

Industry Solution

Industrial Automation

FOCUS ON THE COMPETITIVE EDGE IN A TIGHT MARKET – Today, automation systems include complex software systems with all kinds of requirements: Measuring and control devices, graphical user interfaces, communication stacks. A new software architecture approach allows safe and secure integration of these components on a single hardware.

PIKEOS HYPERVISOR AND INTEGRATED LINUX

The 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 highest requirements in Industrial Automation applications together with competitive advantage in development, certification, and long-term maintenance. It consists of a small, certifiable microkernel, upon which the hypervisor provides separated partitions for broad resource and function needs in safe individual partitions.

PikeOS provides a broad variety of GuestOSs to support diverse Industrial Automation application architectures from graphic applications to time-critical measurement systems and Safety-critical control functions. Thanks to separation technology, Linux applications and proprietary intellectual property can be divided into separate partitions, thus avoiding the application of GPL to proprietary code.

CERTIFICATION SUCCESS INCLUDED

Many Industrial Automation products have highest Safety requirements according to IEC 61508. PikeOS is the best choice for three reasons: Small size, criticality partitioning, and unparalleled company support for the certification process.

Purpose-built to meet highest certification requirements, PikeOS is implemented with a partitioning concept which 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 25 years, SYSGO supports its customers with certification expertise, training workshops as well as full process artifacts and source code kits for system certification activities.

“Historically, it’s been difficult to maintain technology based on aging hardware platforms. PikeOS allows us to make choices that fit today’s needs while knowing that our investments are secured for the future.”

Werner Ganahl
CEO at Gantner Instruments

WHY PIKEOS FOR MEDICAL DEVICES

Cost and time pressures are decisive factors in the development of industrial equipment. Unfortunately, manufacturers typically face disruption from rapid obsolescence of hardware and fast software update cycles. PikeOS restores control over software development processes and brings predictability to life cycle costs:

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 each other in distinct partitions and certified separately.
4. 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 GuestOSs. Adding other architectures and interfaces (incl. legacy code) is easy.
4. Multiple Independent Levels of Security (MILS) architecture: The PikeOS separation kernel controls communications and provides protection against malicious attacks. The PikeOS hypervisor is certified according to Common Criteria EAL3+. Read more → www.sysgo.com/common-criteria
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 COLLABORATIONS

Industrial Automation 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 Industrial Automation suppliers for

PIKEOS GUEST OS

Partitions can host different GuestOSs, run-time environments (RTE) and APIs, which run in non-privileged mode, on top of the PikeOS Hypervisor.

Ind. Autom. GuestOSs include:

- Android · iTRON · Linux
- PikeOS Native · POSIX
- Java

MEDICAL ARCHITECTURES (SINGLE & MULTI-CORE)

- ARM · SPARC V8 · MIPS
- PowerPC · x86

THE ECOSYSTEM

- aicas · ARM · Atego · Esterel · Freescale
- Infineon · Intel
- Lauterbach · MEN
- MIPS · Presagis · Rapita
- Renesas · TTTech · Vector Software · Xilinx

MORE CUSTOMERS AND PARTNERS

- Baumüller · Bucyrus / Caterpillar · Gantner
- Gatsometer · Görlitz
- ICA chip · Kongsberg
- Meyn · Putzmeister
- Staubli · SWARCO

many years now. We support a wide selection of hardware platforms with our software products and have developed interfaces for code generators and analysis tools which are constantly being expanded..

PIKEOS IN ACTION: MINING EXCAVATOR

Bucyrus (Caterpillar) chose PikeOS for IP and investment protection and obsolescence management. PikeOS was ported to a new hardware platform and configured to provide two different partitions, one running legacy code on a POSIX API, and the other running new applications on Linux. Software investments on the excavator product line are protected and complemented by Linux programs running within the Linux partition. Secure partitioning mechanisms ensure that each application remains independent.

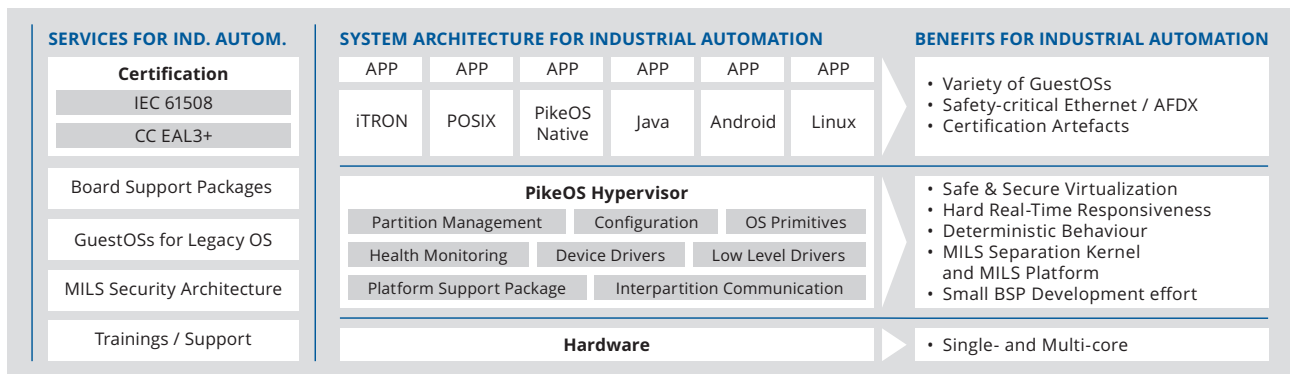


Figure 1: Scheme of an Industrial Automation System with PikeOS Architecture

Founded in 1991, SYSGO became a trusted advisor for Embedded Operating Systems and is the European leader in hypervisor-based OS technology offering worldwide product life cycle support. We are well positioned to meet customer needs in all industries and offer tailor-made solutions with highest expectations in Safety & Security. More information at www.sysgo.com/industrial