



Beyond readiness: The AI-native data center

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INTRODUCTION

AI has entered its accelerated era

AI is moving from experimental to scale. Training runs that used to happen weekly now happen continuously. Models that served hundreds of requests now handle millions. Systems that could wait for batch processing now need sub-second response times. In the accelerated era of AI, infrastructure that runs the business can't pause, reboot, or slow down without real consequences.

The data centers built for traditional workloads are being asked to support something fundamentally different: AI systems that learn continuously, respond in real time, and scale unpredictably.

The difference isn't incremental. In a recent episode of Cisco Tech Stories, principal architect Venkat Kirishnamurthy, who has deployed AI data centers with thousands of GPUs, put it simply: Traditional data center networks average 5-10% utilization with occasional peaks around 30%. AI training infrastructure? "I'm pegged at 100% all the time." When eight GPUs per server are each pushing 400 gigabits per second, the network either performs flawlessly or the entire training job stalls. There's no slack, no buffer, no room for "good enough."

Even in this intense environment, the path forward is clear. Pacesetters who treat AI infrastructure as programmable, automated, and continuously optimized are already seeing results: faster

deployments, fewer disruptions, and infrastructure that evolves as needs change.

Embracing AI infrastructure isn't about ripping out what you have, but it's also not as simple as retrofitting existing data centers. The power and cooling demands of GPU-intensive workloads mean AI-native facilities are often purpose-built from the ground up. The real challenge is integration: ensuring your traditional data centers and new AI infrastructure work in sync, supporting both legacy business processes and emerging AI capabilities. This requires thoughtful technical and operational alignment so you avoid accumulating technical debt that will slow you down later.

This ebook shows what we've learned working with business leaders making this transition and how you can apply it to your own infrastructure journey today.

The AI-ready data center advantage

By modernizing infrastructure, automating operations, deploying unified intelligence, and infusing security everywhere, you can unlock measurable advantages that compound over time.

Faster transformation, shorter time-to-value

Modern infrastructure accelerates every aspect of business transformation. When infrastructure is programmable, testable, and managed as code, deployment cycles shrink dramatically. **You achieve:**



Accelerated time-to-value

By reducing friction and cognitive load, teams can move from planning to production faster, responding quickly to market opportunities and competitive pressures.

5x faster deployment cycles*

Through automation and Services as Code, our approach to defining network services as programmable, reusable templates, what used to take days or weeks now happens in hours—or even minutes.

Reduced operational risk and downtime

When infrastructure operates reliably and changes are validated before deployment, the risk profile transforms.

You achieve:



98%+ change success rates

Automation, pre-production testing, and validated deployment pipelines eliminate the firefighting that comes from failed changes.¹

Proactive issue prevention

Continuous infrastructure assessments identify security vulnerabilities, misconfigurations, and compliance gaps before they cause disruptions, minimizing the effort, time, and cognitive load required to maintain resilience.

Minimized deployment risks

Personalized infrastructure designed for your specific use cases enables seamless, disruption-free operations. The outcome is systems that can absorb change without introducing new failure points.

Improved team productivity and reduced burnout

The true impact of infrastructure modernization is not only measured in technical stats, it's counted in employee satisfaction and happier, more productive teams. **You achieve:**



Shift from survival mode to innovation mode

With personalized learning pathways and streamlined operations, teams reclaim the time and confidence to focus on transformative initiatives, not just maintenance. By alleviating cognitive load and friction, IT teams can finally shift from survival mode to innovation mode.

Empowered teams with knowledge transfer

Expert services build internal capability through hands-on training and knowledge transfer, enabling teams to operate with greater confidence over time.

65% reduction in network operations costs

Operators can reduce network operations costs by up to 65% using automation at the IP layer.²

1. [Cisco Services as Code](#) – 2026 Finalist, Edison Awards, Jan 2026
2. [The quantitative benefits of IP network automation](#), Analysys Mason, Oct 2021

Enhanced security posture

Security that's infused everywhere and continuously adapting creates protection that strengthens rather than degrades over time.

You achieve:



Reduced vulnerabilities

Proactive identification of misconfigurations, vulnerabilities, and compliance gaps means issues are addressed before they can be exploited. Automated security best practices ensure consistent hardening across all devices.

On-demand monitoring and compliance

Rather than periodic security audits, adaptive assessments provide on-demand monitoring of security posture, delivering ongoing insights into vulnerabilities and compliance gaps.

Protection without productivity barriers

Security operates intelligently in the background, achieving robust protection without sacrificing user experience or creating bottlenecks that slow down the business.

Future-ready foundation for autonomous AI

Perhaps the most significant advantage is the hardest to quantify: the ability to adopt emerging technologies and respond to changing conditions with confidence.

You achieve:



The pacesetter advantage

According to Cisco's AI Readiness Index 2025, organizations with networks optimized for AI are nearly 4x more likely to achieve production-scale deployments and 50% more likely to report measurable business value.

