I&O leaders looking to integrate cloud services into their organization’s infrastructure must understand the impact of those services on financial management processes. This research helps I&O leaders communicate the benefits of cloud to the business and plan a successful cloud migration.

Key Challenges

- I&O leaders struggle to determine which workloads should migrate to the cloud.
- Compared to a traditional IT project, justifying a cloud project is an area in which many I&O leaders lack experience.
- Cost savings for cloud initiatives often fail to meet expectations due to lack of planning and improper workload migration scope.

Recommendations

I&O leaders focused on infrastructure delivery strategies must:

- Define the project scope by selecting workloads that stand to gain the most from cloud deployment.
- Build a just-enough private cloud project by combining major IT initiatives and using virtualization automation to realize quick, low-cost wins.
- Justify public cloud infrastructure as a service (IaaS) adoption by focusing the use case on business agility, greater geographic distribution and increased scalability. Gartner has found that cost savings are an ineffective justification for cloud deployments.
Introduction

Enterprise adoption of public cloud is growing to the point that public cloud is an expected approach to IT. But even as the technology matures and adoption increases, longstanding nontechnical concerns such as cost and governance continue to muddle the opinions and approaches of I&O leaders, who, given the impact that cloud computing has on infrastructure, normally drive the cloud IaaS engagement program. In addition to the technical and nontechnical issues that surround cloud adoption, I&O leaders must support the IT financial team to enable this program successfully in the enterprise, because the whole resource sourcing process needs to be reviewed and revised for cloud computing.

Cloud computing is a form of services, which are different from infrastructure assets. In addition, the types of cloud services can vary widely. Gartner recognizes four primary types: public, community, private and hybrid (see Figure 1).

Figure 1. Four Primary Cloud Types

<table>
<thead>
<tr>
<th>Public</th>
<th>Community</th>
<th>Private</th>
<th>Hybrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenant(s)</td>
<td>Unlimited</td>
<td>Limited</td>
<td>Single</td>
</tr>
<tr>
<td>Ownership</td>
<td>Provider</td>
<td>Provider</td>
<td>Provider</td>
</tr>
</tbody>
</table>

Source: Gartner (May 2017)

Analysis

Identify Workloads That Stand to Gain the Most From Cloud Migration

To build the justification for cloud migration, you need know which workloads are fit for cloud migration. Identifying the right workload is essential to project scope definition.

Cloud is an attractive option for organizations because it typically enables developers and other technical team members to be more productive. However, if the enterprise is a mature business that has little interest in new or improved IT capabilities, it might not need cloud (see "15 Reasons Not to Migrate Your Data Center to Public Cloud Infrastructure as a Service"):  

- If applications are not on x86-based servers, these applications cannot be migrated to cloud without rebuilding them.
- Developers are usually the primary beneficiaries of cloud, so if there is little internal software development, the organization may not gain cost saving benefits through the cloud.

Because not all workloads are suited for a cloud solution, most businesses will choose hybrid IT — some applications will run on-premises, while other applications will run in the cloud. The cloud providing server, storage and network resources may not be fit for all traditional workloads.
The following are examples of scenarios that are not suited for migration to cloud:

- A static business with no agile demand
- Static application workloads and stable systems
- Non-x86-based applications like mainframes and midrange servers, and applications that rely on operating systems other than Linux and Windows
- x86-based applications, which don’t perform well under virtualization
- Lack of in-house software development resources to support application migration
- Existing applications running in an efficient steady state
- Applications that have physical server constraints

Build a Just-Enough Private Cloud to Get Real Business Value

If the workload is stable and the CPU utilization is relatively good through virtualization, the costs of private cloud computing in your on-premises data center are often moderately to significantly less than the cost of using public cloud services (when calculated over a three- to five-year period). This is especially true for production workloads that are migrated by lift-and-shift.

From Gartner client inquiries, we observe that business demand for private cloud is primarily focused on accelerating the application deployment cycle, thus improving reliability and availability. Cost savings is not always the first priority of business demand, and business and IT may not want to change the funding and operation models at the first cloud adoption stage. In this case, embedding advanced features like metering by hour, autoscaling, etc., can be avoided to reduce the complexity of the private cloud project. The ideal first step for organizations that need to keep some workloads internal and are looking for a low-cost and quick win is virtualization automation (VA).

VA solutions allow IT organization to offer virtual machines (VMs), container hosts, and/or associated network and storage resources as an automated service for administrators or end users. VA solutions typically include a self-service user interface, automated provisioning and approval workflows, and basic metering and reporting features. VA can be considered an extension of the virtualization management environment and the first step toward building an internal IaaS private cloud (see "When Private Cloud Infrastructure Isn't Cloud, and Why That's Okay").

The major value of a private cloud project is to improve resource usage. In traditional IT, x86 servers run at performance levels of between 7% and 15%. This poor utilization and the desire to increase productive performance for servers are the driving forces behind many private cloud projects.

A typical server at low utilization levels operates at between 60% and 70% of its total power requirements. Therefore, one effective method of reducing costs in floor space, equipment, and power and cooling requirements would be to drive these servers to higher utilization levels or to create virtualized images whenever possible. This reduces the number of physical servers and saves data-center resources.
Private cloud is a large capital investment. We recommend launching private cloud with other initiatives, such as colocation, a legacy application modernization program or a hardware refresh program, to make justification easier:

- **Colocation migration.** Before a data center migration, the organization evaluates the new site space. The private cloud can reduce the total number of racks. This is a good chance to add a one-time investment in private cloud for hardware consolidation.

- **Colocation future expansion.** When an organization’s data center has limited space for the future, private cloud can improve the server CPU utilization rate through virtualization, which reduces the number of physical servers. Clients also need to consider disaster recovery investment at the same time.

