White Paper

Delivering IT Services in the New Hybrid Cloud: Extending the Cloud Experience Across the Enterprise

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March 2019

EXECUTIVE SUMMARY

In today's digitally transforming world, the key to business success is to become digitally determined through adoption of innovative operating models and customer engagement strategies. For digitally determined organizations, IT is hybrid. Workloads, both new and existing, reside within traditional IT environments and dedicated clouds in the organization's own datacenters and edge locations as well as in off-premises clouds.

Every organization is at a different stage of this transformation, shaped by its amount of trapped capital in older IT systems, its level of technical debt associated with maintaining legacy applications, and its ability to align IT skills with new needs. Regardless of where you are on your transformational journey, as a leader in shaping your organization's digital and IT transformation strategies, the keys for ensuring success in this new hybrid world include:

- **Focus more on innovation:** Enable your IT and datacenter teams to focus on delivering required compute, data, and network resources via cloud-based models when and where required, not simply managing siloed sets of systems and applications in existing datacenters.
- **Drive agility and reduce operational costs:** Educating business leaders in your organization that leveraging new dedicated cloud systems and IT financing models is critical for achieving IT agility and reduced operational cost goals.
- **Make the most of your resources:** Recognizing that the role of cloud-based IT solutions of all types (public, private, and edge) is to ingest, deliver, and exploit data, but that achieving this goal requires investments in new IT skill sets through new hires, retraining existing employees, and timely use of partners' management services offerings.

This white paper provides insights into the trends and challenges of delivering IT services in the new hybrid cloud world. You will learn more about how the right solutions and the right partners enable an extension of the cloud experience across your business in a way that's open, flexible, and hybrid by design.

## THE CHANGING ROLE OF IT IN A DIGITALLY TRANSFORMING WORLD

The need for organizations to engage in digital transformation is ubiquitous in every industry around the world. Businesses everywhere are being reinvented. For most of the past 50 years, business leaders viewed financial capital as their most valuable resource. With digital transformation, we are now entering an economy where the most important resource is the generation and real-time use of information drawn from data that is being created at an unprecedented rate.

One consequence for IT teams is that the pace of business change is faster than ever before. When it comes to business focus, the biggest bets by senior business leaders are on speeding product/service innovation, digital customer experience/engagement transformation, geographic expansion, distribution/analysis transformation, and business operating model transformation (see Figure 1).

