How to Calculate and Monitor the Payoff of Cloud Migration: A Step-by-Step Approach

by Chris Churchey
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Clouds in the Forecast

There are clouds in the forecast for IT infrastructures. IT leaders list cloud migration as a top priority in 2016. While 56% of companies are upping their spending on cloud applications, a meager 10% are doing the same for their data center infrastructure.

By 2019, cloud data centers will process more than four-fifths (86 percent) of workloads. Traditional data centers will handle the remaining jobs.

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The Sunny Side of the Cloud

Cost reductions and labor considerations loom large in the forces driving cloud migration decisions. With a pay-as-you-go model, the cloud allows organizations to reduce their capital expenses. Also, because the cloud service providers pool resources, they can create economies of scale that may diminish operating costs. Finally, cloud migration shrinks the number of technical employees required to manage data centers. This not only lowers the cost of salaries and benefits but also saves companies from the lengthy hunts involved in recruiting hard-to-find technical associates.

Beyond cost and labor considerations, the cloud saves companies from the pain of lurching through cycles of waste and poor performance. Instead, they can scale the services they receive based on their needs. With data virtualized and spread across the country, it dilutes the risk of one disaster, such as a power outage, putting a company temporarily out of business. Finally, employees and customers have access to applications anywhere, anytime.

The Hazy Economics

Given the widely hailed benefits, you may be considering jumping on the cloud bandwagon. Before doing so, however, it’s wise to pause and assess your situation carefully. The rationale in favor of cloud migration may not be as crystal clear as it first appears. Bear in mind that an undercurrent of optimism could be driving much of the data that cites cost savings from the cloud. After all, most of the statistics originate from cloud service providers that have their own agendas. So it pays to be aware of the variables that affect whether cloud migration delivers cost savings or adds to the expenditures of a particular company.

If you are managing the IT infrastructure of a Fortune 500 organization, proceed with caution. Enterprise-sized companies are less likely to realize cost savings because they are large enough to enjoy their own economies of scale.

“At certain data traffic volumes, the marginal costs of operating on a cloud provider’s infrastructure may become more expensive than providing the necessary IT infrastructure in-house,” writes Asoke K Talukder, Lawrence Zimmerman and Prahalad H.A. in the book *Cloud Computing: Principles, Systems and Applications.*

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Also, high-performance requirements impact how much cloud services cost. The more flexible you can be, the more likely you are to benefit. That’s because if cloud services providers can move your data around to accommodate others, it minimizes their costs and they can pass on the savings. If on the other hand, you want a performance guarantee, your vendor may need to put your assets on dedicated hardware, curtailing their ability to contain expenses. To remain profitable, they need to pass on the additional costs on to you.

Finally, not all cloud vendors are created equal. If you miss one step in your vetting process, it’s easy to make a costly mistake.

Cutting Through the Fog of Cloud Costs and Performance

Because the decision to move to the cloud is not as clear-cut as it first appears to be, you need to take a step-by-step, objective approach to it as described below.

1. Select Test Environments

Start by testing small, low-risk IT environments in the cloud, those that have no impact on production. As candidates for testing, you might select three or four server groups from development or quality assurance. Then, if there is a loss of performance that affects the user experience, you can rest assured that it will not impact today’s revenues or tarnish the brand.

To select environments for testing, you will need data from a performance management tool that monitors your infrastructure 24/7/365. Ideally, look at a year or more of data so that you can detect demand peaks and valleys. This process enables you to create baseline profiles of utilization, CPU capacity, and I/O performance. Within the monitoring software, create virtual groups that represent your selected environments and then assess their size and complexity. For your test, choose several small, simple, and low-risk groups of IT resources.

2. Go Shopping

Use each test group’s profile as the shopping list you take to cloud service providers. With your specific requirements, you are already a step ahead of many IT departments that simply assume they are using 100 percent of their assets. Also,
for the sake of comparison, make sure you know how much you are spending to support each of your chosen IT environments internally.

Now identify three or more vendors to include in your selection process. Provide them each with your “shopping list” and request quotes.

