

Hybrid Cloud Infrastructure in the “AI Everywhere” Era



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Executive Summary

Welcome to the AI Everywhere era.

Already, a third of tech leaders surveyed by IDC in April 2024 believe generative AI (GenAI) is disrupting their business, and another third believe it will do so in the next 18 months. In addition, only 10% of European organizations admit not doing “anything significant yet with GenAI,” in IDC’s *Future Enterprise Resilience Survey*, June 2024.

Spending will primarily focus on infrastructure, data services, security, skills, and applications. IDC expects AI, including GenAI, to be the number #1 driver of infrastructure investment over the next 18 months. This is because the real-time, data-intensive nature of GenAI applications is forcing many organizations to re-evaluate digital infrastructure plans and priorities.

Presently, 80% of European organizations are running hybrid cloud environments, including public cloud services, private cloud, on-premises datacenters, and hosted services, according to IDC’s *European Cloud Survey, 2023*.

IDC research also revealed that hybrid cloud infrastructure remains strategic in the AI era, with 26% of European organizations already indicating a preference for private clouds for deploying GenAI data and workloads. Some of the main criteria driving infrastructure preferences are security, infrastructure costs, data location and integration, time to value, and vendor support.

Hybrid cloud infrastructure helps businesses balance flexibility and scalability with governance and control. While the use of AI re-emphasizes the importance of hybrid cloud, its value is even more relevant for core application modernization, meeting sovereignty and regulatory needs, and ensuring cost-effective and sustainable operations. As organizations adopt a workload-driven approach, the relevance of hybrid cloud — including public cloud, private cloud, edge, and datacenter — is rising.

IDC predicts that, with GenAI as a catalyst, by 2027, 40% of enterprises will rely on interwoven IT architectures across cloud, core, and edge to support dynamic, location-agnostic workflow priorities, ushering in a new era of hybrid cloud infrastructure designed to deliver on innovation, economics, and resilience-oriented business outcomes.

AT A GLANCE

KEY STATS

- ➔ Worldwide spending on AI solutions will exceed \$500 billion in 2027, more than three times what enterprises spent on AI solutions in 2023.
- ➔ Business transformation continues at high speed with application modernization and cloud-native strategies.
- ➔ The regulatory landscape is ever-evolving.
- ➔ Is your infrastructure, data, and platform foundation versatile and ready to cope with these pressures?

WHAT IS IMPORTANT

- ➔ Hybrid cloud with a workload-first approach can help address modern business needs.
- ➔ A data and governance strategy can guide AI investment for maximum value.
- ➔ A modern, hybrid cloud environment must be:
 - Multipurpose AI-ready
 - Edge-optimized
 - Interoperable
 - Secure
 - Optimized and sustainable
 - An enabler for data and business

Rising Relevance of Hybrid Cloud

Modern businesses have realized the need for a cloud strategy, but new and emerging strategies differ from last decade’s public cloud-first approach. Today, organizations want more cloud options to deploy their applications and business services — be it hybrid cloud, public cloud, sovereign cloud, or multiple public clouds. For instance, in IDC’s *2023 European Cloud Survey*, 26% of tech leaders cited private cloud as their “main environment for running core applications” and another 23% cited it as “our first choice for privacy and regulatory requirements.” IDC predicts that the dedicated cloud software market will reach \$5.5 billion in Europe in 2026.



IDC research also finds that hybrid cloud (defined as a combination of private and public cloud infrastructure) is the number one planned IT investment area for 35% of organizations.

Why is hybrid cloud becoming more strategic than ever before?

AI, workload modernization, resilience, cost-efficiency, and regulations are the key drivers.

Starting with AI, the growing impact is clear. European organizations, on average, are planning to double their GenAI-related investments (infrastructure, models, applications, and services), with overall spending forecast to increase from \$1.9 million in 2024 to \$4.1 million in 2025. These strong investments will come with strong expectations of returns.

While GenAI has captured businesses’ interest, most AI strategies are holistic, including a combination of predictive AI, interpretive AI, and GenAI. Organizations are also not throwing out their existing big data and analytics investments, paving the way for multipurpose AI.

A multipurpose AI strategy is broader, covering multiple use cases that can be served without substantial modification of the existing infrastructure.



Multipurpose AI Infrastructure

Multipurpose AI success rests on key factors, such as clear business alignment, versatile foundation of GPUs, compute and storage infrastructure, data and governance strategies, skills, and change management.

[Here is a closer look at each of these factors.](#)

Business Alignment: This starts with identification and prioritization of use cases to outline the success metrics, timescales, and investments.

AI Governance and Security: Immediately after determining use cases, leaders must establish AI security and governance principles and frameworks to ensure AI adoption is responsible, ethical, compliant, trustworthy, sustainable, transparent, and explainable. AI governance and security are based on risk appetite and simplified decision-making. Establishing governance principles is imperative; however, it is also laborious, and a collaborative approach is advisable to cover all grounds.

AI Data Strategy: Data underpins multipurpose AI success. The need to re-imagine data strategy is essential because traditional data approaches are rapidly becoming irrelevant as AI introduces new data value chains by combining internal data with external models, thereby bringing greater risks and complexity. According to IDC’s *FERS Survey, Wave 1*, January 2024:

- 30% of organizations are concerned that GenAI jeopardizes control of data and intellectual property.
- 26% of organizations fear excessive infrastructure costs associated with model training and/or inference.
- 26% of organizations fear excessive costs associated with GenAI-enhanced application software.

