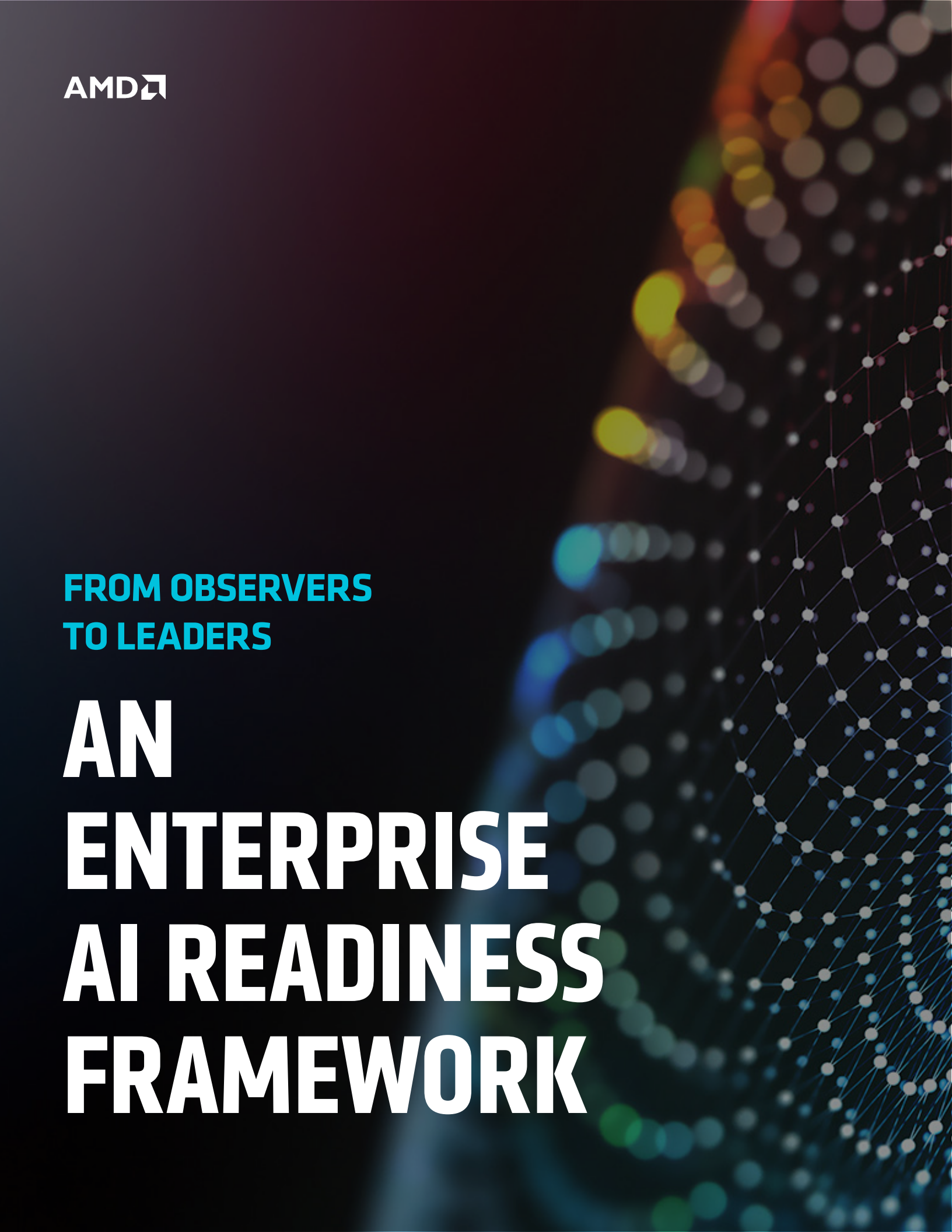
AMD

FROM OBSERVERS
TO LEADERS

AN ENTERPRISE AI READINESS FRAMEWORK



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REDEFINING THE DATA CENTER: AI READINESS IN THE AGE OF ACCELERATION

AI is a business imperative for modern enterprises. From product development and manufacturing to sales, marketing, and customer support, AI enhances decision-making, accelerates growth, and reduces operational costs. But the surge in AI workloads requires greater computing power and data storage. For data center operators, this growing demand creates tremendous pressure for more space and capacity.

