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VxWORKS 653 3.0 MULTI-CORE EDITION

To be competitive in the avionics market, device manufacturers must deliver increasingly complex products at or below budget, within constantly shrinking time frames, and often with stricter constraints on device space, weight, and power (SWaP). Furthermore, in avionics applications, human lives are often at stake—so devices must be reliable and durable and support strict safety certification standards. To meet this need, the avionics industry has a specification for Integrated Modular Avionics (IMA) systems: ARINC Specification 653. Use of this internationally accepted specification enables avionics vendors and hosted-function suppliers to safely deploy multiple applications on a single multi-core-enabled hardware platform, while maintaining complete system conformance with rigorous avionics safety standards such as DO-178C, DO-254, and DO-297.

Wind River® offers the most complete multi-core ARINC 653 product that safely and reliably delivers an ARINC 653–compliant platform to the IMA marketplace. VxWorks® 653 3.0 Multi-core Edition is fully compliant with ARINC Specification 653, providing robust partitioning in time and space to ensure fault containment in accordance with strict IMA and ARINC 653 requirements. VxWorks 653 Multi-core Edition enables reduced SWaP, as well as reduced bill of materials (BOM), on the industry's most advanced aircraft.

FEATURES AND BENEFITS

- Multi-core-enabled scheduler with hardware virtualization assist that enables the virtualization of unmodified guest operating systems, allowing applications to run in parallel on separate cores and virtualization environments, increasing compute capacity
  - Reduced BOM with high performance
  - High performance and low jitter due to two-level virtual machine architecture
  - Scalability, supporting up to 255 partitions
  - Simultaneous support of multiple levels of safety criticality
- High portability for lower upgrade costs
  - Simultaneous support for ARINC 653 APEX, VxWorks, POSIX®, Ada, Java, C, and C++ application programming interfaces (APIs)
  - Aligned with the Future Airborne Capability Environment (FACE™) Technical Reference 2.1 Operating Systems Segment (OSS) Safety Base Profile, with both ARINC 653 and POSIX APIs supported
  - Ease of portability for legacy applications
- Reduced development time and cost
  - Separation based on DO-297 role-based development for platform supplier, application developers, and system integrator

  - Independent build process, reducing the impact of code changes across multiple development teams
  - Wind River Workbench development suite based on the Eclipse open tool architecture, enabling wide integration of industry toolchains
- Reduced DO-178C platform certification time and cost
  - Complete application independence
  - Separate build, debug, test, certification, and recertification of applications
  - DO-297 role-based supplier and team separation support
  - DO-330-qualified development and verification tools
  - Commercial off-the-shelf (COTS) DO-178C DAL A certification evidence
- Built upon VxWorks 653 2.x rich pedigree of single and dual core development that is proven on the world's most challenging aircraft
  - Airbus MRTT and A400
  - Boeing C-130 AMP, KC-767 Tanker, 787 Dreamliner, P-8A Multimission Maritime Aircraft

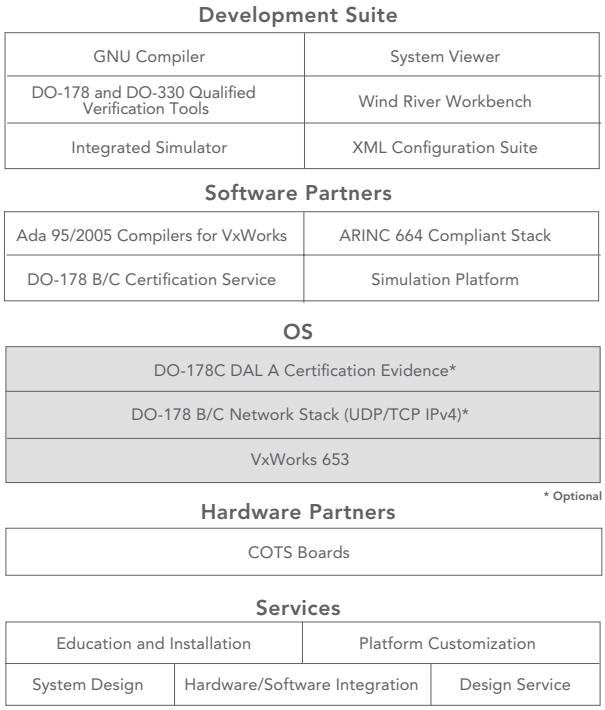

Figure 1: VxWorks 653 3.0 Multi-core Edition

FACE SUPPORT

VxWorks 653 virtualization supports unmodified guest operating systems, including ARINC 653, VxWorks, POSIX, and Linux. VxWorks 653 is also aligned with the FACE Technical Reference 2.1 OSS Safety Base Profile, with both ARINC 653 and POSIX APIs supported. Our unmodified guest OS support also enables the simultaneous use of Wind River Linux guest operating systems enabling FACE OSS General Purpose Profile applications to run on shared VxWorks 653 compute platforms with mixed levels of criticality and real-time response.

