

How cloud architecture design accelerates cloud deployments

Learn how senior IT leaders moved forward in their cloud journeys and achieved quantifiable business outcomes



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Overcoming the hesitation of senior executives when moving to cloud

As enterprises move to the next stage of cloud adoption, including the migration of mission-critical workloads, 83% of top executives are prepared to invest in next-generation cloud technology.¹ But despite available budgets for this phase, two-thirds of senior executives are skeptical about the ability of their enterprises to successfully move to the cloud.²

Some enterprises have used a formal cloud architecture design to help decrease senior executive skepticism. A formal cloud architecture design is a blueprint of the different components and subcomponents needed by an organization for cloud computing. It includes a roadmap that outlines the relationships between the components and subcomponents, and provides the required steps to reach the desired state and achieve business objectives.

In late 2019, IBM surveyed over 200 senior IT executives to better understand whether a formalized cloud architecture design had made them more successful in their move to cloud and helped alleviate skepticism. This paper highlights key findings from the survey.

Of those interviewed, **95% agreed that a cloud architecture design helps improve the success of an organization's journey to the cloud**, and 90% stated they had the right plan in place to maximize business value.

Research methodology

IBM® Services™ commissioned a survey to investigate the effect of a formal cloud architecture design on the move to cloud, particularly for more advanced workloads, and how a unified plan helps reassure senior executives. Of more than 200 senior IT leaders surveyed over 80% of surveyed organizations were considered large enterprises, with over 1,000 employees. The remaining organizations had 500–999 employees. Of the total sample, 43% of organizations were current formal architecture design users, 34% were planning and researching to develop a design, and 21% were considering or had no formal architecture design plan.

“A formal cloud architecture design is vital to our ongoing success. The architectural foundation enables cloud computing accountability to achieve desired business objectives.”

– A CIO in the banking industry

The benefits of an effective cloud architecture design

Overall, respondents agreed that there were multiple benefits to a formal cloud architecture design. An effective design helps achieve seamless intercloud movement and consistent management, which can result in better business value, flexibility, revenue growth and cost control. The following four benefits are reviewed in more detail:

-  Improved security
-  Maximized availability
-  Integrated workloads across hybrid IT and cloud environments
-  Reduced complexity and increased standardization

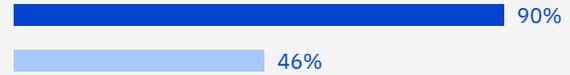
“The existing staff, including myself, are so busy just running day-to-day operations and changing directions due to changing business conditions...If we had an expert to help us define the design and migration path, then we can start moving more consistently.”

– A senior vice president of a large wholesale enterprise

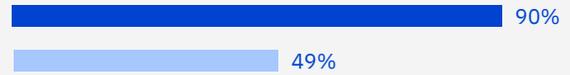
A comparison of the confidence a formal cloud architecture can provide an organization for the following objectives:



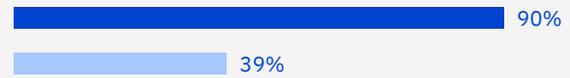
We know how to secure business-critical systems, both legacy and cloud.



We have the right cloud technology strategy in place to maximize business value.



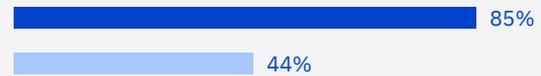
We know what our cloud technology roadmap looks like.



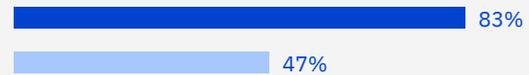
We know what our destination cloud infrastructure looks like.



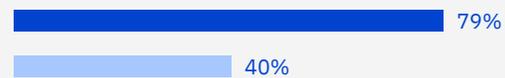
We are continually optimizing the performance of our cloud infrastructure.



We have the right infrastructure architecture across our cloud landscapes.



We have a clearly articulated business continuity strategy and playbook for legacy and cloud infrastructures.



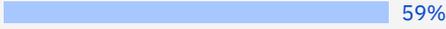
We can streamline management across clouds.

- Organizations with formal cloud architecture design
- Organizations without formal cloud architecture design

Percentage of surveyed organizations that agreed they knew how to secure business-critical systems or traditional and cloud

 93%

with a cloud architecture design in place.

 59%

without a cloud architecture design in place.