FIGURE 1

Top Business Goals from Tech Investments Over the Next Five Years

Q.   What are the top goals for your business over the next five years?
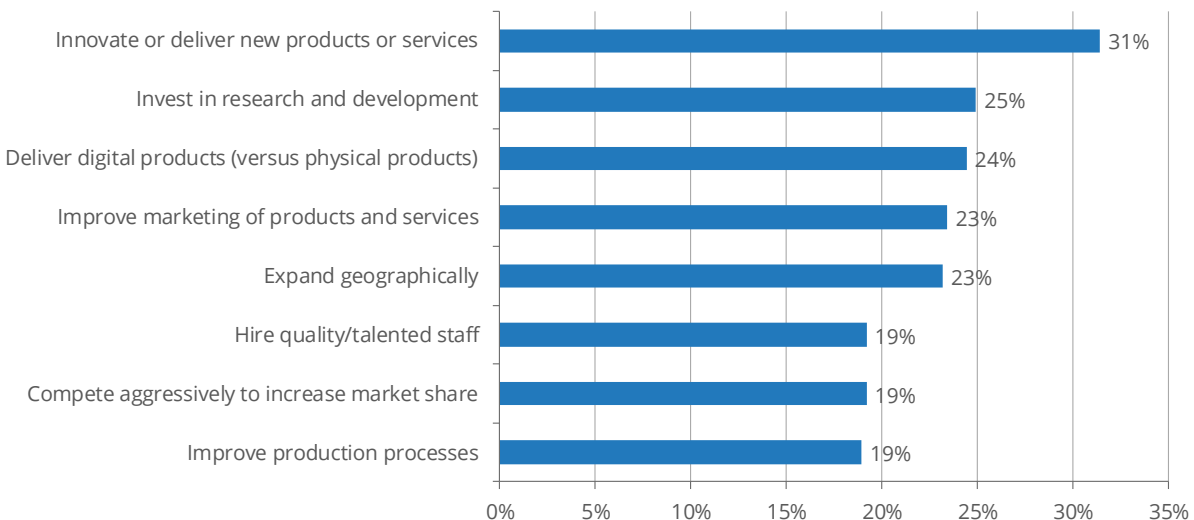
n = 401

Source: IDC's *IT Strategy and AI Adoption Survey,* February 2019

To drive the speed and agility businesses demand, IT teams must deliver IT resources running in shared cloud datacenters as well as in dedicated systems on and off the business premises that enable timely, cost-effective, and secure delivery of business-altering workloads such as:

- Enablement of smart things and facilities associated with the Internet of Things (IoT)
- Enhanced customer experience and business decision making with AI/real-time analytics
- Automation of core business processes and tasks with intelligent process automation
- Greater accessibility of business data and processes with mobility solutions
- Effective interactions with customers, prospects, and partners through social networks

New and Existing Workloads: New Options and IT Requirements

Every organization adopting any of these new workloads faces tasks of integrating new workloads into existing business and IT processes and building an environment in which new and existing workloads will coexist and enhance each other's value. These tasks often aren't as easy and straightforward since they require a good deal of planning, preparation, and execution at multiple levels within an organization.

The new workloads have very different foundations. They use new frameworks such as cloud-based infrastructure, containers, and function as a service that are all associated with Agile development practices (DevOps). IDC believes that by 2022, 90% of all new apps will feature microservices architectures and 35% of all production apps will be cloud native (see *Multiplied Innovation: Scaling a Technology Revolution,* IDC #DR2019_GS1_FG, March 2019).

Developers also have very different expectations when it comes to both the cloud experience they have come to know and the underlying infrastructure, including:
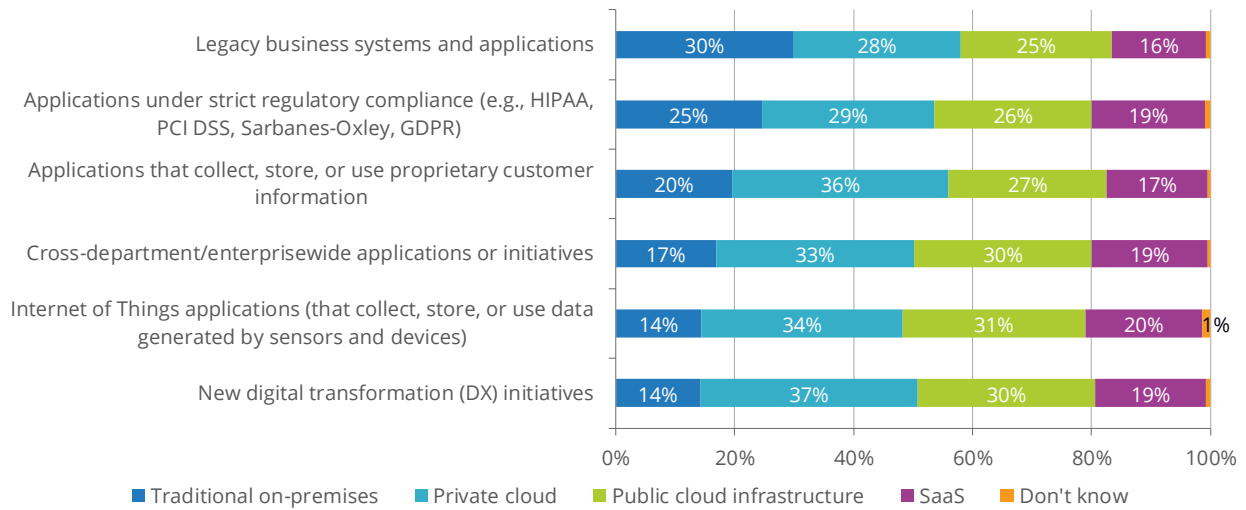
- **Scale:** Systems scale rapidly from supporting a single user/thing to supporting the entire world, and then automatically contract nondisruptively in response to business fluctuations.

