

# LynxSecure®

## A Bare Metal Hypervisor for Aerospace and Defense Applications



LynxSecure is a separation kernel hypervisor that supports multicore CPUs by precisely partitioning hardware resources to meet strict safety and security needs. Each application is assigned only the required CPU cores, memory, I/O, and operating system necessary to complete its function. Proven in commercial and military deployments, LynxSecure is certifiable to DO-178C (up to DAL A) and MIL-HDBK-516C standards.

Unlike many hypervisors in its class, LynxSecure does not include or require a central management kernel between the application and the CPU. This approach provides direct access to CPU cores, which can significantly improve overall system performance. LynxSecure is a completely OS agnostic hypervisor. It can be used with any vendor's RTOS or with the LynxOS-178® RTOS, the LynxElement® unikernel, embedded Linux, or as a bare metal implementation.

### Proven Architecture

- **Minimal and Independent:** Bare-metal separation kernel with no host OS dependencies, designed to reduce complexity, attack surface, and certification effort.
- **Maximum Hardware Utilization:** Portable architecture with broad processor support, providing direct access to the CPU, contributing directly to SWaP (size weight and power) optimization.
- **Deterministic and Predictable:** Supports real-time performance through a static configuration with fixed resource allocation and precise task control, without hidden schedulers or interference.



### Assured Isolation

- **Mixed-Criticality Support:** Enables the simultaneous deployment of safety-critical and non-critical applications by allowing them to run concurrently in fully isolated partitions. Supports both OS-managed and bare-metal applications.
- **Strong Partitioning:** Hardware-backed separation with no shared memory and no centralized scheduling. This eliminates cross-partition interference and helps protect sensitive data.

## A Trusted Computing Base

- **Secure by Design:** Meets modern cybersecurity requirements. Anchored in secure boot and cryptographic root of trust, aligned with NIST SP 800-53 security and privacy controls.
- **Reduced Attack Surface:** A small footprint hypervisor that delivers robust protection and eliminates common intrusion vectors.

## Certification-Ready

- **Airworthiness Certified:** Certifiable to DO-178C DAL A, MIL-HDBK-516C, and key multicore regulatory guidance such as A(M)C 20-193.
- **Integrated Modular Avionics:** A modular architecture that meets IMA and MOSA standards. Supports legacy hardware and software while also ready for future modernization in both commercial and defense-specific contexts.
- **Reduced Certification Costs:** Lean separation kernel architecture isolates components, enabling updates without ripple effects on other certified software. DO-297 / IMA aligned design that simplifies adding or removing subjects while bounding the scope of the certification effort.
- **Field-Proven:** Field-deployed in a variety of commercial and military aircraft.

## AI and ML Workloads

One of the key challenges in deploying applications that use artificial intelligence and machine learning is the potential impact on safety-critical functions and the security of sensitive data. LynxSecure addresses this challenge by providing 100% separation in the application.



LynxSecure Datasheet

## Primary Use Cases

LynxSecure is engineered for mission- and safety-critical environments where fault tolerance, cyber resilience, and strict separation are essential.

- **Fault-Tolerant, Cyber-Resilient Platforms:** Resists cyberattacks and contains faults through hardware-enforced isolation and a trusted computing base.
- **Command vs. Payload Separation:** Protects critical command and control functions by isolating them from complex or higher-risk payload operations.
- **Secure Gateways for Mixed-Criticality Data Flows:** Manages trusted data exchange across domains with different safety and security requirements.
- **Safety-Critical Mission and Flight Systems:** Provides certifiable separation of mission and flight software to meet the highest assurance standards.

## Why LynxSecure

A hypervisor is the cornerstone of your risk profile. LynxSecure delivers the isolation, predictability, and assurance that mixed-criticality and multicore platforms demand.

### Ready to revolutionize your mission-critical systems?

Contact Lynx today to learn more about how LynxSecure can empower your success and help you Seize the Edge in every critical endeavor.

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