3. **Hunt Down Hidden Costs**

It’s likely that the quotes you receive will vary substantially, thus throwing you into the role of a sleuth. The clues for the root of price discrepancies are often buried in the proposals’ fine print.

Sometimes, a vendor might offer you a particular set of virtual resources, but assume you will only use them five percent of the time. If your usage exceeds what they have assumed, the meter starts to run, and they charge you more. The vendor that quotes a higher monthly price may bake into it a higher usage level that keeps you covered. It’s up to you to decide whether you are more comfortable with a fixed price that you know fits within your budget or if you want a variable price that might enable you to accrue more savings.

Also, many cloud service providers that give you the CPU, memory, and storage you need will not include a performance guarantee in their initial quote. They put you in a pool, sharing resources with their other customers, so performance naturally fluctuates. While the option exists for a performance guarantee, they do not mention it because they want to attract you with a low price. If you want a performance guarantee, however, it’s likely available at an additional cost.

4. **Conduct a Trial**

In many cases, unraveling the quotes enables you to make apples-to-apples comparisons. If not, at least you understand when you are comparing apples and oranges. Review the quotes and decide which vendors’ services you want to explore further—ideally, there are a couple that have survived your initial sifting process. Ask each of them for a 30-day free trial. Then, use your disaster recovery plan to duplicate your test groups and place them in each of the cloud providers’ environments. Depending on time and resource constraints, run your tests in parallel or sequentially.

Once your applications are in their new homes, measure and analyze performance, usage, and capacity using a vendor-agnostic infrastructure performance monitoring (IPM) tool. This process ensures consistency of measurements. Compare the CPU, network and disk I/O performance of each vendor as well as with your data center.
5. Dig for Details

Now you have the analytics that show you the performance levels each vendor provides. At one of the vendors, you may find that CPUs are faster than on-premise, but the I/O operations are at 80 percent of your data center’s performance. Since these variances may affect the user experience, it’s something tangible to explore further.

Because you are buying virtual resources, you have to dig around to learn what governs performance and other metrics. By asking questions, you will surface issues that may not have been apparent in initial conversations. That’s something you want to do before you sign on the dotted line and lock into an annual contract.

You may find out, for example, that performance guarantees are available. Since such a guarantee may require dedicated rather than multi-tenanted hardware, there will probably be an upcharge that you need to factor into your calculations.

6. Weigh the Cost and Benefits of a Move to the Cloud

With the performance data and the answers to your questions, you now have all the information you need to make educated decisions about how cloud migration benefits your organization as well as which vendors would serve you best.

The first step is to decide whether cloud migration makes sense. The word ‘migration’ does not mean you have to fly in formation with the flock of companies moving to the cloud. There are a couple of situations where moving your IT infrastructure may not pay off.

Perhaps you lead IT at an organization that’s large enough to be benefiting already from internal economies of scale. In this situation, a cloud service provider cannot move you further down the cost scale. In fact, you may find that it’s more expensive to migrate to the cloud than to remain on premises.

Also, as mentioned before, the cloud is most cost effective when your resources can be completely virtualized, allowing the provider to move your data around as necessary. So high-performance requirements may eradicate the cost savings you anticipated.

The word “migration” does not mean you have to fly in formation with the flock of companies moving to the cloud. There are a couple of situations where moving your IT infrastructure may not pay off.
In such circumstances, assess whether other cloud benefits outweigh cost considerations. These might include the ability to scale your business rapidly, access applications anywhere and anytime, and even the opportunity to get your feet wet in the cloud. This would help you move up the learning curve, so you are ready to make the transition should the cost-benefit equation ever change.

7. **Select, Move and Monitor**

Let’s assume you decide there’s a bright future for parts of your company’s IT infrastructure in the cloud. Now it’s time to choose a cloud services provider.

Because what you see today at a vendor may not be what you get tomorrow, you do not want to put all your eggs in one basket. As cloud vendors acquire new customers, performance can deteriorate. There are also intangibles to assess, such as the service levels offered. You will want to factor in all these variables to future decisions on moving additional parts of your infrastructure to the cloud. So review your findings from steps one through six and select two vendors to which you want to migrate parts of your IT infrastructure.

