LynxOS-178

Certifiable RTOS for safety-critical computing

LynxOS-178 is a FAA-accepted Reusable Software Component that meets the objectives of RTCA/DO-178B, level A

The LynxOS®-178 RTOS is the first and only hard real-time DO-178B level A certifiable operating system to offer the interoperability benefits of POSIX® along with support for the ARINC 653 APplication EXecutive (APEX).

The LynxOS-178 RTOS is also the first and only time- and space-partitioned, FAA-accepted Reusable Software Component (RSC). LynxOS-178 is the only COTS solution that supports both Intel® Pentium® and PowerPC® platforms.

LynxOS-178 is based on open standards and is designed specifically to fulfill the stringent needs of multithread and multiprocess applications in safety-critical systems.

Time and space partitioning for fault containment

Brick-wall partitions make it impossible for system events in one partition to interfere with events in another. It's as if each partition were its own separate computer.

Memory and resources are never shared between the partitions in a LynxOS-178 system, and an ARINC 653-based scheduling algorithm ensures that the system is deterministically safe by providing each partition with fixed cycles of execution time.

Interpartition communication capabilities

LynxOS-178 offers developers the flexibility of advanced networking features that are unmatched by the competition.

The Lynx Certifiable Stack provides users with TCP/IP, UDP, ARP, ICMP, IGMP, FTP and TFTP protocols on a per partition basis certifiable up to DO-178B level A. Users can configure network applications with SNMPv3 and SNTP for added flexibility.

Applications can also make use of the ARINC 653 ports interface to communicate across partition boundaries. These ARINC ports can be configured on multiple hardware modules to make communication with other applications seamless.

Full FAA acceptance at DO-178B, level A

LynxOS-178 is a FAA-recognized Reusable Software Component (RSC) that meets all objectives of RTCA/DO-178B, which enables LynxOS-178 to be used on more than one project without having to regenerate certification artifacts.

The LynxOS-178 RSC is more than just a set of DO-178B artifacts. The documentation set includes a detailed partitioning and interface analysis that focuses on time, space and resource partitioning as well as timing margin analysis so developers can allocate budgets to use of operating system services. The set of RSC guidance documentation includes requirements, design data, test suites and coverage analysis to meet DO-178B requirements.

Additionally, LynxOS-178 comes with a full-fledged Eclipse-based development environment and premium tools for debugging and fine-tuning the performance of safety-critical systems. It's a complete package that includes full customer support and DO-178B consulting services from the specialists at LynuxWorks.

ARINC 653 space and time partitioning

Conformance to ARINC 653 partitioning and scheduling is increasingly required in safety-critical avionics systems. Each ARINC 653 partition supports full-fledged multithread, multiprocess applications. The application executive (APEX) manages system execution by allotting a dedicated time slice to each partition.

LynxOS-178 conforms to the ARINC 653-1 APEX interface and provides the following mandated system service groups:

Features & Advantages

- Low risk—known DO-178B level A certifiable, real-time operating system package at a known cost
- Reduced costs—eliminates man-years of effort and significantly lowers overall cost of DO-178B certification
- Reusable Software Component (RSC)—first and only time- and space-partitioned, FAA-accepted RSC
- POSIX conformance—the only DO-178B-certifiable RTOS available-today for safety-critical systems with POSIX conformance
- Support for ARINC 653—ensures application portability, software reuse and interoperability
- Support for the Lynx Certifiable Stack—enables networking protocols in a DO-178B level A environment

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- Partition management
- Process management
- Time management
- Interpartition communications (sampling ports and queueing ports)
- Intrapartition communications (buffers, blackboards, semaphores and events)
- Health monitoring

Full POSIX conformance

The POSIX standard was developed by the Institute of Electrical and Electronics Engineers (IEEE) and is maintained by The Open Group. POSIX is recognized by the International Organization for Standardization (ISO) and American National Standards Institute (ANSI).

