



SYSGO Introduction

PACEdays 2025



Stephan Wagner, May 2025

Agenda

- Speaker introduction
- Introduction to SYSGO
- Introduction to products (focus on PikeOS)
- Importance of partner ecosystem
- Ecosystem focus: SYSGO x PACE
- Q&A



Connected, Protected, Certifiable

SYSGO is **the leading European operating system vendor** for embedded systems.

As a trusted advisor, **we provide safe and secure technologies and services** to be part of high-end software solutions in any IoT device worldwide.

Founded in 1991: We have a long history and experience in **certification and development** of Safety-critical systems and applications.

SYSGO is part of the Thales Group.



Common
Criteria

ITAR
free

Embedded Performance for critical Systems

- **PikeOS**
 - Certified hard real-time OS (separation kernel with type-1 Hypervisor)
- **PikeOS for MPU**
 - Real-time partitioning for MPU architectures
- **ELinOS**
 - Embedded Linux distribution
- Field proven for Avionics, Defense, Railway, Automotive, Industrial, Medical, and Space applications
- **Seamless Customer Product Development and Management**
 - System architecture and Security approach
 - Hardware integration
 - Long-term customer support
 - Tools and services to cover the full product life cycle



Technologies and Solutions

Products & Services

As Europe's leading embedded OS provider, we've supported Safety- and Security-critical Aerospace, Automotive, Railway, and IIoT systems since 1991 – partnering with customers across the full product life cycle.



PikeOS

Separation Kernel-based RTOS with integrated and certified virtualization technology (Hypervisor) for MMU and MPU



ELinOS

Industrial grade Linux Distribution for embedded systems with easy configuration and real-time extensions



Board Support Packages

Adaptation to the selected architecture, board specific initialization and drivers



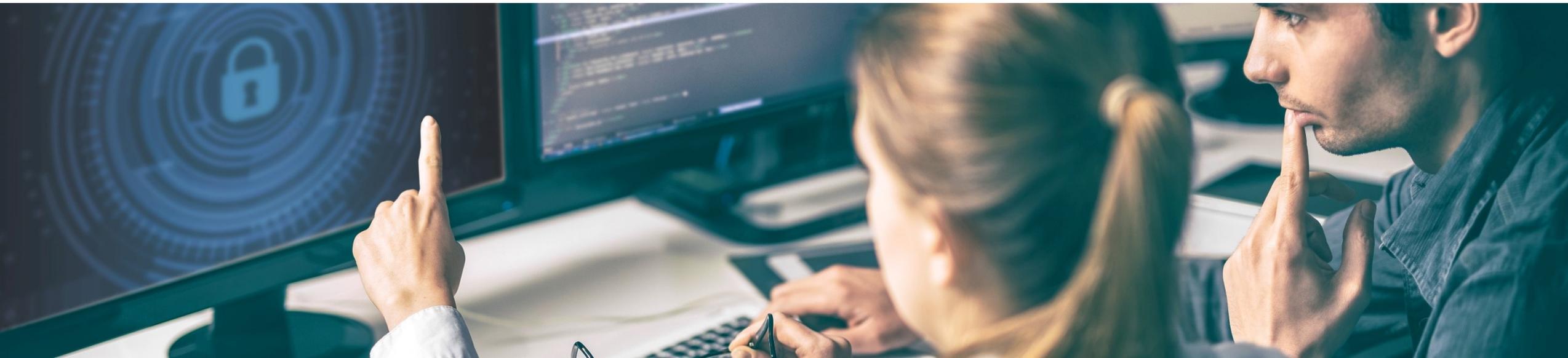
Certification Kits

Extensive collection of certification artefacts for all major generic and industry-specific standards



