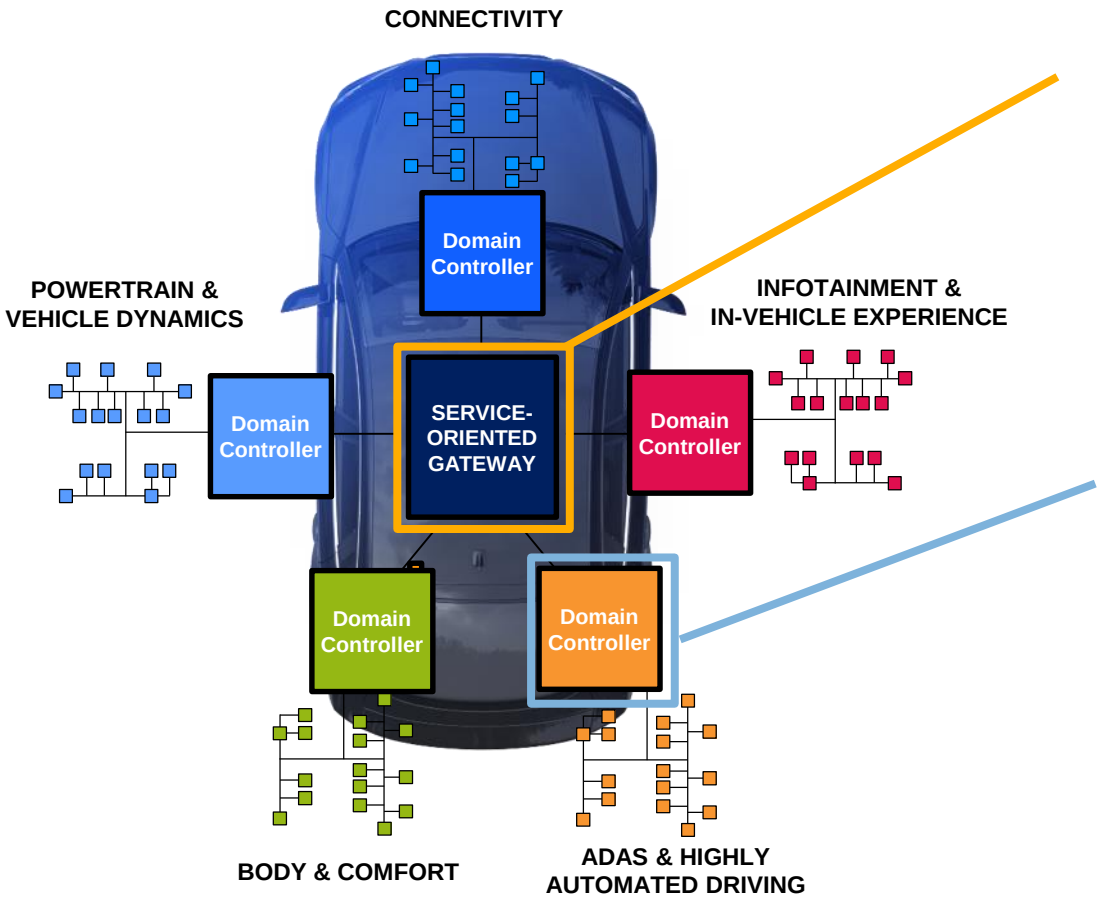
Enables new service-oriented gateways to rapidly deploy new services and support over-the-air (OTA) upgradeable vehicles

High level of compute with legacy automotive and Ethernet network interfaces ideal for domain controllers