“Making the move to be in the cloud takes a lot of strategy, especially since you are entrusting your private information in a possible public forum.”

– A CIO of a large wholesale enterprise

Improved security

A critical part of the cloud journey is helping ensure the enterprise stays security-rich across the IT landscape—on premises, in the cloud and across multiple clouds. The current hybrid multicloud environment often leads to fragmented security solutions and a decrease in threat visibility. Additionally, enterprise security teams are being asked to adapt to a shared responsibility model with their cloud service providers, leading to challenges in establishing visibility, control and compliance across these environments.

For those respondents with a cloud architecture design, 93% said that they knew how to secure business-critical systems—both traditional and in the cloud. Only 50% of those organizations without a cloud architecture design felt the same way. It’s the design’s integrated cloud security framework that helps align business and technology requirements and provides a model to address the leading geographic, industry, risk and compliance components to create the appropriate level of protection.

Securing a hybrid multicloud environment requires a different approach than previous security programs that solely considered on-premises environments. These phases aren’t a linear list of what needs to be done, but rather a continuous iterative cycle of strategy, development, implementation and management.

The benefits of an established cloud security architecture are security standardization, cost and organizational efficiencies, and the ability to more effectively manage day-to-day operations—even during a security event or crisis. Within the critical timeline of identifying and remediating an attack, a security engineer may spend countless hours reverse-engineering or deciphering the architectures trying to determine the entry point.

Look for a partner that can help with the following aspects of a cloud architecture design:

- **Assess your current state of cloud readiness.** Define your ideal cloud security future state based on your business, privacy and regulatory requirements. Create a roadmap to a secure hybrid multicloud and build out your macro-level security architecture.
 - **Manage identity and access across multicloud environments** as a crucial component of cloud security.
 - **Demonstrate how to build security into the application development** process before you discover security vulnerabilities later.
 - Help your teams:
 - Automate secure application development.
 - Define policies by workload requirements.
 - Automate security controls using infrastructure as code.
 - Manage configurations in a multicloud environment.
 - Test your security defenses repeatedly.
 - **Aid the detection of advanced threats** and quickly respond to and recover from disruptions.
-

Maximized availability

Of the surveyed organizations with a formal cloud architecture design, 98% of them said that they were achieving their business availability and uptime agreements “well or very well” when moving to the cloud. But without a formal design, 16% of respondents that had made the move to cloud said that they weren’t achieving their availability goals “at all well.”

Results also showed that a formalized cloud architecture design helped enterprises improve their business continuity strategy for traditional environments. Of organizations with a formal cloud architecture, 83% of respondents said that they had a clearly articulated business continuity strategy for both traditional and cloud environments. But, less than half of organizations without a cloud architecture design said the same.

Multicloud deployment can bring many challenges to application resilience and business continuity. Deployment complexity can increase due to changing technologies and emerging standards, such as:

- Multiple vendors and cloud service providers
- Service-level agreements (SLAs) that vary between providers
- A changing threat landscape that includes cyber-related threats
- Increasing regulatory compliance requirements, including a demonstrated ability to run the business within the agreed SLAs and the disaster recovery environment or other resilience approaches

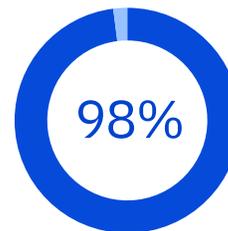
This risk of system downtime significantly increases when organizations acquire and deploy cloud solutions without the involvement and oversight of resilience experts, the use of formalized resilience methods and techniques, and a lack of adequate and regular testing.

An agreed resilience strategy and architecture—based on critical business services requirements and associated implementable designs—is required to provide clear guidance for building and managing a resilient hybrid multicloud solution.

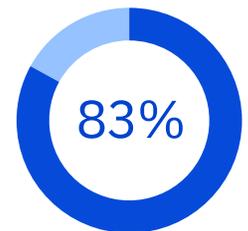
Look for a partner that can help with the following aspects of a cloud architecture design:

- **Map critical workload dependencies** across necessary environments to determine the right resilience strategy.
- **Separate infrastructure dependencies** from application resilience.
- **Provide resilience solutions** designed to be easily tested without impacting day-to-day operations.
- **Deliver an agreed upon resilience strategy** and unifying architecture that are based on critical business services requirements and aligned to the appropriate tiers of resilience.
- **Develop implementable designs** that provide a clear definition for building and managing your resilient target solution.