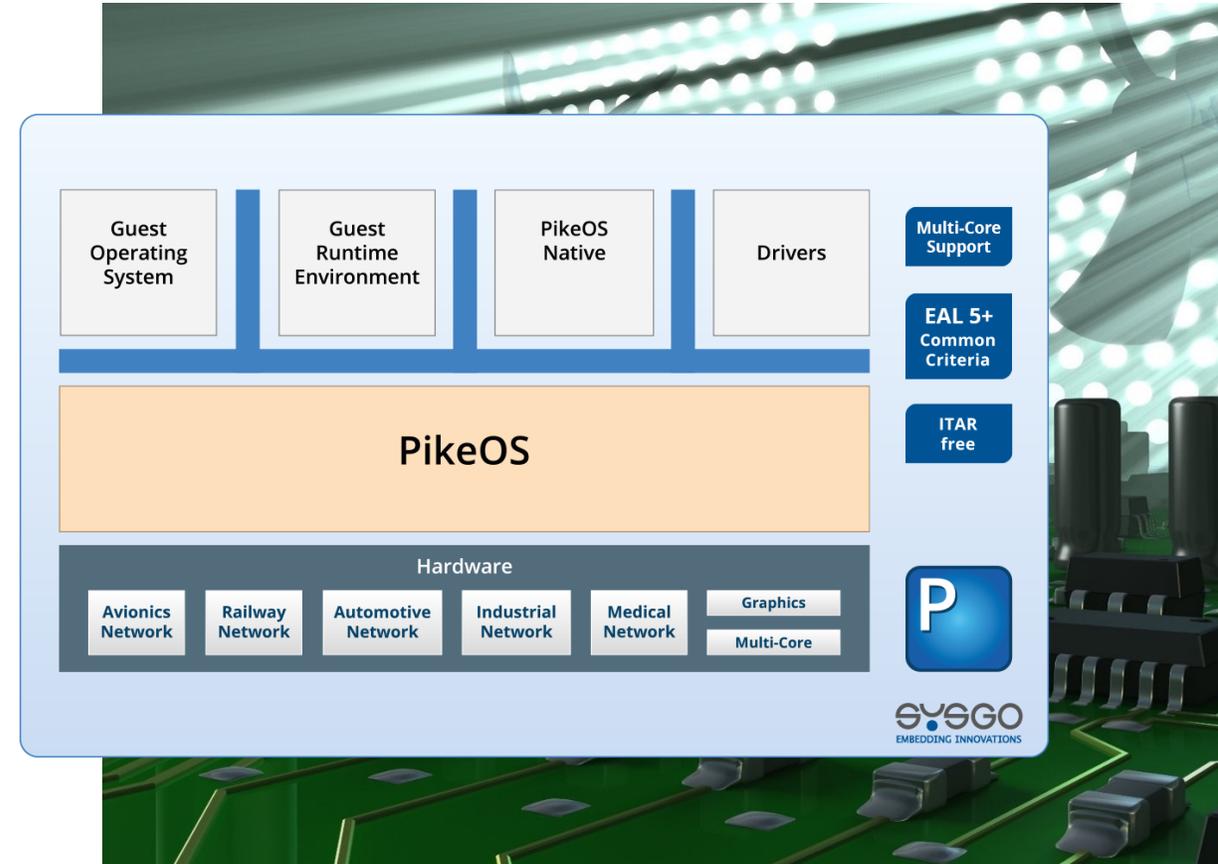
Professional Services

We make sure customers can optimize use our technology from prototyping to certification



