White Paper

TCO Analysis Comparing Private and Public Cloud Solutions for Running Enterprise Workloads Using the 5Cs Framework

Sponsored by: Nutanix

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IDC OPINION

The world of IT and the datacenter remains in the midst of a massive structural shift built on a foundation of mobile, social, big data, and cloud services. At the highest level, the two types of deployment models for cloud services are public and private:

- Public cloud services are shared among unrelated enterprises and consumers, open to a largely unrestricted universe of potential users, and designed for a market, not a single enterprise.
- Private cloud services are shared within a single enterprise or an extended enterprise, with restrictions on access and level of resource dedication, and defined/controlled by the enterprise (and beyond the control available in public cloud offerings) – they can be onsite or offsite and can be managed by a third party or in-house staff.

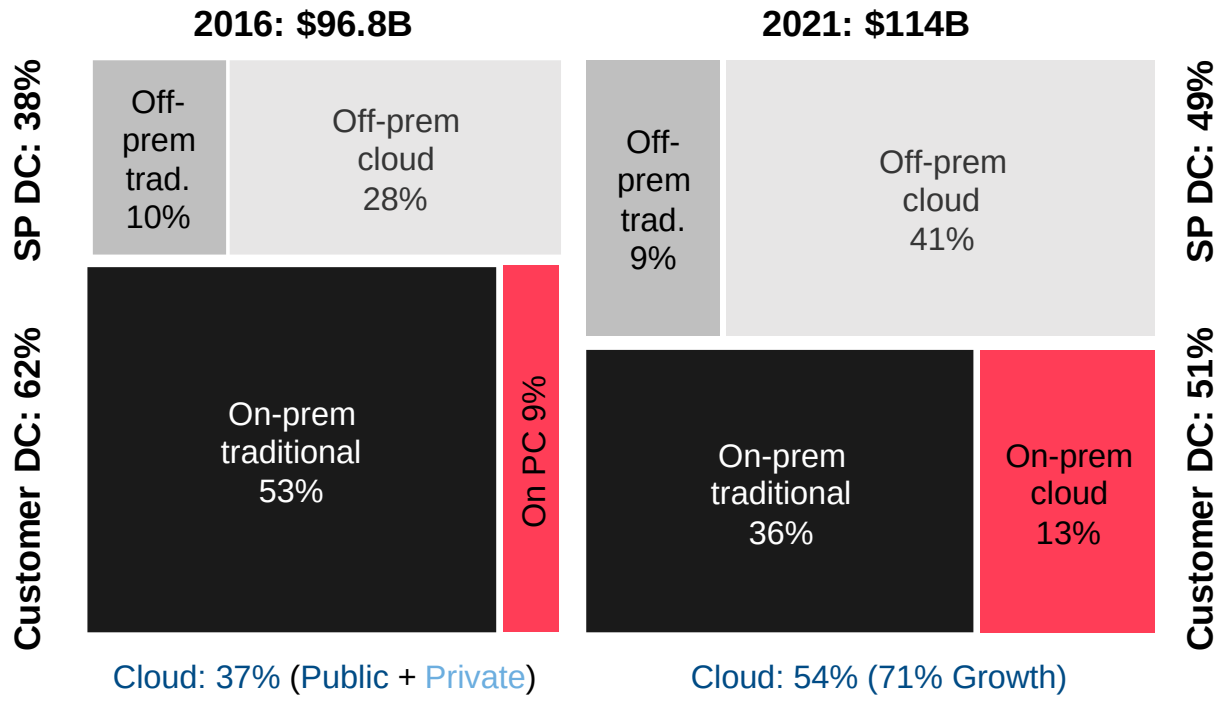
IDC's 2016 *CloudView Survey,* covering over 6,000 IT organizations around the world, revealed that 62.7% of the respondents are either already using or planning to use public cloud infrastructure as a service (IaaS) for their infrastructure needs. For organizations undertaking digital transformation at the business level, cloud isn't just about picking a service delivery model such as public or private cloud. They must complete the shift to a predominantly cloud-based IT environment in the next few years, but one of the most important elements in this shift will be to extend the value of mission-critical applications through cloud enablement products and services. Businesses are looking to transform their IT services to a cloud services model to enable rapid time to market for their applications, support continuous product innovation, have simple infrastructure management, and pay for only what they use – all these without losing control over their data.

