CITO Research
Advancing the craft of technology leadership

May 2012

How the Cloud Reshapes TCO Analysis

Sponsored by rackspace HOSTING

Contents

CITO Research
Advancing the craft of technology leadership

Introduction

As you evaluate the computing landscape at your company, you've probably become used to calculating the total cost of ownership (TCO) of computing assets based on buying and owning a piece of hardware or software. You have some visibility into your landscape but probably far less than you think. What's more, soon your landscape will be clouded, so to speak, with cloud computing. The good news is that more than the lining of this cloud is silver. And it doesn't obscure—it actually improves visibility.

The cloud presents enormous savings opportunities, in terms of data center real estate, staffing, software and hardware maintenance, and accounting.

Even so, TCO is a different proposition when computing assets are transferred to the cloud. The cloud presents enormous savings opportunities, in terms of data center real estate, staffing, software and hardware maintenance, and accounting. It also introduces new management challenges, including balancing cloud and non-cloud assets and altering software that was originally built for on-premise deployment for use in the cloud. Some of these challenges may introduce new costs as they eliminate others.

This CITO Research paper will help you enter this new frontier by illuminating benefits to cloud TCO and important issues to consider before moving applications to the cloud.

Our analysis of how TCO changes in the cloud examines the following categories of benefits:

- The financial impact of the cloud—new ways to save, new ways to think about costs, transparency into IT costs, and economies of scale
- The business impact of the cloud—process improvement, innovation, flexibility, and expertise, among others

CITO Research
Advancing the craft of technology leadership

The Financial Impact of the Cloud

Moving to the cloud creates new savings, changes the way you think about costs, and provides benefits related to scaleability.

New Ways to Save

The cloud brings a variety of savings that derive both from what you don't have to do—such as building new data centers—and what you can do—innovating using capacity that you can turn off and on as needed.

Savings advantage: No data center expansion and upgrades

Migrating to the cloud means you can *stop building or expanding data centers*. Data centers represent some of the world's most expensive real estate, and the costs for energy, monitoring, and security staff to operate them are sky-high. When you switch to a cloud solution, building and running a data center is no longer your problem. Companies that already have a data center can put off or eliminate expanding that data center as their business grows.

With IT outsourcing (ITO), you're essentially handing over your IT configuration to be operated by someone else in a dedicated environment. Savings derive mostly from reduced labor and power costs as you hand over a portion of operational control of your complex environment to a third party. Conversely, public cloud providers optimize your application landscape to run on distributed, shared commodity servers, which are inexpensive but kept up to date and supported to provide the best quality at the lowest price. And while your cloud provider does the "grunt work" of running and maintaining the infrastructure, with interactive tools you have maximum flexibility to provision and change computing resources as you need them.

Outsourcing vs. the Cloud

For many years outsourcing companies have provided managed off-site hosting of computing assets. It's important to understand how the cloud is different. Here are the basic hosting options for computing resources:

Self-hosting

When you self-host, you spend up front to acquire equipment and space and pay for power and cooling on an ongoing basis. For storage, you buy the initial hardware components, which can be expensive even if you only need a small amount of storage.

Outsourced dedicated server hosting

When you outsource, there is no upfront capital expenditure. You pay a monthly fee for dedicated servers. If dedicated storage is needed, you lease expensive hardware, such as that offered by EMC, NetApp, and so on. The cost of the hardware to interface with the servers can also be very expensive, so customers have high startup costs.

Outsourced cloud hosting

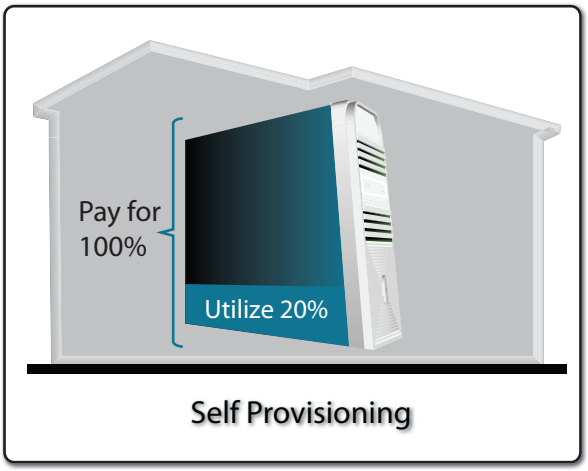
Hosting servers in the cloud is about 50% less expensive than dedicated hosting from a monthly cost perspective. Furthermore, you can turn cloud servers off when they're not needed and pay for their use per day or even per hour. Most dedicated server hosting companies do not allow this. For cloud storage there is no large initial leasing expense because the cloud provider amortizes the cost of the hardware across multiple customers. Cloud storage is truly pay-per-use.