PikeOS - Certifiable RTOS & Hypervisor

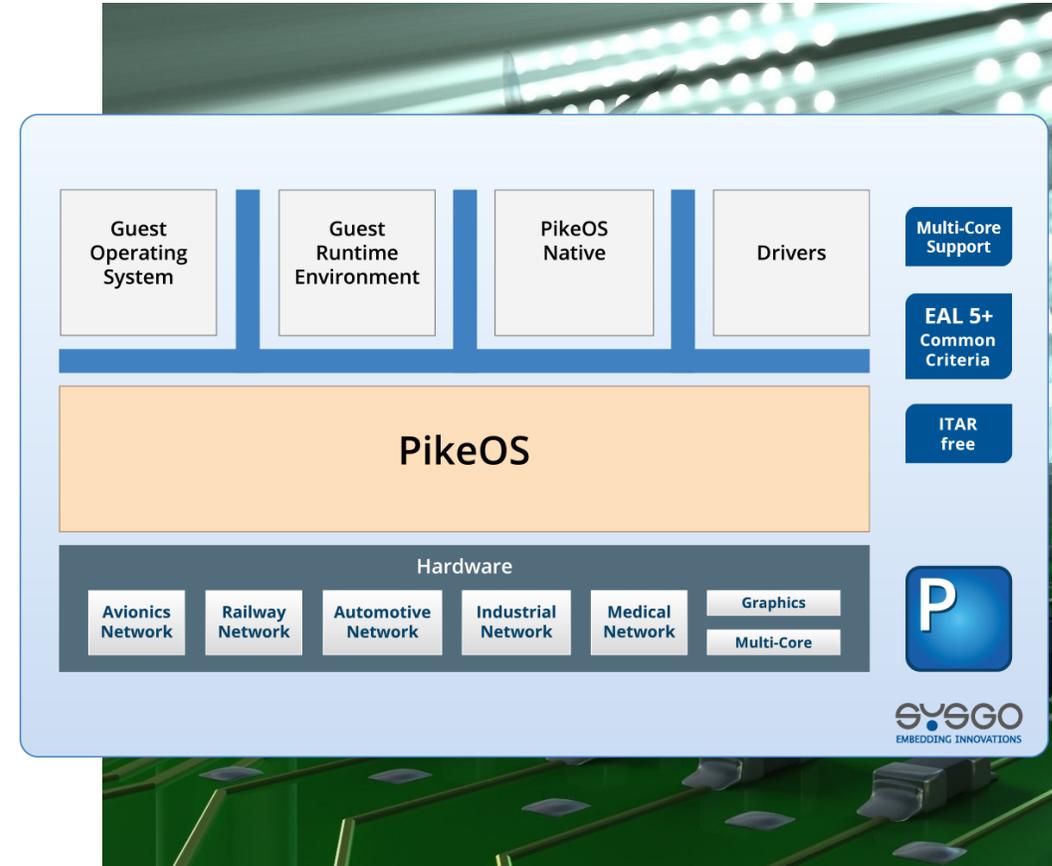
- **Common Criteria EAL 5+ certified* Separation Kernel Architecture**
 - Only required functionalities implemented in kernel mode, while everything else runs in partition context
- **(Pre-)Certified to the strictest Safety Standards**
 - Such as DO-178C, ECSS, IEC 61508, EN 50128 / EN 50657 and ISO 26262
 - PikeOS enables application development following the motto "Safety & Security by Design"
- **Multi-Core Certification**
 - According to DO-178C DAL A, EN 50128 SIL 4 and CAST-32A
- **Certifiable (Certification Kits)**
 - According to highest Safety & Security standards with modular certification kits for Avionics, Industrial, Railway, Automotive and Medical
- **Safety & Security Architecture**
 - For most critical applications up to SIL 4 / ASIL D / DAL A or EAL 5+ / ECSS-E-ST-40C / SAL 4 / ...



* PikeOS Separation Kernel v5.1.3 is currently the only Separation Kernel worldwide that holds a Common Criteria certification for its separation performance.