It's increasingly evident that this shift to cloud-based IT is having a tremendous impact on all areas of IT infrastructure purchasing and usage behavior for compute, storage, and network resources. It is radically altering distribution of IT spending across various deployment segments, including public cloud, off-premises private cloud, on-premises private cloud, and noncloud environments.

As per IDC's Worldwide Quarterly Cloud Infrastructure Tracker, April 2017, the portion of total spending on IT infrastructure hardware used to support private and public cloud deployments will increase from 37% in 2016 to 54% in 2021 and will account for all of the overall growth in IT infrastructure spend during that period (see Figure 1).

FIGURE 1

IT Infrastructure Redistribution — Public and Private Cloud



Source: IDC's Worldwide Quarterly Cloud Infrastructure Tracker, April 2017

One of the biggest challenges facing organizations is deciding where to deploy their application/workloads while balancing cost, compliance, agility, flexibility, and simplicity. Most of the workloads in enterprise datacenters (e.g., exchange, VDI, databases, and active directory) are predictable workloads, run frequently, and have resource needs that are well understood and can be planned for. A vast majority of businesses are exploring or using hybrid/multicloud approaches that use a combination of on-premises (traditional IT) and private (on/off-premises) and public clouds to store their data and run their services. This allows for running workloads that are not cloud ready or predictable workloads that run frequently or workloads that need stringent security and performance "on-premises" while running other workloads in the public cloud. It also allows for some onsite workloads to "burst" into the public cloud in response to temporary spikes in demand.

IDC believes that the future of IT is hybrid/multicloud, and our forecasts over the next five years in enterprise infrastructure show a marked migration of market revenue toward flash storage, virtualization, hyperconverged infrastructure, and other cloud-related technologies that will be required to enable it.

IN THIS WHITE PAPER

In this white paper, IDC describes the business and technical considerations and provides a framework for choosing the appropriate cloud (on-premises private cloud or off-premises public cloud)

solution for deployment of customer workloads. It draws upon IDC research, customer interviews, and analysis of vendor offerings.

SITUATION OVERVIEW

We are soon approaching a new data age. IDC forecasts that by 2025, the global datasphere will grow to 163ZB (i.e., a trillion gigabytes) – that's 10 times the 16.1ZB of data generated in 2016. Powered by this wealth of data and the insight it provides, enterprises around the globe will be embracing new and unique business opportunities.

Is your organization in the midst of a digital transformation journey? Are you assessing the value your organization is able to extract from data? Is there a new executive mandate to embrace data-driven decision making? If you answered "yes" to any of these questions, your organization is among the majority of those in the midst of looking for agile, reliable, and flexible infrastructure to support your digital transformation initiatives in a cost-efficient manner. Organizations are looking for a structured methodology to help decide the right deployment model and location that helps accelerate their pace of innovation, improve customer experience, and gain competitive edge.

IDC recommends using a holistic approach to determine deployment location for applications to meet enterprise SLAs.

FRAMEWORK FOR EVALUATION

Table 1 shows the 5Cs framework that could be leveraged to evaluate individual scenarios.

TABLE 1

The 5Cs Framework

Framework	Description
Cost	The total cost of ownership is capex + opex. An on-premises private cloud requires investments (capex) in infrastructure and ongoing (opex) maintenance alongside basic capacity and delivers a dedicated amount of compute and storage. Public cloud providers can offer massive amounts of storage and computing power on-demand at extremely competitive prices that are billed as used (opex).
Capabilities	Capabilities include features and functionalities (e.g., cloud in a box for edge computing or stringent performance [latency sensitivity] needs).
Customization	Customization means alteration and adaption of the solution to meet business needs (e.g., an ERP solution might have to hook into external tax applications in order to be effective).
Consumption	Consumption in this context refers to the degree of elasticity the business requires. Organizations that experience significant peaks and troughs in network activity — such as retailers around the Christmas period — have consumption patterns that demand a high degree of elasticity.
Compliance	These rules can include legal obligations, industry-specific regulations (PHI/HIPAA in healthcare, PCI-DSS for payment card industry), geographic rules (data sovereignty, GDPR), and even internal mandates such as privacy agreements with end users.