- **Speed and agility:** Systems are continually improving and evolving at hardware and software levels over short time frames (minutes or hours, not months or years).

- **Scope:** Systems must expand beyond traditional limits of space (single systems or single datacenters) and operational usage models (dedicated assets on-premises or shared assets in service provider facilities) without jeopardizing security and reliability.

- **Accessibility:** Resources and tools must be easily and quickly accessible, supported either by IT or through a self-service portal.

At the same time, IT teams cannot simply walk away from their existing business-critical workloads and the systems that they depend upon for reliable and predictable delivery of those workloads. In some cases, this means migrating workloads to new public, private, or edge cloud-based infrastructure options, including hosted private cloud. In other cases, this means modernizing or even refactoring the underlying applications themselves.

A recent survey of companies engaged in digital and IT transformation around the world highlights how balancing of new and existing workloads impacts resources end users utilize (see Figure 2). Respondents consistently reported that they would be leveraging cloud for new workloads, but respondents also made it clear that they planned to leverage a diverse range of cloud options including private cloud, edge clouds, IaaS, and SaaS. For more traditional workloads, companies were more likely to continue using traditional IT systems or on-premises private clouds, as well as plan to leverage shared cloud options as part of efforts to add functionalities and provide more cost-effective disaster recovery.

FIGURE 2

Infrastructure Most Likely to Run Particular Workloads

Workload	Traditional on-premises	Private cloud	Public cloud infrastructure	SaaS	Don't know
Legacy business systems and applications	30%	28%	25%	16%	
Applications under strict regulatory compliance (e.g., HIPAA, PCI DSS, Sarbanes-Oxley, GDPR)	25%	29%	26%	19%	
Applications that collect, store, or use proprietary customer information	20%	36%	27%	17%	
Cross-department/enterprisewide applications or initiatives	17%	33%	30%	19%	
Internet of Things applications (that collect, store, or use data generated by sensors and devices)	14%	34%	31%	20%	1%
New digital transformation (DX) initiatives	14%	37%	30%	19%	

n = 810

Source: IDC's *Hybrid IT Datacenter Transformation Survey*, March 2018

Regardless of the platform mix organizations adopt to modernize their existing applications, IT teams face several new pressures as they remove obstacles and friction that slow the business down:

- Ensuring that the underlying infrastructure used to support existing business-critical workloads is modern, workload optimized, and capable of being consistently managed along with the infrastructure supporting new transformational workloads
- Speeding the pace of migration and refactoring all existing workloads, which require a deeper understanding of all the new options, existing dependencies, and required implementation processes needed to ensure a successful migration/modernization
- Shifting IT investments to better support cloud-native workloads while investing to support modernization of existing infrastructure (e.g., expanding staff to do data and application assessment, planning, and implementation for the modernized infrastructure)

THE WORLD IS HYBRID

In the digitally transformed organization, IT is hybrid. Workloads run on traditional infrastructure and on cloud-based infrastructure (see Figure 3). Workloads and the data supporting them reside on-premises, in the organization's own datacenters and edge locations, and in service provider-owned and service provider-operated private and public cloud facilities. Workloads, especially emerging workloads, are inherently hybrid themselves, consisting of a composite of microservices that operate optimally in different locations.

FIGURE 3

Movement of IT Infrastructure to Cloud

Infrastructure is moving from solely on-premises datacenters to many locations — from the edge of business to large cloud environments.

3 years ago: Private cloud with dedicated resources is growing fastest in share of compute as respondents seek to complement shared IaaS and SaaS resources they already use.

Today: Enterprises are actively choosing the infrastructure types that best suit their individual workloads.

3 years from now: Companies will continue to proactively adjust their infrastructure mix in the years to come.