Successful AI-fueled transformation relies on a modern, AI-ready infrastructure. Yet the demand often outpaces existing IT infrastructure capabilities. Traditional architectures and legacy systems often struggle to support existing workloads—and AI puts further strain on this infrastructure.[1]

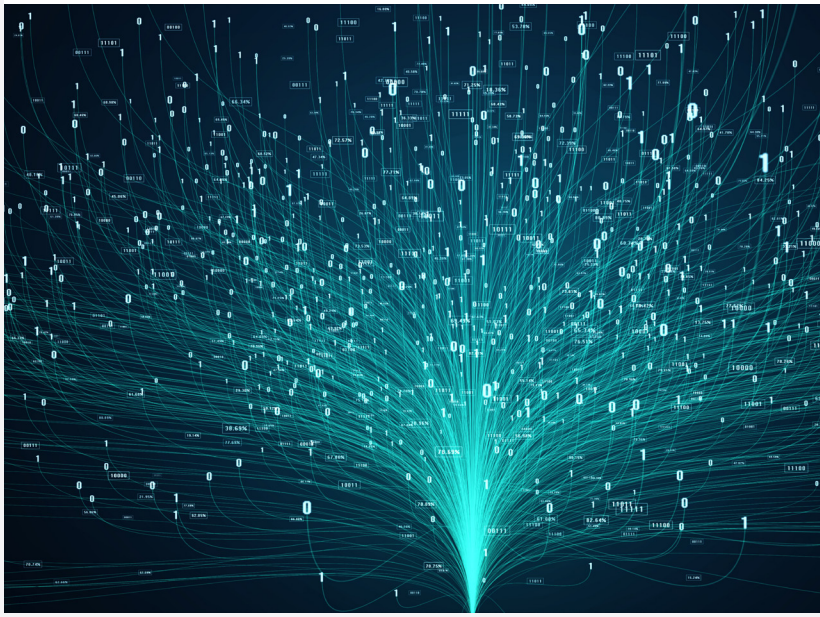
Many organizational leaders understand that data center modernization is a priority for reaching enterprise AI readiness. Two-thirds of surveyed organizations believe their IT environments require upgrades to meet future demand.[2] However, upgrading infrastructure designed for lighter workloads requires significant financial investments. That's why organizations need a clear framework to assess AI readiness, prioritize investments, and move forward with confidence.

How can organizations support an AI data center while balancing infrastructure and financial considerations? It starts with understanding where your organization falls on the spectrum of enterprise AI readiness. Recent research suggests that data center modernization falls into three major segments: **Leaders, Challengers, and Observers**. These segments provide benchmarks for assessing your data center's ability to meet AI's demands and develop an enterprise AI readiness framework.

This eBook offers insights into the three stages of data center modernization and strategies for moving through these stages. We also share real-world examples of how leading organizations use the AMD enterprise AI portfolio to successfully modernize and fully embrace AI-driven innovation.

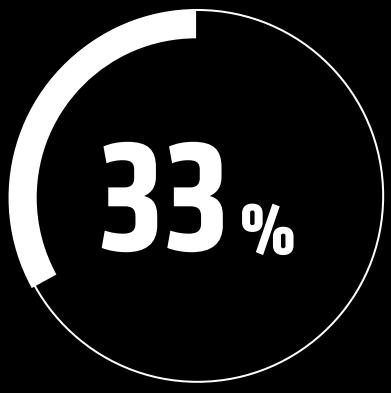
97%

OF THE DATA CENTER CAPACITY WAS OCCUPIED AS OF MARCH 2023 IN THE TOP NORTH AMERICAN MARKETS.[1]

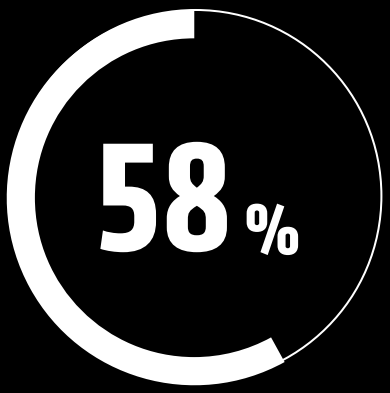


UNDERSTANDING THE THREE STAGES OF DATA CENTER MODERNIZATION

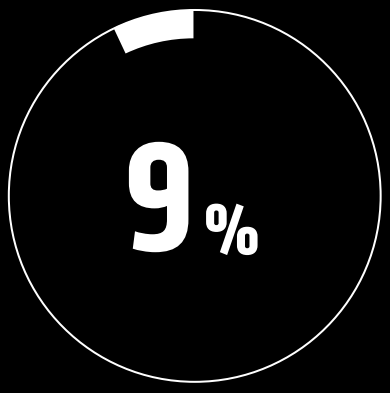
Data center modernization may entail a mix of optimizing existing IT infrastructure and upgrading it. Recent research commissioned by AMD found that organizations' approach, including their workload placement and their technology strategies, varies based on their modernization maturity. Our data shows that:



of organizations– data center Leaders– have fully modernized in the past two years[3]



of organizations– data center Challengers– are currently undertaking modernization initiatives[3]



of organizations– data center Observers– plan to modernize within the next two years[3]

These segments provide benchmark differences that can serve as a framework for understanding the data modernization stages.