Source: IDC, 2017

SCENARIOS EVALUATED AND FINDINGS

As part of this study, IDC leveraged the 5Cs framework to evaluate three common workload scenarios for enterprises:

- **Highly predictable workload:** These are typically performance-sensitive workloads and have consistent and unsurprising resource needs that are known and can be planned for ahead of time; resources are needed 24 x 7. In this example, we found on-premises private cloud solutions to have an edge/advantage (for workload description and our evaluation/findings, see the Scenario 1 — Highly Predictable Workload section).
- **Mixed elastic and predictable workload:** These workloads are a combination of elastic (burst and shrink) and predictable workloads. Resources are needed daily but not 24 x 7, and require a mix of persistent and on-demand resources. In this example, we found on-premises private cloud solutions to have an edge/advantage (for workload description and our evaluation/findings, see the Scenario 2 — Mixed Elastic and Predictable Workload section).
- **Highly elastic (or infrequent usage) workload:** These workloads burst and shrink compute on demand and have varying requirements depending on the time of the week, month, quarter, or year. Resources are needed throughout the year but not 24 x 7, and resources must be available on demand. In this example, we found public cloud solution offerings to have an edge/advantage (for workload description and our evaluation/findings, see the Scenario 3 — Highly Elastic [or Infrequent Usage] Workload section).

Scenario 1 — Highly Predictable Workload

Workload Description

Retail customer with multiple U.S. locations (includes production, development, and QA environments):

- **SAP software:** Enterprise Resource Planning, Customer Activity Repository, Business Warehouse, Process Orchestration, System Landscape Transformation, System Landscape Directory, Global Risk and Controls, Single Sign-On, BusinessObjects/BI, BusinessObjects Data Services, FIORI Front-End Server/SAP Gateway, and Solution Manager
- **Additional software:** Vertex Tax Solution and Redwood Scheduling; OS: Linux and Windows Server; and database: Oracle
- **Infrastructure resources:** Best practices that influenced sizing were 1 vCPU = 8GB RAM, runs 24 x 7, and is performance sensitive, with 10% growth targeted over five years.

Evaluation and Findings

For on-premises private cloud deployment, we used configuration specifications from Nutanix and associated pricing as follows:

- 21 nodes NX-3000 series All-Flash Nutanix Enterprise Cloud Platform cluster — each node had 28 cores, 256GB RAM, and 4.80TB SSD
- List price for Nutanix hardware and software (price source: Nutanix)
- Added the cost for two rack switches (~$25,000)
- Added list price for Microsoft Windows licenses as it was included in the base price of the public cloud solution; used three packs of 2012 R2 Standard Edition (2 CPUs/2 VMs) at $810/pack

- Added list price for Linux licenses as it was included in the base price of the public cloud solution; used $2,499/year/node for enterprise Linux for virtual datacenters, with standard support allowing one to run unlimited number of guests
- Considering the workload was mission critical, we priced mission-critical support (price source: Nutanix)
- Added one-time installation cost (price source: Nutanix)
- Facilities costs (power, cooling, and rack space) were estimated at $0.11/kWh and $50/month/U
- For IT labor time (for infrastructure and infrastructure software maintenance), it was assumed that the entire cluster would require six to seven hours per month, a conservative estimate given the fact that the Nutanix Enterprise Cloud Platform is simple, intuitive, and largely automated; the total cost over five years was estimated with $75/hour rate

For the public cloud solution, we used a leading public cloud provider configuration and pricing as follows:

- Production, development, and QA instances:
  - 7 Enterprise Linux instances each with 32 vCPU, 262GB memory, and high I/O
  - 4 Enterprise Linux instances each with 16 vCPU, 131GB memory, and high I/O
  - 46 Enterprise Linux + 13 WIN instances each with 8 vCPU, 65GB memory, and high I/O
  - 31 Enterprise Linux + 7 WIN instances each with 4 vCPU, 33GB memory, and moderate I/O
  - 46 Enterprise Linux + 4 WIN instances each with 2 vCPU, 16.4GB memory, and moderate I/O
- Block storage — general-purpose SSD 32TB and 10% change for monthly snapshots
- 57GB/day data transfer out
- Enterprise support comparative to on-premises mission-critical support
- Detailed monitoring and load balancing
- On-demand pricing for keeping parity with usage of list pricing for the private cloud solution (Typically, customers may want to use reserved pricing in this scenario and negotiate a discount off list price for private cloud deployments.)

Figure 2 shows the overall resource costs and framework evaluation. An on-premises private cloud solution clearly has an edge/advantage for this workload scenario. In addition to the overall cost being lower for the on-premises private cloud solution, this workload scenario has performance (latency sensitivity) and integration needs with a third-party solution (Vertex Tax Solution) as well as location-specific regulations, leading to four of the 5Cs framework (cost, capabilities, customization, and compliance) attributes being favorable for the on-premises private cloud solution. The consumption attribute in this workload scenario is typically unsurprising but sometimes could vary say due to an acquisition that could not be planned for or if the variation during peak travel seasons/durations is different than expected, and to avoid the risk of running out of resources, some enterprises may opt for a public cloud solution. This would lead to the consumption attribute of the 5Cs framework to be favorable for the public cloud solution in certain cases.

FIGURE 2

Scenario 1 — Highly Predictable Workload Resources and Framework Evaluation

Resources	On-Prem Private Cloud *(Nutanix HW, SW, Support, and Installation List Prices – Source: Nutanix)*
Infrastructure *(6U: 12 NX300, 2xToR switches)*	$1,679,450
Software *(includes Windows and Linux licenses)*	$419,000
Support *(mission critical)*	$580,700
Initial installation	$38,250
Facilities *(power, cooling, five years of rackspace)*	$53,550
IT labor	$30,000
Total for five years (list)	**$2,800,950**

Resources	Public Cloud *(Leading CSP Pricing)*
Compute and block Storage	$4,167,000
Additional storage	-
Data transfer out	$9,400
Enterprise support	$900,000
Monitoring and load balancing	$761,450
Total five years (on demand)	**$5,837,850**

Framework	On-Premises Private Cloud	Public Cloud
Cost	Favorable	
Capabilities	Favorable	
Customization	Favorable	
Consumption		May be favorable in some situations
Compliance	Favorable	

Edge/Advantage

Source: IDC, 2017

Scenario 2 — Mixed Elastic and Predictable Workload

Workload Description

Call center and booking applications for travel agency:

- Web applications for call center and booking with Microsoft SQL Server back end
- Running majority of compute daily during main business hours (12 hours per day for 5 days each week) and then turned off, equal to 40% utilized per month
- Needs some persistent capability
- 10 virtual machines (VMs) persistent and 130 VMs on demand
- No growth planned
- One geographic region over the next five years

Evaluation and Findings

For the on-premises private cloud deployment, we used configuration specifications from Nutanix and associated pricing as follows:

- 12 nodes NX-3000 Series Nutanix Enterprise Cloud Platform cluster – each node had 36 cores, 256GB RAM, 960GB SSD, and 4TB HDD
- List price for Nutanix hardware and software (price source: Nutanix)
- Added the cost for two rack switches (~$25,000)

- Added list price for Microsoft Windows licenses as it was included in the base price of the public cloud solution; because of high VM count, we used 12 packs of datacenter edition (2 CPUs) at $5,801/pack
- Added list price for SQL Server licenses as it was included in the base price of the public cloud solution; we used SQL 2016 with a minimum of 4 cores per VM at $3,717 (cost per pack) and Enterprise SQL 2016 with a minimum of 4 cores per VM at $14,256 (cost per pack)
- We went for professional support to support business SLAs (price source: Nutanix)
- Added one-time installation cost (price source: Nutanix)
- Facilities costs (power, cooling, and rack space) were estimated at $0.11/kWh and $50/month/U
- For IT labor time (for infrastructure and infrastructure software maintenance), it was assumed that the entire cluster would require five hours per month, a conservative estimate given the fact that the Nutanix Enterprise Cloud Platform is simple, intuitive, and largely automated; the total cost over five years was estimated with $75/hour rate