High-level of ASIL D processing for AD/ADAS safety controllers

The Versatile Uses of the S32G Vehicle Network Processor

DOMAIN VEHICLE ARCHITECTURES

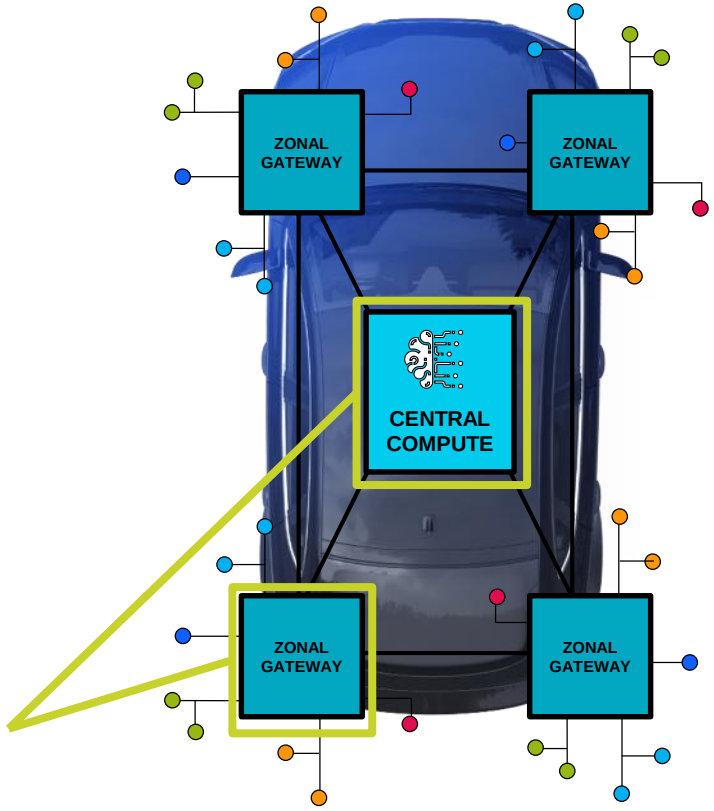


Service-oriented Gateway

Domain Controller / ADAS Safety Controller

Zonal Compute / Gateways

ZONAL VEHICLE ARCHITECTURES



S32G is a New Type of Automotive Processor: **V**ehicle **N**etwork **P**rocessor

SAMPLING NOW

Processing

Lockstep Microcontrollers

Cluster Lockstep Microprocessors

Automotive Networks Acceleration

Ethernet Packet Acceleration

Networking

20 x CAN/CAN FD Interfaces

LIN and FlexRay™ Interfaces

4 x Gigabit Ethernet Interfaces

PCI Express Gen 3 Interfaces

Safety & Security

ASIL D Functional Safety Support

Advanced Hardware Security Engine

Applications

Service-oriented Gateway

Domain Controller

ADAS/AD Safety Controller

S32G: Bringing Together Automotive and Enterprise Worlds to Enable Disruptive Opportunities

Technology Convergence

Automotive Networking →

- CAN/LIN/FlexRay Interfaces — Gigabit Ethernet / Network Acceleration
- Real-time Processing — Applications/Services
- CAN Gateway — Ethernet Routing / Firewalling