Benefits of a formal cloud architecture design



of surveyed organizations are achieving their business availability and uptime agreements “well or very well.”



of respondents had a clearly articulated business continuity strategy “for traditional and cloud environments.”

Integrated workloads across hybrid, cloud and IT environments

Organizations often create multiple hybrid service delivery platforms over time. This method results in an assortment of service providers for uncoordinated purposes, and makes it difficult to pay attention to the overall environment and complications due to different vendors and tools.

A lack of integration can lead to disjointed technical solutions, disparate interfaces and disconnected management processes. Effective cross-cloud integration requires both common application integration techniques and common management, and operational processes and tools.

IT departments are tasked with solving this problem. A cloud architecture design can help deliver the coordination needed to help bring it all together.

The design helps define the scope for workload development and deployment, as well as the rules for when and where they should be used. For example, a hybrid cloud architecture might include containers, VMware, Microsoft Azure, IBM Cloud™ and on premises, each having rules that should be used for that specific environment. Additionally, an effective architecture governance should be in place to ensure the architecture and standards are maintained and used correctly.

Look for a partner that can help with the following aspects of a cloud architecture design:

- **Select from multiple reference architectures** to define your target state.
 - **Leverage industry experience** to provide a sound analysis of your current state and develop your future state design.
 - **Provide a cloud management solution architecture** with build-ready component designs, reflecting multiple platform and technology options.
 - **Develop an executive summary** and briefing for all key decisions and resulting architecture.
 - **Deliver an effective governance framework** and architecture management process.
-

The ability of organizations to integrate workloads across hybrid, cloud and IT environments

 86%
with a cloud architecture design in place stated they met this objective either “extremely well or very well.”

 41%
without a cloud architecture design in place agreed they weren’t achieving this objective.

“Having a formal blueprint that the entire organization would have to follow would help with the current fragmentation we have now, where different departments are purchasing products with cloud pieces, but nothing is standardized, so IT is left with a hodgepodge of differing systems, making support more difficult.”

– A director of IT at a large education enterprise

Reduced complexity and increased standardization

In 2018, IBM Institute for Business Value (IBV) research noted that managing complexity was an upcoming challenge for enterprises. Only 41% of organizations had a multicloud management strategy, and just 38% had the procedures and tools in place to operate a multicloud environment.³

In this IBM Services study, it was obvious that **standardization was improved for those enterprises that had a cloud architecture design in place, with 44% of respondents saying that they were achieving standardization across the cloud landscapes “extremely well.”** This result is exactly the opposite for those enterprises without a cloud architecture design as only 7% said they were achieving their objectives “extremely well.”

The numbers for reduced complexity were even more telling. Of surveyed individuals with a cloud architecture design, 42% noted they were managing complexity “extremely well.” In comparison, 51% of respondents without a cloud architecture design noted they were “not achieving very well.”

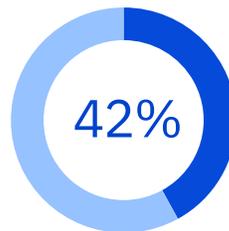
The myriad range of deployment options and cloud platforms has also introduced new pain points, including movement and management across multiple clouds. To mitigate these issues, a formalized cloud architecture enables operational visibility across multicloud environments. A formal architecture also provides a design that allows you to work with your current infrastructure and a vehicle to leverage new technologies, services and service providers. Ultimately, this method can facilitate better service integration and enable more effective governance.

One of the technical building blocks to help with standardization is containers. In that same IBV study, 61% of multicloud leaders stated that at least 80% of new applications will be developed using containers by 2021. Along with automation, adoption of containers helps improve standardization and reduce complexity by eliminating manual work and the resulting errors, in addition to increasing responsiveness.