For the public cloud solution, we used a leading public cloud provider configuration and pricing as follows:

- 10 persistent instances of Windows and Enterprise SQL server each with 4 vCPU, 16GB memory, high I/O, and block storage – general-purpose SSD 50GB/instance and 10% change for monthly snapshots
- 130 transient instances of Windows and Standard SQL Server 360 hours per month (4 vCPU, 16 GB memory, high I/O, block storage – general-purpose SSD 50GB/instance and 10% change for monthly snapshots)
- 4,000GB/month data transfer out
- Object storage for 10 persistent instances – 500GB
- 10 million requests per month for both PUT and GET categories
- Transfer out: 100GB/month
- Business support
- Detailed monitoring and load balancing
- On-demand pricing keeping parity with usage of list pricing for the private cloud solution as well as the partial nature of the workload

Figure 3 shows the overall resource costs and framework evaluation. An on-premises private cloud solution has an edge/advantage for this workload scenario. The overall cost of the on-premises solution is lower than the public cloud solution, making the cost attribute of the 5Cs framework favorable for the on-premises private cloud solution. The consumption attribute in this workload scenario could vary during peak travel seasons/durations, and to avoid risk of running out of resources that they may not be able to plan in advance, some enterprises may opt for a public cloud solution. This would lead to the consumption attribute being favorable for the public cloud solution in certain cases. However, this workload scenario did not have any special capabilities requirement (e.g., latency sensitivity), customization need (e.g., integration with a third-party solution), or compliance need (e.g., location-specific regulation or privacy), leading to the three other attributes of the 5Cs framework (capabilities, customization, and compliance) to be neutral for either of the solutions.

FIGURE 3

Scenario 2 — Mixed Elastic and Predictable Workload Resources and Framework Evaluation

Resources	On-Prem Private Cloud *(Nutanix HW, SW, Support, and Installation List Prices – Source: Nutanix)*
Infrastructure *(6U: 12 NX300, 2xToR switches)*	$816,915
Software *(Includes Windows & SQL Server licenses)*	$2,716,800
Support *(professional)*	$249,450
Initial installation	$22,500
Facilities *(power, cooling, five years of rackspace)*	$34,600
IT labor	$22,500
Total for five years (list)	**$3,862,800**

Resources	Public Cloud *(Leading CSP Pricing)*
Compute and block storage	$4,254,600
Additional storage	$4,300
Data transfer out	$34,450
Business support	$318,500
Monitoring and load balancing	$691,800
Total five years (on demand)	**$5,303,650**

Framework	On-Premises Private Cloud	Public Cloud
Cost	Favorable	
Capabilities	Neutral	
Customization	Neutral	
Consumption		May be favorable in some situations
Compliance	Neutral	

Edge/Advantage

Source: IDC, 2017

Scenario 3 — Highly Elastic (or Infrequent Usage) Workload

Workload Description

A reporting application for an insurance company with multiple locations:

- 300 Linux virtual machines
  - 60GB storage needed per VM
- Compute resources to run reporting: 10 hours per week, 18 hours at month end, 24 hours at quarter end, and 48 hours at year end; total = 60 hours per month, which is 8% utilized per month
- Total data output: 0.750TB during weeks 1 through 3, 1.35TB during the fourth week, 1.8TB each quarter, 3.6TB yearly; total = 4.5TB/month
- No growth planned
- Five years ownership

Evaluation and Findings

For on-premises private cloud deployment, we used configuration specifications from Nutanix and associated pricing as follows:

- 24 nodes of NX-3000 series Nutanix Enterprise Cloud Platform cluster – each node had 36 cores, 256GB RAM, 960GB SSD, and 4TB HDD