← **Enterprise Networking**

Edge-to-Cloud Processing

Automotive Sensors ↔ Service-oriented Gateway (Edge Processing)  ↔ ☁

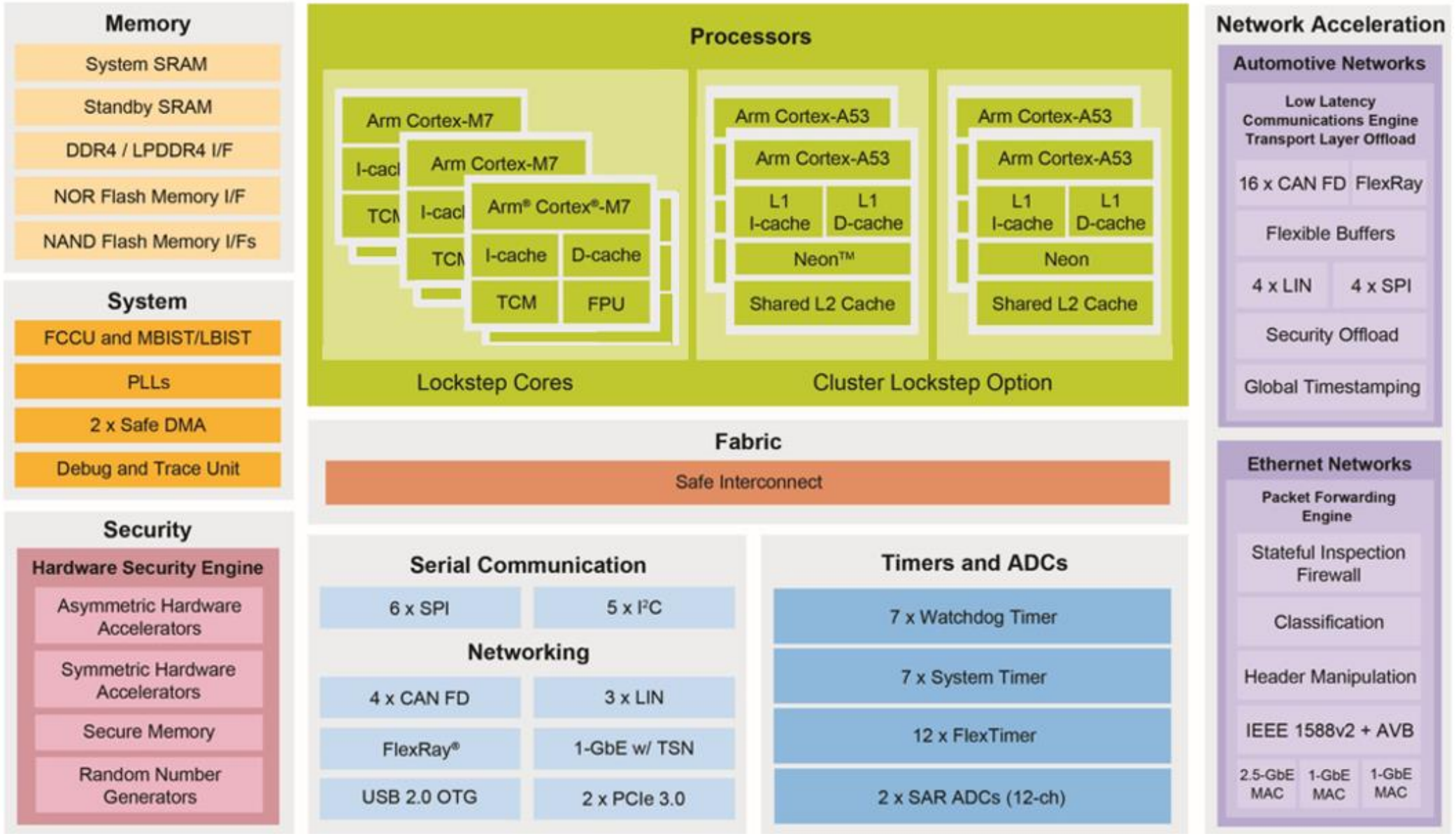
New Opportunities

- Vehicle Health
- Usage-Based Insurance
- Over-the-Air Upgradeable Vehicles
- Other Monetization Opportunities

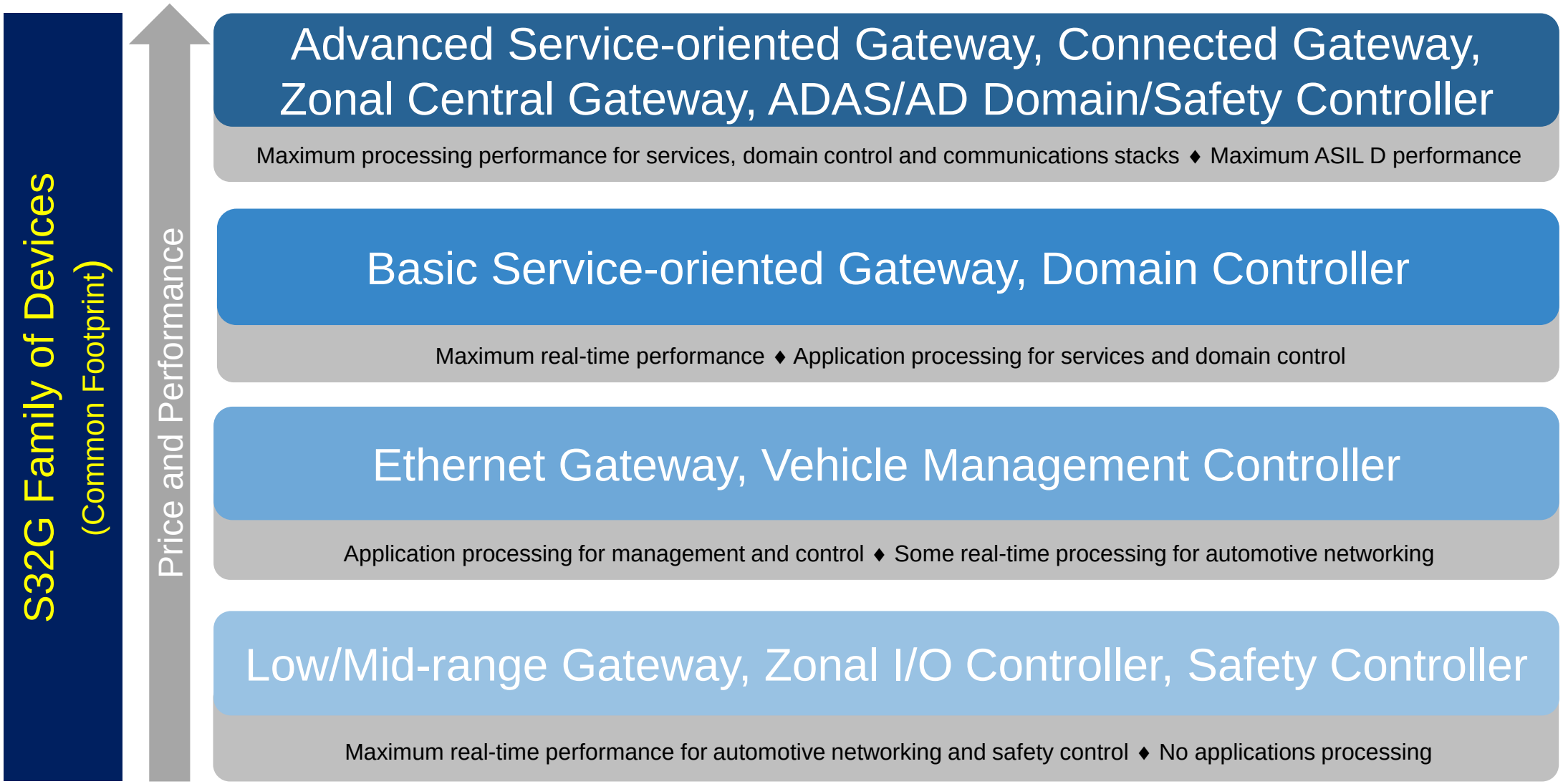
S32G is Optimized for Target Applications