Infrastructure agility

The agility built into AI-ready data centers becomes a sustainable competitive advantage in rapidly evolving business environments. Infrastructure that evolves and is ready for what comes next.

Sustainable competitive advantage

With more organizations implementing structured infrastructure automation to deliver flexibility and efficiency, the gap between leaders and followers will widen.

Improve agility and productivity

70%

By 2025, 70% of organizations will implement structured infrastructure automation to deliver flexibility and efficiency, up from 20% in 2021.*

Getting started: Infrastructure built for what's next



COMPREHENSIVE SYSTEMS THAT POWER AI WITHOUT BREAKING

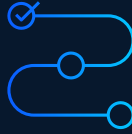
The infrastructure that powered traditional enterprise applications wasn't designed for what AI demands. Batch processing could wait. Periodic updates were acceptable. Scheduled maintenance windows were part of the plan.

AI workloads operate on different principles entirely. They run continuously, not periodically. They require real-time responses measured in milliseconds, not minutes. The price of inefficiency is measured in costly GPUs. And they cannot tolerate the downtime that once seemed routine.

The three pillars of AI-ready infrastructure



Comprehensive
infrastructure



Seamless operations
and observability



Security from
ground to cloud

The infrastructure gap is real

The challenge isn't theoretical. Consider what IT leaders report in our AI Readiness report:*

70%

of total data center demand will be for facilities equipped to host advanced AI workloads by 2030.

#1

Complexity is the #1 challenge in network and data center operations.

37%

of IT leaders struggle with staff resource shortages to manage consistent network designs and deployment.

Ignoring these realities accumulate what we call AI Infrastructure Debt: the silent accumulation of compromises, deferred upgrades, and underfunded architecture that erodes AI value over time. Early warning signs include workloads rising by 30%+ within three years, difficulty centralizing data, limited GPU capacity, and inability to detect AI-specific threats.

What modern infrastructure makes possible

Here's what's possible

When you treat AI infrastructure as an integrated system:

- Networks designed for growth and scale: **98% of leading organizations architect their networks specifically for AI complexity, compared to just 46% overall**
- Readiness translates to action: **These same organizations are 90% more likely** to capture stronger financial and non-financial value from their AI investments

When infrastructure is designed for AI workloads from the start, you see tangible benefits:



Faster AI deployment



Optimized performance



Reduced risks and downtime



Empowered teams

The path forward isn't about ripping everything out and starting over

It's about designing infrastructure that can evolve, scale without breaking, adapt to new workloads, and maintain performance under constantly changing demands.

When infrastructure becomes programmable, testable, and manageable as code, it finally matches the pace AI requires.

Automation that reduces risk

AI DEMANDS A NEW WAY TO MANAGE INFRASTRUCTURE

When infrastructure is managed manually, every change becomes a potential point of failure.

Teams rely on institutional knowledge, shared spreadsheets, and hope that configurations stay consistent across environments. This approach might have worked when changes happened quarterly and infrastructure was relatively simple.

It doesn't work for AI.

The data is clear:

80%

of network issues stem from misconfiguration and change management gaps.¹

Services as Code: The foundation for reliable infrastructure.

Forward-looking leaders are applying software development principles to infrastructure management through Services as Code. This allows hardware configurations to be treated as software. Instead of manually configuring switches, routers, and servers, configurations are defined in code, stored in version control systems, and deployed through automated pipelines.

Services as Code unlocks three critical capabilities:

- ✓ Version control
- ✓ Automation
- ✓ Pre- and post-deployment validation

5x

faster change configuration²

98%+

change success rate²

2x

faster implementation of new technologies²

Intelligence that keeps you ahead



PROACTIVE INSIGHTS THAT SHIFT TEAMS FROM FIREFIGHTING TO STRATEGY

The fast pace of AI-driven change is an enormous opportunity. The organizations thriving aren't necessarily those with the largest teams or deepest expertise pools.

They're the ones who recognized that skills gaps don't have to be barriers. By deploying unified intelligence that brings everything together, these organizations are enabling existing teams to operate with greater confidence and capability than ever before. When intelligence reduces cognitive burden and makes it easy to act on insights, teams discover capabilities they didn't know they had.

76%

of IT leaders lack skilled professionals to manage AI/ML infrastructure.*

You need intelligence that brings everything together, reduces cognitive burden, and makes it easy to act on insights.

“In my conversations with leaders across the industry, one theme is constant: the drive to adopt AI is putting immense strain on their existing IT infrastructure, revealing that today’s tools are not ready for the demands of tomorrow.”

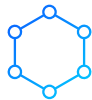
Liz Centoni, EVP, Chief Customer Experience Officer, Cisco

The three pillars of unified intelligence:



Predictive asset insights: Understanding your landscape

One of the most immediate challenges IT teams face is simply knowing what they have and what risks are lurking.



Adaptive infrastructure assessments: Preventing problems

The best outages are the ones that never happen. Enable teams to identify and remediate issues before they impact operations.



