

Conference Abstracts

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The Xen Project: The OSS Hypervisor Powering Clouds, Cars, and Beyond

Tags: [Developer](#) [DevOps](#) [Infrastructure](#)

Virtualization is everywhere, but the technology behind it often flies under the radar. The Xen Project, a Linux Foundation project since 2013, is one of the world's most battle-tested hypervisors. It powers everything from cloud providers to embedded automotive systems, all with an open-source foundation that puts security, performance, and freedom first.

This session introduces Xen to the uninitiated, with a look at its history, why it's still a key player in modern infrastructure, and how it's evolving to meet the demands of edge, embedded, and security-first environments. Whether you're a DevOps engineer, OSS advocate, or just virtualization-curious, you'll leave with a clear sense of why Xen matters and how it fits into the future of open infrastructure.

Key takeaways

- What Xen is and how it differs from other hypervisors
- Why its open architecture makes it ideal for secure, flexible deployments
- Real-world use cases in cloud, embedded, and automotive
- How Xen's OSS community helps ensure transparency and innovation

Benefits to CNCF ecosystem

- Raises awareness of a critical open source infrastructure project
- Highlights how OSS can succeed long-term with strong community governance
- Showcases new and unexpected Xen use cases in emerging industries
- Encourages participation and contribution to a mature Linux Foundation project

Virtualization as Code: Automate Your VMs With Xen

Tags: [Developer](#) [DevOps](#) [Infrastructure](#)

Infrastructure should be repeatable, scalable, and version-controlled. So why rely on costly Cloud and CI providers for your infrastructure and build environments?

In this session, we'll explore how Xen + Infrastructure as Code (IaC) tools like Terraform and Ansible can automate virtualization while keeping full control in your hands. Learn how to define

VMs, networking, and security policies in code, making deployments faster, more reliable, and cost-efficient. All without vendor lock-in.

Own your infrastructure. Automate your virtualization.

Key takeaways

- How to automate VM deployments using Xen and Infrastructure as Code (IaC) tools like Terraform and Ansible.
- Why treating virtualization as code improves scalability, repeatability, and reliability.
- How to reduce dependency on costly cloud and CI providers by managing infrastructure in-house.
- The benefits of open-source virtualization for flexibility, security, and avoiding vendor lock-in.
- Best practices for defining VMs, networking, and security policies in code.

Benefits to CNCF ecosystem

- Promotes automation and best practices by integrating virtualization with Infrastructure as Code (IaC), aligning with CNCF's cloud-native principles.
- Encourages open-source adoption by showcasing Xen, a fully open-source hypervisor, as a flexible alternative to proprietary virtualization solutions.
- Reduces dependency on costly cloud providers by teaching teams how to self-manage infrastructure efficiently.
- Bridges the gap between virtualization and cloud-native workflows, helping DevOps teams leverage Xen alongside Kubernetes and container ecosystems.
- Empowers developers with greater control over infrastructure, reducing vendor lock-in and enhancing security.
- Provides actionable insights on how to integrate virtualization seamlessly into modern DevOps and cloud-native environments.

Raspberry Pi, Xen, and the Future of Automotive Software

Tags: [Developer](#) [Embedded](#)

Once upon a time, cars were just machines: metal, rubber, and horsepower. Now they're rolling data centers, packed with sensors, AI, and advanced software systems. But cramming dozens of computers into a car is expensive, complex, and a nightmare to maintain.

What if one powerful SoC could do it all? Enter Xen on Raspberry Pi. This is a glimpse into how virtualization can consolidate infotainment, telemetry, and safety-critical workloads while keeping them securely isolated. This talk explores how Xen enables automotive-grade workload isolation, why manufacturers are turning to virtualization to cut costs and increase flexibility. Explore the challenges of running Xen on embedded systems and how to solve them.

The future of automotive software is modular, efficient, and virtualized. Let's take it for a spin!

Key takeaways

- How automotive software is evolving from multiple ECUs to a single, virtualized system-on-chip (SoC).
- How this architecture is a great fit for the embedded and industrial sectors (not just automotive).
- Why Xen's open-source architecture is ideal for automotive virtualization, offering security, flexibility, and cost savings.
- How virtualization enables workload isolation for infotainment, telemetry, and safety-critical systems.
- The benefits of reducing hardware complexity in automotive design through SoC consolidation.
- Challenges of running Xen on embedded systems and strategies to overcome them.
- How OSS plays a critical role in shaping the future of automotive software by enabling transparency, security, and innovation.

