

Deloitte.

In association with **Dell Technologies**



***THE HYBRID INFRASTRUCTURE
ADVANTAGE:*** GAINING CONTROL
AND ACCELERATING GROWTH IN
THE AI ERA



Introduction

As organizations scale AI from pilots to production, they face two new realities. First, AI infrastructure must span on-premises, cloud, and edge environments. Second, data center constraints around power, cooling, and physical space have become a critical bottleneck. These demands require a fundamental shift in infrastructure strategy.

Traditional, single-environment approaches cannot absorb these pressures. In response, business leaders are pursuing a variety of paths: consuming off-the-shelf AI products, investing in dedicated "AI factories," or undertaking costly data center build-outs. While each approach has its merits, they often lead to new silos, vendor lock-in, or exposure to unforeseen costs and security risks.

A more deliberate, strategic approach is required. A thoughtfully designed hybrid infrastructure provides the practical, scalable foundation needed to support the enterprise as it expands AI adoption. This strategy allows organizations to harness the power of AI where it makes the most sense—whether in the cloud, on-premises, or at the edge—while addressing critical constraints around data sovereignty, security, and power consumption.

How, then, can organizations implement this approach and move from siloed to integrated? The answer lies in a practical framework, drawing on the combined strengths of Deloitte's industry-leading advisory services and a cutting-edge technology portfolio from Dell Technologies (Dell) to unlock enterprise value while maintaining operational stability.

Learning from the cloud era

The recent wave of cloud adoption offers a powerful precedent for the AI era. As cloud maturity grew, organizations learned that a one-size-fits-all approach was not sustainable. A hybrid model—blending public cloud with on-premises systems—became the pragmatic standard, driven by the need to control costs, leverage existing assets, and meet specific regulatory or low-latency performance requirements.

AI is now accelerating this lesson at an unprecedented speed and scale. Requests for AI resources are no longer confined to central IT; they emerge from every corner of the business. Demands for sandboxes to test new models, production servers for lab-tested use cases, and access to third-party AI products are creating an ad-hoc response pattern that traditional infrastructure cannot support.

This reactive posture introduces new risks, creates technology silos, and undermines the hard-won lessons of the cloud era. A deliberate, enterprise-wide hybrid strategy is no longer just a leading practice. It is a foundational requirement for achieving results.

Three realities shaping the AI infrastructure agenda

The signals shaping infrastructure decisions today reflect three key realities: AI is driving exponential compute growth, a strategic rebalancing of workloads is underway, and physical data center constraints are becoming primary architectural drivers—alongside software engineering and development.

1

AI is accelerating compute demand at an unprecedented rate

The demand for processing power is growing faster than many organizations anticipated. In a [recent Deloitte survey](#), respondents expect AI-driven workloads to grow by 20% or more across all environments—public cloud, private cloud, on-premises, and edge—in the next year alone. This growth is driving material increases in compute demand, pushing organizations to scale GPU-heavy workloads while balancing cost, latency, and security.

The velocity of adoption is also significant. Another [Deloitte survey](#) found that 50% of leaders are already piloting 31 or more AI use cases, with projections showing that figure rising to 70% by 2028. As these pilots move to production, the strain on infrastructure will only intensify.

20%

AI-driven workload growth
in the next year

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use cases



70%

of leaders projected
by 2028

2

A strategic rebalancing of workloads is underway

In response, a clear trend has emerged: hybrid architectures are now the default. Organizations are moving away from a "cloud-only" or "on-prem-only" mindset and are instead strategically placing workloads where they make the most sense.

This rebalancing is driven by two main factors:



The rise of the on-premises AI factory

The need for customized performance, security, and cost control is leading many to build their own AI capabilities. The [Deloitte Enterprise AI Infrastructure Survey](#) found that 64% of organizations have already started building on-premises AI factories (at limited or full scale), with 88% expecting to do so by 2028. A similar pattern holds for AI at the edge, with deployments expected to double from 36% today to 72% by 2028.



