



POINT OF VIEW | CLOUD

Optimizing IT: Key Considerations for Cloud Migration

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Introduction

Confronted by the digital evolution, enterprises are facing significant disruptive and competitive forces that are not constrained by legacy infrastructure and mindsets. No longer considered a mere operational expense, IT has shifted to become the cornerstone of an organization's strategy — and ultimately its success. Innovating, bringing new and improved products to market quickly, and delivering the ultimate customer experience are critical to a company's future.



Business has always been a race, but today the engine required to win seems to begin and end with IT.

Public cloud represents an enticing alternative to traditional data centers, as it more effectively enables organizations to keep with the pace of innovation. With massive computing power, unparalleled agility and instant scalability — all with lower costs — the benefits of the cloud are too attractive to ignore. Incredible year-over-year growth in public cloud spending reflects this dynamic. According to Gartner, “The IaaS compute market has been growing more than 40 percent in revenue per year since 2011, and it is projected to continue to grow more than 25 percent per year through 2019.”¹

Although organizations may know what they need to do to succeed in today's high-octane landscape, the how is more far-sweeping than many realize. Moving to the cloud is not simply a question of adding a few virtual machines (VMs), uploading data and calling it a day (also known as lift and shift), it needs to be treated more holistically. Cloud adoption should be approached with the goals of workload migration, application modernization and building a virtual data center (VDC), rooted in an all-encompassing IT transformation.

Organizations that do not think in these broader terms risk missing out on the full benefits of the cloud, to the detriment of both the bottom and the top lines.

1. Gartner, “Market Insight: Cloud Computing's Drive to Digital Business Creates Opportunities for Providers.” Smith, Anderson, Heiser, et al., May 2016, July 24, 2017 (refreshed). <https://www.gartner.com/doc/3328028/market-insight-cloud-computings-drive>

Defining a cloud strategy

IT strategy does not exist in isolation; rather, it's the foundation of the broader business strategy. The starting point for cloud adoption planning is to assess the organization's needs, both now and in the future. For example, what are the current challenges (delays in getting new products to market quickly, unable to meet customer expectations, disparate or outdated tools/solutions)? What does the organization hope to achieve (ability to sponsor innovation, reduced reliance on ineffective systems, compete effectively in the marketplace, become an industry leader)? What will IT delivery systems need to be able to achieve in the next five years to meet those needs?

Without a sound cloud strategy and next-generation architecture built specifically to support the future state, transformation initiatives will be disconnected and full of insurmountable hurdles. Haphazard approaches will also yield significant overspend, degraded performance and (preventable) confusion.

To avoid those pitfalls, the IT transformation strategy will need to take into account and assess the following key factors prior to developing the architecture:



Business priorities. What are the main drivers of the move to the cloud from a business perspective? For some, the priorities may include faster launches, modernization and global expansion, while capacity, agility and simplified management will be more critical to others. These priorities help determine architectural junctures and are woven into the virtual data center design.



Functional requirements. The cloud environment will have dependencies on how the organization and IT currently operate. Locations, remote workers, virtual private network requirements, network performance, stability and speed will be important measures.



Security. What security solutions, tools and processes are in place now, and are they suitable for the cloud? What do they need to mitigate risks, and how will these be integrated to secure data, improve threat visibility and expedite responses?



Compliance. Many organizations have regulatory requirements they must meet, such as General Data Protection, Payment Card Industry and the Health Insurance Portability and Accountability Act. The VDC must be constructed to support these controls, and operations planning must also account for industry-specific obligations.



Resiliency. What actions are needed when faced with an outage? Consider functionality such as self-healing design, backups and disaster recovery. Does the application have a specific recovery point or time objective that must met so as to not disrupt the business?



Operations management and monitoring. How will the organization manage and measure the performance of its legacy data center in combination with its cloud-based VDC? Does it have an integrated way to monitor solution health across the varied platforms? Is the existing IT team capable of taking on new computing realms while still being accountable for on-premises workloads?



Service management and governance. Does the organization have strong processes for testing, change management, approvals, cost management and procedural controls, with end-to-end transparency? Does the organization have certain service-level agreements (SLAs) that must be met, and can it feasibly manage them? Who manages the cloud subscriptions, and who has access to what resources and for which reasons?

Building an IT transformation plan

After completing the analysis of the organization's business, functional and operational requirements, it is time to build the IT transformation plan. A phased approach is highly recommended and can be tackled strategically, yet tactically.