	On-premises	Private cloud	IaaS	SaaS
3 years ago	47%	18%	15%	18%
Today	38%	24%	18%	18%
3 years from now	31%	28%	18%	19%
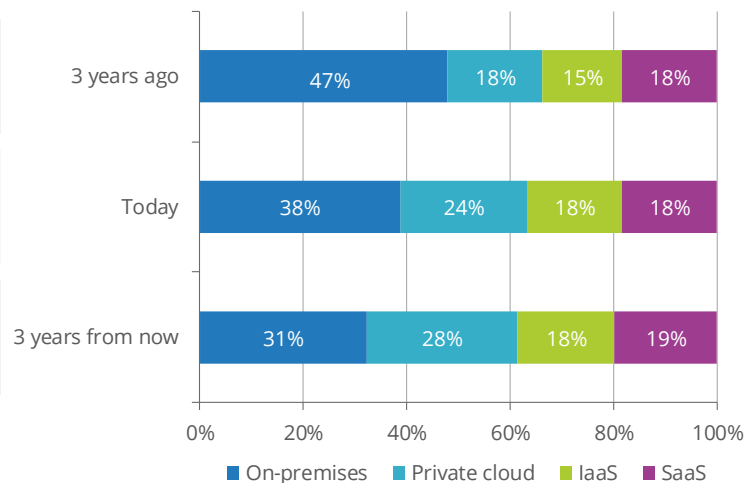
Note: For more detail, see *IT Strategies to Accelerate Digital Transformation: How the Most Successful IT Organizations Stand Out from the Rest* (IDC #US44414418, November 2018).

Source: IDC, November 2018

The key challenge for the CIO and the IT team is to take advantage of the right technologies, supporting services, and economic models that make it possible to optimally place workloads across existing hybrid options and quickly rebalance workloads as technologies and business conditions evolve. All technology investments and workload decisions in the next three years must be linked to achieving one or more of the following goals:

- Enable leadership teams to more quickly identify opportunities, assess risks, and guide organizational change in response to new technologies and market developments.
- Provide workforces with the tools, data, and insight they need to deliver the optimal customer experience (direct person-to-person interaction always being the gold standard).
- Guarantee consistent engagement with customers and partners across all personal and digital forums without jeopardizing privacy, intellectual capital, or corporate reputation.

- Accelerate transformation of business operations by reducing the complexity and risks associated with major changes in business processes.
- Speed the ability of the entire organization to achieve maximum insight and return from all data it generates, accesses, manages, and shares.

THE IMPORTANCE OF THE CLOUD EXPERIENCE

The shift to cloud-based IT plays a critical role in IT teams' ability to thrive in a hybrid world, while overall cloud impact extends beyond the IT domain:

- On the IT side, cloud-based IT accelerates the adoption and extended use of new technical capabilities. It's shaping the nature of IT hardware and software development. Cloud-based infrastructure and emerging platform services are key to delivering flexible, on-demand access to the resources underpinning modernized versions of existing applications while serving as the platform for enabling Agile application development of new digital business offerings.
- On the operational side, cloud-based IT allows organizations to scale resources as needed to support changing business priorities, while reducing the risks of wasted resources that can inhibit needed investments in new digital services.
- On the financial side, the pay-as-you-go model associated with cloud-based IT enables balancing of capital and operational expenses that matches corporate objectives.
- On the business side, cloud-based IT is a key enabler of business innovation. The cloud experience builds a more flexible and agile business environment capable of improving customer engagement, speeding delivery of new products and services, increasing operational efficiency, and driving greater workforce productivity and satisfaction.

Enabling Hybrid Cloud Is Key

In today's world, cloud is not about a specific datacenter or a specific cloud IaaS, PaaS, or SaaS environment. In IDC's May 2018 *CloudView Survey* of 5,470 IT and business leaders worldwide, 94.2% indicated that they would be using multiple types of cloud deployment options within 12 months (see *CloudView 2018: Executive Summary Presentation,* IDC #US44187718, August 2018).