The growing importance of data sovereignty

As regulations tighten, controlling the location, governance, and ownership of data is a rising priority. A detailed sovereignty strategy requires technical controls over data, compute, models, and ownership, all guided by a comprehensive legal and ethical framework. This is driving demand for solutions that can help ensure data remains within specified geographic or organizational boundaries without sacrificing performance—a task often best suited for a hybrid model. This trend is so significant that major cloud providers are now offering on-premises and "air-gapped" versions of their cloud services, signaling a market-wide shift toward portable, hybrid-native solutions.

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*Over **70%** of respondents expect to scale "AI factory" and "AI at the edge" deployments (AI computing near the data source, with minimal reliance on centralized cloud) by 2028, roughly doubling current adoption levels in three years.*

— Deloitte Insights

3

Physical constraints are reshaping infrastructure choices

For the first time, physical limitations like power, cooling, and space are becoming top-level design inputs for digital strategy, influencing where workloads run and how hybrid capacity is planned. These are no longer just facilities problems; they are fundamental constraints on AI ambition.



Power and cooling

AI workloads are incredibly power-intensive. The high-density compute required for training and inference generates enormous heat, making advanced cooling solutions like direct liquid cooling a requirement for new AI deployments, not an option. From a [recent survey of data center executives](#), more than half stated they will move AI workloads off public cloud infrastructure when hosting and compute costs hit a certain threshold, underscoring the real-world financial impact of these physical constraints.



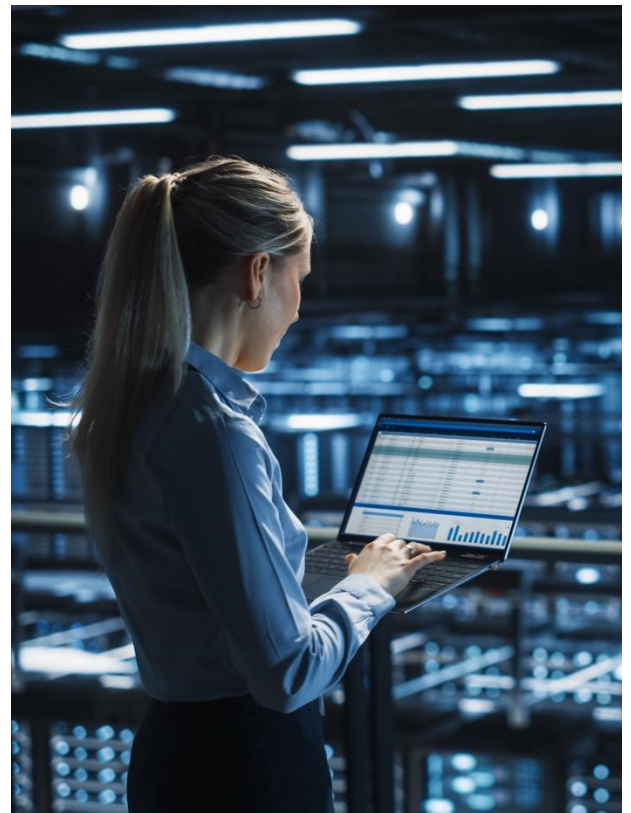
Density and footprint

Optimizing the data center footprint is now a strategic priority. Modern, high-density CPUs and integrated systems can deliver significant performance gains while reducing power consumption and physical space. For example, replacing a fleet of older servers with a handful of new servers powered by high-core-count CPUs [can reduce TCO by over 60% while delivering the same performance](#). This requires a holistic view of the data center, from the chipset to the chassis to the cooling infrastructure.

The mandate for an intentional hybrid foundation

These trends lead to one clear conclusion: a single-environment strategy is no longer viable. A clear hybrid platform strategy—one that defines where AI workloads will run, how data will be governed, and how operations will scale consistently—is a path to achieving the expected results. For leaders, this requires being intentional about the way they architect, enabling development, inference, and consumption where it delivers the most value.

