LYNX

Accelerate Critical System Development with LYNX MOSA.ic™ VIE and EBF

Save up to 45% in development costs with the Lynx Virtual Integration Environment and Embedded Board Farm Add-On. Accelerate your development lifecycle through simulation, automation, and asset management.



Revolutionizing Development and Testing Workflows

At Lynx, we understand the challenges of delivering reliable, scalable, and secure systems under tight deadlines. To keep pace with competitors, companies must reduce time to production, increase deployment frequency, and issue software updates at "the speed of operations."[2]

LYNX MOSA.ic.VIE Virtual Integration Environment (VIE) empowers you to streamline your workflows, reduce costs, and meet the demands of critical applications by providing an advanced virtual testing environment. LYNX MOSA.ic.VIE with the LYNX MOSA.ic.EBF Embedded Board Farm (EBF) add-on further improves the development process by combining virtual and physical testing into a unified solution.

Modern engineering practices emphasize shifting development and testing activities earlier in the lifecycle to accelerate deployment and minimize risk—a concept known as "Shift Left." By decoupling software development from hardware availability, LYNX MOSA.ic.VIE enables teams to start development, catch issues earlier, and deliver software updates faster.

For teams requiring both virtual and physical testing capabilities, LYNX MOSA.ic.VIE with the LYNX MOSA.ic.EBF add-on integrates an Embedded Board Farm (EBF) into your workflows. This hybrid approach provides secure, remote access to live hardware, ensuring seamless transitions between virtual and physical environments. Whether developing applications for Linux, LynxOS-178™, or LynxElement™, our solution is designed to integrate with your CI/CD pipelines, enabling efficient and scalable development from start to finish.

With LYNX MOSA.ic.VIE and LYNX MOSA.ic.EBF, you can Seize the Edge by transforming workflows and accelerating project success.

Overcoming Barriers to Agile Development and Testing

Developing critical systems is no small feat. Teams face significant hurdles in meeting aggressive timelines, ensuring compliance, and managing resource constraints. Traditional development workflows often exacerbate these challenges, leading to delays, cost overruns, and increased risks.

Key Challenges:

Hardware Dependencies: Waiting for physical hardware to become available delays development and testing, leaving teams unable to address critical issues early.

Increased Risk of Late-Stage Defects: Software developed in host environments can result in late breaking defects when moved to your target hardware, jeopardizing project timelines and outcomes.

Limited Scalability: Traditional workflows lack the flexibility to scale development teams or adapt to rapidly changing requirements.

Inefficient Resource Utilization: Physical hardware is a costly and limited resource. It is often involved in scheduling conflicts or underutilized, slowing progress.

Compliance and Certification Bottlenecks: Without early-stage testing and validation, compliance with standards such as DO-178C becomes more complex and costly.

At Lynx, we've designed LYNX MOSA.ic.VIE and LYNX MOSA.ic.EBF to tackle these challenges. By shifting development earlier and integrating virtual and physical testing, we streamline workflows, reduce costs, and accelerate timelines to ensure project success.

Virtual Target Infrastructure: Accelerate Development from Day One

Delays caused by hardware availability are a common challenge for development teams, increasing risk and frustration. To address this, LYNX MOSA.ic.VIE provides a disaggregated virtual target infrastructure to empower your team to develop, debug, and validate applications earlier in the lifecycle.

LYNX MOSA.ic.VIE supports QEMU virtual targets for Arm and Intel architectures, offering seamless integration into your CI/CD pipelines. This solution lets you quickly introduce virtual target testing into your workflows, accelerating schedules while reducing cost and risk.

How LYNX MOSA.ic.VIE™ Works for You:

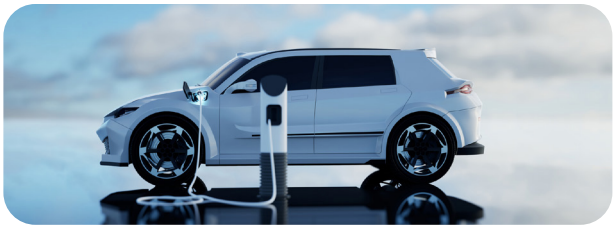
Flexible Deployment Options - Create workflows on-premises or in the cloud to meet your unique needs. The environment is quickly established using a client-server model.