Start with discovery

Creating a virtual data center in the public cloud, whether on Microsoft Azure, Amazon Web Services (AWS) or Google Cloud Platform, requires the enterprise to look closely at each of its existing data centers, systems and associated processes. Each application and discipline requires its own evaluation.

Key points to capture during discovery include:

- Application portfolio and dependency mapping, including type (in-house or vendor developed), language, libraries, full dependencies, specifications (OS, file systems, libraries, other systems and software) and performance
- Workload, server, storage and application details (including size, performance, CPUs and memory)
- Network design, speed, traffic and performance
- Operational requirements, such as availability, data protection, disaster recovery and connectivity
- Geographical considerations

To enhance the picture of the IT landscape, additional considerations should include:

- What are the current security requirements? How are they monitored and responded to?
- How is the environment separated around product, business unit, development and testing?
- How is traffic being monitored, and how might this map to the cloud data center?
- What network separation is currently used, and how will this be applied in the cloud environment?
- How will local resources or the data center connect to the VDC?

Continue with implementation planning

With a clear view of the current state and some preliminary work on how the end state will look post-transformation, it's time to build the migration plan. Considerations should include:

- What security architecture will be implemented? Always think — security first.
- How will the VDC be architected and how will it be built? Templates and scripts can substantially expedite the build time and decrease errors.
- How will existing IT practices and tools map across this new environment? What will be required from the business, its people and processes to effectively operate once the migration is complete?
- How will the solutions be monitored? If disparate tools are used for workloads residing on-premises (or via co-location) and the cloud, how are performance metrics combined for a comprehensive view of service health?
- What is the plan for integrating service management and governance principles?

Focus on the challenges

A broad range of factors are likely to have an impact on the implementation timeline, including application readiness and complexity. Some organizations may be armed with more cloud-ready applications, such as cloud native, microservices and software as a service (SaaS), compared to those built on traditional or monolithic platforms. Each application must be evaluated independently based on decision-making criteria such as:

- Retire: Phase out as it is no longer required.
- Replace: Upgrade to SaaS or a cloud-native app.
- Re-host: Pertains to lift and shift, typically a lighter application or one that is not availability dependent. (That is, it does not severely impact the business if uptime is less than ~99.95%.)

- Replatform: May need to make some code changes to prepare it for hosting on a different platform.
- Re-architect or refactor: Modernize or rebuild the application at its core, often using microservices to enable it for cloud.

The end-state cloud environment (or VDC) will be a blend of applications that were assessed and updated according to the preceding list. Organizations often move cloud-capable applications as a first step because these are structurally designed to perform at peak levels in the cloud.

Another key consideration in implementation planning is the mission criticality of each application and risk that downtime poses. The extent to which the business relies on a workload is likely to influence timelines, with many organizations choosing to move their least critical applications first. As a steady state is achieved and confidence in the migration process grows, more critical solutions are moved in a staged manner.

Don't underestimate the value of subject-matter expertise

Transformation planning is best accomplished by a blended team of employees from different disciplines to help build a representative view of the current landscape. Each member of the team — the chief technology officer or chief information officer, the IT administrator, the service desk, the business user, the HR team member and the finance lead — all have invaluable perspectives of the solutions, tools and resources the organization has in place today, what challenges they observe and what's needed to make things run more efficiently.

Enterprises typically find it highly beneficial to partner with an outside service provider to not only provide both traditional and cloud technology expertise, but also help develop an unbiased evaluation of the current state and guide the cloud adoption strategy.

A cloud service provider can work with the organization's IT transformation team throughout the planning and development process. It can offer counsel based on similar scenarios that other enterprises have faced and overcome, develop plans to target specific issues in alignment with industry best practices and help translate the end-to-end requirements into an optimized cloud model. A specialized service provider can also identify opportunities to reduce costs, challenges and risks.



Architecting and building the environment

The architecture of any cloud-based VDC should be designed with the end state in mind, not limited to what would suffice now. The goal should be an environment that is optimized to meet all captured business, functional and operational requirements. Some elements will evolve or be refined over time, but the foundation must be approached both thoughtfully and strategically.

Organizations that plan to move all or most of their resources to the cloud often rely on structural segregations, such as Azure Resource Groups, AWS Organizations or even separate subscriptions to help manage costs, performance and applications to apply in a measure of isolation. These are often paired with the specific business units that the workloads support.