This is where a cohesive hardware and software strategy, built on validated reference architectures and principles of disaggregated infrastructure, also becomes critical. Drawing on the combined strengths of Deloitte and Dell, this approach helps de-risk the journey. It allows organizations to move from fragmented AI experiments to an industrialized AI platform: a foundation of AI-ready building blocks that can scale with complexity, minimize disruption, and avoid the tech debt of previous technology waves.



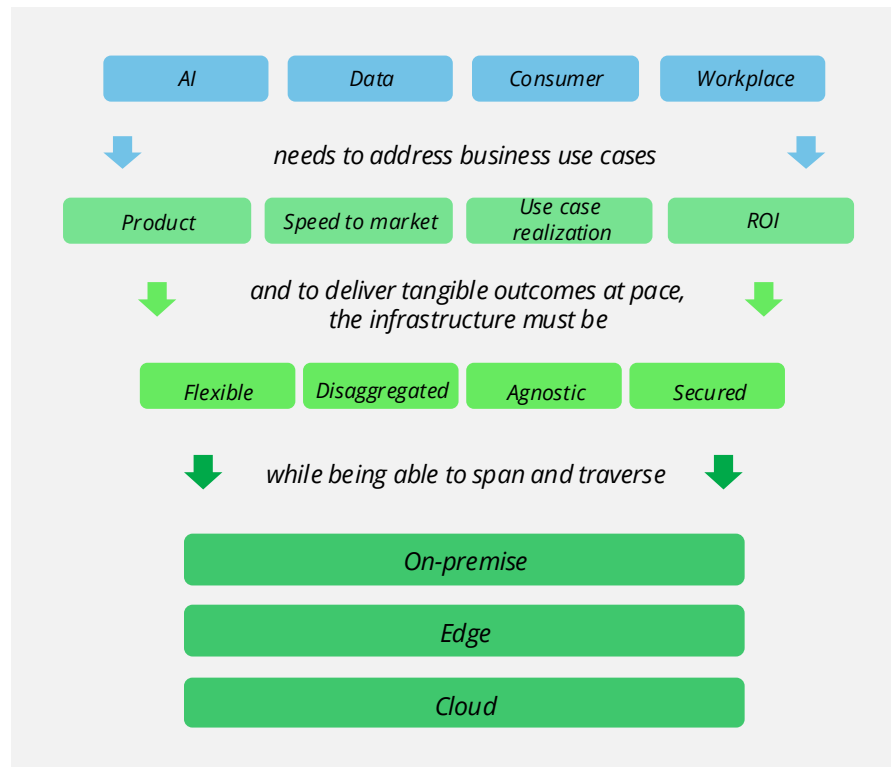
Defining the modern hybrid infrastructure stack

The modern hybrid infrastructure stack is no longer designed around isolated infrastructure layers. Instead, it is architected around a single principle: getting the right data to the right compute at the right time, with governance and resilience built-in across all environments. How efficiently, quickly, and safely an organization can move its data is what can ultimately determine whether an AI use case delivers its expected return on investment or stalls in a proof of concept.

This data-centric reality is why hybrid infrastructure has become the practical architecture for AI at scale. While the journey to hybrid looks different for every organization, it often begins in the public cloud—a natural and often unavoidable sandbox for AI pilots, given its established data gravity and maturity within the enterprise.

The true challenge emerges as these pilots scale into production. At this stage, leaders must balance the agility and rapid innovation of cloud-native development with the distinct advantages of on-premises hosting, which is often shaped by needs for performance, low latency, data sovereignty, and cost control.

AI's rapid evolution from basic prompting to complex reasoning and inference will continue to push these boundaries. In effect, AI acts as a powerful amplifier for existing infrastructure tradeoffs. The high cost of GPUs, the complexity of data movement, and the necessity for repeatable, cross-environment operations are not new problems—but AI elevates their importance from operational hurdles to critical strategic concerns.



