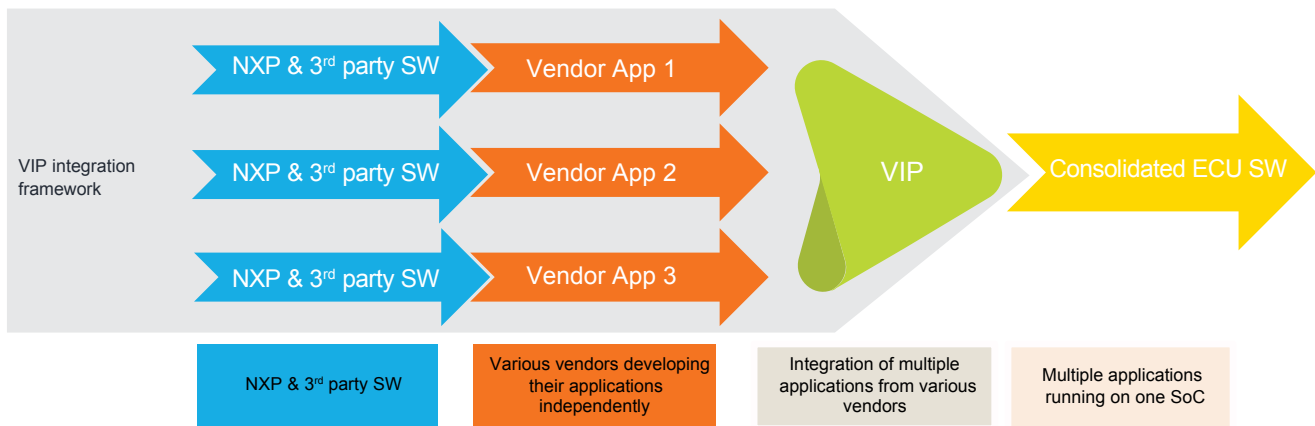


GreenVIP

S32Z/E vehicle integration platform



GreenVIP provides a reference software integration platform for real-time zonal and domain applications. It streamlines S32Z/E hardware evaluation and accelerates software development with ease-of-use, hardware abstraction, software pre-integration and visualization.

Overview

GreenVIP showcases S32Z/E key value propositions; provides pre-integration of NXP, open-source, and third-party software; offers a sandbox for real-time applications development; comes with pre-configured applications running across multiple isolated partitions; real-time local and remote visualization of key resources' metrics offers valuable insights into S32Z/E performance.

Target use cases

- Vehicle zonal applications: up-integration of real-time vehicle functions
- Vehicle domain applications: full ECU-consolidation with isolated partitions and virtual execution environments
- RT Gateway; efficient CAN and Ethernet data routing with and without acceleration (incl. ETH2CAN, CAN2ETH)

- Mixed criticality: hypervisor running multiple OS instances of varying safety and RT features
- AI/math performance: offloading of advanced algorithms to a dedicated digital signal processor
- Real-time boot: fast and secure boot performance

Key capabilities

- AUTOSAR® Classic applications
- FreeRTOS™ and Zephyr® RTOS integration
- L4Re hypervisor support for multi-OS integration and application isolation
- CAN and Ethernet reference applications
- Supports expansion capabilities with roadmap for future software integration and ecosystem partner support

