Industry Solution

Aerospace & Defense

GET READY FOR IMA AND BEYOND – The vast number of components exceeds tolerable limits of weight, space, cabling and energy consumption. The avionics approach to an Integrated Modular Avionics (IMA) reduces isolated hardware by integrating multiple software applications on standard hardware.

PIKEOS HYPERVISOR

IMA comes with new performance requirements, new security requirements and the need to reduce certification costs. Thus IMA calls for a modernized and flexible software platform rather than a monolithic operating system. PikeOS is the ideal embodiment of the IMA vision. PikeOS consists of a small, certifiable micro-kernel, upon which the hypervisor provides separated partitions for diverse resource and function needs. Avionics applications range from open world to highly time critical control functions in the cockpit PikeOS accordingly provides a broad variety of personalities: from avionics-specific ARINC-653 API or space-specific RTEMs to certified POSIX, Ada and embedded Linux. Thanks to separation technology, applications of differing security levels, varying criticality levels, real- time or non-real-time can run concurrently in a mixed criticality environment on a single standard hardware platform.

CERTIFICATION SUCCESS INCLUDED

Safety-critical Aerospace & Defense applications must be certified to safety standards DO-178B/C. PikeOS is the best certification solution for three reasons: small size, criticality partitioning and unparalleled company support for the certification process. Purpose-built to meet certification requirements, PikeOS is implemented in about 10,000 lines of code. Its partitioning concept enables the certification of applications of various levels of criticality to their individual safety levels while running securely separated on one hardware platform. Equally important for certification is a competent and reliable partner when it comes to planning, documentation, verification, validation and quality assurance processes. For over 15 years, SYSGO supports its customers with certification expertise, training workshops as well as full process artifacts and source code kits for system certification activities.

> *"We are very pleased to benefit from SYSGO's technology and expertise for this actual avionics equipment. SYSGO offers a perfect complementary portfolio to our platforms with field-proven RTOSs and a unique software-based AFDX implementation that has already been DO-178B certified."*
> Patrizio Bollini, Marketing and Programs Director, Sirio Panel

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WHY PIKEOS FOR AEROSPACE & DEFENSE

Aerospace & Defense projects are extremely complex due to the high demands on technology and safety, coupled with pressure on time and costs. The use of PikeOS resolves a wide array of challenges at the same time:

1. **Reduced complexity saves weight, energy, space and costs:** PikeOS enables integration of a large number of electronic devices onto lesser standardized hardware platforms, using Virtualisation Technology.
2. **Integrated safety reduces certification costs:** Applications of various levels of criticality and security are safely separated from one another in distinct partitions and certified separately.
3. **Extreme flexibility provides independence from suppliers in the choice of hardware and software:** PikeOS supports a broad range of hardware architectures and provides interfaces for a wide array of personalities. It is easy to add additional architectures and interfaces (including legacy code).
4. **Multiple Independent Levels of Security (MILS) architecture:** PikeOS separation kernel controls communications and provides protection against malicious attacks. Common Criteria certification process has been engaged.
5. **Expandability saves costs in downstream incremental development:** Partitions are simple to configure in the development phase and can even be supplemented and expanded with new applications after entry into service.

INDUSTRY ECOSYSTEM AND COLLABORATION

Aerospace & Defense projects use a wide range of software and hardware products. As flawless interaction between the components is vital, we work closely with the leading global Aerospace & Defense suppliers. We support many hardware platforms and have developed interfaces for code generators and analysis tools, which are enhance to meet ever changing market segments requirements.

PIKEOS PERSONALITIES

Partitions can host different personalities, i.e. guest operating systems, run-time environments (RTE) and APIs, which run in non-privileged mode, on top of the PikeOS Hypervisor. Aerospace & Defense personalities include:

· Ada · AFDX · ARINC 653
· Certified POSIX · Linux
· Native · RTEMS

HARDWARE ARCHITECTURES *(SINGLE & MULTI-CORE)*

· ARM · PowerPC · x86
· SPARC V8/LEON · MIPS

THE ECOSYSTEM

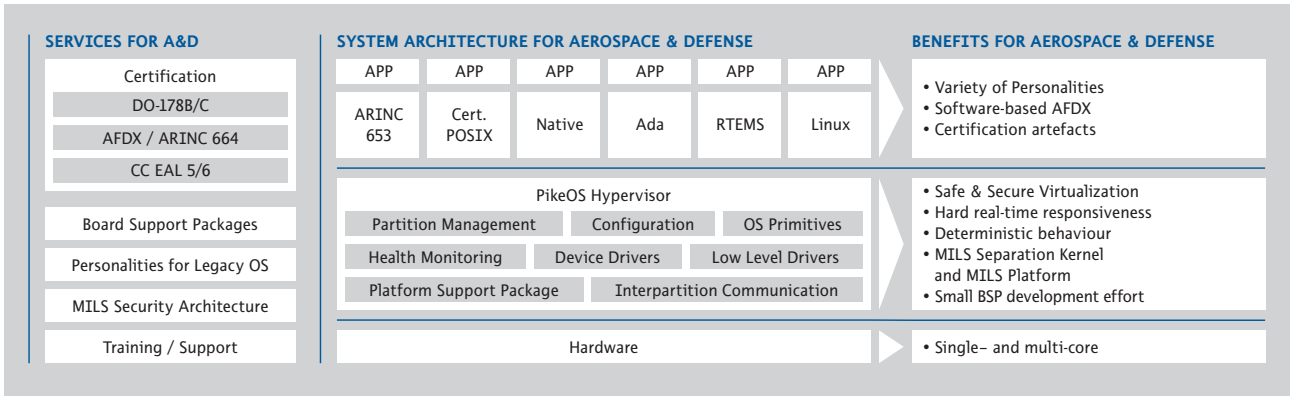
· AbsInt · AcQ · AdaCore
· aicas · Atego · CoreAVI
· Curtiss Wright
· Esterel · Freescale
· GE Intelligent Platforms
· Kontron · Lauterbach
· MEN · Presagis · PrismTech
· Rapita · Symtavision
· TechSAT · TTTech
· Vector Software · Xilinx

MORE CUSTOMERS

· Airbus · Astrium
· Embraer · EMT
· ESA · GosNIIAS
· KMW · MBDA/LFK
· Meggit · RheinMetall
· Rockwell Collins
· Sagem · Sirio Panel · TAI
· Zodiac Aerospace

PIKEOS IN ACTION: AIRBUS A350

PikeOS is used for critical and non-critical applications at Airbus in the cockpit of the A350. The IMA-compatible FSA-NG system provides access to recorded flight data for both the pilots during the flight and the maintenance crew on the ground. These are mixed-critical applications divided into multiple partitions that use personalities like POSIX for new external applications and PikeOS native for internal platform services, using ARINC 653 mechanisms. The applications are safety-critical and certified under various safety levels according to DO-178B standard.



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