Capability	Gateway	Domain Controller	AD/ADAS Safety Controller
Microcontrollers for real-time processing	✓	✓	✓
Microprocessors for applications and services	✓	✓	✓
Embedded hardware security for trusted boot and services	✓	✓	✓
Low-latency, deterministic CAN network acceleration	✓	✓	✓
Ethernet network acceleration for routing and firewalling	✓	✓	✓
PCI Express interfaces for co-processors and storage	✓	✓	✓
ISO 26262:2018 ASIL D support for functional safety	Optional	Optional	✓
ASIL D applications processing on Cortex-A cores	Optional	Optional	✓

S32G274A Vehicle Network Processor High-level Block Diagram

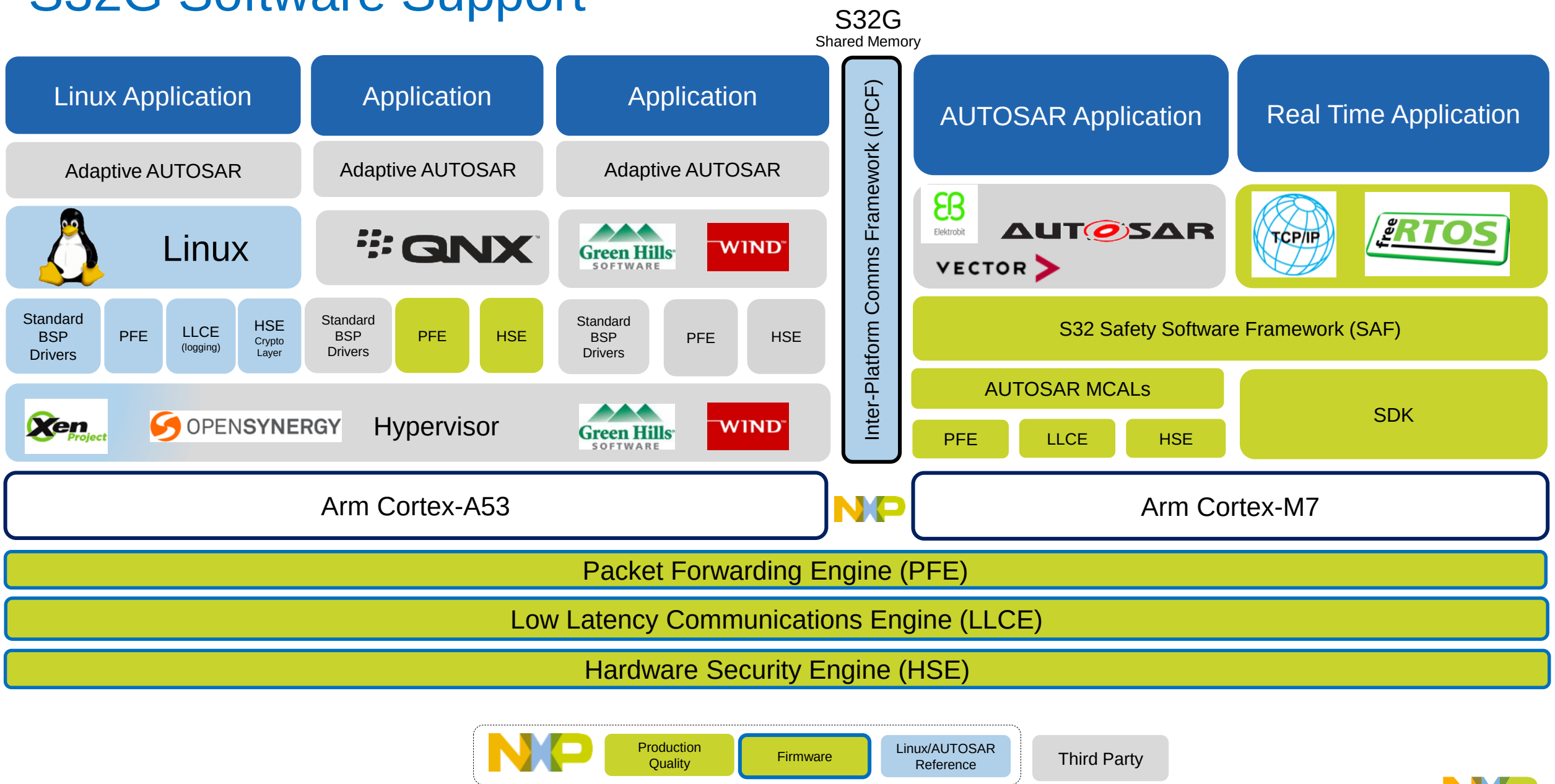


S32G Scalable Family Applications*



*These applications are only for guidance and can vary based on customer requirements.