Consider capacity carefully; the network has to be able to handle the traffic expected in the short term, but it must also be scalable to expand bandwidth as use increases over time. Many begin with a dedicated pipeline using services such as Azure ExpressRoute or AWS Direct Connect, configured at a capable mid-level range. Increased traffic or speed requirements are reevaluated once a steady state is achieved or as more workloads are transitioned to the VDC.

The network design must also address security, specifically the use of private and/or public IP addresses, firewalls, network access lists, and network security groups. It's also important to implement role-based access control (RBAC) to specific resources, in accordance with industry best practices and aligned to least-privilege rights. The cloud provides for the use of extremely granular identity and access rights to help address growing security concerns. Organizations should evaluate access controls on a recurring basis, ideally no more than quarterly.

These factors are determined from insights captured during the discovery process, coupled with the analysis of the business and technical requirements. The goal is to provision what is needed now, while preparing the VDC for a vibrant tomorrow.

Migrating and deploying workloads

With the VDC's foundation designed in accordance with the future state in mind, the migration process can begin. Many tools are available to move an organization's applications; there is no one-size-fits-all migration solution. Each scenario must be analyzed to ensure the best tool is selected and each workload is migrated properly. This helps reduce costs, transmit data more efficiently and stand up the workload at the target destination with greater ease.

Cloud-native migration solutions can sometimes be used, at minimal cost, to move cloud-ready applications. When evaluating applications that need to be refactored or are more complex, consider using containers or more advanced tooling to ensure the application can be re-orchestrated once it's in the cloud environment.

Migrations are most successful when workloads are moved to a staging or testing environment first, or when the process is approached as a proof of concept. Even SaaS solutions and cloud-ready applications should be thoroughly tested in isolation, prior to being moved to production.

Once successful testing is completed, applications can be conservatively moved into production with relative speed and simplicity. The final production-ready checklist should include the data protection solution or configuration, security protocols are implemented (including RBAC) and that the application meets testing standards. Moving the application to production once these steps are completed will significantly reduce performance issues and risks.

Operating, automating and governing

The operational components are just as critical as the mindful IT transformation strategy and migration process.

The day-to-day management will significantly impact the overall cloud adoption experience.

Well-chosen monitoring and management solutions will help support optimal performance, where both routine maintenance and remedial actions are carried out swiftly. Resources in the cloud can be configured to be largely self-healing and strengthened with automation to help correct common issues. It's also important to have processes in place for remedying issues that fall outside of that scope.

In practice, even enterprises with large IT departments tend to bring in a specialized cloud managed service provider to address daily management and help integrate the VDC with their existing technology and governance practices. Most organizations find their existing IT departments are the resident experts with their on-premises landscape, but the cloud is a new element. Outsourcing operations frees up the time of internal IT resources so their focus can be shifted to innovation, product development and driving revenue.



The use of a managed service provider is also typically a more cost-effective approach than staffing internal headcount to support the cloud environment. But when exploring providers, it's important to note that cost is not everything — the lowest bidder may not be the best fit for today's enterprise, as these providers often rely on rudimentary runbooks and lower level support offerings. Such cost-saving measures look great on paper, but these providers often fail to meet their SLAs, which can impact production. Managed service providers should have a tiered delivery model to keep costs low, but this should be supported by senior resources who can address complex issues or events quickly. The managed service provider will act as an extension of the organization's in-house IT department, and needs to understand the business, as much as it understands the cloud.

In addition to cloud expertise, most enterprises prefer to work with a provider that has a long-standing legacy infrastructure background and established credentials across different technology platforms and verticals. IT is not managed in isolation; advisers must understand where the organization is coming from, as well as where it is headed.

The cloud can enable success

As organizations consider the risks and rewards of cloud adoption, it's worth noting that it does not have to be an all-or-nothing proposition. In many cases, the best approach will be to move certain services and operations to the cloud while continuing to operate others on-premises, at least for the time being.

Nevertheless, the benefits of cloud — including its ability to facilitate innovation, enable organizations to compete effectively, and provide instant scalability with endless flexibility — are likely to add up to an increasingly compelling case for adoption. Organizations that take a strategic approach to migration will succeed in capturing these benefits while minimizing downtime, risks and challenges.

About the authors



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