DATA CENTER LEADERS

Gartner forecasts that by 2026, more than 80% of enterprises will have used generative AI technology, either through API and models or applications deployed in their production environments.[4] Before integrating AI into their production environment, organizations need to modernize their infrastructure. Leaders are ready for AI expansion, enabling them to reap the benefits of early adoption.

ADVANTAGES FOR LEADERS

01

Efficiencies

They can reduce operational costs by allocating more time and budget to innovation rather than system maintenance. AI can boost operational efficiency further through automation, streamlined asset management, and more.

02

Agility and competitive advantage

AI helps widen the gap between the competition through enhanced decision-making, customer experiences, and innovative products and services. Our survey found that Leaders have adopted more AI applications than their peers, with line-of-business and department-specific use cases showing the most significant difference in adoption.

RISKS

01

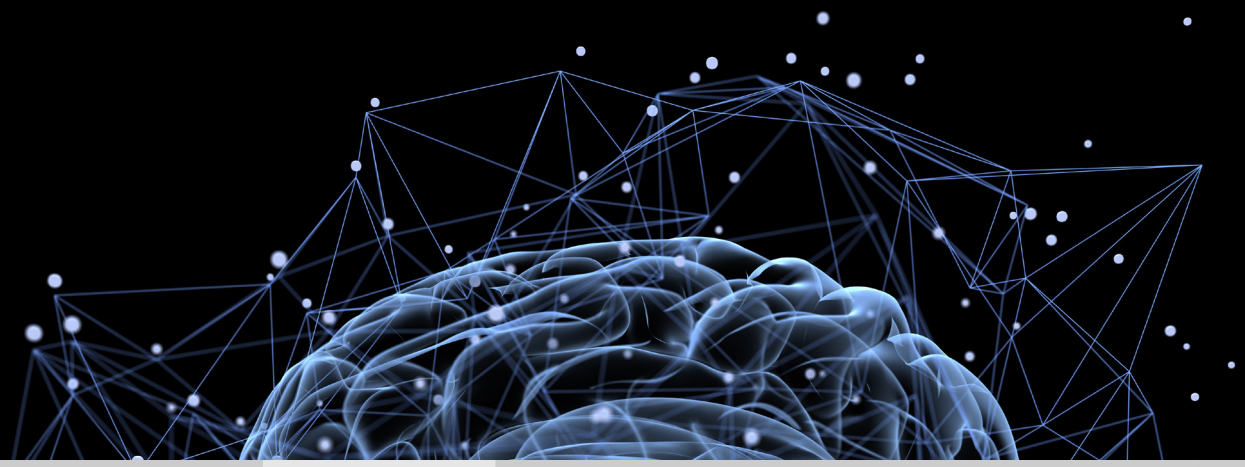
Unforeseen costs

The top reason organizations overspend on digital infrastructure is technical debt.[5] Cost overruns due to cloud migration and overprovisioning are also common.

02

Integration challenges

Our survey shows that integration is the most significant technical challenge for AI adoption across all organizations.[3] Compatibility between AI and existing systems and integration complexity are among the biggest struggles.



DATA CENTER CHALLENGERS

Most organizations fall into the Challengers segment. They are modernizing actively but face both strategic and infrastructure challenges. Even when AI makes it into production, 61% of surveyed organizations say that infrastructure limitations either currently prevent or will prevent them in the future from retraining AI models more frequently.[6]

ADVANTAGES FOR CHALLENGERS

01

Avoiding pitfalls

Challengers can learn from Leaders' scars and use lessons learned to prevent mistakes proactively. Taking a more measured approach also means Challengers can apply the best practices established by Leaders.

02

Improved stability and cost efficiency

Early adopters often pay a premium for emerging technologies, which may also require more frequent rework. Challengers can avoid these extra expenses and cycles, while benefiting from AI solutions that are already proven in the marketplace.

RISKS

01

ROI uncertainty

Demonstrating AI's return on investment (ROI) can be a significant organizational challenge. Nearly half of surveyed organizations say the difficulty of estimating and demonstrating the value of AI is their biggest obstacle to GenAI adoption.[7]

02

IT-business misalignment

A third of organizations identify misalignment between IT and business goals as their biggest modernization obstacle, according to our data. Primary drivers of this misalignment include the differing priorities between the two sides (50%)[3], a lack of IT team's understanding of business needs (47%)[3], and poor communication (43%)[3].