Navigating the path to an AI-ready foundation

While the principles of a modern AI foundation are universal, the path to achieving it is unique to every organization. The right strategy depends on the enterprise's current maturity, existing infrastructure investments, and specific business objectives. A successful approach, therefore, is not a rigid prescription, but a tailored roadmap that aligns with an organization's specific starting point.

Drawing on extensive experience across industries, Deloitte and Dell have identified common client journeys and developed a comprehensive approach to accelerate progress at any stage. This approach combines strategic advisory, proven frameworks, and leading technology solutions—from hardware and software to validated architectural blueprints.

WHERE ARE YOU ON YOUR JOURNEY

AI JOURNEY

- Beginning your AI journey
- AI pilot developed
- AI pilot ready for production deployment
- Using AI and expanding our footprint

DATA CENTER JOURNEY

- Data center transformations
- Data center exits
- Data center new build

CLOUD JOURNEY

- Planning cloud migrations and/or repatriation

COST OPTIMIZATION JOURNEY

- Switching service provider
- Hardware decisions
- Needing a flexible model for expansion
- Address sprawl
- ROI evaluation and planning

HOW WE SOLVE OR CAN HELP

- Achieving the right solutions can be complex; we collaborate with your key leaders to identify genuine use cases and develop an agnostic, future-focused strategy
- For organizations with established models and strategies, we can support execution and expansion to drive greater impact
- Deloitte has ready to go AI factories powered by Dell hardware and validated architectures
- AI-enabled workstations

- Building blocks that can enable or drive efficiencies across the vertical domains in IT

- Move cloud workloads back to on premises

- Cloud migrations and repatriation
- Financial levers
- Technical levers
- Consumption-based models
- Exit locked-in Infrastructure



SECURITY & PROTECTION INFUSED

Security is integral across all our journeys—protecting the environment while maintaining data integrity and sovereignty with the needed resiliency. We bring validated security frameworks, hardware and software solutions, and capabilities to help safeguard and control with clear visibility and insight.

YOUR ROLE

- Design with a hybrid mindset
- Embrace a multi-supplier model, especially in AI, to bring together the necessary infrastructure, models, capabilities, and knowledge to achieve your goals
- Maintain an open and collaborative mindset
- Demonstrate readiness to co-develop impactful use cases

The business impact of a hybrid foundation

While the value of technology is often measured in traditional IT terms like cost, control, and simplification, an intentional hybrid foundation unlocks a more critical, second order of benefits. The true impact of this approach is measured in enhanced productivity, reduced risk, and accelerated business growth.

The scale of these benefits will vary based on industry, maturity, and strategic objectives, but the following table lists some of the direct IT-specific advantages organizations can broadly expect.

<i>BUSINESS ACCELERATION</i>	<i>DEVELOPER PRODUCTIVITY</i>	<i>INFRASTRUCTURE COSTS</i>	<i>RISK AND REGULATORY</i>
Competitiveness - Accelerate time to market - Feed the innovation continuum - Address AI infusion and needs	Productivity - Run at developer pace - Increase speed to access critical resources - Accelerate application deployment - Increase LML learning time	Agility and cost arbitrage - Optimize costs across environments - Simplify management - Leverage common technology layers - Disaggregated infrastructure that enables flexible cost models	Security risk - Leverage expanded insights for decision making - Accelerate detection and remediation - Automate and embed DevSecOps - Understand the “heartbeat” of the business and protect that - Clear ownership and governance - Consistent security and audit controls - Ubiquitous secure by design
Revenue Growth - Ecosystem development - Economies of scale - Rapid deployment of new services	Maintenance and cost avoidance - Problem and incident management and resolution scaled across environments - Maintenance automation - Reduce maintenance and extended shutdown impacts - Reduce tech debt - Reduce development environment sprawl and breaches - Migrate legacy workloads for agility and control	Infrastructure support and spend - Financial and technical levers from vested partner ecosystem - Maintain enterprise status quo while introducing and integrating new AI technologies - Leverage support that matters and scales up or down	Compliance/Audit risk - Streamline and enhance security / compliance processes - Help manage compliance costs with consistent, modernized technology stack - Improve security / audit posture - Maintain data sovereignty and localization with visibility and tracking - Protect brand reputation
Enablement and continuity - IT delivery at business pace - Integration accelerated for AI wave with infrastructure building blocks and ecosystem partners		Operational efficiencies - Support and training from vested ecosystem of partners that walk the talk - Visibility across enterprise and new AI infrastructure - Utilize building blocks already established - Engineer with a future right set - Consistent Integration and security across all the environments	Operational leverage and efficiencies - Maintain security stability and continue to strengthen posture for AI wave - AI-driven insights and analysis - Data sovereignty and localization - Imitability and recovery - Discover, protect, defend, and recover effectively - Defined strategy, process, and partnerships for tactical responses - Technology surge support
Operational expense - Flexible spend options - Financial levers to align with ROI - Automate manual and labor-intensive repeatable tasks - Address on-premises, cloud, edge, and AI use cases			