Robust Client/Server Model - Quickly establish the virtual environment by deploying the Virtual Target Emulator and Manager on the Lynx DevOps Server. Deploy the client side of the Virtual Target Manager on the MOSA.ic CDK workstations to provide the user with streamlined access to the emulation features.

Seamless Build and Debugging - You can build Linux and LynxOS-178™ images, upload them via CLI, and run deployment scripts for rapid iteration.

Streamlined Automation - Insert the virtual target client and services into a CI/CD workflow to fully automate the deployment and execution of the images on virtual targets, saving time and improving efficiency.

By decoupling software development from hardware availability, LYNX MOSA.ic.VIE empowers your team to Seize the Edge by focusing on innovation and confidently delivering critical milestones.



Physical Target Advantages: Flexibility Redefined with Hybrid Testing

Developing complex embedded systems demands efficiency, scalability, and seamless transitions between virtual and physical environments. With the LYNX MOSA.ic.EBF add-on for LYNX MOSA.ic.VIE, Lynx delivers a groundbreaking solution integrating virtual testing with secure remote access to live hardware. This enables your team to tackle even the most challenging projects confidently.

Key Advantages of the VIE + EBF Integration:

- Effortless Hybrid Testing: Transition seamlessly between virtual and physical environments, leveraging the best of both worlds for greater flexibility and scalability.
- Streamlined Workflow Integration: Incorporate VIE and EBF into your existing workflows using REST APIs and CLI tools, enabling easy interfacing with popular test frameworks and CI/CD systems.
- Accelerated Time-to-Market: Reduce delays by combining advanced virtual testing capabilities with efficient, shared access to the live hardware to deliver projects faster and more efficiently.

By integrating LYNX MOSA.ic.VIE with the Embedded Board Farm, you gain the power to automate hybrid testing, simplify transitions, and ensure collaboration across teams—all within a secure and efficient framework. Lynx enables you to reimagine what's possible for your critical systems and Seize the Edge.

Why Organizations Choose LYNX MOSA.ic.VIE and EBF

At Lynx, we empower organizations to achieve success by addressing the complexities of modern embedded system development. With LYNX MOSA.ic.VIE and the LYNX MOSA.ic.EBF add-on, your team gains the tools to streamline workflows, reduce costs, and accelerate timelines, all while minimizing risk and maximizing efficiency. Here's how LYNX MOSA.ic.VIE delivers measurable results for your critical systems.

Agile Software Development for Critical Systems – Save on average 30% of development time[3]	• Accelerate and parallelize development and testing cycles. • Evaluate alternative system architectures effectively before hardware finalization. • Use tools and Python libraries to build and test Buildroot, LynxOS-178™, and LynxElement™ images in CI/CD pipelines, enabling seamless deployments to the target hardware.
Scalable Development with Minimal Infrastructure – Virtually zero cost to add users	• Expand your team without rigid infrastructure dependencies. • Provide early prototype access to development and testing teams.

Key Capabilities: Transforming Development and Testing

LYNX MOSA.ic.VIE and the LYNX MOSA.ic.EBF add-on provide advanced tools and frameworks to empower your team, addressing the challenges of early-stage development, productivity, and safety certification with unparalleled efficiency and precision.

Early-Stage Development and Increased Productivity

- **LYNX MOSA.ic.VIE -** Traditional embedded software development relies heavily on hardware availability, often leading to delays and cost overruns due to supply chain constraints. With LYNX MOSA.ic.VIE, your team can start development immediately using representative environments for LynxOS-178™ and Linux applications. By decoupling software development from hardware dependencies, you reduce risk and gain critical time to accelerate progress.
- **LYNX MOSA.ic.EBF -** The Embedded Board Farm (EBF) adds the ability to efficiently insert hardware in the loop to address even the most complex hardware timing and design challenges early in development. By identifying and resolving critical issues at the start, your team minimizes costly late-stage adjustments, ensuring a smoother path to deployment.

Increased Productivity

- **LYNX MOSA.ic.VIE -** Physical hardware is often a bottleneck, requiring on-site access and complex scheduling. LYNX MOSA. ic.VIE eliminates these barriers by providing an emulated environment where development and testing can proceed without waiting for physical resources. This approach helps your team reach critical milestones faster while improving collaboration and flexibility.
- **LYNX MOSA.ic.EBF -** When physical hardware testing is needed, the boards farm seamlessly bridges the gap, allowing engineers to transition between virtual and physical environments effortlessly. By reserving precious hardware resources only when strictly needed, your workflows become very efficient, capable of adapting to evolving requirements and keeping progress on track.