Review and sign Service Level Agreements (SLAs) that clearly define your requirements for both vendors. Once you have made the move, monitor their performance 24/7/365 with a vendor-agnostic IPM tool. This process enables you to see if the vendors are meeting your requirements and whether performance is degrading, improving or remaining constant. Also, at year end, you can look at the data to decide whether to shift everything to one vendor or continue on parallel tracks. In the best case scenario, both vendors are meeting or exceeding your expectations so that you can remain diversified. At this time, you may also want to review whether it’s worth moving more of your IT assets to the cloud. With two vendors in the mix, you may be more likely to achieve more competitive costs.
Slow, Steady and *Informed* Wins the Race

While there’s a mass movement to the cloud, it does not mean you should follow blindly. Before making the move, make sure your company will realize benefits from your efforts. Also, vet your potential cloud providers vigorously. Even after you have made the move, continue to monitor performance to ensure there is no degradation. When your contract terminates, you can make informed decisions about whether to stay with a cloud services provider or migrate more IT resources.

**Galileo Performance Explorer® Makes Cloud Assessments Easy**

Galileo is a cloud-based IPM solution that enables you to monitor servers, storage, and SAN from a single pane of glass—a workstation or smartphone. It offers operational intelligence about performance. It monitors your IT environment 24/7/365 whether on your premises, in the cloud, or in hybrid or virtual environment. Because this flexibility allows you to monitor your environments before you move them, during a test and after you’ve committed to a cloud service provider, it is an ideal tool for cloud migration assessments.

You can use it to help select cloud test environments. Simply assign custom tags to any storage, server, SAN, or application assets to group them virtually. For your selected environments, you’ll be able to view the profiles of utilization, CPU capacity, and I/O performance. User-friendly, visually engaging dashboards distill data and provide at-a-glance insights and enable you to monitor trends at your cloud service providers and rapidly compare cloud vendors and on-premise performance.

There are many more applications for Galileo. The dashboards enable you to drill down and pinpoint threatening issues in minutes. Thresholds provide advanced warnings on when you need to take action to optimize performance, so you can optimize the end-user experiences and never have to fight fires again. Galileo stores historical data, enabling you to view trends and deviations that may signal a need to take action. It’s like having a crystal ball for your entire enterprise infrastructure that empowers you to keep operations running without a hitch.

What’s more, the monthly subscription pricing is a fraction of what you would invest in an enterprise-wide solution, and a modular approach allows you to customize your subscription to your needs.

*Find out how to take a strategic approach to optimizing the user experience while minimizing costs.*

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About the Author

Chris Churchey, Co-Founder and Principal of ATS Group and the Galileo Division, has over 35 years of IT experience in enterprise open systems and storage technologies. His emphasis is on operating systems, virtualization, large-scale systems/storage architecting, design and integration, and performance optimization of computer resources. Chris holds numerous IBM Certifications and is a subject matter expert (SME) in Server/Storage Consolidation, Performance, AIX, Linux, Power, Virtualization, and IBM Storage technologies. Before ATS, Chris was with IBM for 23 years. As a Consultant Systems Architect, he provided architecture, design, and IT consulting services to IBM Commercial and Federal customers. Chris was recognized as IBM Systems Engineer of the Year in 1991.

About Galileo

Tim Conley and Chris Churchey, former IBM systems architects and engineers, are co-founders of Galileo Performance Explorer®. Conley specializes in storage performance and Churchey in server performance. Together, they have more than six decades of experience in system implementations, upgrades/migrations, backup/recoveries, performance analysis, and capacity planning. With a thorough understanding of user needs, Conley and Churchey originally developed Galileo as a proprietary tool to help clients of the ATS Group, a systems integration firm that they founded in 2001. Now available to everyone, Galileo was the industry’s first integrated and cloud-based IPM suite. It has gained wide popularity with SMBs, Fortune 500 companies, government agencies and everything in between.