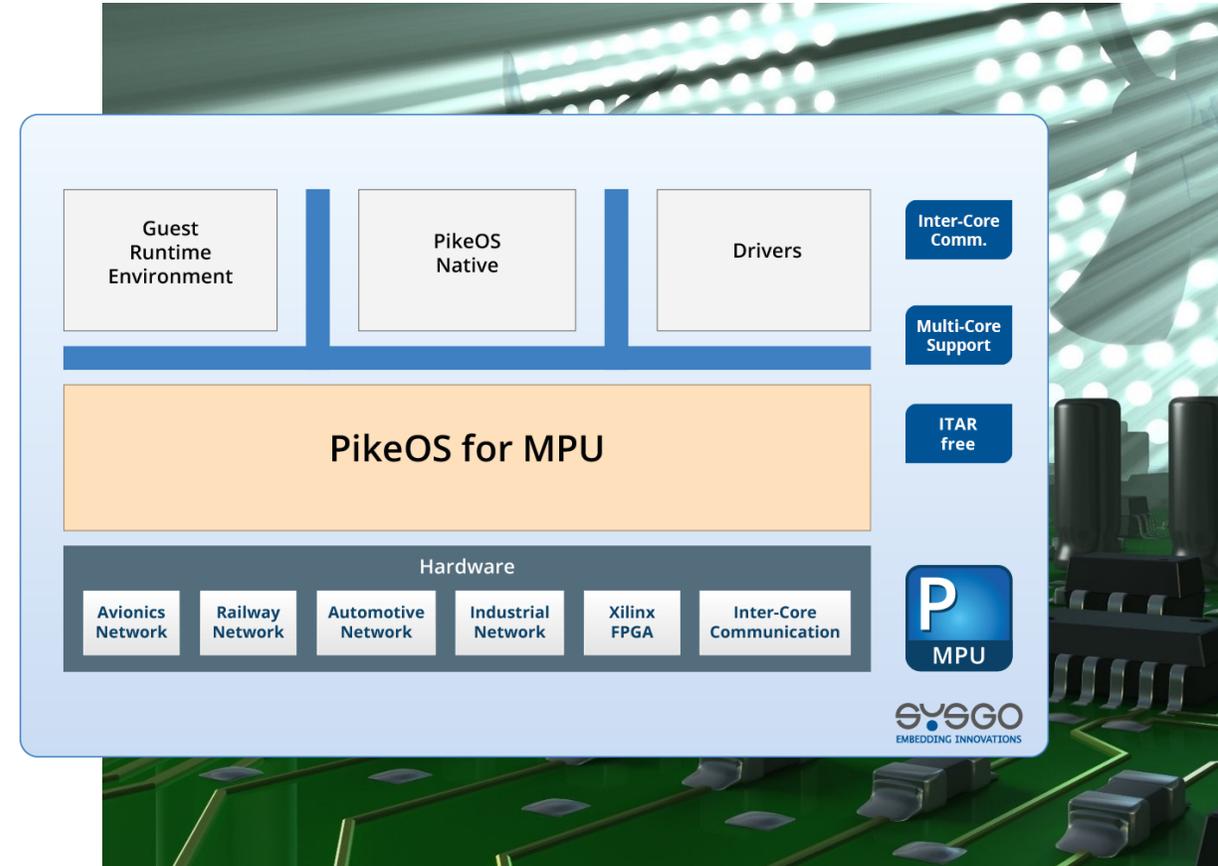
PikeOS - Certifiable RTOS & Hypervisor

- **Hard Real-Time Operating System and Hypervisor**
 - With safe and secure virtualization, mixed criticality with multiple guest operating systems and highly portable, supporting all important CPU architectures
- **Guest Operating Systems**
 - Can run in parallel partitions on a single or multi-core processor to serve specific use cases
- **Mixed Criticality**
 - Strict spatial and time partitioning
- **Eclipse-based CODEO**
 - A comprehensive integrated development environment supporting C/C++
- **Without any Export Restrictions**
 - ITAR free



PikeOS for MPU - Real-Time Partitioning for MPU Architectures

- **Based on a Separation Kernel with the Performance of a traditional RTOS**
 - Available to lightweight systems with a Memory Protection Unit (MPU) only
 - For controllers targeting Medical, Automotive, Aeronautics and Space industries
- **Inter-Core Communication**
 - To be used on MPU-based SoCs as well as on heterogeneous SoC implementing MMU and MPU clusters
- **PikeOS Compatibility**
 - +80% of the original code base makes the available PikeOS documentation and certification artefacts reusable
- **Eclipse-based CODEO**
 - A comprehensive integrated development environment supporting C/C++
- **Without any Export Restrictions**
 - ITAR free



ELinOS - Embedded Linux

- **Industrial grade Linux Distribution** for embedded applications allows customers to focus on their application rather than customization
- **Long-term stable Kernel** to support new features and to guarantee previous compatibility throughout the life cycle
- **Real-time extensions** especially designed and tested for industrial needs. Include kernel pre-emption and low-latency patches
- **Eclipse-based CODEO** - a comprehensive integrated development environment supporting C/C++ and Java
- **Broad Hardware Support** with BSPs for all major architectures and boards, including single- and multi-core
- **Professional Services** with E-Mail and peer-to-peer support, trainings and life cycle updates
- **Security Services** includes regular customized Security advisories about newly identified Security issues and early access to updated software packages



Free ELinOS Test Version & Projects

www.sysgo.com/get-elinos

Professional Services

SYSGO has been certified to fulfil the **ISO 9001:2015** Quality Management and the **DIN EN ISO / IEC 27001:2017** Information Security Management Standards. Our engineering processes are assessed according to **SPICE Level 3** and our professional services organization supports customers throughout the entire product life cycle.