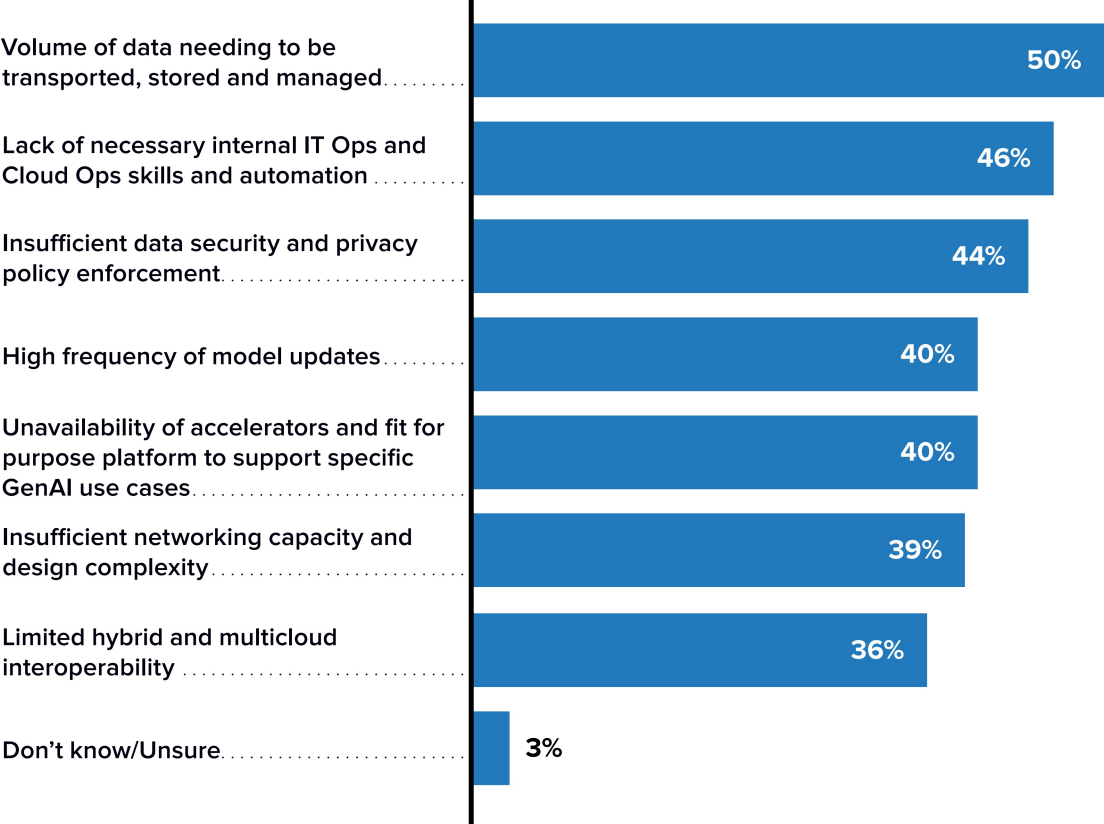
Beyond this are concerns about data quality, data access, silos, control of sensitive data, and compliance. Early AI initiatives reveal that most of the challenges are data- and operations-related, as shown in Figure 1, below, from the same survey. Half of respondents cite data storage, management, and mobility as a challenge.



A data strategy combines data governance and data technologies including storage, security, and management.

FIGURE 1
Infrastructure Challenges to Implementing GenAI Use Cases
% of respondents

Greatest digital infrastructure challenges to successful implementation of organization’s highest priority GenAI use cases in the next 18 months



Source: IDC's *Future Enterprise Resilience & Spending Survey, Wave 1, January 2024* n = 881

Many organizations embrace public cloud for more expedient access to third-party models, but when it comes to model tuning and inferencing, they are bringing AI applications to platforms hosting business data. This indicates how critical data proximity and interoperability are when taking AI from pilot to production. Bringing AI applications closer to data helps avoid costs and risks associated with moving data.

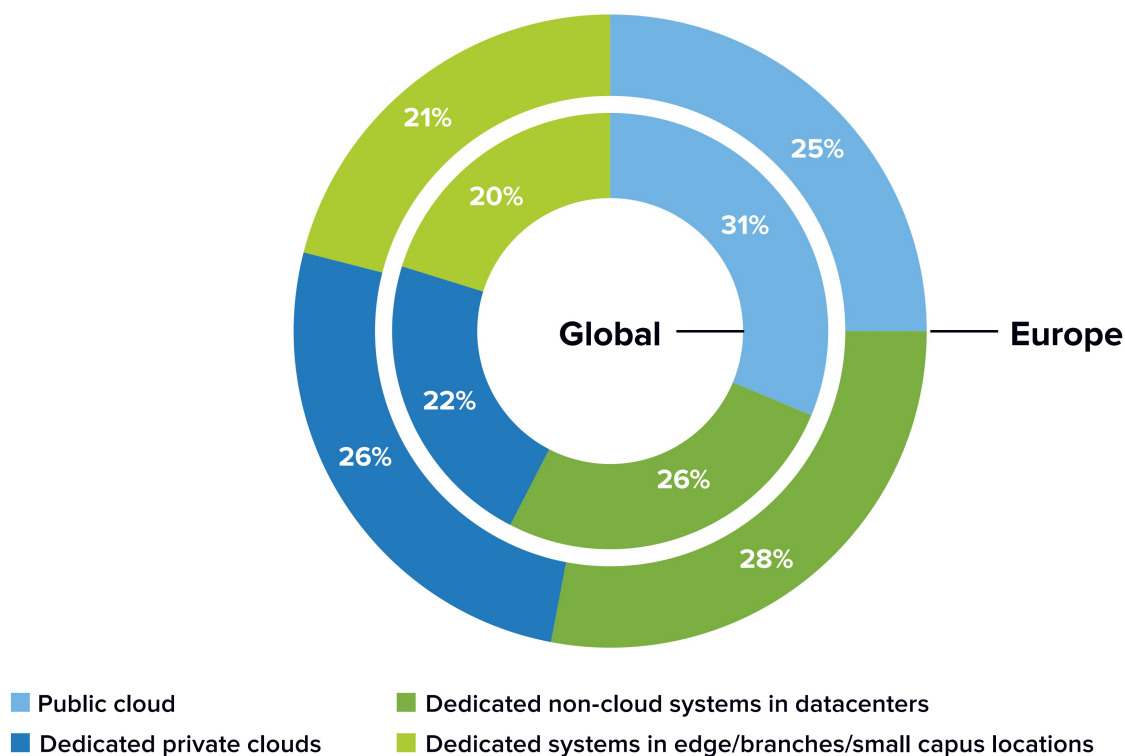
In fact, more European IT leaders expect their GenAI workloads to be deployed in non-public-cloud environments (on premises, private cloud, and dedicated edge), as shown in Figure 2, below, contrasting with the global trend of cloud being the most popular choice — cited by 31% of respondents in IDC's *FERS Survey, Wave 1, January 2024*.



