Industry Solution

Automotive

MEET FUTURE MOBILITY DEMANDS WHILE MAINTAINING SAFETY – Car manufacturers have to integrate a flood of electronic components, reduce development and production costs, and respond quickly to new demands while ensuring functional safety. The ISO 26262 certification increases the needs for intelligently extensible system architectures.

PIKEOS HYPERVISOR TO MANAGE COMPLEXITY

PikeOS Hypervisor provides a modular system architecture that integrates multiple applications on a single hardware. PikeOS is a full RTOS, virtualization and partitioning system designed to support the requirements of automotive applications. Basis of PikeOS is a small, certifiable microkernel, upon which a virtualization infrastructure provides the ability to host diverse resource and function needs in safe individual partitions. Automotive applications range from non-critical infotainment systems to highly critical control functions. That's why PikeOS provides a broad variety of personalities: from POSIX and Linux to Android and AUTOSAR. Thanks to strict separation technology, applications of different security levels, different criticality levels, real-time or non-real-time can run concurrently in a mixed critical environment on a single standard hardware.

CERTIFICATION SUCCESS INCLUDED

When ISO 26262 certification is required in Automotive applications, PikeOS is the best choice for three reasons: small size, criticality partitioning, and unparalleled company support for the certification process. As PikeOS is purpose-built to meet these requirements, its main features are implemented in about 10,000 lines of code. Its partitioning concept enables the certification of applications to their individual required safety levels while running securely in parallel on the same hardware. Equally important for certification is a competent and reliable partner when it comes to documentation, requirements and tests. For over 15 years, SYSGO supports its customers with own resources, engineers, workshops and training, as well as with artifacts and provision of source code.

> *"We have developed a virtualization technology for our V850 architecture to control multiple systems on a single CPU core with no mutual interference, allowing high speed and composite control for industrial machinery and automotive, where real-time is essential. SYSGO enables us to achieve a scalable CPU architecture with virtualization technology that supports our customers in building flexible development systems."*
> Michiya Nakamura, General Manager, 1st MCU Business Division, Renesas Electronic Corporation

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WHY PIKEOS FOR AUTOMOTIVE

Automotive applications today go beyond the actual vehicle. In particular, reliable communication is needed to ensure smooth mobility. The use of PikeOS resolves a wide array of challenges at the same time:

1. **Reduced complexity saves weight, space and cabling:** PikeOS enables integration of a large number of electronic devices onto a single hardware platform.
2. **Secure communication protects subsystems:** Strict separation of applications into secure partitions allows authorized access only and avoids mutual interference.
3. **Integrated safety reduces certification costs:** Applications of various levels of criticality and security are safely separated from one another and certified separately.
4. **High scalability and hardware independence secures investment:** PikeOS allows legacy code re-use and minimizes impact of future hardware and software platforms adoption.
5. **Flexible time scheduling schemes:** PikeOS provides controllable, yet flexible time partitioning schemes to allow strict real-time guarantees as well as situation based scheduling like fast startup scenarios.

INDUSTRY ECOSYSTEM AND COLLABORATIONS

Automotive projects use a wide range of software and hardware products. Flawless interaction between the components used is vital to the success of complex projects. For this reason, we have been working in close collaboration with the leading global automotive suppliers for many years. We support a wide selection of hardware platforms with our software products and have developed interfaces for code generators and analysis tools that are constantly being expanded.

PIKEOS PERSONALITIES

Partitions can host different personalities, i.e. guest operating systems, run-time environments and APIs, on top of the hypervisor running in non-privileged mode. Automotive personalities include:
· Android · AUTOSAR
· GENIVI · Linux · Native
· OSEK · POSIX

AUTOMOTIVE ARCHITECTURES

(SINGLE & MULTI-CORE)
· ARM · V850 · PowerPC
· x86

THE ECOSYSTEM

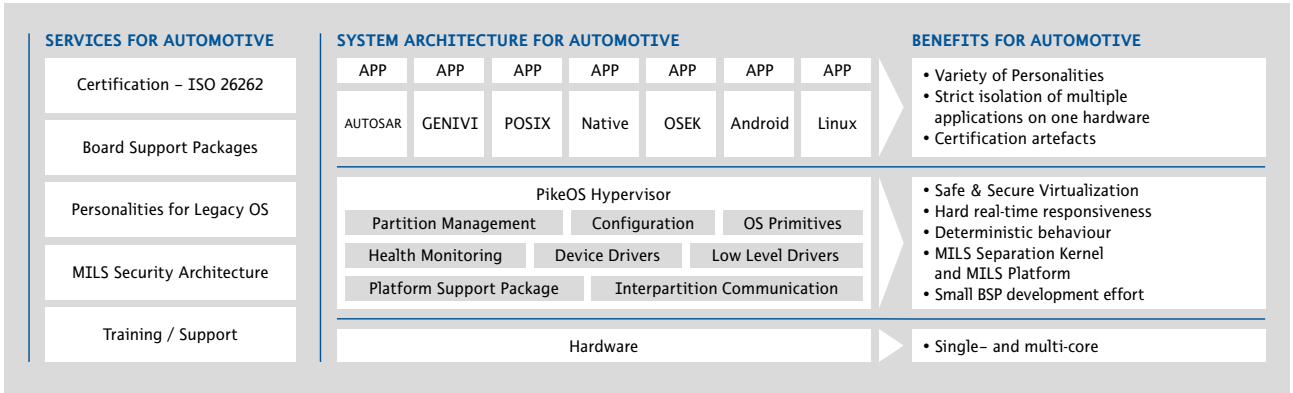
· AbsInt · aicas · Atego
· Esterel · Freescale
· Infineon · Kontron
· Lauterbach · MEN · NEC
· OpenSynergy · PrismTech
· Rapita · Symtavision
· Systerel · TTTech
· Vector Software · Xilinx

MORE CUSTOMERS AND PARTNERS

Audi · BMW · Bosch
· Continental · Daimler
· Delphi · Denso
· EB Automotive · ESG
· Funkwerk Dabendorf
· PSA · SAIC
· TÜV SÜD Automotive
· VDO Dayton

PIKEOS IN ACTION: ACTROS TRAFFIC CONTROL SYSTEM

Swarco (formerly Signalbau Huber) selected PikeOS for its traffic control system ACTROS to control highly complex traffic situations in centralized networks. Developers used PikeOS partitioning to consolidate several boards onto a single hardware platform while successfully separating applications of varying criticality. PikeOS virtualization allowed reuse of legacy applications, minimize porting and migration efforts. All future development will be based on PikeOS-supported standards like POSIX, Linux and Java.



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