- Trainings
- Consulting
- Technical support
- Certification services



Partner Eco System

Partners & Alliances

We foster strong tech and business partnerships – collaborating across hardware, software, and industry consortia to support our customers' success.



Hardware

We work closely with all relevant MCU and board vendors, supplying BSPs for single- and multi-core architectures



Software

Our software partners provide both generic middleware and industry specific applications



Tools

SYSGO customers can rely on deep relationships with tool vendors to create a comprehensive development environment



Alliances

We are involved numerous industry groups, developing standards and sharing our expertise

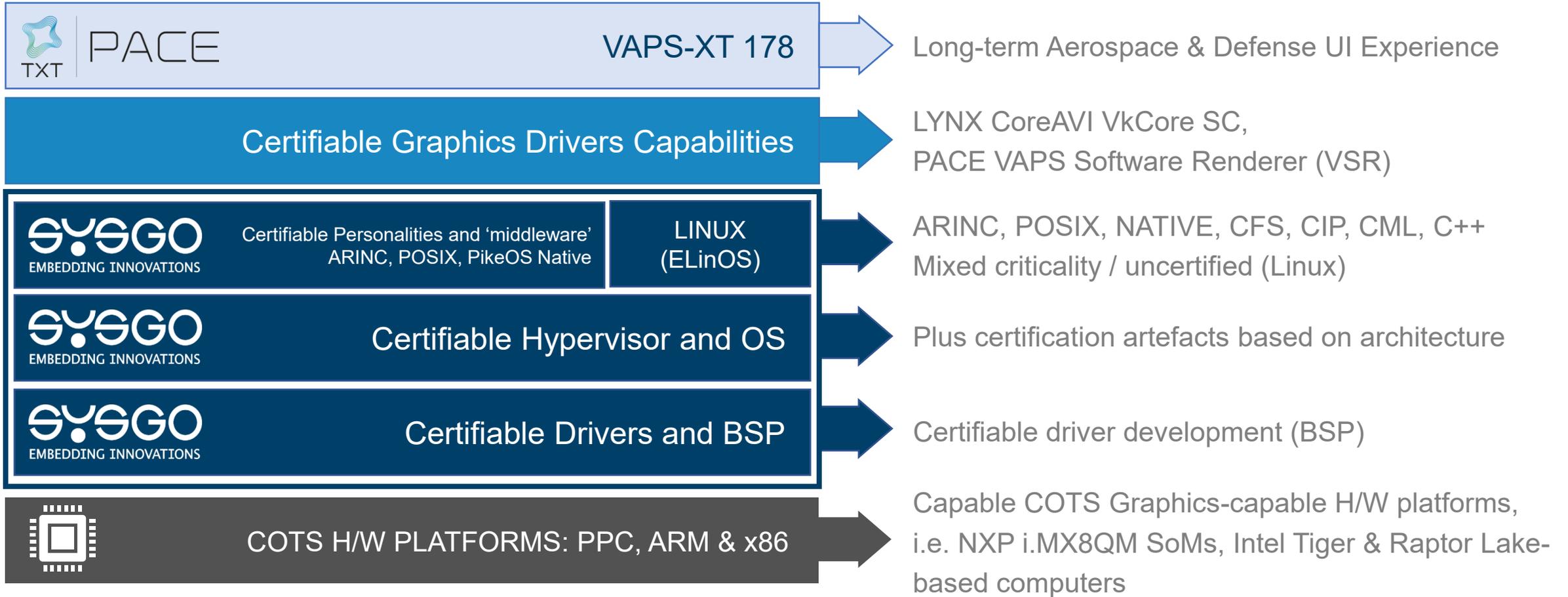


PikeOS' strong heritage and capabilities in 'High DAL' applications paired with PACE VAPS-XT for certifiable graphics platforms