POSIX conformance assures code portability between systems and is increasingly mandated for commercial applications and government contracts. POSIX is the native LynxOS-178 interface, and POSIX calls are not an optional add-on library for the operating system, ensuring maximum performance.

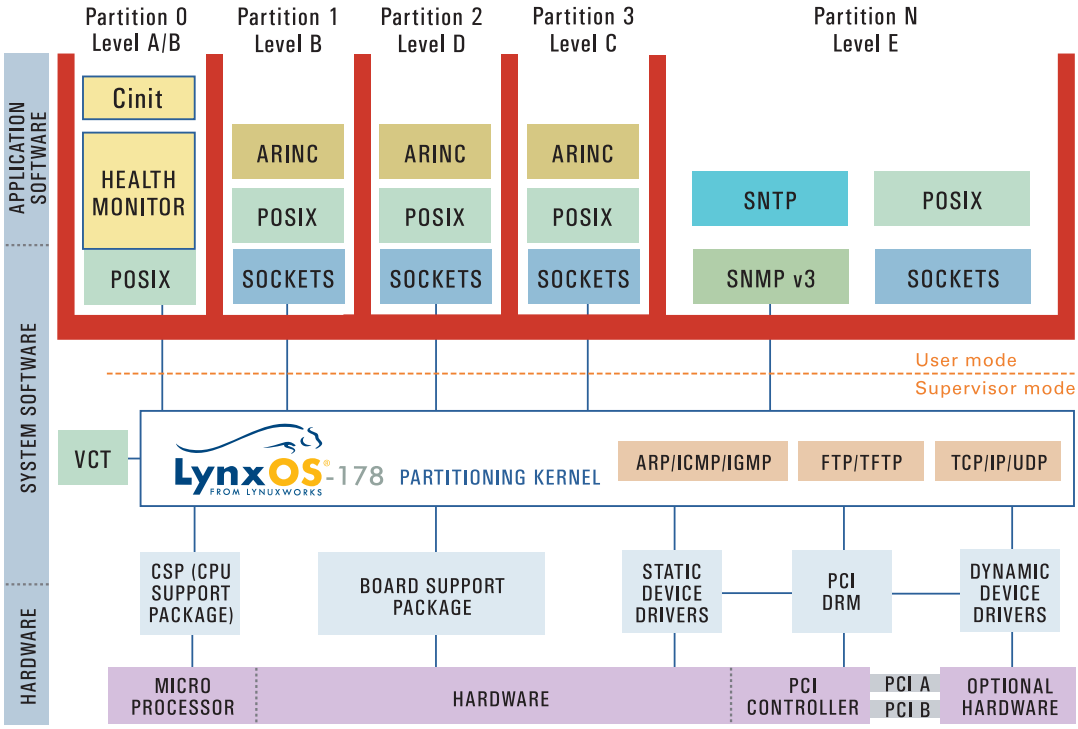
LynxOS-178–the smart choice

Certification of software to DO-178B and EUROCAE/ED-12B has traditionally demanded multiple man-years of effort, resulting in considerable costs and time-to-market penalties.

But now, LynxOS-178 enables companies to mitigate this risk. LynxOS-178 provides a known-certifiable package at a predictable cost, potentially saving thousands of man-hours and tens of millions of dollars over the course of a certification project.

Developers can now bring their safety-critical products to market faster than ever by leveraging software and artifacts that have been previously certified.

Once again, LynuxWorks leads the industry, as LynxOS-178 ushers in a new era of productivity for safety-critical system development.



LYNUXWORKS

1.800.255.5969

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LynuxWorks, Inc.
855 Embedded Way
San José, CA 95138-1018
408.979.3900
408.979.3920 fax
www.lynuxworks.com

LynuxWorks Europe
Craven House
121 Kingsway, Holborn
London WC2B 6PA
United Kingdom
+44 208 906 9506
+44 208 906 2338 fax