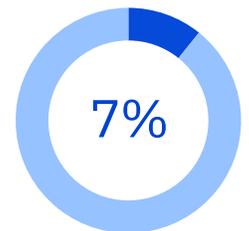
Look for a service provider partner that can help with the following aspects of a cloud architecture design:

- **Develop a target cloud solution baseline.** This baseline is a standardized solution architecture, reflecting the required service layers, deployment models and provider choices with integrated tool chains, a management platform, and resilience and security solutions.
- **Select the right tools** and deployment methodologies.
- **Maximize deployment** and service selection flexibility.
- **Provide a strategy** that leverages technology and outlines a roadmap for deployment.
- **Review DevOps tool chain requirements** and determine the tools that will help standardize application development and the continuous integration continuous delivery pipeline, including evaluating the use of containers.
- **Adopt a software-defined infrastructure**, allowing automation of your infrastructure as code and integration with the DevSecOps process and pipeline.
- **Develop the following based on roadmap priorities:**
 - The component platform designs with required toolchain implementations
 - Management and security service integrations
 - Multicloud management system design
 - Critical services resilience design

Comparison with and without a formal cloud architecture design



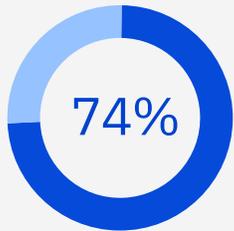
of respondents noted they were managing complexity “extremely well” with cloud architecture.



of surveyed organizations said they were achieving their objectives “extremely well” without cloud architecture.

“Having an architecture provides us with a business and technology framework upon which to make key strategic and operational decisions, set priorities, maintain standards and to have an agile path from today’s architecture to a future one, which more extensively embraces cloud solutions.”

– A CTO of a large media and entertainment enterprise



of IT leaders with a cloud architecture design completely agreed that it had positively impacted the success of their organization's journey to cloud.

An effective cloud architecture design helps organizations successfully embrace cloud

In summary, a plan allows your team to create a vision agreed to and shared by IT leaders and business stakeholders, helping reassure executives of their ability to successfully embracing the cloud. Among the IT leaders interviewed, 74% of IT leaders with a cloud architecture design completely agreed that a formal cloud architecture design can positively impact the success of an organization's cloud journey.

The right strategy and roadmap helps teams stay focused and can result in standardization that improves security, maximizes availability, integrates workloads across a hybrid IT and multicloud environment and can reduce complexity.

The value of a service provider

Nearly half of survey respondents noted a lack of skills and knowledge as one of their top three challenges when moving to the cloud. Survey results also provided insight into the key attributes IT leaders looked for in a service provider. The most often cited skillsets include a service partner, end-to-end cloud services capabilities, established processes and methodologies to structure the cloud initiative, tools and diagnostics to make data-driven recommendations, and experts who have successfully migrated applications many times.

Even when a services partner isn't engaged, enterprises should agree upon a unifying architecture design that provides clear guidance for building and managing a hybrid IT and multicloud environment. The design should also capture business requirements and technology needs to deliver a strategy, roadmap and implementable architecture that integrates security, resiliency and management. These plan elements create an essential foundation for successful cloud adoption.

Why IBM?

Enterprises focus on accelerating digital transformation with cloud, and most organizations view their future cloud environments as both hybrid and multicloud. In a hybrid approach, you run applications across private, dedicated and public cloud infrastructures. In a multicloud approach, you use multiple cloud providers to support a breadth of enterprise workloads. IBM can deliver solutions based on extensive research into quantum computing, the Internet of Things, artificial intelligence and the experience of monitoring over 70 billion security events every day.

The IBM point of view on managing hybrid multicloud IT environments is based on an achievable plan, working design and a proof of concept that help speed your cloud journey and minimize trial and error. IBM Cloud Architecture Design Services helps provide you with a comprehensive technical strategy, architecture and roadmap that can include:



A technology strategy aligned to business value, optimizing costs and flexibility based on open standards with a prioritized roadmap for implementation



An architecture and design that separates the service layer from deployment platform choice and provider selection



A design that includes resilient technology platforms with appropriate security and compliance



A management framework and recommended toolsets based on a uniform set of capabilities and skills

“It is a daunting task to move to the cloud as the infrastructure and concept are both gigantic. A formal cloud architecture design helps to reign in the fear that goes with moving to the cloud.”

– A director of IT at a mid-market media and entertainment enterprise

To learn more about cloud architecture design, please contact your IBM representative or IBM Business Partner, or visit ibm.com/services/cloud/architecture.



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1 Forbes Insights, “The Future of Cloud” Report 2019

2 Move to Cloud Survey, IBM, 2019

3 Institute for Business Value, “Assembling your Cloud Orchestra”, 2018

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