- Flexible, agile & focused pairing, who are able to work together towards a common goal
 - Experience
 - Pedigree
 - Certifiability
- Great reference points in the team
 - ITAR free, secure, safe
- Inflection points in the Industry
 - Multi-core & SoC becoming the norm (SWaP)
 - Integrated & performant SoC Graphics becoming available
 - PowerPC is gradually being replaced with ARM & x86 alternatives...



Team Capabilities



Certifiable Graphics Reference Platform

SYSGO & PACE have built a certifiable graphics reference platform capable of achieving DO-178C DAL A

Overview

- Pre-integrated, certifiable digital avionics displays – key to modern avionics suites, powered by advanced tech and the reliable PikeOS platform.

Hardware Architecture

- Operating on the NXP i.MX8QuadMax SoC, based on ARMv8
- i.MX8QM enables dual-display avionics use-cases

CoreAVI VulkanSC Graphics Driver

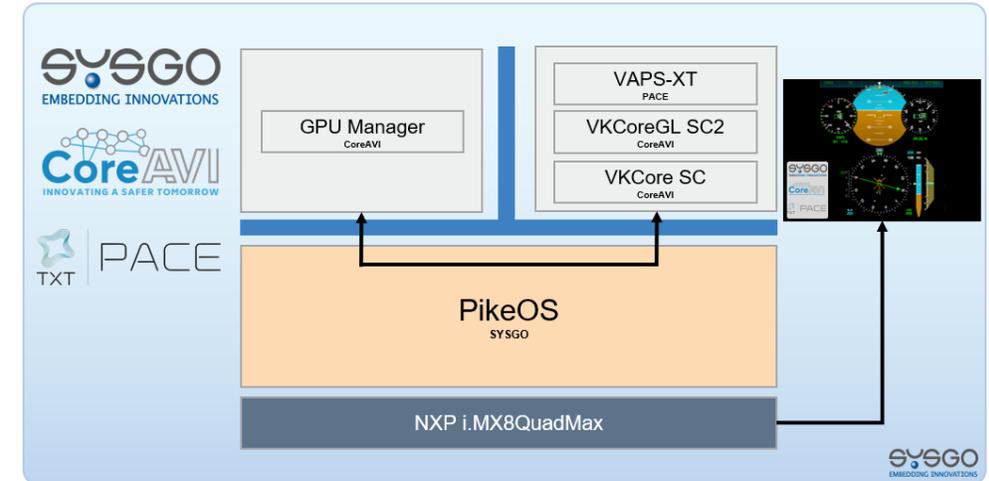
- Enables use of the Vivante GPU in a certifiable way

PACE VAPS-XT Certifiable HMI Suite

- Utilizes PACE VAPS-XT for advanced GUI development, enabling the creation of immersive and intuitive user interfaces.

Cybersecurity and Safety Certification

- PikeOS serves as the foundation for Cybersecurity and Safety certification
- i.e. DO-178C DAL A, Common Criteria EAL5+



VAPS Software Renderer (VSR)

PACE's release of the VSR opens the door to more flexibility on H/W usage and selection for certifiable graphics systems

- PikeOS + VSR + VAPS-XT enables development of certifiable graphics on virtually any display-capable platform
 - GPU-independent therefore reduced certification challenges
 - Opens the door to lower-cost hardware choices
 - Software Rendering can realize lower Size, Weight & Power (SWaP)



Image courtesy of PACE

Franz Walkembach, VP Marketing & Alliances at SYSGO said, “The combination of SYSGO’s ITAR-free certified hard real-time RTOS PikeOS and PACE VAPS XT allow avionics customers a full certifiable software stack from hardware over RTOS to HMI.”

Get connected with us!

SYSGO GmbH

Am Pfaffenstein 8
55270 Klein-Winternheim
Germany

+49 6136 99480
info@sysgo.com

Sales Contact
sales@sysgo.com

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