FIGURE 2

Where Organizations Will Deploy Production GenAI Workloads

% of respondents



Source: IDC's Future Enterprise Resilience & Spending Survey, Wave 1, January 2024 n = 881

According to IDC research, infrastructure preferences in Europe are driven by:

- Implications of cybersecurity and resilience
- Data volume, location, and integration requirements
- Vendor support
- Time to value
- Openness and interoperability to avoid vendor lock-in

IDC believes that strong desire for vendor support indicates organizations' need for a technology partner that can help them address AI-related skills shortages and an aversion to a DIY approach to public cloud.

Organizations also have large datasets that need to be stored and processed within specific boundaries.

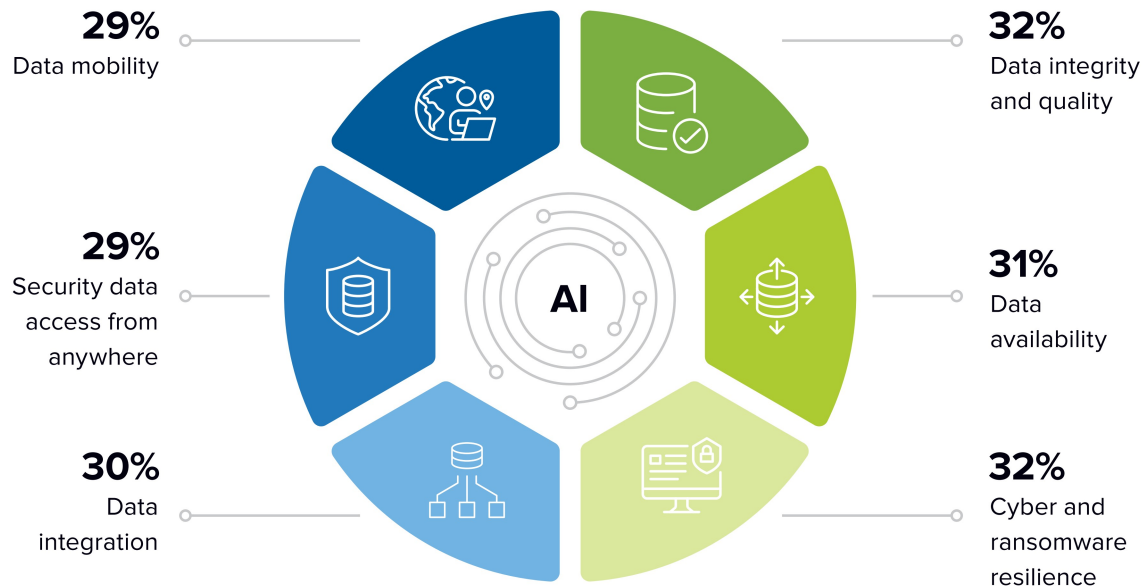
“Data localization and sovereignty laws such as GDPR or EU AI Act add additional risks around AI. IDC's *Digital Sovereignty Survey, 2024* indicates that 13% organizations are already using sovereign technology to build AI solutions and another 34% plan to do so in 12 months.

Figure 3, below, highlights the data capabilities that organizations see as essential for their current and future AI strategies. Data capabilities range from data quality and availability to security and mobility.

FIGURE 3

Essential Data Capabilities for Organizations’ AI Strategies

% of respondents



Source: IDC's CloudOps Survey, 2024, EMEA (Europe, n = 925; META, n = 506)

To achieve the essential data capabilities, organizations require an integrated, versatile hybrid cloud foundation that can support multipurpose AI with:

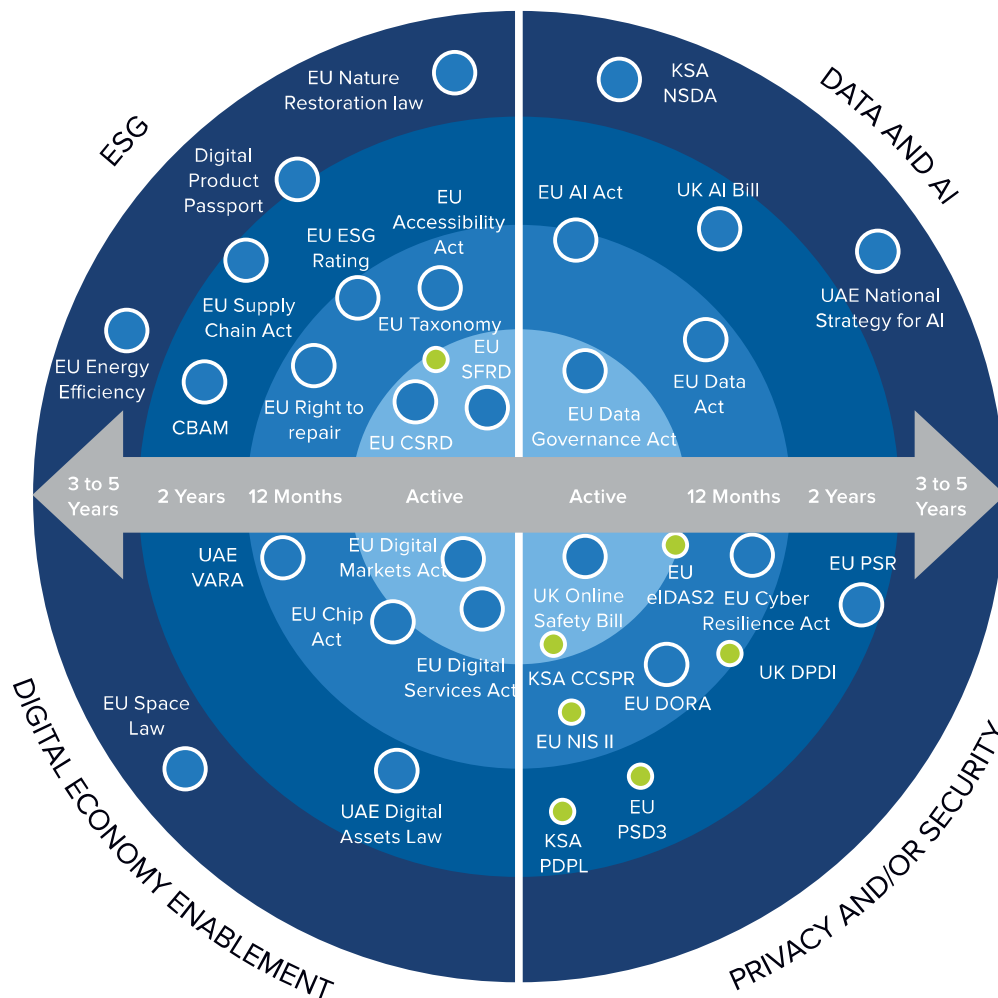
- A versatile platform to suit multiple AI workloads
- Moving workloads as necessary
- Managed unstructured datasets that power GenAI workloads
- Flexibility to use expensive AI processors where appropriate and existing CPU architectures where possible
- Secure access to relevant data
- AI adoption in phases
- The use of existing skills while retraining staff
- The extraction of higher value from existing and new investments
- Reduced risk of AI strategies from cost and compliance perspectives



A versatile platform foundation with modern compute, storage, and data services brings flexibility and choice of infrastructure to enable a workload-first approach.

This helps meet multiple C-suite objectives, ranging from cost-efficiency and sustainability to compliance and resilience. IDC believes a workload-first approach can help C-suites build resilience to navigate today’s rapidly evolving regulatory landscape (see Figure 4).

FIGURE 4
European Regulatory Landscape



Types of Regulation

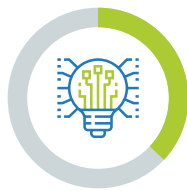
- Regulation update
- New regulation

Source: EMEA Digital Regulations and Policies Radar – 2024 Update (IDC #EUR152325424, June 2024)

As the figure highlights, Europe, the Middle East, and Africa (EMEA) organizations have to consider regulations across four areas: data and AI; environmental, social, and governance (ESG); privacy, security, and resilience; and digital enablement.

Foundation for App Modernization and Cloud-Native Strategies

AI initiatives are not restricted to net-new applications alone. Organizations are looking to modernize core applications with AI, as well as open and cloud-native components.



Application modernization is high on the agenda of European organizations, with 37% considering legacy application modernization as a top priority over the next 12 months, according to IDC's *DevOps and Modern Apps Survey*, July 2023.

Organizations want to extend the value, resilience, and security of their applications by infusing them with AI capabilities.

Application modernization is an increasingly pressing matter for many European organizations. Not only are legacy applications reaching their end of life, but the need to embrace modern cloud-native technology building blocks such as containers, micro-services architecture, infrastructure as code, automation, and APIs are providing impetus for organizations to expedite modernization efforts in Europe.



Already 62% of organizations have adopted container technologies, according to IDC's *European CloudOps Survey*, 2024.

Modern applications and AI workloads are built with cloud-native technologies. This is exposing newer limitations, risks, silos, and complexities for IT teams. Key IT risks that were highlighted by organizations include security and compliance, rising tech debt, vendor lock-in, and data challenges.

Decisions about app modernization and where to deploy workloads are made collaboratively by C-suite, line-of-business teams, DevOps and DataOps teams, and AI leaders as they seek to balance security, costs, and performance requirements across workloads.

As a result, to get the most from their platforms, organizations must include AI in their app modernization and cloud-native strategies when investing in platform foundations.