Safety Certification Risk Reduction

- **LYNX MOSA.ic.VIE -** Establishing a CI/CD workflow with LYNX MOSA.ic.VIE builds confidence early in the development cycle. The emulated environment identifies target-specific bugs long before formal qualification testing, ensuring that challenging DO-178C objectives are met. Most target-related issues can be addressed in the representative hardware emulation environment, significantly reducing risks.

VIE Architecture and Features: Flexibility and Adaptability for Advanced Development

At Lynx, we design solutions that empower your team to adapt to complex development environments with confidence and ease. LYNX MOSA.ic.VIE architecture is built to provide greater flexibility, enhanced debuggability, and seamless integration into your workflows, ensuring your systems are ready for critical success.

Advanced Architecture for Optimized Workflows

The **Virtual Integration Environment** leverages QEMU instances on the VIE Server to run guest operating systems, including Buildroot Linux, LynxOS-178™, and LynxElement™. By disaggregating these environments from LynxSecure™, LYNX MOSA.ic.VIE creates a modular setup that supports adaptable development and testing workflows tailored to your needs.

Seamless Integration with Automation Tools

Python APIs and a command-line interface (CLI) provide robust control over the VIE Server, simplifying integration with CI/CD pipelines. These tools enable your team to automate testing and streamline development processes, reducing time-to-market and improving efficiency.

With LYNX MOSA.ic.VIE, you gain the adaptability and control needed to meet the demands of today's fast-paced development cycles, all while maintaining the precision required forcritical applications.

Streamlined Deployment and Management

The client/server model simplifies how your team interacts with the VIE Server, allowing you to efficiently manage operating system images and their deployment. Key commands include:

- **Upload OS Images -** Quickly transfer images to the VIE Server for deployment.
- **Launch Virtual Targets -** Spin up new virtual targets with ease to test and validate applications.
- **Delete Virtual Targets -** Manage your testing environment dynamically by removing unnecessary targets.



Embedded Board Farm (EBF) Integration: Bridging Virtual and Physical Testing

To meet the demands of scaling complex development and testing workflows, Lynx integrates LYNX MOSA.ic.VIE with the LYNX MOSA.ic.EBF Embedded Board Farm (EBF) add-on, creating a unified solution that empowers your team to seamlessly transition between virtual and physical environments.

Consistent Commands and API

Both the application developer and the CI/CD automation engineer control the virtual and physical environment with the same commands and primitives.

Remote Hardware Access

Securely manage live hardware with features like power control, USB hot-plugging, and network management.

Enhanced Collaboration

Enable continuous integration, remote debugging, and automated testing, streamlining teamwork and reducing dependence on physical hardware.

Comprehensive Framework

Maintain a secure, efficient workflow that adapts to your evolving needs, ensuring your team stays ahead in critical projects.

By combining LYNX MOSA.ic.VIE with the LYNX MOSA.ic.EBF add-on, you gain the flexibility, scalability, and precision needed to overcome hardware constraints and deliver projects with confidence.



Education and Services: Empowering Your Success

At Lynx, we're committed to empowering your team with the knowledge and tools needed to maximize the value of LYNX MOSA.ic.VIE and LYNX MOSA.ic.EBF.

Our Services Include:

- **Quick Start Training -** Get your team up and running in days, ensuring immediate productivity. • **Productivity Assessment -** Collaborate with Lynx experts to identify and resolve bottlenecks, streamlining your workflows. • **Deployment Acceleration -** Integrate tools into your software pipeline quickly and efficiently with expert guidance.

Drive Innovation and Seize the Edge

Take the next step in transforming your development and testing workflows. With LYNX MOSA.ic.VIE and LYNX MOSA.ic.EBF, you can accelerate timelines, reduce costs, and deliver critical systems with unmatched precision and efficiency.

Ready to Seize the Edge? Contact Lynx today to learn how our solutions can empower your success.

Sources

1. McKinsey - Creating Value with the Cloud, 2018.
2. DoD Enterprise DevSecOps Reference Design, 2019.
3. Internal Lynx Report.

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Ready to revolutionize your critical systems?

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

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