Benefits to the ecosystem

- Demonstrates how open source virtualization enables cost-effective, secure automotive software architectures.
- Promotes collaboration between OSS communities, embedded developers, and the automotive industry.
- Highlights Xen as a mature, Linux Foundation project with real-world applications beyond data centers.
- Encourages adoption of OSS in safety-critical and regulated environments through transparency and modular design.
- Showcases how OSS lowers the barrier for experimentation and prototyping on accessible hardware like Raspberry Pi.
- Sparks cross-industry innovation by applying open source practices to traditionally closed ecosystems.
- Reinforces the value of OSS in driving flexible, maintainable infrastructure for next-gen automotive and industrial systems.

The Rise of MicroVMs: Tiny, Mighty, and Ready to Take Over

Tags: [Developer](#) [DevOps](#) [Infrastructure](#)

Once upon a time, containers were the new hotness. But then came MicroVMs: faster, more secure, and stripped down to just what you need. Goodbye bloat, hello speed and security.

This talk explores how Xen is perfectly built for the MicroVM revolution. How we can blend isolation, efficiency, and near-instant startup times. We'll dive into real-world use cases,

compare MicroVMs to containers, and show how they're changing the way we think about cloud-native workloads.

Containers had their time in the sun. Now, MicroVMs are here to steal the spotlight.

Key takeaways

- Why MicroVMs are the next evolution beyond traditional containers.
- Xen's open-source architecture is ideal for MicroVMs, offering lightweight isolation and fast startup times.
- Comparing MicroVMs to containers including strengths, weaknesses, and real-world use cases.
- How MicroVMs enhance security and efficiency for cloud-native workloads.
- The role of open-source in driving MicroVM adoption and innovation.
- Practical strategies for adopting MicroVMs in DevOps, infrastructure, and cloud environments

Benefits to CNCF ecosystem

- Educating developers and platform engineers on how MicroVMs fit into cloud-native environments.
- Demonstrating how Xen's open-source architecture aligns with CNCF's commitment to innovation and vendor-neutral solutions.
- Bridging the gap between virtualization and containers, helping attendees explore alternative approaches to workload isolation.
- Encouraging open-source adoption by showcasing real-world use cases and tools that integrate MicroVMs into cloud-native stacks.
- Providing actionable insights on how DevOps teams can use MicroVMs to improve performance, security, and flexibility in their infrastructure.

Security in Virtualization: Your DevOps Pipeline is a House of Cards

Tags: [Developer](#) [DevOps](#) [Infrastructure](#) [Security](#)

Your CI/CD pipeline is sleek, fast, and automated... until an attacker sneaks in through a misconfigured workload and pivots across your entire system. Whoops.

Security isn't just about patching and firewalls. It's about strong workload isolation at the virtualization layer. In this talk, we'll explore how Xen provides rock-solid security boundaries that protect DevOps environments from supply chain attacks, VM escapes, and privilege escalation.

Your infrastructure shouldn't be a house of cards. Let's build something stronger.

The Evolution of Virtualization: Adding some Xen to HPC

Tags: Infrastructure ▾

As High Performance Computing (HPC) continues to evolve with the integration of AI and accelerated computing, virtualization is more important than ever. This session explores how Xen, a mature open-source hypervisor and LF project, adapts to meet the unique demands of HPC environments. Learn about Xen's capabilities in providing lightweight, secure, and high-performance virtualization. It will also cover Xen's support for hardware accelerators and its integration within HPC software stacks. Learn how to leverage Xen to enhance resource utilization, scalability, and flexibility in HPC infrastructures.

Benefits to the ecosystem

- Bridges HPC and Virtualization: Educates the community on how modern hypervisors like Xen enhance HPC workloads.
- Promotes Open-Source Adoption: Highlights Xen as a vendor-neutral, open-source alternative to proprietary HPC solutions.
- Enhances HPC Security: Showcases Xen's security-first architecture for better workload isolation and protection.
- Integrates with Existing HPC Tools: Connects Xen to containerization solutions like Apptainer, Spack, and Charliecloud for better resource sharing.

Beyond the Datacenter: Xen's Quest to Power HPC at the Edge

Tags: Infrastructure ▾

HPC has long lived in massive data centers, but AI, IoT, and real-time analytics demand compute closer to the action. Enter Xen, our hero in the journey beyond the datacenter—bringing lightweight virtualization, hardware flexibility, and security to the edge. This talk explores real-world case studies, how Xen enables HPC in edge environments, and why the future of high-performance computing is everywhere.

Benefits to the ecosystem

- Brings HPC to the Edge: Enables high-performance computing outside traditional data centers.
- Enhances Security: Provides strong workload isolation for IoT and edge environments.
- Optimizes Resource Use: Improves efficiency with lightweight virtualization.
- Expands Hardware Flexibility: Supports diverse platforms for edge and distributed HPC.
- Future-Proofs HPC: Bridges the gap between centralized clusters and real-time, remote computing.