Beyond these foundational IT improvements, an intentional hybrid design creates systemic advantages that drive value across the entire enterprise in four key areas:



Enhanced financial transparency

An integrated hybrid environment provides a holistic view of technology spending. Advanced IT financial management and FinOps tools can operate across this landscape, giving business and finance leaders a clearer, more accurate way to measure and plan for innovation-driven initiatives. This can improve an organization's ability to manage costs and allocate investments where they will have the greatest impact.



Accelerated and secure development

When development, security, and operations teams work with an integrated DevSecOps process that spans the entire hybrid estate, they can significantly reduce deployment times and security risks. A standardized data environment enables businesses to aggregate and process the right data for any need—regulatory, customer, or operational—no matter where it resides, streamlining operations and improving performance consistency.



Enterprise-wide cyber resilience

In an age of ever-increasing threats, a "hybrid by design" approach provides critical risk and regulatory benefits. Instead of managing security in silos, organizations can implement controls and threat detection that operate consistently across all points of the IT estate. This unified security posture can increase detection speed and enable more effective threat remediation, strengthening trust with customers and partners.



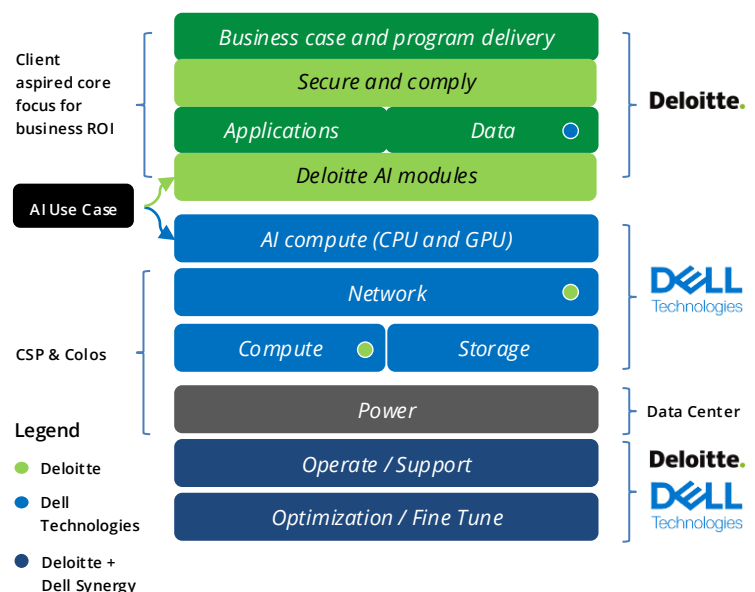
Data-driven business acceleration

Perhaps the most important outcome is business acceleration. With intentional connections across cloud and on-premises systems, organizations can more effectively use data from hundreds of sources. This breaks down operating silos and accelerates the identification of actionable insights, which can be used to automate operational inefficiencies, reduce manual effort, and inform new business strategies. The integrated visibility that a hybrid foundation provides is what ultimately empowers revenue growth and creates new opportunities for innovation.