S32G Software Support



Current S32G Ecosystem Partners*

Cortex-A53 Operating Systems

Green Hills SOFTWARE

Linux

QNX

WIND

Hypervisor / Virtualization

Green Hills SOFTWARE

OPENSYNERGY

WIND

Xen

Debuggers / Probes

Green Hills SOFTWARE

iSYSTEM

LAUTERBACH DEVELOPMENT TOOLS

Data Analytics

CLOUDERA

Data Reduction

SAFERIDE TECHNOLOGIES

TERAKI

Cloud and OTA Services

Airbiquity

CLOUDERA

Cortex-M7 Operating Systems

freeRTOS

Hardware Platforms

MicroSys

Compilers

Green Hills SOFTWARE

IAR SYSTEMS

WIND

Security / IDPS Anomaly Detection

ARGUS CYBER SECURITY

SAFERIDE TECHNOLOGIES

Virtual Prototyping

SYNOPSYS®

Classic AUTOSAR

VECTOR

Adaptive AUTOSAR

WIND

Others

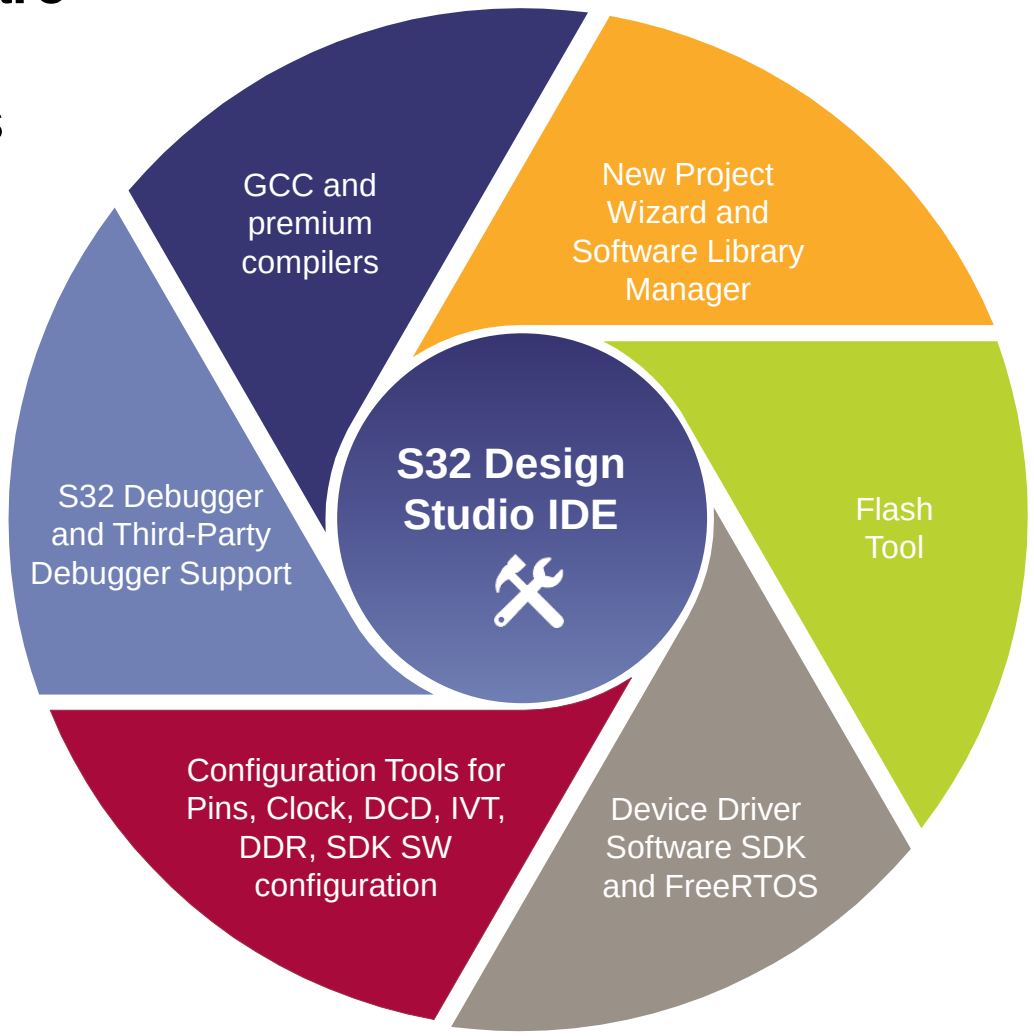
To Be Announced

* NOTE: S32G ecosystem partner list as of 3/4/2020. Check with partners for support details. Contact NXP Sales for future updates.

