

Connected • Protected • Certifiable



PikeOS

For a Safe & Secure Operation



Safety & Security first



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EMBEDDING INNOVATIONS

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Challenges & Pain Points

There are several challenges and pain points associated with real-time applications and real-time operating systems:

▶ **Safety and Security**

In Defense and Military applications, Safety and Security are critical concerns. Real-time applications and operating systems must be designed and implemented with robust Security measures to ensure that they cannot be compromised by unauthorized parties.

▶ **System Complexity**

Military systems are often complex, and real-time applications and operating systems can add additional complexity. Designing and implementing these systems requires a high level of expertise and can be time-consuming.

▶ **Integration**

Real-time applications and operating systems must be integrated with existing systems, which can be a complex and challenging process.

▶ **Cost**

Real-time applications and operating systems can be expensive to develop and implement, which can be a pain point for customers.

▶ **Maintenance and Support**

Real-time applications and operating systems require ongoing maintenance and support, which can be a challenge for customers, particularly in the military where systems are deployed in remote and challenging environments.

Challenges & Solutions

Best Practice Use Cases

Secure Vehicle Station Gateway (Vetronics)

Challenge

- Provide hardware virtualization and connectivity in real-time
- Connect systems with trusted and untrusted data sources
- Real-time data transfer and communication between the vehicle and its environment
- Secure and reliable platform for applications such as telematics, remote diagnostics, and fleet management

Solution

- PikeOS provides HW-Virt enabling multiple applications to run on a single hardware platform
- Reduces costs and simplifies system management while providing a secure and reliable platform for real-time applications
- Connectivity seamless communication between vehicles, drivers, and fleet managers, enabling efficient data exchange and communication
- Reduces size, weight, and power (SWaP)
- ARINC-style queuing and sampling ports can enable data diode

IN A NUTSHELL

• **x86_64 / PPC**

• **HW Virtualization**

• **Connectivity (Ethernet)**

• **POSIX**

• **TPM**



NATO Secure Messaging System

Challenge

- Provides secure and reliable communication for NATO and its member nations
- Quick and efficient real-time communication in critical situations
- Meet stringent Security requirements
- Encrypted and protected from unauthorized access, ensuring the confidentiality and integrity of sensitive information

Solution

- PikeOS real-time operating system
- Common Criteria EAL5+ certification
- VirtIO communication between guests

IN A NUTSHELL

- **Security certification (CC EAL 5+)**
- **Multiple Windows & Linux in parallel**
- **Hardware virtualization**



Optronics Systems

Challenge

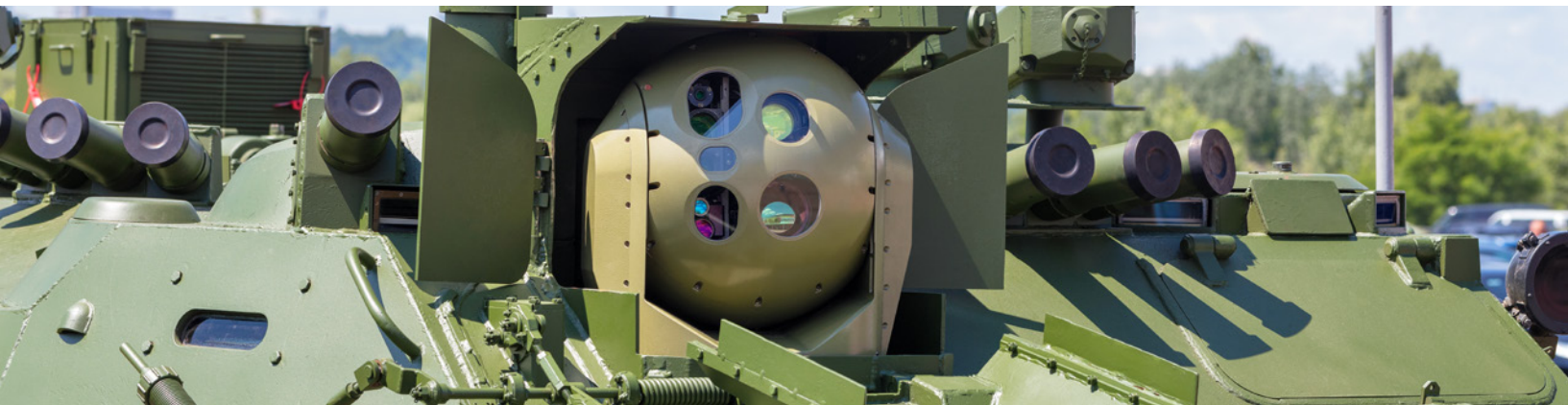
- High-performance optical and electronic systems used in real-time
- Camera interfaces, allowing for real-time imaging and video capture
- Use cases: Surveillance and targeting, navigation and guidance, driver assistance and Safety systems

Solution

- PikeOS with multi-core support
- CoreAVI support
- Data Distribution Service (DDS)
- Safety and Security certification kits available
- General purpose and real-time applications running on the same HW
- PCIe video capture and GP-GPU

IN A NUTSHELL

- | | |
|---------------------------|--|
| • Camera interface | • Real-time performance |
| • General purpose | • Securing augmented reality data |



Radio Communication

Challenge

- Real-time communication between military personnel for quick and efficient coordination in the field
- Tactical communications, surveillance, and remote control of unmanned vehicles
- Transmission voice, data, and video in real-time