A scalable platform with Deloitte and Dell

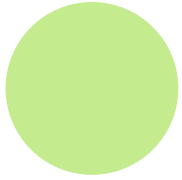
Deloitte and Dell see the market converging on a repeatable set of hybrid scenarios and reference architectures that help executives move from fragmented infrastructure decisions to an intentional, scalable platform strategy. Dell provides the modern infrastructure building blocks: validated architectures, integrated systems, and management capabilities designed for AI-ready platforms.

Deloitte helps translate those building blocks into enterprise-grade architecture that wraps security and risk controls, infuses operating models, and establishes delivery execution rigor while paying attention to the IT financial and economics. The result: clients can move faster with confidence and avoid one-off implementations that don't scale.



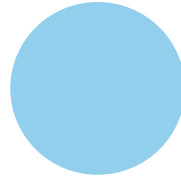
The Deloitte and Dell hybrid cloud advantage

Deloitte and Dell Technologies come together to help clients build a repeatable hybrid infrastructure foundation; one that's designed to scale across on-premises, public cloud, and edge without creating new silos. We also take into account the AI-readiness organizations need today.



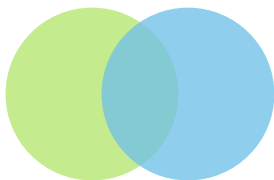
***Deloitte
brings:***

- **Strategy to platform direction:** Hybrid/multi-cloud strategy, target architecture, and modernization roadmaps aligned to business outcomes.
- **End-to-end delivery:** From platform selection and migration waves to DevSecOps (Development, Security, and Operations), automation, and managed services.
- **Enterprise controls and governance:** Security, risk, compliance, and operating model design so hybrid works consistently at scale.
- **Program rigor and acceleration:** Tooling, frameworks, and delivery cadence to de-risk complex migrations.
- **Industry depth:** Experience translating hybrid cloud into sector-specific outcomes.



***Dell
brings:***

- **Infrastructure engineered for hybrid cloud and AI:** Enterprise compute, storage, and integrated systems optimized for modern workloads.
- **Reference architectures and automation:** Standardized, production-ready blueprints designed for interoperability and scalability that simplify deployment and repeatability.
- **Ecosystem connectivity:** Integration with major public clouds and hybrid management capabilities.
- **Resilience and trust:** Policy-driven capabilities designed for mission-critical performance and consistent operations.



***Together,
we help you:***

- **Design the right landing zones:** Decide what runs where based on latency, cost, sovereignty, and performance.
- **Deploy and migrate faster:** Use validated Dell architectures with Deloitte-led secure workload migration and best practices.
- **Operate as a platform:** Standardize governance and automation so scaling AI doesn't require reinvention.
- **Improve flexibility and economics:** Reduce lock-in risk, strengthen AI data security, and enable more predictable cost models as demand grows.
- **Build resilience by design:** Pair governance, security, and change management with robust infrastructure to protect critical workloads and sensitive data.

Ready to transform?

Is it time to rethink how your organization places, protects, and operates workloads across hybrid infrastructure at scale?

This isn't a one-time migration: it's a sustained shift in how infrastructure, data, and teams work together. To scale with confidence, organizations should align executive stakeholders, standardize architectures, strengthen controls, and industrialize operations across cloud, on-premises, and edge.

And there's no reason to make this shift alone.

Deloitte and Dell are ready to help you design, deploy, and operate a hybrid infrastructure foundation so you can move faster, adopt AI, reduce risk, and avoid one-off, siloed implementations. From hybrid platform strategy and design to Dell infrastructure deployment, migration wave execution, AI-enablement, and managed hybrid operations, we can engage at the stage you're in today and build toward a foundation that scales with your ambition.

Let's build what comes next, together.

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