- List price for Nutanix hardware and software (price source: Nutanix)
- Added the cost for two rack switches (~$25,000)
- Added list price for Linux licenses as it was included in the base price of the public cloud solution; used $2,499/year/node for enterprise Linux for virtual datacenters, with standard support allowing one to run unlimited number of guests
- Considering the workload was not mission critical, we priced using professional support (price source: Nutanix)
- Added one-time installation cost (price source: Nutanix)
- Facilities costs (power, cooling, and rack space) were estimated at $0.11/kWh and $50/month/U
- For IT labor time (for infrastructure and infrastructure software maintenance), it was assumed that the entire cluster would require six to seven hours per month, a conservative estimate given the fact that the Nutanix Enterprise Cloud Platform is simple, intuitive, and largely automated; the total cost over five years was estimated with $75/hour rate

For the public cloud solution, we used a leading public cloud provider configuration and pricing as follows:

- 300 Linux instances (each with 4 vCPU, 16GB memory, high I/O, and block storage – general-purpose SSD 60GB/instance and 10% change for monthly snapshots)
- 60 hours per month usage
- 4500GB/month data transfer out
- Business support
- Detailed monitoring and load balancing
- On-demand pricing used in line with the elastic nature of the workload, as well as to keep parity with the usage of list pricing for the private cloud solution

Figure 4 shows the overall resource costs and framework evaluation. Public cloud deployment has an edge/advantage for this workload scenario because of the limited and infrequent usage of resources. This led to two (cost and consumption) of the attributes of the 5Cs framework being favorable for the public cloud solution. However, note that the private cloud solution has unused resources that could potentially be leveraged for other workloads or could help support seasonality/additional business needs and likely improve the overall cost economics of this solution comparison. There were no specific capabilities (e.g., latency sensitivity), customization (e.g., integration with any third-party software solution), or compliance (e.g., geo-specific rules or privacy) requirements, leading to the other three attributes (capabilities, customization, and compliance) of the 5Cs framework to be neutral for either of the solutions.

FIGURE 4

Scenario 3 — Highly Elastic (Infrequent Usage) Workload Resources and Framework Evaluation

Resources	On-Prem Private Cloud *(Nutanix HW, SW, Support, and Installation List Prices – Source: Nutanix)*
Infrastructure *(12U: 24 NX300, 2xToR switches)*	$1,608,850
Software *(Nutanix SW, Linux licenses)*	$588,150
Support *(professional)*	$498,900
Initial installation	$43,500
Facilities *(power, cooling, five years of rackspace)*	$90,950
IT labor	$30,000
Total for five years (list)	**$2,860,350**

Resources	Public Cloud *(Leading CSP Pricing)*
Compute and associated storage	$449,350
Additional storage	-
Data transfer out	$24,300
Business support	$47,350
Monitoring and load balancing	$78,150
Total five years (on demand)	**$599,150**

Framework	On-Premises Private Cloud	Public Cloud
Cost		Favorable
Capabilities	Neutral	
Customization	Neutral	
Consumption		Favorable
Compliance	Neutral	