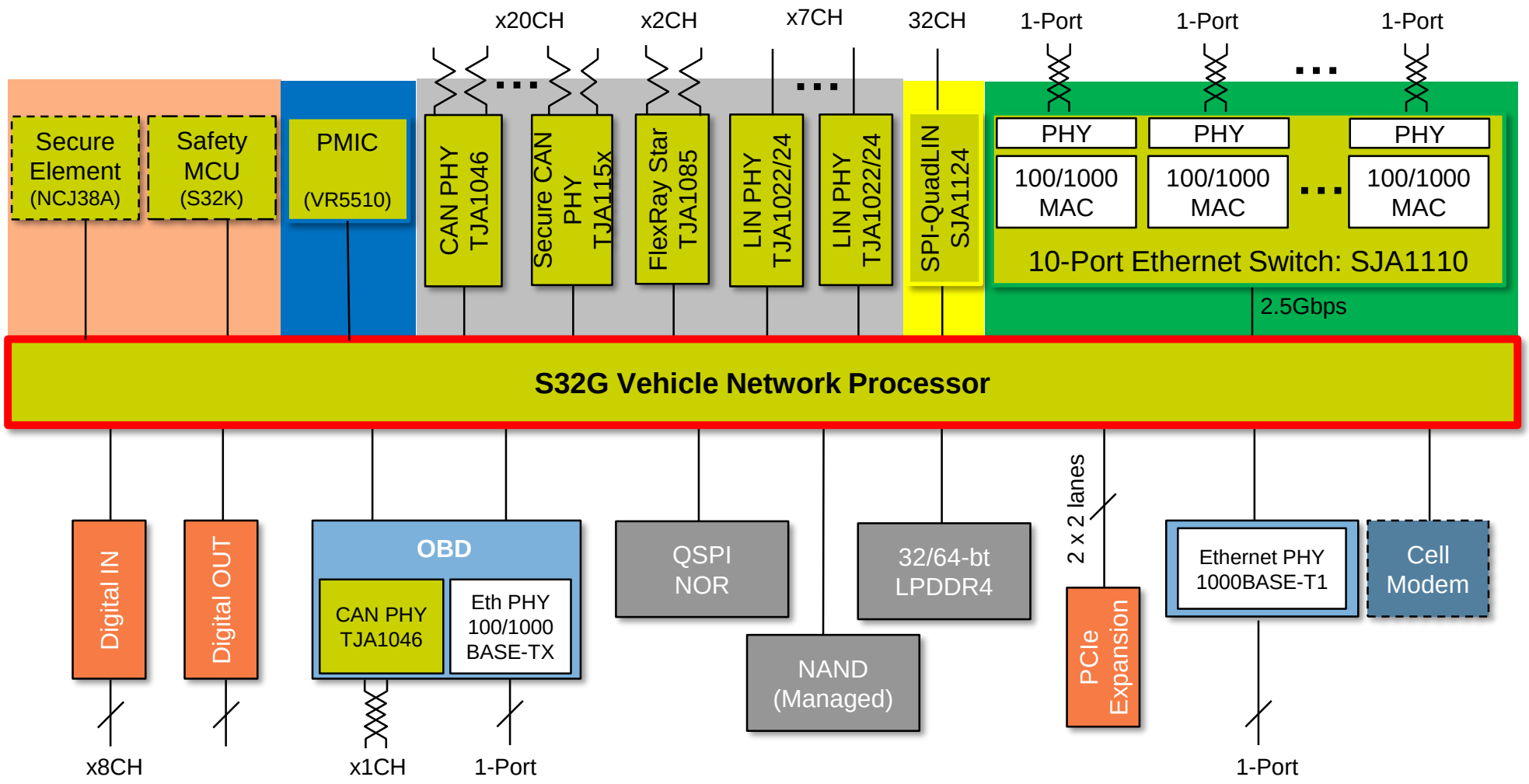
S32 Design Studio Software Development Environment

One integrated environment with tools and software

- GCC and premium industry compilers for all Arm® cores
- NXP S32 Debugger and 3rd party debugger support
- S32 Configuration Tools:
  - Pins, Clocks, DDR, DCD, IVT, Peripheral, SW Config
- New Project Wizard
- Software Library Manager
- Flash Tool
- Platform software SDKs
  - S32 SDK, Drivers, Initialization Functions
  - FreeRTOS
- Operating system development support
  - Linux/FreeRTOS



NXP S32G System Solution



NXP Devices

VR5510 ASIL D PMIC
- 60V direct connect
- All system supplies
- ASIL D Functional Safety

SJA1110 Ethernet Switch
- Highest connectivity
- 2.5Gb/s Interfaces
- Integrated Security

S32G Highly-Integrated Solution
- Real-time MCU
- High-performance MPU
- HW offload for Ethernet & Auto Communications
- Integrated Security Engine