Hybrid cloud is about delivering and managing cloud-based resources everywhere in your organization, including large, shared facilities; in internal datacenters; and in critical business facilities at the edge of the business. The mix of data and resources in each of these locations shouldn't be based upon historical investments (technical debt). Today, organizations have access to different delivery models to remove this barrier. What they should depend upon is where they can best meet the latency, resource availability, and data control needs of existing and new workloads.

Hybrid cloud reflects an approach to workload design, deployment, and delivery that allows organizations to get more effective use out of their compute and data assets, as well as the open source ecosystems available for cloud-native development.
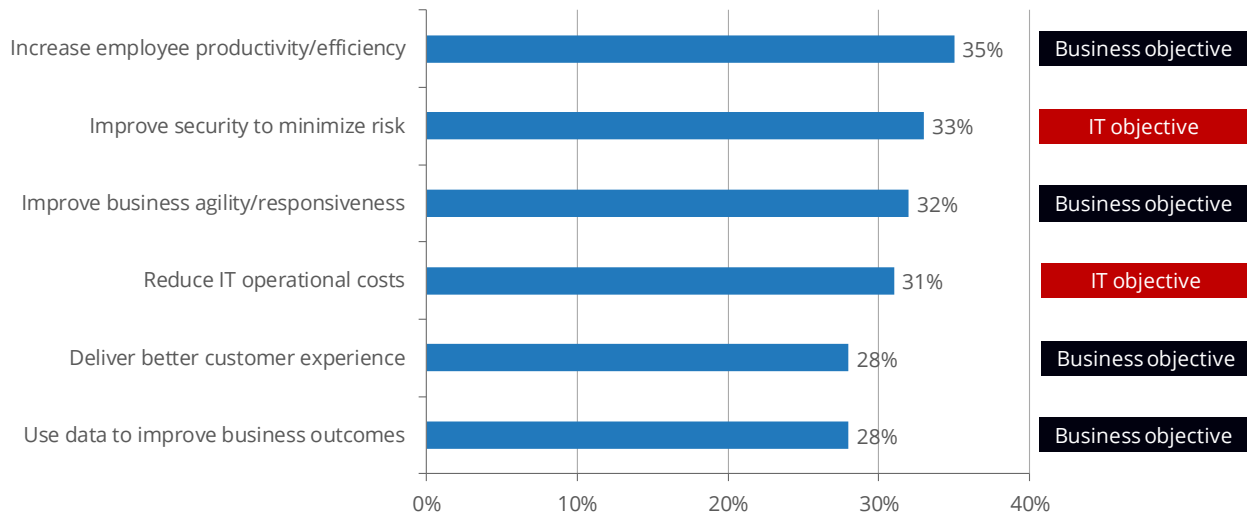
Achieving a Cloud Experience, Everywhere

While IT is a key element in successful operations of organizations in the digital world, business objectives drive more investments in new projects and initiatives (see Figure 4). In fact, IT strategies are an integral part of all these initiatives, whether they are focused on IT or business objectives. As such, enablement of hybrid cloud is not limited to the IT side of organizations but rather becomes a part of the broader cloud experience spreading across multiple functions within the organization.

FIGURE 4

Top Enterprise Initiatives

Four of IT's six most important initiatives are business oriented and not IT oriented.

Initiative	Percentage	Objective Type
Increase employee productivity/efficiency	35%	Business objective
Improve security to minimize risk	33%	IT objective
Improve business agility/responsiveness	32%	Business objective
Reduce IT operational costs	31%	IT objective
Deliver better customer experience	28%	Business objective
Use data to improve business outcomes	28%	Business objective

Source: *Accelerating Digital Transformation: 9 IT Strategies That Work,* an IDC InfoBrief, October 2018

Key elements of a flexible and open cloud experience include:

- **Digital business at scale:** Ensure the efficiency, scalability, reliability, quality, and predictability of cloud-based IT and dedicated infrastructure support the company's digital business-driven workloads in a context of exponential speed and volume growth.

- **Compliance:** Apply controls across the entire hybrid cloud environment to offset risks associated with the loss of confidentiality, integrity, and availability of data.

- **Visibility and control:** Provide, operate, enhance, and manage all IT infrastructure to provide cross-cloud visibility and control.