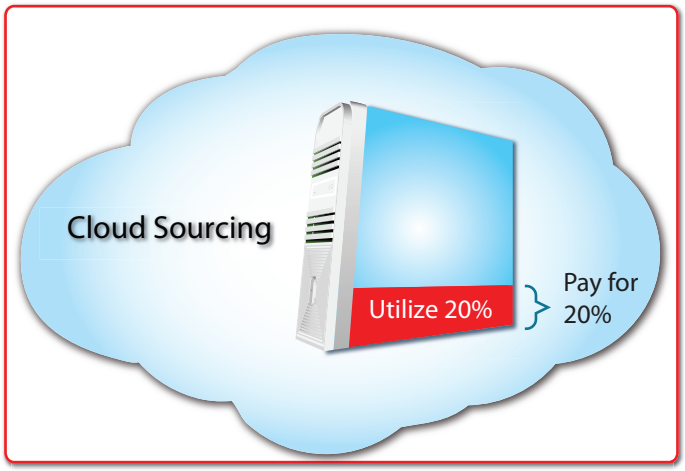
CITO Research
Advancing the craft of technology leadership

Savings advantage: No more overprovisioning

When enterprises build their own data centers, they build to accommodate peak loads—the moments of highest predictable activity, such as the spike after a Super Bowl ad or a compelling marketing promotion. This means that while you have the capacity for peak loads, your average utilization of servers may be only 20%, or even less. If you're not using 80% of your capacity 90% of the time, what is your actual TCO for that on-premise equipment?

In the cloud, you can turn costs on and off in ways that you can't when you own and operate your own data centers.

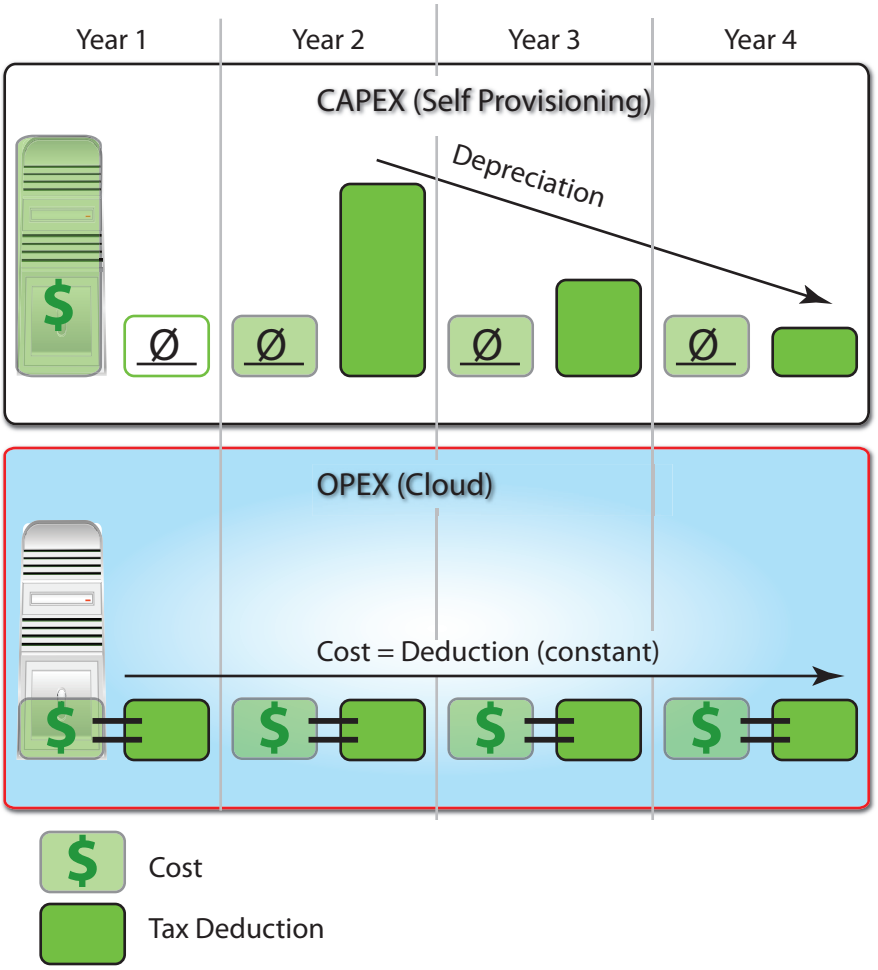




Despite the costs, overprovisioning has historically been the only way to handle peak loads, sufficient redundancy, and data replication capabilities, which means duplication of your already overbuilt data center. In the cloud, vendors manage these issues at scale and automatically reassign computing assets to maximize efficiency, passing the savings on to you. Simply put, in the cloud you can turn costs on and off in ways that you can't when you own and operate your own data centers.