The Hypervisor Hierarchy: Why Architecture Matters for Performance, Security, and Flexibility

Tags: [Developer](#) [Infrastructure](#) [Embedded](#)

Not all hypervisors are created equal. Some claim to be "bare metal" but rely on an underlying OS, while others truly separate hardware from workloads, enhancing security, stability, and performance. This session breaks down the differences between Type 1 and Type 2 hypervisors, why some architectures blur the lines, and how Xen stands apart as a true, independent Type 1 hypervisor. We'll explore how Xen can run with dom0 or dom0less, offering flexibility for both dynamic and fixed VM environments. We'll also discuss how Xen's streamlined, unified ecosystem avoids the fragmentation seen in other virtualization stacks. Attendees will leave with a clear understanding of why hypervisor design matters and how it impacts security, efficiency, and long-term infrastructure choices.

Benefits to the ecosystem

- Helps developers and architects make informed decisions about virtualization architecture.
- Clarifies key differences between hypervisor types, encouraging more secure and efficient infrastructure design.
- Highlights the importance of clean, minimal hypervisor stacks in embedded and infrastructure use cases.
- Showcases Xen as a mature, true Type 1 hypervisor with flexible deployment options (dom0 and dom0less).
- Encourages ecosystem adoption of unified, less fragmented virtualization solutions.
- Educates OSS and infra communities on the long-term benefits of architecture simplicity and maintainability.
- Supports better alignment between hardware capabilities and virtualization strategies in cloud and embedded sectors.
- Reinforces the value of open, community-driven virtualization projects like the Xen Project.

Breaking Free: How Open Source Virtualization is Reshaping Finance

Tags: [Developer](#) [Infrastructure](#) [Security](#)

Financial institutions have long relied on costly, proprietary virtualization stacks—paying high licensing fees and facing vendor lock-in. But open-source solutions like Xen and XCP-ng offer a way out, providing enterprise-grade virtualization with full control, security, and compliance—without the overhead. As a Linux Foundation project, the Xen Project powers major cloud and financial workloads, while XCP-ng builds on its foundation for seamless,

scalable deployments. This talk explores real-world financial use cases, how open-source virtualization reduces costs, enhances security and compliance, and why breaking free from proprietary stacks is key to financial innovation.

What Problem Does This Solve?

Financial institutions struggle with rising virtualization costs, vendor lock-in, and compliance challenges tied to proprietary infrastructure. Open-source virtualization offers a secure, cost-effective alternative that provides full control over infrastructure while aligning with open banking and regulatory requirements. This session will demonstrate real-world applications of Xen and XCP-ng in finance, showing how they enhance security, flexibility, and resilience for mission-critical workloads.

Virtualization, Security, and Compliance: How Open-Source Keeps Finance Safe

Security in financial services isn't optional: it's critical. Yet many institutions rely on proprietary virtualization stacks that introduce vendor lock-in, compliance headaches, and unseen risks. What if open-source virtualization could offer stronger workload isolation, transparency, and cost efficiency. All while keeping full control in your hands?

As a Linux Foundation project, Xen and XCP-ng provide enterprise-grade security with fine-grained isolation, reducing attack surfaces and preventing vulnerabilities from spreading. This session explores how open-source virtualization strengthens security, mitigates risk, and ensures compliance in financial environments, backed by real-world use cases from financial institutions. In a world where security breaches cost millions, open-source isn't just an alternative... it's the smarter choice.

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Securing Financial Infrastructure: Why Open-Source Virtualization is the Key

Financial institutions handle billions of transactions daily, making security and compliance non-negotiable. But while many rely on proprietary virtualization stacks, these come with hidden security risks, lack of transparency, and vendor lock-in.

This session explores how Xen and XCP-ng, as part of the Linux Foundation's Xen Project, provide enterprise-grade security, workload isolation, and compliance-ready infrastructure—without the costs of proprietary solutions. We'll dive into:

- How open-source virtualization strengthens security and regulatory compliance.
- Real-world use cases of Xen securing financial workloads.
- Why transparency in open-source software is crucial for risk management.

Security breaches cost financial institutions millions—it's time to rethink infrastructure security with open-source solutions.

What Problem Does This Solve?

Financial services face growing threats from cyberattacks, regulatory requirements, and opaque proprietary infrastructure. Xen and XCP-ng provide open-source, security-first virtualization, ensuring fine-grained workload isolation, transparency for compliance, and reduced vendor dependence.

The AI Gold Rush: Why Open-Source Virtualization is the Bedrock of Financial AI

AI in finance is booming. From real-time fraud detection to automated trading, banks and fintechs are racing to deploy AI at scale. But AI demands serious computing power, strict regulatory compliance, and airtight security, and many financial institutions find themselves locked into expensive, proprietary infrastructure with little flexibility.