- **Automation:** Provide, enhance, manage, and monitor technology and business capabilities as an integrated platform of services, allowing organizations to free up resources to focus on what matters most to the business.

- **Self-awareness and self-healing:** Dynamically allocate infrastructure and data resources based on service demand as well as automatically adjusting to mitigate failures.

- **Cost optimization:** Utilize flexible payment models to enable alignment of capital investment with business growth and innovation.

- **Open and flexible environment:** Manage the creation, life cycle, publication, access, and usage of APIs associated with new digital services that expose information and services to internal and external applications, partners, and ecosystem.

- **Service management:** Broker, integrate, and orchestrate IT "business oriented" services built on essential workloads to provide a rich catalog of digital transformation-enabling services.

- **DevOps:** Improve development, testing, deployment, and operations of workloads through an approach characterized by early collaboration, automation, continuous updating, and iterative agility.

A Cloud Experience On-Premises as Part of the Hybrid Cloud Strategy

Business and IT needs of any organization are defined by myriad of factors including but not limited to its specialization and business model, mix of workloads, financial health, maturity, composition of the workforce, and profile of customer base. These needs shape an organization's choice when it comes to electing where to run its workloads and defining a right combination of on-premises and off-premises resources. However, what should be common for all organizations choosing the cloud path is the fact that private cloud remains a central point of a hybrid strategy, in either a datacenter or hosted.

After some initial missteps associated with defining services catalogs and setting provisioning commitments, most private clouds in operation today are meeting the IT goals of enabling a modernized datacenter with higher levels of utilization, lower operational costs, and greater IT agility when compared with traditional IT environments. For almost half of organizations, however, datacenter modernization associated with private clouds involves the use of hosted private clouds or managed private clouds in colocation facilities because there are shortcomings in internal datacenter facilities and misalignments in IT staff skills. These shortcomings include:

- **Inconsistency in configuration:** Most current private clouds are built on a mix of separate, often unintegrated compute, storage, and network systems that vary significantly from company to company and even within a single organization.

- **Inflexible deployment/operating options:** Once an initial hardware and software design as well as service catalog is set, altering, expanding, or upgrading the private environment to take advantage of new technologies (e.g., NVMe-based storage or GPU accelerators) is impractical.

- **Limited usefulness for innovation:** Current private clouds are based on virtual machine technologies that accommodate most traditional enterprise workloads but can't easily be adapted to support cloud-native options such as containers and serverless functions preferred by developers for most new hybrid cloud workload design.

Another fundamental shortcoming with most of today's enterprise private cloud deployments is that each private cloud is unique, unlike the public clouds that are available in a limited number of different forms. Availability of more formalized and standardized hybrid cloud solutions and services will help mitigate these shortcomings and bring the enterprise cloud experience to the next level.

THE NEW HYBRID CLOUD

Today, many cloud service and IT solution providers like HPE are building and delivering a new set of hybrid cloud services and solutions that help organizations deliver a flexible and open cloud experience at the speed businesses demand.

Hybrid cloud solutions also take advantage of advanced multicloud management software and services to maintain visibility, control, and compliance across all clouds and for all hybrid workloads. Three characteristics are at the heart of these new hybrid cloud platforms:

- **Software defined, workload optimized, and composable:** Built on a software-defined and composable infrastructure that aggregates compute, storage, and networking resources into shared resource pools available for on-demand allocation; includes an orchestration layer; and supports integrated functions for self-discovery, workload provisioning, infrastructure analytics, and self-healing
- **Open and hybrid by design:** Leverages a highly standardized cloud software platform that supports instance, container, and serverless operating environments; is tightly linked to one or more public cloud platforms; and is easy to link to a hybrid cloud management solution
- **Easily consumable:** Delivery via an easy to configure, order, deploy, maintain, upgrade and, ultimately, replace solution that can be consumed via subscription or pay-as-you-use models