DATA CENTER OBSERVERS

Observers, who plan to modernize within two years, are lagging far behind. Our data shows that only 12% of Observers believe their IT infrastructure is fully adequate to support their AI plans[3], compared to 64% of Leaders and 21% of Challengers.[3]

The Observers' most significant obstacle to aligning data center modernization with organizational priorities is a limited budget for strategic initiatives–18% cite this hurdle, compared to 11% of Leaders and 10% of Challengers.[3] Observers are also much more likely to agree that their IT infrastructure will require a significant rather than a minor upgrade.

ADVANTAGES FOR OBSERVERS

01

Intelligent adoption

Observers can leapfrog with modern, AI-centric designs while avoiding a rapid, "cobbled-up" approach that often happens during the early days of emerging technologies.

02

Proven use cases

By moving cautiously, Observers can target their resources better by adopting AI for use cases that have been proven or show better value rather than experimenting with a broader range of potential benefits.

RISKS

01

Competitive disadvantage

Delayed modernization significantly increases the risk of falling behind on AI competitiveness. The rapid advancement in AI technologies also means that the longer Observers wait, the harder it will be for them to catch up and reap AI's benefits.

02

Operational inefficiencies

Half of existing applications still run on legacy code,[8] which can result in adverse outcomes such as higher maintenance costs, integration challenges, and reduced performance.

THE PATH TO LEADERSHIP: MOVING THROUGH THE STAGES

A holistic AI integration strategy—embedding AI into both IT and business processes for maximum impact—is integral to maturing enterprise AI readiness. The first step is to develop your strategic priorities, including aligning IT with your business vision and understanding the value of AI so you can justify your infrastructure investments.

OVERCOMING BARRIERS

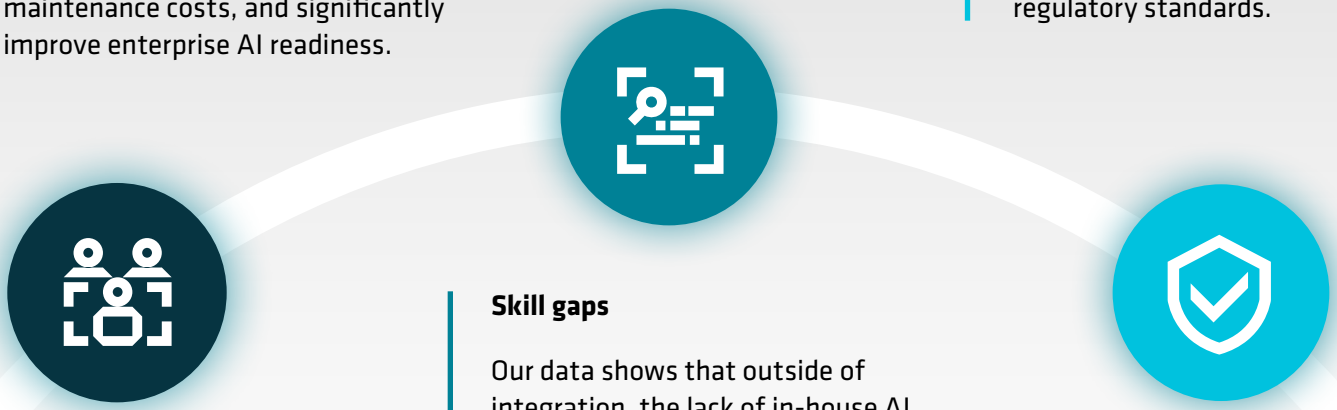
As AI technology matures and organizations gain more experience, some early challenges are being solved. But significant barriers to adoption remain, including:

Legacy infrastructure

As noted earlier, existing IT infrastructure does not sufficiently support a modern AI data center. Modernizing your data center can help improve efficiency, optimize workloads, streamline physical space usage, reduce operational and maintenance costs, and significantly improve enterprise AI readiness.