Savings advantage: Hand over maintenance

The cloud helps alleviate another costly chore—the need to upgrade and update software and hardware and to purchase and maintain dedicated instances for specific business uses. In the cloud this is baked into the service fee and the vendor handles upgrades and updates on your behalf. When you run your systems in-house, once you've bought a Windows license and a server, you're stuck with them whether you need them or not. In the cloud, you don't have to worry about security patches and upgrades for servers managed by cloud providers, and, if you don't need that server or the software license anymore, you don't have to pay for it and you certainly don't have to patch it.



Savings advantage: From CapEx to OpEx

When switching to a pay-as-you-go model, many companies find that savings accrue from changing their financial accounting for computing assets from capital expenditures (CapEx) to operating expenditures (OpEx). With CapEx ,the full cost of an asset is levied right away, but the expense of the asset is depreciated over time. With OpEx, the expense can be deducted in full in the year it occurs.

Savings advantage: Avoid vendor lock-in

The cloud implementation and partners you choose do make a difference. If the cloud provider is committed to an open strategy and open standards, that keeps costs over time low. A proprietary strategy tends to lead to vendor lock-in, which can result in higher costs. Proprietary systems cannot be easily moved to other vendors; applications need to be rewritten or heavily modified. Customers are also forced to seek out additional vendors for new functionalities if their hosting partner chooses not to offer features in their platform that customers need.

By selecting a cloud partner committed to open standards, you have access to the world (literally) for support. This often means that you get answers to problems more quickly than if you were to wait for a response from a company that owns a proprietary standard and has a limited support staff. Also, because multiple parties with an interest in advancing standards and developing new solutions are involved, new features can be developed faster.

The Cloud Changes Thinking about Costs

The cloud introduces new cost variables that are not typically part of traditional TCO calculations. In the cloud, computing resources are delivered as utilities, similar to electricity—someone else invests in building the resource, and you pay for what you use. In a dedicated server-hosting scenario, your computing assets still must be directly purchased, but your service provider runs your assets in a hotel and charges for the use of space and power.

In the cloud, you pay for computing as you would for electricity—as you use it, like a utility.

Cost advantage: Per-use charges

Instead of examining one-time purchase costs and calculating depreciation, cloud TCO accounting considers per-use charges. And, because you're changing the way you examine costs, some of the management infrastructure you use to administer assets may also need to change.

There are different categories of management tools. Some providers offer a standard web portal that allows customers to perform or delegate many tasks through a simple interface. There is also a growing market for third-party cloud management services such as RightScale, enStratus, Scalar, and others that consolidate multiple cloud vendors into a single web portal with powerful features, such as auto-scaling and billing alerts.

Careful planning of your cloud deployment is critical to achieving ownership cost decreases quickly.

Customers have many choices of monitoring tools depending on what aspects of their hosting configuration they want to monitor, for example, hardware, networking, storage, applications, or security (physical and logical). Enterprises that deploy these tools can monitor a range of installations, from a single facility to many locations across the globe.

Outsourcing to the cloud can reduce the number of devices that companies need to monitor, lowering costs for companies using applications that charge per device monitored or by a tiered quantity of devices monitored. In some cases, if all critical infrastructure is outsourced, customers can eliminate the need to do any monitoring on their own. They cannot recover software costs, but they no longer have to renew their monitoring licenses.

Also, by cloud-sourcing, you may eliminate the need to have your own people monitoring your systems 24x7, which means teams can be repurposed or downsized. A cloud provider staffs for 24x7 coverage and responds to alerts. Customers only need to retain subject matter experts (SMEs) who can interact with outside support personnel for questions and problem resolution.

For some, this change of model is an adjustment. For customers who didn't spend much time or effort monitoring their computing assets, the cloud offers a wealth of information and control around resource usage and efficiency. Customers accustomed to detailed networking or server monitoring might find that cloud-based monitoring provides less detail than they are accustomed to seeing, but they usually conclude that the tradeoff in terms of time gained to focus on core business objectives—rather than undifferentiating IT work—is worth it.