The important and differentiating element of these new services and solutions is the fact that they aren't solely focused on the technological aspect but embrace a broad spectrum of end-user needs when it comes to implementation of a hybrid cloud strategy: right technologies, expertise, and flexible economic models that help organizations advance to the next level in their business journeys. To fully utilize the potential of a hybrid cloud strategy, organizations need to adopt a hybrid cloud platform that incorporates support for existing and emerging operating environments and enables seamless connection of resources across multiple cloud types. The benefits of deploying a hybrid cloud platform include:

- **Continuation of end-user experience.** The impact of technologies on people can't be underestimated, and the success of implementation of IT strategies and technologies often depends on end-user support for new services and processes. Utilization of a platform that feels and functions similarly independently of where it runs enhances the end-user experience, increases productivity, and reduces the time required for staff training and service implementation.
- **Cloudlike abilities on-premises.** This benefit is not just about the automation and fast provisioning and scaling of resources but also about the ability to produce a timely but not time-consuming outcome for the customer – whether it is an LOB leader, a data scientist, or a DevOps team.
- **Seamless integration and control across all clouds.** Visibility, control, and compliance are critical factors for every IT environment. Deployment of a common platform that spans multiple cloud types and locations assures operational efficiency and administration.

- **Optimal deployment and use of resources depending on workload.** Linkage of a cloud platform to public cloud enables the optimal match of resources to workload needs that increases efficiency and cost optimization. It also makes it more practical to take advantage of public clouds to address certain requirements such as disaster recovery and rapid development while ensuring that public cloud-originated workloads can be extended to dedicated on-premises cloud environments when conditions require.
- **Evergreen resources.** IT organizations can deploy and refresh datacenter hardware, software solutions, and services without large up-front capital investment.
- **Economics.** Customers pay for what they use with a flexible, consumption-based model based on actual metered usage of the assets, providing cloudlike economics with no minimum on-premises capacity commitment.

FINAL THOUGHTS

Companies that undertake digital transformation efforts must adopt a hybrid approach to IT and cloud to ensure their development efforts and IT operations are much more responsive to business needs. A hybrid cloud approach for developing, deploying, and continually enhancing legacy and emerging workloads will enable organizations to improve their competitive positions and capture substantial additional revenue. Three specific ways that organizations are realizing revenue gains through these efforts include:

- Reducing time to market for customer-facing applications and services, thus taking advantage of more business opportunities and winning more business
- Improving the quality of existing applications and services, including increasing employee productivity levels, thereby better serving customers
- Having the capacity and capabilities to quickly create new products, services, and offerings that address market demand

The most common element that IDC finds in organizations that successfully adopt a hybrid approach is the organization's selection of a partner to accelerate IT modernization, ease the shift to cloud-based IT, and establish consistent data/resource management policies and procedures across all clouds.
This partner must be able to participate fully in the evaluation, deployment, and use of the right hardware, software, IaaS, and SaaS solutions across internal and external datacenters as well as edge locations. The right partner needs to have choice of leading technology, expertise, and flexibility to offer the right economic models to help you accelerate transformation. End users need a partner that:

- Helps IT determine which existing workloads can move to a cloud model and which model is optimal, and can continuously advise as business needs change
- Successfully architects/migrates new workloads across a hybrid set of facilities (datacenters), application architectures (bare metal, instances, containers), and operating models (DevOps)
- Continuously facilitates ongoing architectural decision making and new service innovation by keeping up to date with technology and service delivery models
- Provides a consumption-based IT experience on-premises so that the cloud benefits are available across the hybrid estate
- Provides choice of leading technology solutions that deliver the speed and agility required and work as part of your hybrid approach

- Extends the reach of IT teams by covering skill set gaps, which helps internal IT to focus more on strategic business initiatives versus just managing technology
- Offers flexible economic models that can be used to accelerate transformation
- Supports enterprises not only through the initial implementation but also through the ongoing management and optimization of the environment over time

The right partner for the move to hybrid cloud must also have a long and extensive track record of helping organizations manage the asset and operational challenges associated with major datacenter and technology transitions. They will have the expertise and resources required to keep a digitally driven business running with the speed and agility required, which is at the heart of digital transformation.

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