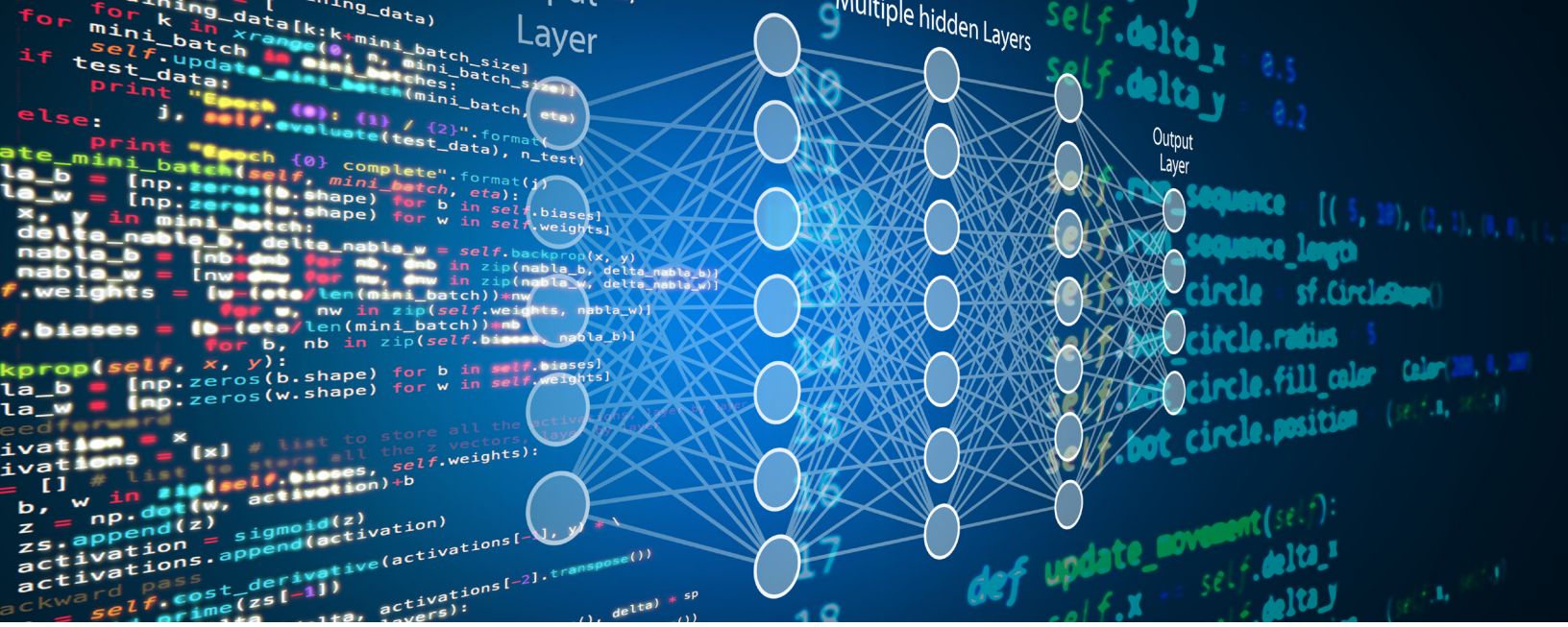
Data security and privacy

Among surveyed IT leaders, security and data privacy are the top two barriers to GenAI adoption.[9] Compliance further compounds the challenge as organizations must protect their data to meet evolving regulatory standards.



Skill gaps

Our data shows that outside of integration, the lack of in-house AI expertise is a significant technical challenge to AI adoption as organizations struggle to recruit talent that's in high demand but low supply.[3] Data center Challengers are more likely to experience this concern (34%) than Leaders (28%) and Observers (31%).[3] Organizations are turning to technology partners to help solve this problem—59% seek technical expertise from partners, 55% want help upskilling their workforce, and 54% want ongoing support and maintenance.[3]



MODERNIZATION MODELS

While there's no "one-size-fits-all" way to create an AI data center, two modernization strategies are the most common: "modernizing in place" and "refactoring and shifting." The path your organization may take depends on your goals.

MODERNIZING IN PLACE

Modernizing in place—updating existing applications on-premises to modern architectures and integrating AI—can often be the best approach for cost-effective transformation. Upgrading your current infrastructure without fundamental changes to architecture or location allows you to achieve meaningful transformation without the costs, complexities, and risks of complete cloud migrations.

According to our data center survey, "modernize in place" is the top approach for application modernization across organizations but is most prominent among Leaders (53%).[3] This approach may include upgrading on-premises hardware with hyperconverged infrastructure or next-generation servers, adopting virtualization and containerization, or creating a hybrid environment by adding cloud-based applications.

Data also shows that Leaders rely on the cloud less than the average organization while relying on edge locations and colocation more than average. Further, only 31% of workloads across all organizations are located in a cloud service provider's environment,[3] and this number is expected to show only a modest increase (33%) in the next three years.[3] This data indicates that on-premises environments remain best for specific applications.