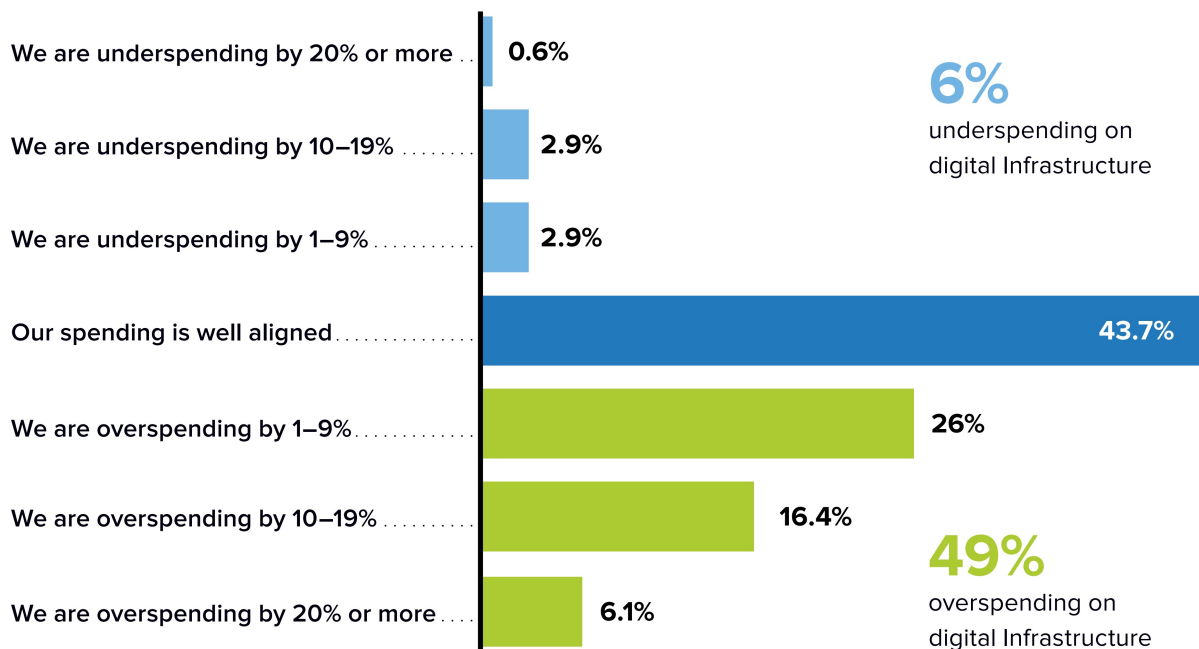
Trends and Investments in Private Cloud, Datacenter, and On-Premises Infrastructures

A majority of organizations (77%) surveyed in IDC’s *Worldwide Future of Digital Infrastructure Sentiment Survey* said that infrastructure is “important or mission critical” for their digital future. However, decades of public cloud-first strategy or siloed investments have resulted in severe misalignment in investments (see Figure 5).

FIGURE 5

Infrastructure Spending and Value: Investment Poorly Aligned with Business Outcomes

% of respondents



Source: IDC’s *CloudOps Survey, 2024, EMEA* (Europe, n = 925; META, n = 506)

Reasons for overspend:

- Excessive tech debt/costs
- Lack of business-aligned infrastructure strategy
- Too many uncoordinated infrastructure purchasing centers
- Inefficient infrastructure management
- Poorly managed public cloud spending
- Risks of future bill shocks owing to the dynamic nature of AI and large language models (LLMs) to scale quickly to unprecedented levels (e.g., new GPT workloads)



For 55% of organizations, infrastructure spending is not effectively aligned with their expected business outcomes, with 49% acknowledging they overspend.