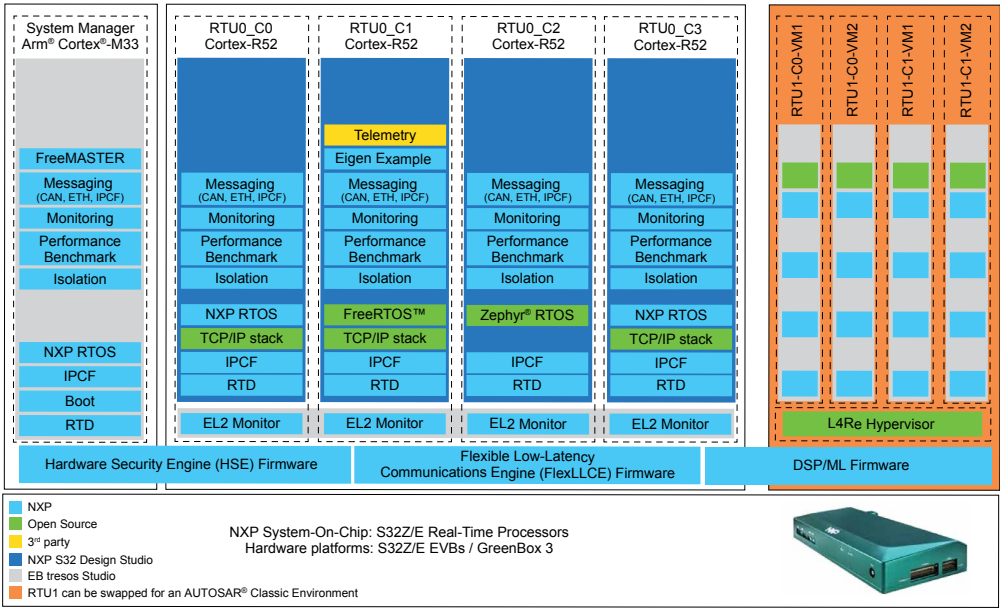
Value propositions

- Showcases S32Z/E value propositions by addressing numerous domain and zonal use cases
- Visualization of S32Z/E performance during use cases demonstrates the value of hardware acceleration
- Visualization of S32Z/E resource utilization provides insights for design optimization
- Demonstration of HW-assisted virtualization across device

- Supports AUTOSAR Classic for real-time applications to be developed with the S32Z/E
- Supports Zephyr RTOS for rapid proof of concept prototyping
- Provides a consistent platform for streamlined third-party software integration and support
- Pre-integration of partner software for faster time-to-market with out-of-the-box insights into related use cases: EB (AUTOSAR), KernKonzept (Hypervisor)

GreenVIP is comprised of software components from NXP, the open-source community and third-party ecosystem partners combined to provide a multi-purpose, reference integration platform to provide value to NXP customers and partners. It can expand in the future to rapidly develop, deploy, evaluate and demonstrate new real-time zonal and domain applications.

GreenVIP (S32Z/E Vehicle integration platform) block diagram



GreenVIP provides several out-of-the-box demonstrations of key use cases that show the value of the S32Z/E real-time processors and their key hardware and software capabilities that enable up-integration of real-time vehicle functions. The table below provides a summary of the current out-of-the-box demonstrations.

GreenVIP (S32Z/E Vehicle integration platform) block diagram

Key Use Case	Demonstration
Type-1 hypervisor, multiple virtual machines (VMs)	L4Re Hypervisor from Kernkonzept is deployed on RTU 1. While RTU 0 cores, configured in split-lock runs four applications on four cores, RTU 1 cores, configured in lock-step, runs again four applications but on two cores in four virtual machines. The benefits of execution in lock-step for safety are evident.
Multiple Isolated Partitions	The Cortex-R52 partitions in each RTU are independent, and each can run a different operating system. AUTOSAR-compatible NXP RTOS, FreeRTOS and Zephyr RTOS are used either in physical partitions (on RTU 0) or in virtual machines (in RTU 1)
NETC Virtualized Ethernet	Internally, NETC offers up to eight ports for individual partitions. Externally, NETC offers two ports for a connection to another device or the Internet. This enables each partition to have its own IP address and communicates with the external world independently. The ETH Connectivity demo enables to ping different partitions, using different IP addresses
CAN HUB + FlexLLCE	Internal CAN routing. CAN Messaging Demo runs on SMU and all RTU applications. Each application has one FlexCAN module allocated or uses FlexLLCE services.
Advance Math Offload	SPF2 Demo which uses OpenAMP interaction between a Cortex-R52 host(RTU_0_C1) and the SPF2 remote accelerator on S32Z/E processor. This includes loading SPF2 firmware from the Cortex-R52 core and messaging between the Cortex-R52 and SPF2 DSP cores.
Boot Service	The boot service is presented as a configurable component in the SMU tresos® project. This component allows the configuration of multiple boot scenarios.

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