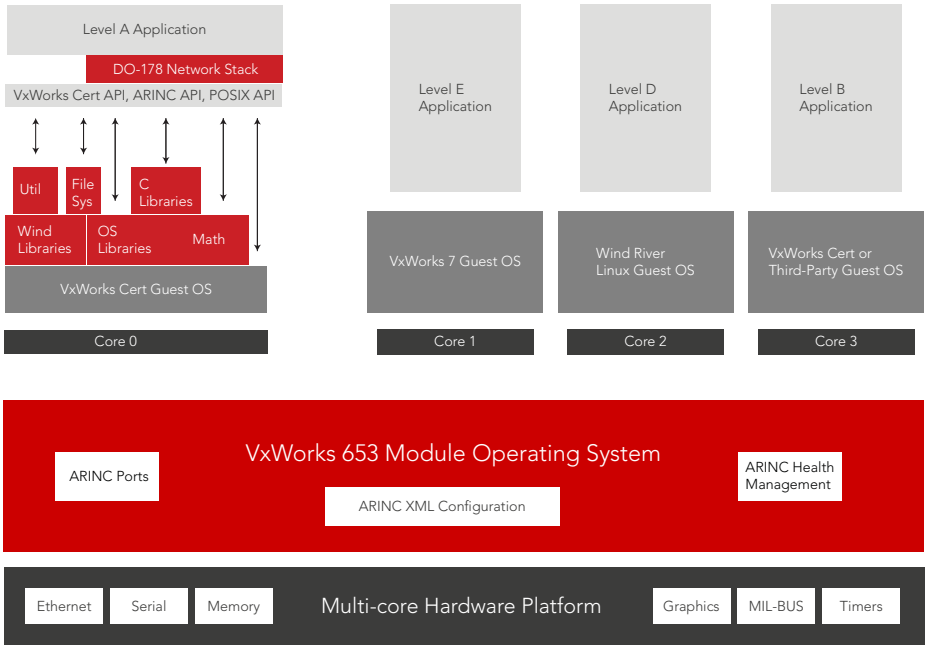

Figure 2: IMA design with VxWorks 653 3.0 Multi-core Edition

OPTIMIZED, INTEGRATED DEVELOPMENT SUITE

VxWorks 653 Multi-core Edition includes Wind River Workbench 4, a fully integrated Eclipse-based development suite optimized to support design, development, test, and certification of applications to meet RTCA DO-178C and EUROCAE ED-12C DAL A. The development suite consists of a project facility to define application resources and an XML configuration tool to easily define the static configuration records required for ARINC 653 applications. The development suite also offers DO-330-qualified development and verification tools that assist in the application test for credit and also enable the insertion of new applications into a tested environment without forcing a retest of the entire platform. This facilitates faster deployment of ARINC 653 systems, conserving certification testing resources and significantly reducing the cost of change.

The DO-330-qualified XML configuration tool suite allows developers to make changes to application or system configuration information without rebuilding and retesting the entire system. Changes to independent applications can be made without the need to retest or recertify other applications or the underlying OS in the system. This significantly reduces the time to achieve initial certification, as well as the cost of change and maintenance throughout the device lifecycle. In addition, this tool fully complies with the DO-297 IMA Development Guidance and Certification Issues Document, enabling intellectual property and security separation between the platform supplier, the application supplier, and the system integrator.

Unique to this platform are three high-performance tools that aid in the deployment of certified applications. They allow developers to measure CPU use by individual applications

or all applications; report memory usage of various areas of the OS, including heaps, stacks, ports, and health monitoring memory use; and monitor traffic across sampling and queuing ports. Along with the OS, the interfaces to these tools are DO-330-qualified, enabling testing of the exact deployment environment for certification.

INTELLIGENT LICENSING MODEL

Wind River VxWorks 653 Platform is available to companies under two Wind River licensing models: (1) Perpetual (paid up front) licensing, and (2) Enterprise License Agreement (ELA) subscription-based licensing, which gives businesses unprecedented flexibility in project budgeting and ease in license management across the enterprise. Two modes of production licensing (production license or production license–free) offer the option of capturing license fees in research and development or manufacturing.

PROVEN, RELIABLE PARTNER

The right technology partner can greatly increase your odds of success in a highly competitive marketplace. As the industry leader, Wind River has met and exceeded the requirements of our customers and their markets for more than 35 years, and our technology is found in more than 2 billion global devices. A vibrant, wholly owned subsidiary of Intel® Corporation, Wind River is positioned to continue our high level of support with established device manufacturers and new companies alike.

COMMERCIAL-GRADE SUPPORT AND SERVICES

VxWorks 653 Platform includes full access to the Wind River worldwide support organization, with 24/7 product support and training available through multiple channels. We also offer a specialized aerospace and defense services practice—a team of Wind River Professional Services engineers with extensive experience in delivering design, integration, and optimization services tailored to the needs of your industry, including creating DO-178C certification artifacts for board support packages (BSPs) and additional software libraries and modules. We are fully equipped to protect International Traffic in Arms Regulations (ITAR) technical data and meet government accounting needs.

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Wind River is a global leader in delivering software for the Internet of Things. The company's technology is found in more than 2 billion devices, backed by world-class professional services and customer support. Wind River delivers the software and expertise that enable the innovation and deployment of safe, secure, and reliable intelligent systems.