FACTORS DRIVING IN-PLACE MODERNIZATION INCLUDE:

- **Lower capital expenditures**
- **More predictable costs**
- **Better control over sensitive data**
- **Optimized existing investments**
- **Reduced operational risk**
- **Migration complexity**
- **Uptime requirements for critical workloads**

FACTORS DRIVING REFACTOR-AND-SHIFT MODERNIZATION INCLUDE:

- **Accelerated innovation**
- **Agile development**
- **Faster AI tool integration**
- **More efficient scalability**
- **Personalized customer experiences**
- **Reduced long-term operational overhead**

REFACTORING AND SHIFTING

Refactor and shift—rearchitecting applications for AI with cloud-native frameworks and migrating them to the cloud—is an advanced, future-forward cloud strategy. By moving legacy applications to the cloud, you can fully benefit from the cloud's elasticity and scalability and optimize applications for sustainability.

This path may include rewriting or refactoring legacy applications, migrating to public cloud platforms, or deploying containers.

According to our data, 27% of Leaders took this approach to application modernization.[3] Modernizing in place and refactoring and shifting are equally preferred by Challengers (tied at 33%).[3] For Observers, refactoring and shifting is the second most likely approach after repurchasing and shifting (28% and 33%, respectively).[3]

AI will evolve into a pervasive and integrated force across enterprises, spanning hybrid cloud, edge, and endpoint deployments to support the entire value chain. Regardless of the path you choose, you can accelerate your path to becoming a data center Leader and advance your AI innovation with a holistic AI integration strategy and the right technology partnerships.

> "AMD offers a significant performance-per-watt energy efficiency advantage as well as a consolidation advantage. People can now adopt it in their current data centers to help power their AI needs."[10]

ROBERT HORMUTH

Corporate Vice President of Architecture and Strategy, Data Center Solutions Group, AMD

CASE STUDY

MODERNIZATION IN ACTION: CUSTOMER SUCCESS SNAPSHOTS

KT CLOUD EXPANDS AI POWER WITH AMD INSTINCT™ ACCELERATORS

KT Cloud (formerly Korea Telecom) delivers secure and reliable cloud-based solutions to businesses. The company has ambitious plans to introduce several new offerings, including AI Cloud service for public cloud users in the form of Infrastructure-as-a-Service (IaaS).

KT Cloud partnered with AMD and Moreh to create a new AI platform powered by AMD Instinct™ MI250 accelerators for a scalable AI cloud service with superior performance and significant cost reductions.

> With cost-effective AMD Instinct accelerators and a pay-as-you-go pricing model, KT Cloud expects to be able to reduce the effective price of its GPU cloud service by 70%.[11]

JooSung Kim
VP of KT Cloud

KT Cloud's project to develop its own large language model for Korean requires substantial computational resources. The company is leveraging the power of over 1,000 AMD Instinct GPUs[12], which offer the immense compute "horsepower" needed to efficiently power KT Cloud's massive Transformer-based encoder-decoder models and train them using billions of parameters.

"In terms of cost-effectiveness, the AMD Instinct-based cluster using Moreh software exhibited 1.9 times higher throughput per dollar compared to the NVIDIA cluster while improving results by up to 117%[11]," says Kim. Encouraged by its results, KT Cloud announced the construction of a new supercomputer cluster—featuring 1,200 AMD Instinct MI250 GPUs[11]—for training the next version of its Korean language model.

READ THE CASE STUDY

kt cloud CLOUD

CASE STUDY

SMURFIT WESTROCK SAVES AWS COSTS FOR INNOVATION WITH AMD

Smurfit Westrock reduced costs by 25 percent with 10 percent lower carbon footprint by switching to AWS cloud instances powered by AMD EPYC™ CPUs.[12]

> We have hundreds of AWS accounts. We support thousands of EC2 instances, alongside the hundred-plus other services just in Amazon alone. The company has started to focus on achieving cloud cost savings and optimization objectives.

Thomas Burke
Senior Cloud Engineer, Smurfit Westrock

Smurfit Westrock started converting to AMD using non-production workloads, to test comfort levels. "This included a test comparing CPU and memory utilization between the AMD and non-AMD instances," says Burke. "The utilization metrics did not change at all when we switched to AMD EPYC processor-powered AWS instances. The migration from non-AMD instances, which only took about three minutes in the AWS console, went very smoothly."

Sustainability is a key concern for Smurfit Westrock. There is a company-wide goal to reduce carbon emissions by 30 percent by 2025.[12] "We found that three months into the fiscal year our carbon emissions were up about 14 percent before we kicked off the huge AMD rollout,[12]" says Burke. "Now, ten months into the fiscal year, instead of being up 14 percent, we're only up about 3.5 percent. It's helped us reduce our carbon emissions by about 10 percent in AWS.[12]"

Smurfit Westrock now plans to deploy AMD first for new EC2 instances, as well as other AMD-enabled AWS services. "As long as we have the option to choose AMD for that optimal cost performance ratio," says Burke, "we're absolutely going to do it. There is literally no downside."