AI-powered troubleshooting: Resolving incidents faster

When issues do arise, speed matters. Tools that accelerate resolution while reducing the friction of case management make all the difference.

What unified intelligence makes possible

When intelligence is unified rather than fragmented, you achieve outcomes that were previously out of reach:



Understand your IT landscape

With dynamic, predictive asset insights and AI-powered risk identification, teams gain a clear, actionable view of infrastructure. By reducing complexity and cognitive burden, they can act with less friction and greater agility.



Resolve incidents faster with less effort

From AI-powered troubleshooting to conversational AI, accelerate resolution and reduce the friction of case management. Overwhelmed teams can focus on what matters, not just what's urgent.



Prevent outages and disruptions

Adaptive infrastructure assessments provide prioritized, step-by-step recommendations that help teams intervene before minor issues become major disruptions. This proactive approach minimizes effort, time, and cognitive load required to maintain resilience.



Accelerate innovation

With personalized learning pathways and streamlined operations, teams can reclaim the time and confidence to focus on transformative initiatives, not just maintenance. By alleviating cognitive load and friction, IT teams can finally shift from survival mode to innovation mode.

Security that scales with complexity

PROTECTION THAT ADAPTS TO AI-SPECIFIC THREATS WITHOUT SLOWING YOU DOWN

Traditional data center security was designed for predictable workloads with defined perimeters. Applications ran in known locations. Data flows followed expected patterns. Security policies could be configured once and remain stable for months.

AI workloads break all these assumptions and introduce new challenges and new attack surfaces.

77%

of organizations lack the foundational data and AI security practices needed to safeguard critical models, data pipelines and cloud infrastructure.*

AI systems span on-premises infrastructure, public clouds, and edge locations. They continuously learn and adapt, creating dynamic data flows that change in real time. Autonomous agents make decisions and take actions without human intervention, expanding the attack surface in ways traditional security models weren't designed to handle.

The result: AI workloads are hyper-distributed, requiring security that's infused everywhere rather than bolted on at the perimeter.

Security infused everywhere: The new paradigm

Security from ground to cloud means infusing protection everywhere rather than concentrating it at network boundaries, without consuming the GPU cycles AI workloads need. Security that doesn't compete with compute.

What “everywhere” actually requires

Infusing security everywhere isn’t just a philosophy. It demands capabilities that can see, adapt, and act across every layer of infrastructure.



See everywhere:

Adaptive infrastructure assessments use AI to continuously surface misconfigurations, vulnerabilities, and compliance gaps across your entire environment, not just the places you thought to look.



Stay ahead everywhere:

Proactive advisory management assesses devices against critical security advisories and field notices, delivering tailored recommendations before vulnerabilities escalate, reducing manual burden while strengthening posture across the full stack.



Understand context everywhere:

On-premises AI agents perform deep assessments that understand each device’s specific configuration, diagnose vulnerabilities with detailed reasoning, and recommend precise hardening actions based on actual usage patterns.

Key benefits:

- Personalized risk insights for network devices based on known vulnerabilities
- Continuous monitoring of security posture
- Streamlined identification and prioritization of vulnerable devices, enabling proactive risk reduction

Here's what's possible

When security is infused everywhere, adaptive, and continuously improving, you achieve outcomes that seemed impossible under traditional approaches:



Strengthen security posture over time

Each assessment refines understanding of the environment. Each remediation makes the next one easier. The system learns what matters most for your specific infrastructure.



Decrease risk exposure

Proactive identification of misconfigurations, vulnerabilities, and compliance gaps means issues are addressed before they can be exploited.



Protection becomes less intrusive

As security intelligence improves, it requires less human intervention. Teams spend less time managing security and more time ensuring it's effective.



Increase confidence

When teams trust that security is continuously monitoring and adapting, they can focus on innovation rather than constantly worrying about what they might have missed.

Security that evolves with your infrastructure

The most sophisticated aspect of modern security is the approach you take. Security that's infused everywhere lays the foundation that can adapt to tomorrow's challenges.

As AI workloads evolve, security evolves with them. As new vulnerabilities emerge, adaptive assessments identify them in your specific context. As your infrastructure grows more complex, security scales without creating bottlenecks.

This is security designed for the AI era: comprehensive, intelligent, and always getting better.

Ready for AI, ready to lead

Modernization isn't rip-and-replace. It's building from where you are to eliminate friction and prepare your team for the AI revolution.

When you modernize your data center, you reduce IT overhead, improve resource utilization, and strengthen resilience. With high availability, low latency, and predictable performance, training jobs complete faster and AI services consistently hit millisecond-level thresholds. By shifting IT from firefighting to innovation, programmable and intelligently managed infrastructure becomes a strategic advantage, giving you the foundation to lead in the AI future.

15%

Companies that successfully pursue AI-fueled reinvention outperform their peers in top-line performance by 15%—a gap that is expected to more than double by 2026.*

The future of AI infrastructure is programmable, predictable, and built for resilience. With Cisco Services, so are you.

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