Private Cloud Renaissance

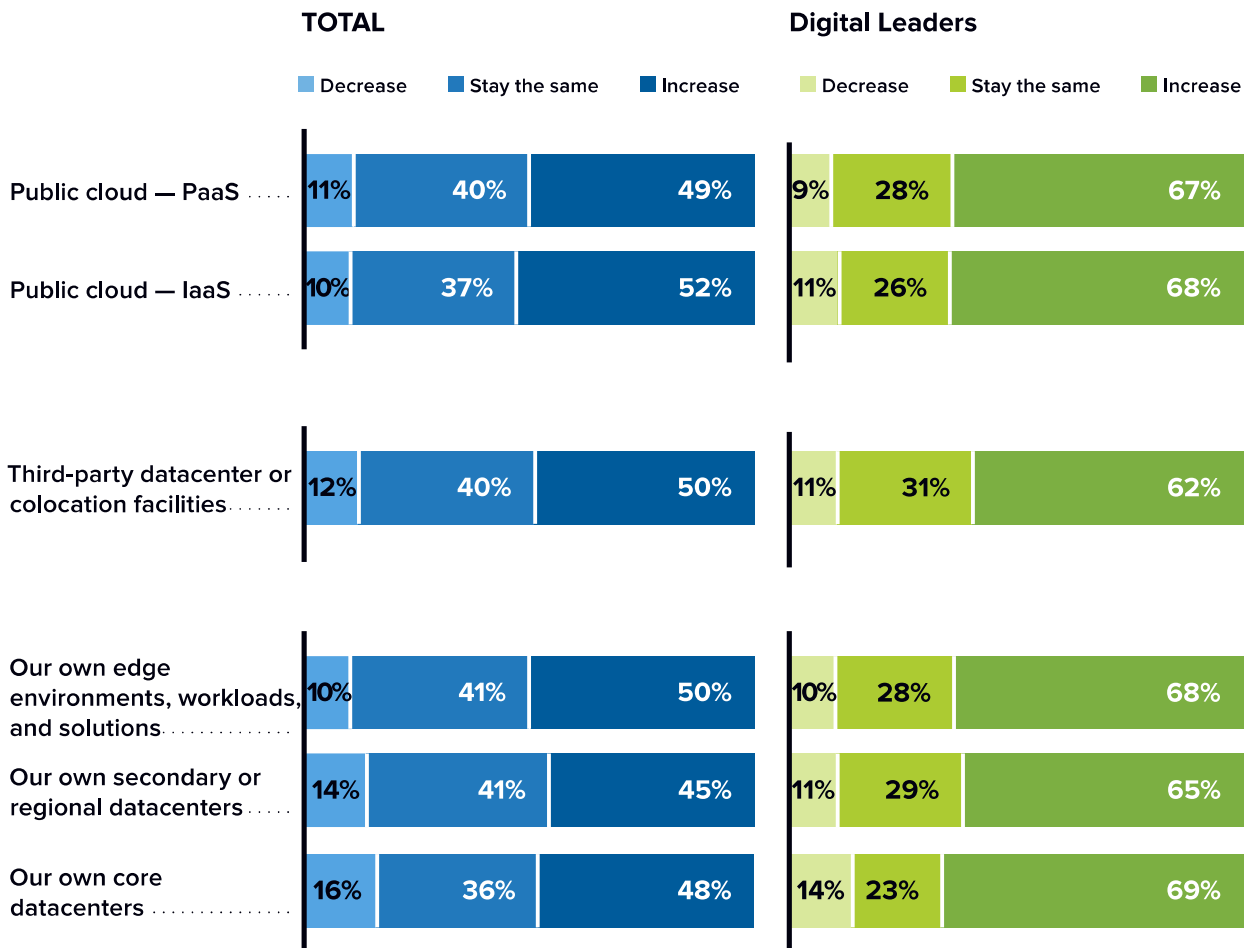
Investment in private infrastructure remains solid, as seen in Figure 6, especially among more mature organizations (Digital Leaders) who plan to significantly increase investments across all infrastructures to pave the way for a hybrid cloud foundation. This investment ensures that on-premises infrastructure is modernized, standardized, and integrated, enabling it to provide the same experience and capabilities as public cloud.

FIGURE 6

Investment in Private IT Infrastructure

% of respondents

How will your organization’s spending change in each of these areas?



Source: IDC's Edge to Cloud Infrastructure Survey, 2023, EMEA (n = 1,626)



IDC estimates that, by 2025, 60% of technology buyers will prioritize an “as a service” consumption model to optimize spending.

Public cloud has reset users’ expectations with a pay-as-you-go approach. Modern features such as consumption-based pricing models in on-premises infrastructure allows cloud-like opex experience across full hybrid cloud environments.

IDC notes the following characteristics that make private infrastructure fit for modern needs:

1. Fit-for-purpose advanced coprocessors and accelerators for all workloads
2. Next-generation storage to cost-effectively support the requirements of unstructured and semi-structured data
3. Sustainable and efficient technologies
4. Cloud-like compute infrastructure that can scale according to need
5. Flexible consumption-based pricing models for a pay-what-you-use approach
6. Interoperability to avoid lock-in
7. Cloud-native and abstraction features
8. Data sovereignty, regulatory compliance, data security, and cyber preparedness
9. Automation and observability



Today, it is possible to access all these characteristics in private clouds, thanks to accelerated innovation from highly reputable and long-standing infrastructure vendors.

Emerging Signs of Organizations Bringing Workloads Back on Premises

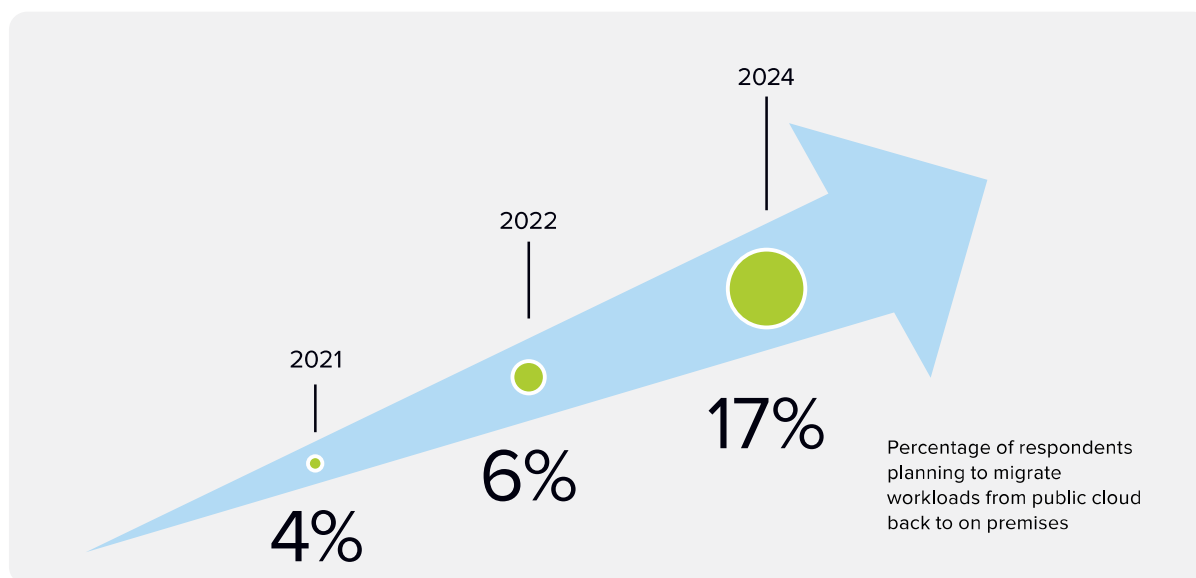
Does a private cloud renaissance signal a major slowdown in public cloud use?