READ THE CASE STUDY

Smurfit Westrock

CASE STUDY

PQR OFFERS NEXT-GEN IT SERVICES WITH AMD PENSANDO™ DPUs

PQR provides services across the workspace, networking, security, data center, and IT management. The company plans to build service revenues by creating a new data center offering that emphasizes security, scalability, and operational simplicity. The challenge for PQR is to deliver a seamless service experience while effectively managing operational costs and processes.

The company is creating a high-performance data center service offering specialized workloads, built around zero trust and rapid scalability.

> The idea is that everything can and will be automated, from onboarding to upscaling. That requires a state-of-the-art network with a new approach.

Thierry Lubbers
Principal Consultant Networking, PQR

At the core of PQR's next-generation data center service is the HPE Aruba Networking CX 10000, integrating AMD Pensando™ DPU technology. This represents a new category of data center switch that introduces a new network orchestration solution, combined with the industry's first hardware-accelerated services processor.

For IT service provisioning across compute, virtualization, storage, and network infrastructure environments, PQR believes the Smart Switch will make manual and siloed activities a thing of the past. This entirely new switching architecture enables PQR operators to seamlessly extend the capabilities of its new leaf-spine fabric across three data centers. PQR can natively provide 800 Gb/s of distributed stateful firewall throughput for East/West traffic, deliver zero trust microsegmentation, and obtain pervasive telemetry data.

"PQR is expecting savings of 50%[13]" says Lubbers. "More importantly, we have security where we need it."

READ THE CASE STUDY

PQR

WHERE DO YOU STAND ON THE MODERNIZATION CURVE?

01
How closely aligned are your data center investments with your enterprise AI strategy? Are your infrastructure decisions being made with AI in mind—or are they happening in separate silos?

02
When was the last time your core infrastructure was meaningfully modernized? Would you describe your environment as recently modernized, mid-upgrade, or overdue for change?

03
Can your current IT environment support AI workloads without requiring major infrastructure changes? What would it take to confidently scale AI across your environments: cloud, on-prem, and edge?

04
How well are you tracking the business impact of your modernization efforts? Do you have clear, shared KPIs—or is ROI still more promise than proof?

05
Is your infrastructure resilient enough to meet rising energy, cooling, and performance demands? Are you confident in its ability to scale efficiently and sustainably for AI-driven workloads?

06
Does your team have the expertise to drive modernization and AI adoption at scale? Where are you leaning on internal capability, and where are you relying on external partners?

07
Is your AI strategy supported by a dedicated or protected budget? Do you have the investment in place to move from pilot projects to enterprise deployment?

08
What's your approach to application modernization, and is it keeping pace with your infrastructure goals? Are you actively modernizing apps to match new infrastructure, or maintaining legacy systems that limit transformation?

WHY AMD

YOUR STRATEGIC PARTNER FOR DATA CENTER AND AI MODERNIZATION

AI will become increasingly task-specific and industry-specialized, driving more optimized data, models, and compute solutions. AMD is a trusted partner that can guide you through AI adoption and innovation and help you optimize AI innovation with tailored solutions that align with your specific workloads, budget constraints, and deployment strategies.

AMD offers an open ecosystem of CPU, GPU, and adaptive computing solutions that empowers you to build workload-optimized architectures without vendor lock-in. Design a solution around your goals with a customizable portfolio of AMD products: AMD EPYC™ (CPUs), AMD Instinct™ (GPUs), and AMD Pensando™ (DPUs).

AMD allows you to choose the right-sized AI solutions that optimize cost efficiency without over-provisioning resources—whether cloud-based AI to preserve capital expenditures, on-prem AI to reduce operational expenses, or a hybrid approach to balance cost and security objectives.

WHY AI PCS

THEIR PART OF THE ENTERPRISE PUZZLE

Modern AI PCs bring intelligence to the device. They empower employees with real-time AI tools while reducing cloud dependency, improving security, and lowering costs. For enterprise teams, they're a critical link in delivering AI at scale.

ARE YOUR DEVICES AI-READY?

Do your current devices include hardware accelerators built to support AI workloads? Are you equipped with NPUs, discrete GPUs, or other AI-specific hardware—or are you still relying on general-purpose compute?

Can your endpoints handle compute-intensive tasks like simulation, AI inference, or 3D modeling without throttling or lag? How confident are you that performance holds up under pressure?

Are your devices powered by modern, multi-core processors designed for parallel AI processing? Or are you seeing signs that your CPU architecture is becoming a bottleneck?