Cost advantage: A holistic view

It's likely that some computing resources will remain in-house, and you will find yourself managing both in-house and cloud resources. This requires a holistic view of all of your resources, something you may not currently have. Investment may be required in order to gain this view.

CITO Research
Advancing the craft of technology leadership

An Ad Agency Weighs Cloud Computing Costs

An ad agency outsources a few dedicated servers to handle a specific client's regular traffic. Its monthly spend is $5,000. The client needs to host a one-time live TV show and needs hundreds of servers to support real-time voting and survey traffic. Instead of having to scope out heavy-duty networking hardware and figure out how many servers they might need to handle this three-hour event, they just fire up 100 cloud servers and run them for five hours (an hour before the event, three hours during the event, and an hour after the event). The cost of deploying dedicated hardware would have been several hundreds of thousands of dollars in capital expenditure, and tens of thousands of dollars per month. Thanks to the cloud-sourcing model, this temporary capacity came at a one-time cost of $400.

Still, over time your TCO will go down as you have less "O" in the equation—that is, less to own. In some cases, TCO improves immediately because the customer reduces its "O"-level via outsourcing. The degree of improvement depends on how much is outsourced.

Cost advantage: Transparency

In the cloud, vendors organize their offerings so that you can understand exactly how much a resource is costing you, a calculation you might have a hard time replicating for in-house assets. You can calculate the precise cost impact that would come from adding or changing an application or from adding or removing a server. As a result, your decision-making acumen becomes much sharper and you save money over time.

Benefits from Cloud Providers' Scale

Cloud providers have the ability to negotiate volume discounts, which means a lowered cost per CPU for your company.

Cloud providers are working at scale in every sense of the word. They purchase more servers than almost any of their customers. They have a direct relationship with the hardware and software manufacturers that you use to run your business. They can lower your costs in several key areas.

Scale advantage: Volume discounts and vendor relationships

Cloud providers have the ability to negotiate volume discounts. Cloud providers are on the front lines working with vendors, learning about upcoming releases, anticipating problems, and uncovering opportunities for their customers, who then get the benefit of this cumulative knowledge and can concentrate on their own businesses.

Scale advantage: Repeal of the "R&D tax"

Your goal is to run your business. You may not be able to afford the time or money required to research new developments in the open cloud or the latest improvements in hardware technology. Cloud providers have made research and development part of their mission. When you purchase cloud services, you are offloading the "R&D tax" that would otherwise come with staying on top of running an IT estate on your own. Further, the cloud opens the door to conduct R&D within your own industry, on hardware and software that's available when you need it but doesn't cost you when you don't.

Running your business in the cloud removes the "R & D tax" that comes with staying on top of technology issues.

The Business Impact of the Cloud

Moving to the cloud reduces TCO by automating functions hampered by lengthy, hands-on processes and offers opportunities for significant process improvements.

Business advantage: Harmonized vendor roadmaps

When you transfer the acquisition and management of your computing assets to the cloud, your IT team can focus on strategic decisions for your enterprise and avoid spending time and money on your vendors' agendas. When you work with a cloud provider, managing and harmonizing complicated vendor roadmaps is no longer your problem. You no longer have to ask:

- "What should we upgrade when?"
- "Is this patch really necessary now?"
- "How long will my system be down?"
- "Will adding a capability from Vendor A negatively affect Vendor B's product?"

Cloud vendors work directly with hardware and software vendors, handling these issues every day, for all of their customers, at scale.

Business advantage: Expertise on demand

With the rise of new technologies including cloud, mobility, and virtualization, and with the technology challenges we face such as big data and power management, running a technology estate has only become more complicated. The level and quality of skill required has increased in recent years, making it difficult to recruit and maintain talent in-house. Today you need experts in security, system administration, virtualization, storage, and more. Good cloud vendors have experts in all of these disciplines and make them available on the same amortized cost basis as the physical hardware and software. You often can talk to them directly when needed, but you can also be assured that they are working in the background, supporting you all the time.

How much would it cost you to retain these skills? The cost of expertise depends on the resources needed. Keep in mind that a company needs more than one of each of these people to staff their operation 24x7. Ideally you need someone to cover all three shifts every day, plus weekends, and you also need to account for vacation and sick time. Staffing this on your own may not be practical, while outsourcing allows you to cover some aspects of your online presence 24x7.