Edge/Advantage

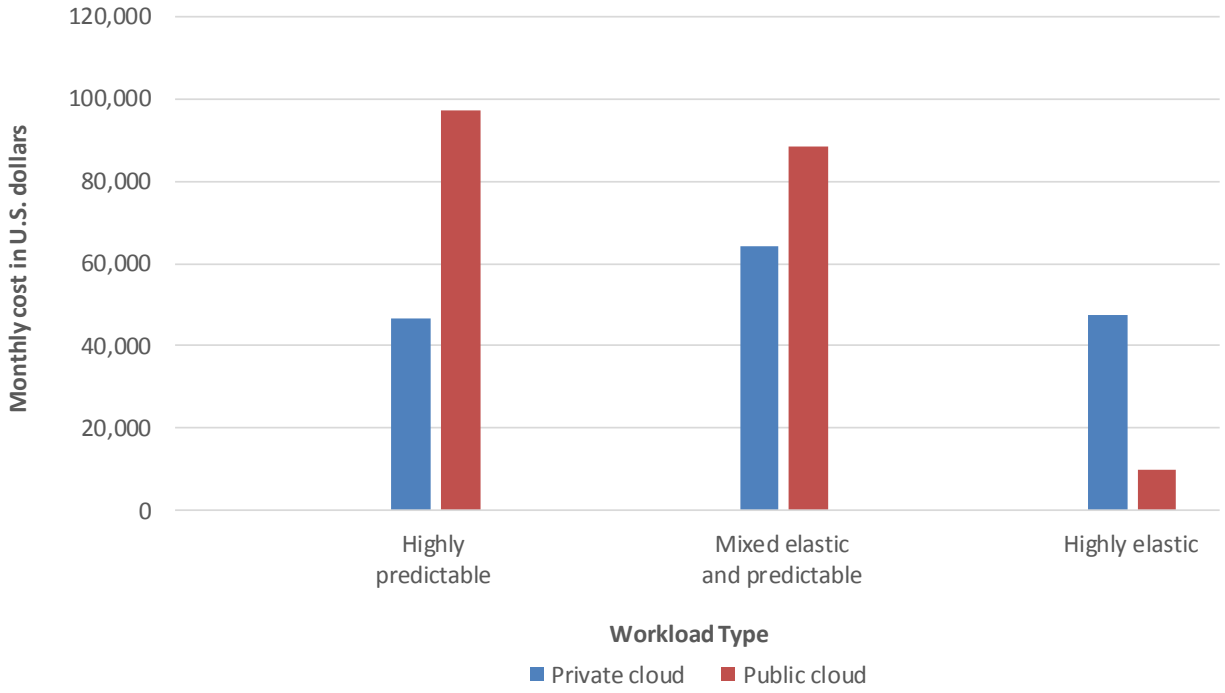
Source: IDC, 2017

Summary Cost Comparison

Finally, we did a straight-line amortization over 60 months for the total cost (using list price [source: Nutanix for Nutanix hardware, software, support, and initial installation] for the private cloud solution and on-demand pricing for the public cloud offering) for each of the three workload scenarios. As shown in Figure 5, based on the example scenarios for these representative workloads, the private cloud solution was half the cost of the public cloud solution for the highly predictable workload and is typically attractive for it; the private cloud solution typically has an edge for the mixed elastic and predictable workload and was two-thirds the cost of the public cloud solution; and last, the public cloud solution was one-fourth the cost of private cloud solution for the highly elastic workload and is typically very attractive for it.

FIGURE 5

Private Versus Public Cloud Cost Comparison (Private Cloud — List Price, Public Cloud — On-Demand Pricing)



Note: Monthly cost is straight-line amortization over 60 months.

Source: IDC, 2017

CONSIDERING NUTANIX ENTERPRISE CLOUD PLATFORM FOR PRIVATE CLOUD

The Nutanix Enterprise Cloud Platform is a distributed, resilient, secure, predictable, and 100% software-defined web-scale infrastructure. Nutanix supports a variety of software deployment approaches, including appliances such as native NX-series, OEMed Dell XC, Lenovo HX, and IBM CS series, as well as Nutanix software as "meet in the channel" offering available on validated Cisco UCS and HPE ProLiant general-purpose servers and ruggedized/tactical platforms from KlasTelecom and Crystal Group.

Nutanix nodes come in different compute and storage configurations and are clustered in a scale-out topology, with the Nutanix software running as a VM. Storage from each node is pooled in a distributed file system architecture and exposed to the hypervisor through traditional interfaces. Customers can choose between a wide range of virtualization and cloud stacks including Nutanix AHV, VMware vSphere, and Microsoft Hyper-V within their own datacenter and AWS, Google Cloud Platform, and Microsoft Azure in the public cloud. Nutanix AHV, developed from KVM roots, is included in all models at no charge. The controller VM handles all the local I/O operations to each node. Nutanix's "App Mobility Fabric" enables simple migration of VMs into AHV and back if desired. Workloads can seamlessly move across hypervisors, containers, and different infrastructure platforms (including cloud

stacks), providing true application mobility. Enterprise IT is free to leverage the best attributes of public and private clouds without lock-in, thus optimizing IT's business benefits.