What if there was another way? Xen and XCP-ng, as part of the Linux Foundation's Xen Project, provide the secure, scalable, and open-source virtualization that AI workloads demand. This session explores how open-source virtualization ensures AI security and compliance without vendor lock-in, why Xen's lightweight architecture is a perfect fit for AI acceleration, and how financial institutions can take control of their AI infrastructure to future-proof their stack. The AI revolution in finance is here, but who controls the infrastructure powering it? Let's explore how open-source virtualization gives financial institutions the freedom, security, and performance they need to innovate with AI.

What Problem Does This Solve?

AI in finance demands high-performance compute, strict security, and regulatory compliance. But proprietary infrastructure comes with skyrocketing costs, vendor lock-in, and opaque security practices. Xen and XCP-ng provide a fully open-source, highly secure, and scalable alternative, giving financial institutions the freedom to control their AI infrastructure while meeting compliance and performance requirements.

Xen and the Art of Open Source: One Developer's Journey into Community and Impact

Open source isn't just about code, it's about community, collaboration, and the unexpected ways it can change lives. In this talk, I'll share my personal journey: from developer and OSS contributor to FINOS ambassador, OpenJS CPC member, and now Community Manager for the Xen Project at the Linux Foundation.

We'll talk about what it really means to get involved in OSS foundations, how open governance creates room for new voices, and why businesses win when they engage with open communities. I'll share lessons learned from bridging the gap between code and culture, enterprise and ecosystem, and how embracing open source opened unexpected doors in my career and life.

Benefits to the ecosystem

- Encourages broader and more diverse participation in OSS leadership
- Helps newcomers and enterprise contributors understand how governance works
- Highlights the long-term career and organizational benefits of OSS engagement
- Provides a transparent, relatable story about the human side of open source

Dom0less and Deterministic: Building Safer Automotive Systems with Xen

Automotive software is moving fast—but safety can't fall behind. As modern vehicles consolidate workloads onto shared hardware, strong isolation becomes critical. Enter dom0less Xen: a powerful, open-source approach that launches multiple virtual machines in parallel at boot time, eliminating the dependency on a privileged control domain.

This session explores how Xen's dom0less architecture enables lean, deterministic startup of isolated environments for infotainment, telematics, and even safety-critical functions. We'll walk through how this design supports functional safety goals, simplifies compliance (e.g., ISO 26262), and reduces attack surfaces—all with real-world applicability on embedded hardware like ARM SoCs and Raspberry Pi (as a POC).

Benefits to the ecosystem

Xen is a foundational aspect to the AGL reference architecture
Bridges the OSS and functional safety communities through transparent, testable virtualization
Lowers the barrier for automotive companies to experiment with open hypervisors
Shows that OSS can meet real-time and safety-critical constraints
Highlights Xen as a vendor-neutral, Linux Foundation-hosted project already used in embedded systems

When JavaScript Meets the Hypervisor: Automating Xen with Node.js

Virtualization isn't just for ops engineers anymore. With modern APIs, powerful open-source tooling, and a bit of JavaScript, developers can take full control of their infrastructure, even the hypervisor layer.

In this session, we'll explore how Node.js can be used to manage and automate Xen-based virtual machines, with real-world examples using libraries like node-libvirt, ssh2, and custom wrappers for Xen's command-line interface. We'll cover how JavaScript-based automation bridges gaps between dev and infra, enabling faster testing environments, developer-controlled CI/CD workflows, and even hardware lab orchestration.

It's a fresh perspective on infrastructure: using JavaScript not just for the cloud, but for the hardware beneath it.

Benefits to the ecosystem

Expands the role of JavaScript developers in infrastructure automation
Encourages OSS integration between modern developer tooling and low-level virtualization
Shows how Xen can be adapted for modern workflows using popular languages
Brings new contributors to Xen from the vibrant Node.js ecosystem

Beyond the Datacenter: From Cars to Clouds with Open Virtualization

Virtualization used to mean racks of servers humming in data centers. Today it powers everything from cloud platforms to connected cars, industrial robots, and edge AI devices. This talk follows that evolution: how open virtualization, built on projects like Xen, is moving beyond the cloud to shape the next generation of compute.

We'll look at what makes this shift possible: lightweight hypervisors, strong isolation, and architectures like dom0less that deliver predictable startup for mixed-critical workloads. Attendees will see how the same open foundations that run the cloud are now consolidating hardware in vehicles, factories, and IoT systems.

There is no product to pitch. Instead, let's connect communities, open source projects, engineers, embedded developers and safety-focused teams to solve a common problem: how to build secure and efficient systems everywhere.

Notes

Proposed for the main track. This talk connects open virtualization projects such as Xen and KVM to broader trends in edge and automotive computing. It highlights how mature open infrastructure is being reused in new domains and aims to bring cloud and embedded communities together around shared challenges in performance, security, and transparency.