Staff member	Average Salary*
Mid-level Programmer, Engineer, or App programmer	$78,000
Mid-level Network Security Analyst or Web Security Engineer	$78,000
Mid-level database administrator	$87,000
Web application developer	$75,000
Security guard	$30,000

*Source: Salary.com

Business advantage: An IT assembly line

Considering that the purpose of technology is to reduce labor it is remarkable how much IT still feels "handmade." The amount of labor that goes into assembling IT infrastructure is striking, especially when there are so many commonalities between enterprises. A major cloud benefit derives from the automation of infrastructure, effectively creating an "assembly line" of modular parts. The fewer people that touch hardware, the more savings that can be passed on to customers.

The cloud changes IT from handmade to efficient, automated deployment.

Network Installation at Rackspace

*For many years, Rackspace has been performing network installations of servers. When new physical servers are ordered, the specific hardware is assembled and the completed build is connected to the network. At this point, a Rackspace-developed installation script runs and installs the operating system and necessary support files, configures network and security variables, and—*voila*!—the server is ready to use. This process has been improved thanks to Rackspace's relationship with Dell. The company orders servers pre-built in a finite set of configurations. In other words, the outsourcer in this case outsources the actual hardware building to the hardware vendor. Rackspace employees simply rack the newly received servers and perform an automated network configuration, with no need for hardware assembly.*

Once the machines are up in the cloud, the process is even more automated. Customers simply go online, select their server options, and press a button. Three to four minutes later, their cloud servers are online and they receive an email with their logon information.

Business advantage: Redesigned processes

Cloud-related savings are not just one-time net from offloading procurement and management responsibilities from in-house IT. Ease of deployment and on-the-fly compute adjustments may actually enable enterprises to redesign business processes that were based on outdated assumptions of resource constraints. This means your enterprise isn't just saving money and becoming more efficient—it may actually be able to sharpen its competitive edge and add to top-line growth with new processes that capitalize on cloud efficiency and availability.

Here's an example: Enterprises are starting to adopt the concept of deploying nonsensitive data in the cloud. Instead of having to rely on internal IT departments to acquire or repurpose hardware in their own data center—a process that can take weeks or longer—they can go to a cloud provider and purchase virtual machines. The attractiveness of this option improves when the cloud provider offers dedicated physical network security gear in front of its public cloud servers, improving security and peace of mind. To maximize this effect, customers who don't want to run on a multi-tenant cloud infrastructure have the option of using private cloud offerings. Time and money can also be saved by outsourcing development and staging servers in the cloud. In fact, this is a most common use case for private clouds.

Business advantage: Self-service IT

When considering the cloud, it is important to assess the impact of business users' ability to conduct self-service computing. When business users can directly access and apportion applications and services—with cost transparency—IT no longer has to be involved in every decision, but can provide support because they have visibility.

The cloud lowers IT costs and fosters innovation for business users.

Business advantage: Right-sizing staff

Through cloud-enabled automation and the support capabilities of your hosting partner, you can reduce staff levels needed to build and maintain IT infrastructure, while increasing quality through cloud vendors' accumulated collective knowledge.

CITO Research
Advancing the craft of technology leadership

Walk Before You Run

It would be a mistake to assume that every application in your stack should be moved to the cloud right away. Moving too quickly in this direction could negatively impact your TCO, as mistakes or improper planning could drive up the cost of cloud conversion, at least initially, and reduce savings. Here are a few factors to verify before moving applications to the cloud:

- **You have a variable workload.** Because flexibility is one of the core value propositions of the cloud, enterprises that have wide swings in capacity needs stand to benefit the most.
- **Your homespun application can scale up and down.** Some applications were not built with the cloud in mind. A homespun application built for a localized deployment might need to be redesigned in order to operate properly in the cloud.
- **You do not have a per-machine commercial application license.** Commercial applications often have licensing models that require registering individual machines or physical processors. Moving these applications to the cloud could increase license purchases, wiping out advantages gained from savings on infrastructure.

Conclusion

Moving to the cloud can significantly lower the TCO of your computing assets as your enterprise essentially moves from an "own" to a "rent" IT business model. Successfully lowering TCO requires a sophisticated understanding of your own software architecture, the capabilities of cloud providers, and the accounting and management changes that could result from switching applications to the cloud. In some cases, you may first find yourself "spending to save." But ultimately, if your organization has high infrastructure and IT personnel costs and a need to expand and contract applications or computing power quickly, you can substantially lower TCO by moving to the cloud and gain a better understanding of your IT landscape in the process.

CITO Research

CITO Research is a source of news, analysis, research, and knowledge for CIOs, CTOs, and other IT and business professionals. CITO Research engages in a dialogue with its audience to capture technology trends that are harvested, analyzed, and communicated in a sophisticated way to help practitioners solve difficult business problems.

This paper was created by CITO Research and sponsored by Rackspace.