European organizations have always been cautious about going “all in” on public cloud. But, today, the need for control over workloads and data resilience in public cloud strategies is a lot stronger.

A growing number of European organizations are planning to bring applications back from public cloud environments — citing regulations, cost, and sovereignty reasons (see Figure 7). In 2022, 4% of organizations cited plans to move workloads back on premises; in 2024, this figure has risen to 17%. IDC believes that public cloud will continue to remain strategic for many applications, but a workload-first strategy is making organizations bring certain workloads back on premises.

FIGURE 7

Trend in Migration of Workloads Back on Premises



Source: Sources: IDC's Multicloud Survey, 2021 (August), Multicloud Survey, 2022 (September), and Cloud Survey, 2024 (September) — all EMEA

Organizations' workload strategies are changing, and workloads are being designed so they can be easily migrated back on premises. This includes using technologies such as containers for abstraction, adhering to open standards and principles for standardization, and reducing dependencies on single public cloud stacks.

According to IDC’s *CloudOps Survey, 2024* (EMEA, n = 1,431), in 2024, only 4% of European organizations are not wasting or underutilizing their public cloud spending, compared with 7% in 2022.

If public cloud adoption grows unbridled, so does cloud waste. Organizations need to be especially cautious of bill shocks, owing to the dynamic nature of AI and LLMs and their ability to quickly scale to unprecedented levels. Already, excessive costs associated with infrastructure for model training are cited by a quarter of organizations as a key factor limiting AI project expansion. Before hitting roadblocks, organizations must prepare a clear strategy pertaining to infrastructure and facilitate multipurpose AI with versatile infrastructure foundation.



In 2024, about 86% of EMEA organizations stated they are wasting or underutilizing up to 50% of their public cloud spending, compared with 77% in 2022.

Respondent organizations in Europe to IDC’s *CloudOps Survey, 2024* (EMEA) cited limited cost control (31.4%), lack of operational skills (30.3%), limited visibility into IT infrastructure and applications (28.1%), and cloud sprawl (27.2%) to be the top CloudOps challenges.

Sustainability is also becoming more critical in Europe, especially because of the wide range of upcoming regulations highlighted in Figure 4, above. Sustainability will be a key consideration in the design and operation of future infrastructures. The energy demands of AI workloads are significant and will inevitably increase. To address this challenge, organizations will prefer infrastructure that is energy efficient, long lasting, and renewable energy powered and uses AI to improve operational efficiency.



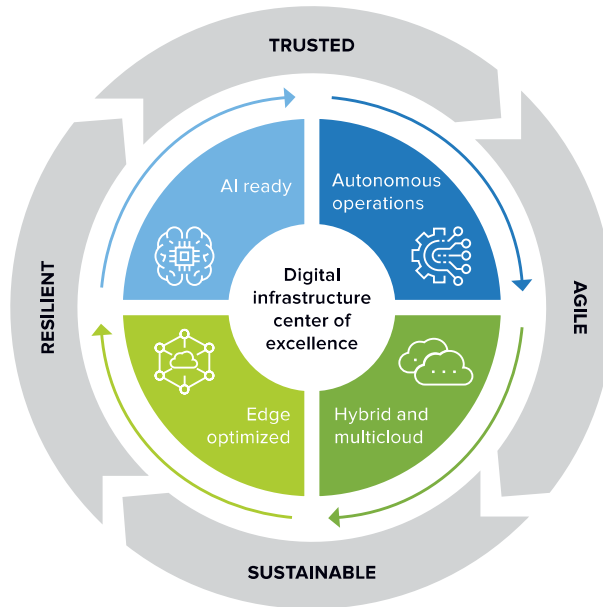
This acute awareness of freedom from lock-in follows the en-masse lift and shift to the cloud during the pandemic that resulted in bill shocks and reduced value from public cloud delivery.

Hybrid Cloud Foundation: Framework and Design Principles

IDC’s Future of Digital Infrastructure Framework (Figure 8) provides a view of a modern hybrid cloud foundation for multipurpose AI. It is not just an integrated technology stack, but includes re-imagined operations and processes with a Center of Excellence team focused on governance.

The framework also highlights the vital role that operating models, sourcing strategies, and governance processes play in ensuring that budgets, policies, and outcomes are well aligned across the business.

FIGURE 8
IDC’s Future of Digital Infrastructure Framework, 2024



Source: *The Future of Digital Infrastructure, 2024: AI-Ready Platforms, Operating Models, and Governance* (IDC #US50614724, March 2024)

The framework focuses on five key pillars:

- ➔ **AI-Readiness:** Infrastructure technologies, products, and cloud services need to be optimized for the scale, performance, cost, sustainability, and interoperability requirements of emerging AI and other high-performance, data-intensive workloads.
- ➔ **Edge-Optimized:** Architectures are required that anticipate and accommodate the increasingly distributed nature of enterprise computing and data management entailed by the convergence of IT and operating technology (OT) and increased demands for widely distributed network connectivity and location-independent workloads.
- ➔ **Interoperability:** Infrastructure must be designed with the awareness that applications and data are deployed depending on the specific needs of the individual workloads, as well as the interactions required when multiple applications and data repositories need to interconnect. Interoperable environments benefit the entire enterprise by enabling workload portability and modernization, while supporting seamless data and process links.
- ➔ **Autonomous Operations:** This requires intelligent infrastructure that takes full advantage of AI, observability, and automation to enable organizations to manage, scale, and secure infrastructure consistently across datacenters, colocation and hosting sites, mobile and edge locations, and public cloud infrastructure-as-a-service (IaaS) and software-as-a-service (SaaS) platforms.
- ➔ **Centers of Excellence (COE):** This consists of a multi-stakeholder team that provides collaborative governance and strategic coordination across IT, cloud, line-of-business, DevOps, and data science teams. These teams must promote tech debt avoidance, interoperability, and coordinated engagement with strategic vendors and ecosystem partners.