SJA1124 SPI-QuadLIN
- Integrated MACs + PHYs
- Reduced MCU Pins

NXP PHY Portfolio
- CAN, LIN, FlexRay

Broader NXP Portfolio
- Secure Element, MCU

Key Benefits of NXP S32G System Solution

BOM Optimization

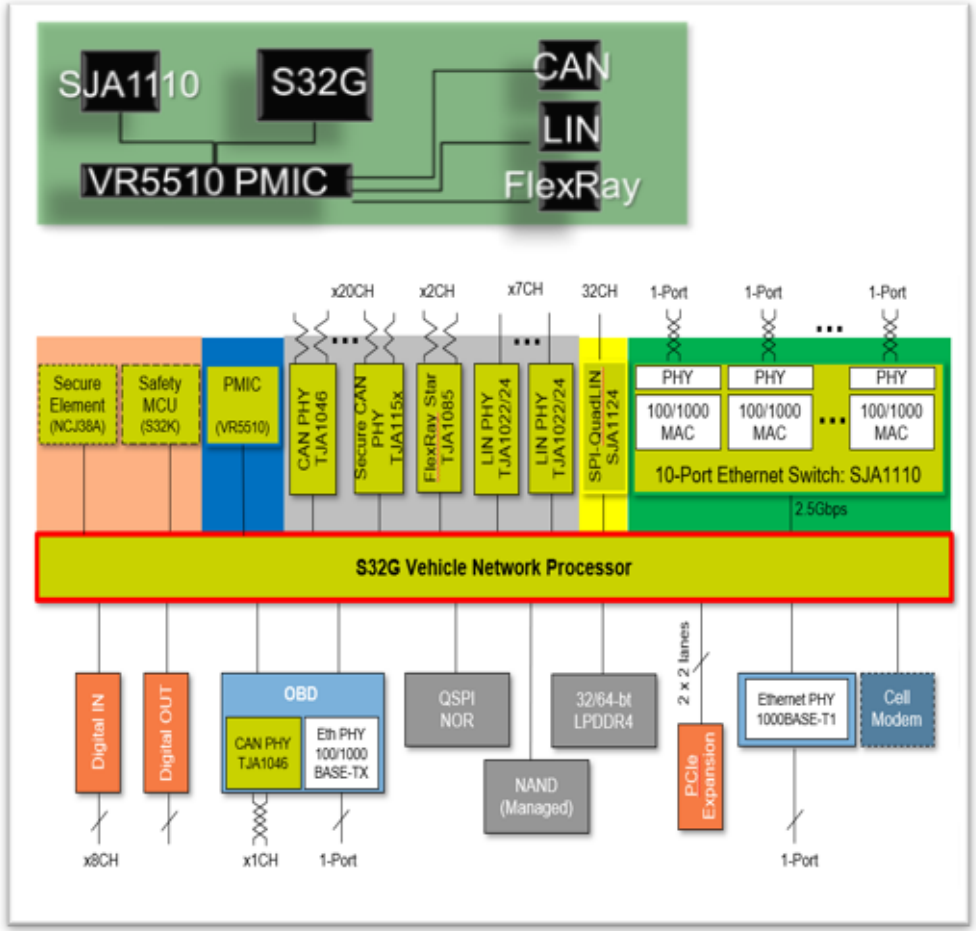
- Reduced BOM via common PMIC for S32G, switch, transceivers, DDR
- Optimal PCB layout via optimized pin alignment
- Optimal Ethernet BOM with HW/SW-compatible switch variants
- Integrated Ethernet PHYs lowers cost and reduces design effort

Differentiating Capabilities

- High-speed 2.5Gbps SGMII link between Ethernet switch and S32G
- Strong, layered security partitioning between Ethernet switch and S32G
- Strong functional safety support across S32G/Ethernet Switch/PMIC
- Integrated ASIL D support with VR5510 power management (PMIC)

Faster Time to Market

- Common reference design hardware platform with design information
- Common software tools and drivers
- Common AVB/gPTP software for important redundancy capabilities
- Common NXP support



Multiple S32G Hardware Platforms*

Lab / Desktop

NXP
S32G-VNP-EVB

S32G Evaluation Board

Available Now

Lab/Desktop

NXP
S32G-VNP-RDB

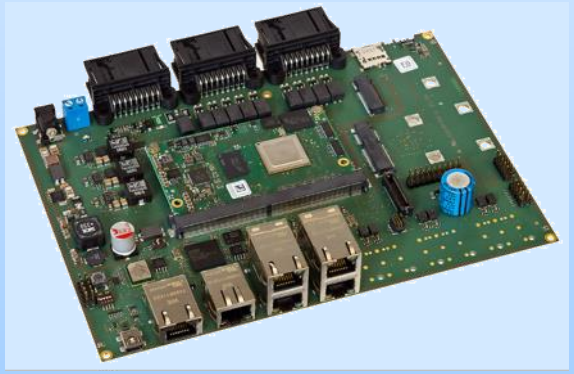
S32G Reference Design Board

Early Access Now, Broader Availability June'20

In-Vehicle

Embedded

MicroSys miriac™
SBC-S32G274A



S32G Single Board Computer + SoM

Available 2Q'20

* NOTE: Hardware platform delivery requires NXP marketing approval at this time.