Do your devices have fast memory and storage, such as DDR5 and NVMe SSDs, to keep up with AI's real-time data needs? How often does storage or memory become the limiting factor in local performance?

Can your endpoints process and visualize large, complex datasets locally—without relying on external infrastructure? Are they enabling edge intelligence or simply passing data upstream?

How strong is your device-level security posture against today's AI-era threats? Are you leveraging hardware-based protections like TPM 2.0, firmware shielding, or AI-powered threat detection?

Can your device fleet integrate seamlessly into your broader hybrid or multi-cloud infrastructure? How easily can data, models, and workloads move securely across environments?

Are your endpoints prepared to support the next wave of AI innovation, such as embedded generative AI in business applications? Will your fleet be a launchpad for what's next—or an obstacle?

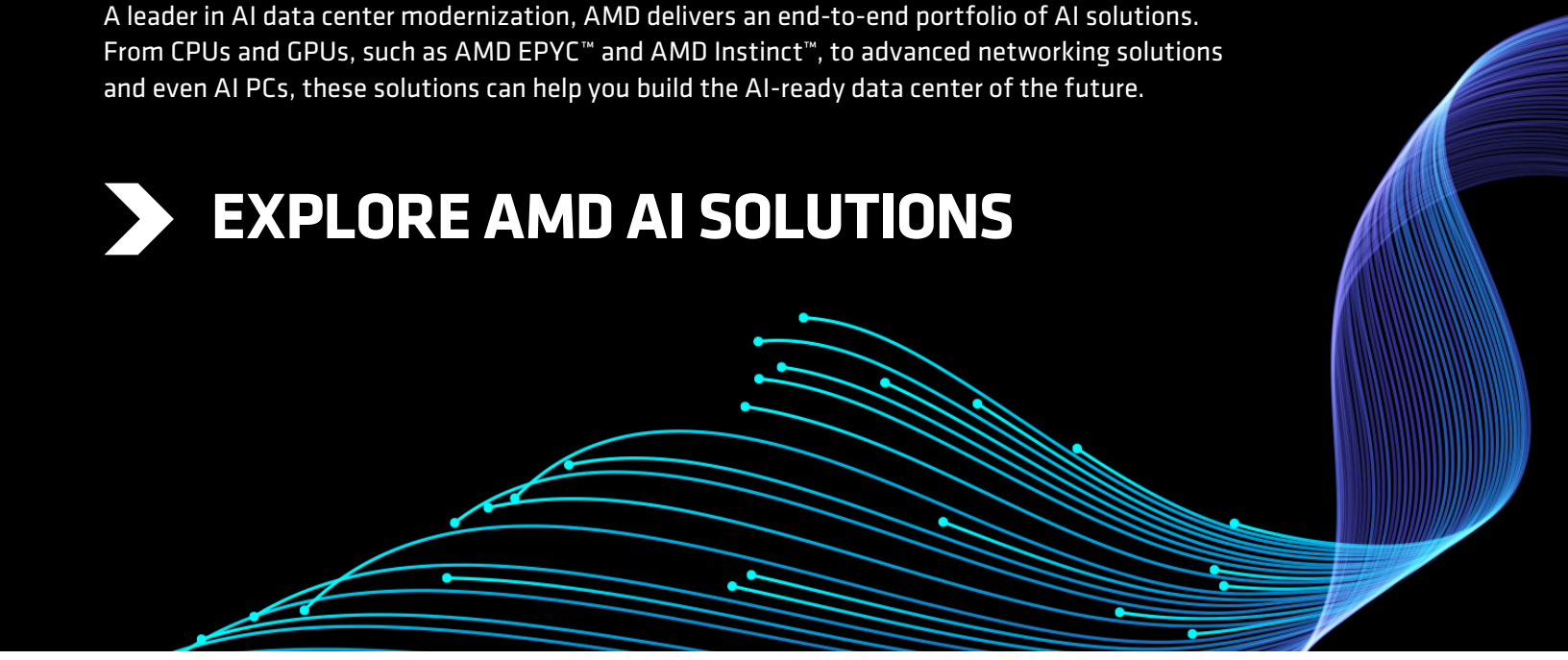
WANT TO EXPLORE MORE?

Discover how AMD PRO processors provide your team with real-time AI tools while reducing cloud dependency:

LEARN MORE

A leader in AI data center modernization, AMD delivers an end-to-end portfolio of AI solutions. From CPUs and GPUs, such as AMD EPYC™ and AMD Instinct™, to advanced networking solutions and even AI PCs, these solutions can help you build the AI-ready data center of the future.

EXPLORE AMD AI SOLUTIONS



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