Businesses that are moving to this kind of hybrid cloud are able to:

- Adopt fit-for-purpose platform architectures that match workloads and infrastructure
- Leverages AI for automation and proactive management
- Win investments for upskilling and change management
- Avoid over-reliance on a single vendor
- Break down data silos
- Benefit from a consumption-as-a-service model

Future Outlook and Conclusion

IDC anticipates a rise in multipurpose AI activities and regulatory needs in Europe fueling demand for a distributed but connected cloud infrastructure. Hybrid cloud designed to seamlessly extend to the edge, enabling AI workloads to be processed locally with lower latency, will become an imperative. Preparing for it with the right investments today can represent a competitive advantage.

It is time European technology and business leaders became proactive in anticipating and exploiting infrastructure innovations, as AI and digital success now requires a new generation of compute, storage, network, edge, and management technologies alongside public cloud services.

It also vital to acknowledge the key role of that collaborative COEs play in building the foundations for AI while minimizing the risk of tech debt, data, and skills.

As European organizations embark on this journey, they must evaluate modern technology platforms, private cloud, and data infrastructure from tried-and-tested vendors. This will ensure sustainable, proven, and stable progress as AI technologies evolve in Europe.



End User Recommendations

IDC offers the following guidance to end users:

- ➔ **Prioritize data management and governance.** Effective AI models depend on high-quality sensitive data, making data management and governance a top priority. End users should ensure that their hybrid cloud infrastructure supports seamless data integration across multiple environments. This includes implementing robust data governance policies that address data quality, consistency, and accessibility. With a centralized data catalog and metadata management tools, users can streamline data discovery and access.
- ➔ **Leverage AI-optimized resources where necessary.** Some AI workloads are resource intensive, often requiring significant computational power and specialized hardware like graphics processing units (GPUs) or tensor processing units (TPUs). But less-intensive AI workloads do not require heavy-weight GPU capacity and can be resourced with CPU-based infrastructure. End users should assess their hybrid cloud environments to ensure they do not use AI-optimized resources for all AI workloads. Organizations will also need to ensure a hybrid cloud infrastructure that can support AI workloads and LLMs that need to be trained using core IP.
- ➔ **Focus on security, data location, and compliance for AI workloads.** AI applications often handle sensitive data, making security and compliance the number-one priority for European organizations. End users should implement solid encryption protocols and ensure compliance with industry-specific regulations like GDPR. Continuous monitoring and regular security audits can further help maintain security and access controls that meet regulatory requirements.
- ➔ **Adopt a scalable and cost-efficient approach with multipurpose AI.** As AI workloads are often unpredictable, with resource demands varying based on the complexity of the models and the volume of data processed, a designed hybrid cloud infrastructure should be implemented to ensure scalability and a pay-per-use model. Leveraging cloud-native tools for automatic scaling and adopting a pay-as-you-go model for cloud resources will help reduce costs. A monitoring solution can be used to track resource utilization and performance and help users optimize costs by identifying, reducing, and even eliminating unused resources.
- ➔ **Use a sustainable approach.** Optimization practices not only reduce costs, but they also reduce carbon emissions. FinOps and GreenOps go hand in hand and complement one another in a very effective way, driving innovation and delivering on sustainability commitments. As a result, end users can achieve business advantages beyond cost savings and attract customers, employees, and investors, who are increasingly concerned by ESG considerations and aim to reduce their own environmental impact.

About the IDC Analysts



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Archana Venkatraman leads IDC’s European CloudOps and Governance research and Cloud Data Management research. A big focus of her research is on cloud value realization, cloud-native success, and operational excellence.

[More about Archana Venkatraman](#)



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Filippo Vanara co-leads and contributes to IDC’s European CloudOps and Cloud Governance. FinOps and sustainable operations (GreenOps) are, among others, key research areas in his research agenda.

[More about Filippo Vanara](#)

Message from the Sponsor



At Fujitsu, our vision is to harness AI and cutting-edge technologies to enhance the environment, economies, and people’s well-being.

According to IDC, 79% of organizations consider hybrid and multicloud environments essential for digital transformation and resilience. AI, including generative AI, is a key driver of infrastructure investments, with European organizations using hybrid cloud to achieve flexibility, scalability, and governance.

To support diverse initiatives, customers require a versatile, integrated AI environment. This involves leveraging hybrid cloud to balance flexibility, scalability, and governance, ensuring the right cloud for the right workload. Fujitsu’s hybrid cloud solutions are tailored to support AI workloads, application modernization, and cloud-native strategies. Our versatile, secure, and sustainable platforms maximize investments and mitigate AI strategy risks by providing solutions that reduce complexity, cost, and risk, helping customers develop future-proof datacenter infrastructures.

“By partnering with Fujitsu, organizations can confidently navigate the complexities of AI and hybrid cloud, ensuring they are well-equipped for future challenges.” — Andrew Arthur, Strategic Lead for Hybrid Cloud at Fujitsu.

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