Solution

- PikeOS real-time operating system
- Multiple communications drivers (CAN, ARINC 429, RS232)
- Interfacing to external industry standard systems (Iridium SatCom, HF, UHF, VHF)
- Encryption
- PikeOS for MPU for mobile communication stations

IN A NUTSHELL

- **Software radio (CONTACT) for soldiers**
- **SCA POSIX**
- **Ruggedized tablet**



UAV Ground Control Systems

Challenge

- Remote control and monitoring UAVs in real-time
- Need to meet rigorous certification standards to ensure the system's reliability and Security
- Meets stringent requirements of the Aviation industry
- Storage of UAV location coordination

Solution

- PikeOS real-time operating system
- Certifiable 2D or 3D graphics for UAV mapping
- Multiple communication methods that need securing (Common Criteria EAL5+)
- Integration with Presagis / Ansys

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- For UAVs and drones
- Certifiable IP stack
- Certifiable graphics
- POSIX
- Certifiable file system



Military Land Vehicles

Challenge

- Reliable transportation and rapid deployment of troops and equipment
- Safety and Security certification in high-stress environments
- Real-time communication for operators to communicate with other vehicles
- Autonomous operation is driving harder Safety certification compliance

Solution

- PikeOS with multi-core support
- Strong separation performance
- HW virtualization
- Built-in Security features
- Operate critical and non-critical operating systems in parallel (mixed-criticality)

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- **Safety certification (ISO 26262)**
- **x86 support**
- **Security certification (CC EAL5+, ISO 21434)**
- **Windows & Linux support**



Battle Management System

Challenge

- Provide real-time monitoring and control of variety of ground combat systems in real-time (tanks, armoured vehicles, and artillery)
- Real-time communication and coordination between commanders and ground forces

Solution

- PikeOS for high-performance supporting multi-core
- Scalable for the use of many operating systems running in parallel
- Security features for communication
- Support for multiple communication technologies for system integration
- Support for Safety-critical protocols (e.g. TSN)

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- **Main Ground Combat System (MGCS)**
- **Secure platform for data flow (data diode)**
- **Safety & Security certifiable OS and drivers**

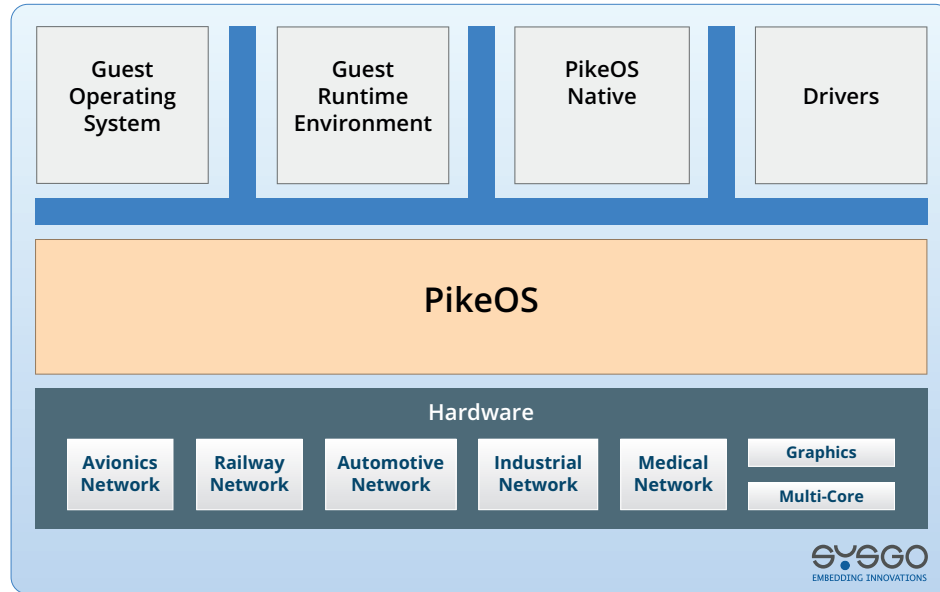


Certifiable Real-Time Performance

PikeOS

RTOS & Hypervisor

PikeOS – Certifiable RTOS & Hypervisor



CUSTOMER BENEFITS

▶ Application Separation

PikeOS offers strict partitioning and strong separation to provide built-in Security by design.

▶ Hardware Consolidation

Extreme flexibility provides independence from suppliers in the choice of hardware architectures.

▶ Use of COTS

The benefit of using Commercial-Off-The-Shelf (COTS) components is to lower overall costs for applications.

▶ Certification Kits

SYSGO offers the right certification kit in order to help facing the certification authorities.

▶ Common Criteria

PikeOS 5.1.3 is certified according to CC EAL5+ to fast-forward the approval processes.

▶ ITAR free

As an European company, our products have no export restrictions and are therefore ITAR free.

PikeOS – Certifiable RTOS & Hypervisor

PikeOS is a real-time operating system that offers a separation kernel-based hypervisor with multiple partitions for many other operating systems and applications. It enables you to build devices for environments with strong demands for Safety and Security.

- Separation kernel-based hypervisor
- Multiple and strictly separated partitions
- Guest operating systems and applications
- Compliant to the highest Safety & Security standards
- Aerospace & Defense, Railway, Automotive, Industrial Automation and Medical



PikeOS offers a separation kernel-based hypervisor with multiple partitions for many other operating systems and applications. It enables you to build devices for environments with strong demands for Safety and Security.

PikeOS is available for x86, ARM v7 v8, SPARC/LEON v8, PowerPC and RISC-V.





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