- ✓ S32G Reference Design Board (RDB)
- ✓ Software Enablement
- ✓ Demonstrations

Carmakers	Application Developers	Cloud & Service Providers
Proof of concept	Innovation platform	Symbiotic compute
Benchmarking	Software development	Over-the-Air (OTA) updates
Vehicle data insights	Test and validation	Machine learning deployment
New services deployment	Demo showcase	Edge service deployment

Accelerating Transformation Across the Automotive Ecosystem

Summary

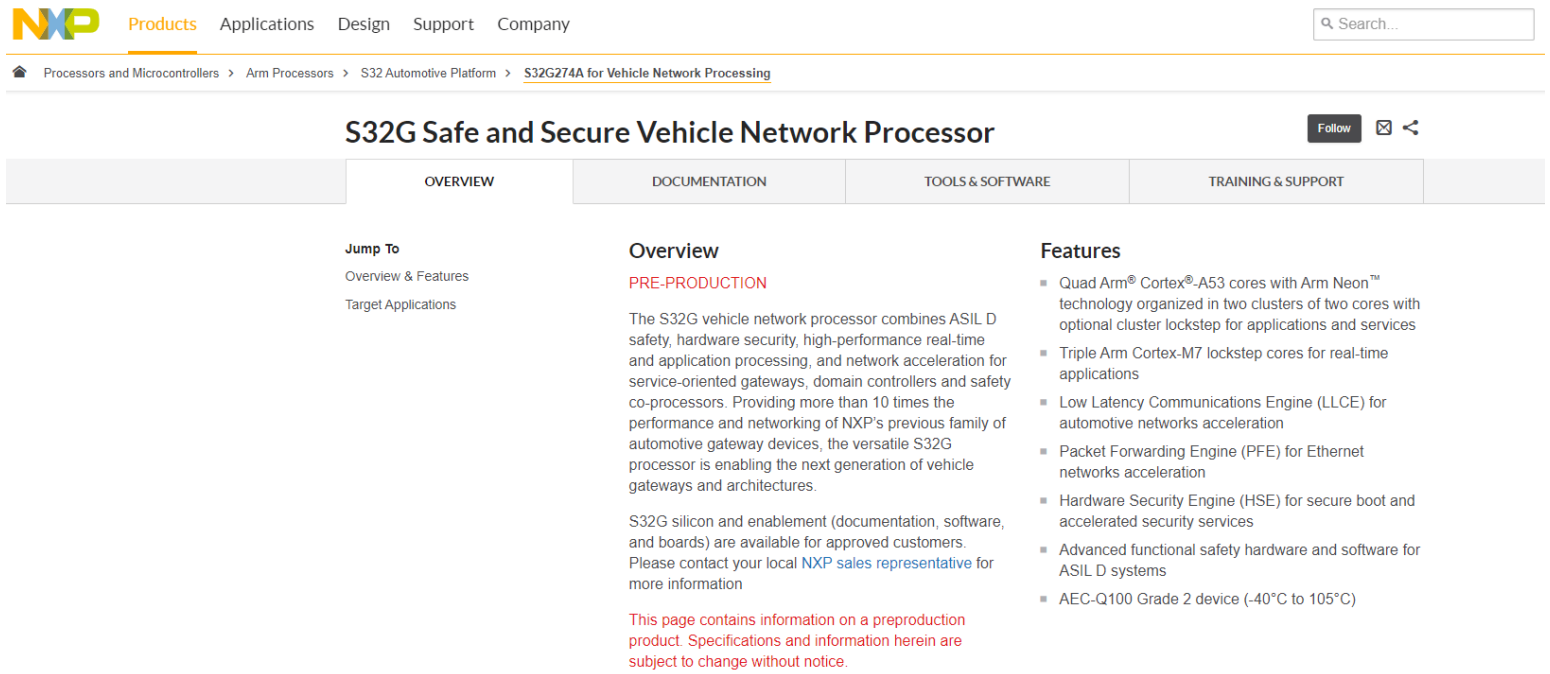
S32G delivers advanced levels of performance, security, ASIL D safety and system integration

S32G enables edge-to-cloud processing as well as ECU consolidation to simplify vehicle architectures

NXP offers a system solution for the S32G along with a strong ecosystem

For More Information

- Contact your local NXP sales representative for questions involving pricing and schedule or to obtain further technical information under Non-Disclosure Agreement
- Check nxp.com/s32g for more information about the S32G processor



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