- **A hardware refresh program.** If the data center uses large-scale hardware refreshes rather than continual, gradual replacement, a hardware refresh is the proper time to consider cloud migration.

- **Legacy application rebuild.** Few businesses have the appetite to "waste" new hardware by migrating workloads to public cloud IaaS. But workloads can be migrated gradually, whenever servers are due to be refreshed, so that new hardware does not need to be purchased in the future.

Justifications for private cloud deployments are listed in Figure 2.

**Figure 2. Leverage the Right Business Justification for Private Cloud Deployment**

<table>
<thead>
<tr>
<th><strong>Reduce Data Center Space:</strong></th>
<th><strong>Security Demand Fulfillment:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce hosting cost: Physical server reuse.</td>
<td>Meet security need that compares with public cloud.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Increase Server Provision Agility:</strong></th>
<th><strong>Reduce Operational Complexity:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce the server provision time on delivery.</td>
<td>Reduce complexity through standardization.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Increase Reliability/Availability:</strong></th>
<th><strong>Reduce the Total Cost:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce the whole system downtime.</td>
<td>Rely on private cloud solution and application migration plan.</td>
</tr>
</tbody>
</table>

Source: Gartner (May 2017)

**Justify Public Cloud IaaS Adoption by Focusing on Business Agility, Geographic Distribution and Increased Scalability**

In the data center of most organizations, system hardware and software, as assets owned by the organization, are capital expenditures. However, when engaging public cloud IaaS, the organization
does not own the assets being used, shifting the expense type from capital expenditure to operational expenditure. In this model, costs are measured according to service usage, like a utility. This service-using model is not a fit for many organizations.

An effective case for a cloud-migration project depends heavily on citing the right justifications.

Justifications for cloud migration include the following (also see Figure 3):

- **Shorter project times**: Cloud IaaS is a good approach for Mode 2 trial and error, offering the speed required to test the business model success.

- **Broader geographic distribution**: The global distribution of cloud IaaS enables applications to be deployed to other regions quickly.

- **Agility and scalability**: The resource is pay-as-you-go. If an application is designed properly, then it is easy to scale the capability in a short period of time.

- **Increased application availability**: The major cloud IaaS providers have demonstrated high levels of security and reliability. If you have the right application design, you can increase application availability accordingly (see "Clouds Are Secure: Are You Using Them Securely?").

- **Cost forecasting**: Use functions based on business demand to build the traditional IT cost model and public cloud cost model for comparison.

- **Functions base**: Build a cost forecast on functions base, like a data analytics business case.

- **The technical requirement**: This refers to the configuration of servers, storage, network, data center and operation resources.

*Figure 3. Leverage the Right Business Justification for Public Cloud Deployment*

Source: Gartner (May 2017)
Properly understanding and controlling spend on public cloud IaaS is not a straightforward process. Organizations new to public cloud IaaS may not understand the fundamental issues that contribute to unnecessary spend. The cost model must be carefully prepared in the justification.

Key considerations for comparing traditional IT and public cloud are listed in Figure 4.

**Figure 4. Public Cloud Versus Traditional IT**

<table>
<thead>
<tr>
<th>Traditional IT</th>
<th>Public Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Assets Costs</td>
<td>▪ Infrastructure Costs</td>
</tr>
<tr>
<td>- Server Hardware</td>
<td>- Server Capability</td>
</tr>
<tr>
<td>- Storage Hardware</td>
<td>- Storage Capability</td>
</tr>
<tr>
<td>- Network Hardware</td>
<td>- Network Hardware</td>
</tr>
<tr>
<td>- Software Licenses</td>
<td>- Software Licenses</td>
</tr>
<tr>
<td>▪ Labor Cost of Hardware Maintenance</td>
<td>▪ Professional Service Costs</td>
</tr>
<tr>
<td>▪ Physical Data Center Cost</td>
<td>▪ Network Bandwidth</td>
</tr>
<tr>
<td>▪ Outsourcing Costs</td>
<td>▪ Managed Service Costs</td>
</tr>
<tr>
<td>▪ Network Bandwidth</td>
<td></td>
</tr>
</tbody>
</table>

Source: Gartner (May 2017)

I&O leaders can use the Gartner template to build the framework for justification (see "Toolkit: Estimating the Cost of Cloud Infrastructure").

**Bottom Line**

- To build the right justification for cloud migration, you need to know that not all workloads are fit for cloud migration. Identifying the right workload is essential to project scope definition.

- Building a good business justification for cloud migration is also important. Cost savings is an opportunity afforded by the cloud, but requires workload optimization for cloud infrastructure. Other benefits such as flexibility in commitments, elasticity to scale, and supplier innovations and features may be better justifications for your specific workloads.

- Build the just-enough private cloud to meet business demand, reduce infrastructure complexity and shorten application deployment time.

- Justify public cloud to demonstrate business values.

- Use application-function-based cost estimation to evaluate the budget.
Gartner Recommended Reading

*Some documents may not be available as part of your current Gartner subscription.*

"Designing a Cloud Strategy Document"

"Prepare Now for the Impact of Cloud on Opex/Capex"

"A Dynamic End-User Computing Environment Demands a Zero-Capex Approach"

"Market Insight: Cloud Shift — The Transition of IT Spending From Traditional Systems to Cloud"

"Incorporating and Optimizing Public Cloud Costs in Modern SaaS Pricing Models"

"Deliver Data Center Modernization Using Three Cloud-Complementary Approaches"

**More on This Topic**

This is part of an in-depth collection of research. See the collection:

- Research Roundup: Building and Marketing Cloud-Based Offerings — 3Q18
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