Nutanix Enterprise Cloud Platform starts small and scales to keep in lockstep with business needs. This predictable pay-as-you-grow scaling eliminates up-front overprovisioning, idle spare hardware, and painful forklift upgrades. Capacity can be added on-demand with a single click and no disruption to production applications. Linear scaling yields predictable performance and capacity as resources are added.

The centralized management software platform "Prism" is HTML5 powered. It automates and orchestrates overall management of the nodes, clusters, and the hypervisor and supports REST APIs and command-line interface tools. It also includes the ability to monitor performance from the system and storage hardware levels through the hypervisor and perform one-click, nondisruptive upgrades and other management and planning tasks.

Nutanix has a fully featured enterprise storage solution that supports inline data reduction, snapshots, clones, encryption, replication, disaster recovery, and a full suite of telemetrics for management purposes. What really differentiates the company from most of the other competitors offering hyperconverged platforms is its vision. Nutanix has defined what it thinks the IT infrastructure of the future will be, and it is single-mindedly working to become the hybrid enterprise cloud platform for all workloads – past, present, and future. Nutanix has made great strides in that direction, building off the capabilities of its core hyperconverged infrastructure. Initially, Nutanix supported file services with AFS, and it has now introduced block services with ABS and container services with ACS, but it is yet to release a native, object-based storage support capability.

CHALLENGES/OPPORTUNITIES FOR NUTANIX

In the current environment, as the adoption of a hybrid/multicloud model has begun in earnest, Nutanix has the opportunity to continue to innovate and ensure that its current and new clients are able to fulfill their cloud technology strategy and plans:

- Nutanix needs to provide a cloud platform that can be deployed as readily in on-premises and off-premises private and public cloud environments and enable one-click application mobility from any platform to any other platform (physical or virtual).
- Nutanix also needs to make its enterprise cloud platform available through a variety of consumption models and partners.
- IDC believes Nutanix's forward-looking plans make the company a thought leader within the enterprise infrastructure space and sets the company apart from many other infrastructure vendors of comparable size and age. That said, it's important to note that much of the company's past growth has come at a time when some of the largest infrastructure suppliers were less committed to the hyperconverged market and/or unable to bring a competing solution to market that aligned with user expectations. Such conditions no longer exist, which means Nutanix will need to execute on its vision of the future at a time of heightened competition from suppliers with far more robust go-to-market strategies.

CONCLUSION

In evaluating private or public cloud solutions, IT professionals are recommended to use the evaluation framework noted previously. In addition, they could leverage special considerations:

- Is the workload/application in support of a net-new product or service idea to be tested?
  - If yes, public cloud may be preferred to start with, and once the value is determined, the workload could be brought on-premises.
- Is it a legacy application?
  - If yes, there could be inability to migrate it to the public cloud as such an application may not be supported in the public cloud setup.
- What is the life span of the application?
  - If it is short-lived (e.g., a one-off analysis of market conditions is done to determine strategic course of action), public cloud may be preferred.
- Are adjacent services (e.g., analytics services like Amazon EMR) available on public cloud to be used on top of data gathered from their core workload?
  - If yes, then public cloud may be preferred to avoid moving data back and forth from on-premises to public cloud.
- Overall economics:
  - The overall economics of deployment should be evaluated. Similar to leasing versus owning a car or an apartment analogy, there is a threshold of time when owning is more economical than leasing/renting.

As a general rule of thumb:

- For highly predictable workloads with long life span, on-premises private cloud is preferred.
- For highly elastic workloads, public cloud is preferred.
- For mixed elastic and predictable workloads, on-premises private cloud is preferred.
- Overall, hybrid cloud with multiple cloud stack choices subject to workload is the new norm.

Enterprise infrastructure vendors should continue to innovate and ensure the following:

- Provide overall flexibility and simplicity in their offering.
- Help lower the TCO of their on-premises offering, support different consumption models, and exploit cloud economics.
- Provide customers the ability to choose the public cloud provider and avoid cloud lock-in.
- Bridge the best of both the worlds — on-premises and public cloud.
- Help businesses embrace the digital era, create new value, improve their customer experience, and gain a competitive edge.

About IDC

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