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Getting to the Cloud Faster: The 5 Ws of Cloud Migration

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Introduction

This whitepaper is designed to help organizations that are considering migrating a portion or all of their applications/services to a public cloud environment. The information presented is based on the many conversations we at ScienceLogic have had with our customers, our prospects, and others in the industry. As the leader in hybrid IT monitoring, we are often brought in at all stages of the cloud migration lifecycle, whether it be prior to any work being done, in the middle of a migration, or at the end of the migration.

For ease of readability we are basing this paper on the 5 Ws as they relate to cloud migration:

1.   Why Migrate?

2.   What to Migrate?

3.   What is Migration and What are the Steps that Go into It?

4.   When to Migrate?

5.   Where to Migrate?

6.   Who to Ask for more Help?

Further, this paper provides both a "quick glance" view of content, and a more in-depth read. The graphical elements are designed to summarize most of the main points. One suggested way to consume this document would be to focus on the graphical elements first and then read the text to get more data on areas of interest.

WHY MIGRATE

MOBILE FRIENDLY
Ensure your application can be seen by clients anywhere in the world, and grow as your install base grows

AGILITY
Easier to expand and deploy additional capabilities for your applications

COST SAVINGS
Only utilize resources when needed, eliminate expensive CapEx Data Center costs

Why Migrate?

Many organizations today are looking for ways to cut costs but at the same time drive competitive differentiation via greater business agility. They see adopting public cloud services as a way to accomplish these goals faster. But are agility and cost savings the only reason IT organizations are adopting or considering adopting public cloud services? The answer is simple: no.

To understand another underlying driver consider two of the most populous countries in the world – India and China. Many of their citizens are just now getting internet access and only through the use of a mobile device. They represent an enormous untapped market opportunity for many companies. Now, consider the dramatic growth and adoption of mobile apps. Mobile apps have reset user expectations in terms of performance, scalability, and availability. They expect, based on other consumer-targeted web applications, that any internet-enabled application will perform flawlessly. Tied into that flawless performance is scalability. With the ability for mobile applications to go "viral", mobile application solutions need to be able to handle spikes in traffic. Perhaps most important is global availability. Will the application be available and perform well for the fastest growing segment of the internet-enabled population?

All of these factors tie into the two other "Whys" of cloud migration – cost and agility. To build a resilient application that delivers consistently good performance across the entire globe, an organization would need to open up a data center or, at the very least, engage in contract discussions with several different data center providers across the globe. They would have to have the ability to automatically scale as demand increased (i.e. auto-scaling) – to handle fluctuating demand. This combination results in exorbitant costs on both time (handling contracts with different providers) and money.

Public cloud service providers offer all of these capabilities. They typically offer high levels of customer self-service - usually as simple as selecting some parameters and clicking a button to deploy capabilities. Public cloud providers also offer support for auto-scaling natively within their product set to handle spikes in demand and need. Further, these instances can also be brought down automatically once the spike in demand has passed. Finally, they offer a global services footprint, allowing organizations to deploy resources across most geographies.

The other key benefit is agility. Enterprises can very quickly create and launch new services in the public cloud, without much investment in supporting infrastructure. And if a test of the new service doesn't work they can easily bring it down.

WHAT TO MIGRATE

✓ **STANDALONE APPLICATIONS ARE THE EASIEST**
- COTS are the first place to start (Microsoft)
- Loosely coupled SOA-based architectures

✓ **HIGHLY CUSTOMIZED AND INTEGRATED REQUIRE THE MOST PLANNING**
- Does the code point to IP addresses?
- Direct Database calls can be hard to replicate exactly

What to Migrate

At ScienceLogic we've spent a fair amount of time thinking about the migration of applications to public cloud. As a part of those discussions, we've considered the different characteristics of applications and different ways of classifying broad sets of workloads. Our goal in that particular set of exercises was to identify which applications are prime candidates for cloud migration and which are more suited to stay onsite. One way to classify applications is either as standalone applications, often known as commercial off the shelf, or highly customized applications.

Standalone applications would be the a-typical enterprise applications such as Microsoft Exchange, Sharepoint, or MS Dynamics. These already have instances and images created within public cloud environments that simply need to be selected during the initial server launch. They run automatically and you can easily move licenses over to these cloud-based applications. Ultimately the largest task is that of transferring the data.

Highly customized applications are more nuanced. These can't simply be selected from a drop-down list of offerings provided by your public cloud provider and need to be evaluated individually. Many of these custom applications are built in house - often with software that uses direct API calls and hard-coded direct IP addresses, rather than using variables. They also are not containerized pieces of software designed to run anywhere. All of which makes many of these applications ill-suited for the cloud. This is where third party migration focused tools, such as Racemi, come into the picture. They provide the ability to look at the code and get a feel for how many direct IP addresses are included in the code, essentially how suited applications are to deployment to a public cloud.

MIGRATION STEPS

FIRST BUILD

- Utilize COTs applications purpose built for cloud
- Get your hands dirty and understand what you need build vs. buy

NEXT FORKLIFT

- Great for COTS tools
- Run the cloud like a co-lo only

THEN EMBRACE

- Minor modifications for better usage
- Automation of services

FINALLY OPTIMIZE

- Build or rebuild applications to utilize auto scaling and on demand

SPEED OF DEPLOYMENT

COMPLEXITY OF DEPLOYMENT

What is Migration and What are the Steps that go into It?

Build vs. Buy

First, an organization has to decide what type of public cloud service they want to use. Or more simply, do they deploy this application as a PaaS, SaaS, or IaaS based application? For example, does it make sense to run an exchange server in an IaaS environment or use Office 365 as the platform? Is that organization going to use all of the extra capabilities they would have in Exchange in a cloud environment or can they settle for the core capabilities provided by Office 365?

Forklift

An organization also has to decide their approach to cloud adoption/migration. Are they going to forklift applications? If so, what is the purpose? Is it to provide for colocation? If the purpose is to provide colocation and you will not be using any of the on-

demand optimization abilities offered by public cloud providers, you may find running it in a public cloud to be not nearly as financially effective as going with a traditional colocation service provider.

Embrace

In the embrace stage, organizations begin to design their applications and deploy them with the cloud and cloud capabilities in mind. This is often done in small steps. For example, instead of deploying 10 Gigabytes of storage at the outset for a particular application, you will deploy the application with a much smaller block of memory and design the application to add more memory as needed.

Optimization

This is where the most cloud-mature organizations sit in this lifecycle. In this stage applications are constantly honed and developed in a devops fashion. Truly designed to take full advantage of the powerful capabilities public cloud providers offer, this is where the true cost benefits begin to

WHEN TO MIGRATE

PERSONNEL MANAGEMENT

- Ensure team members get training on cloud offerings
- Ensuring various groups, within IT work together (Network vs. Application vs. System)
- Ensure that various departments understand IT's role

RETURN ON INVESTMENT

- What are your most expensive apps?
- Are you planning on phasing out hardware for refresh cycles?
- Private cloud licenses usage

APPLICATION MANAGEMENT

- When are your application most used?
- Which applications are the most critical and at what times?

LEGAL REGUIREMENTS

- Data sovereignty
- Security requirements
- SLAs

show themselves. Whereas organizations who first begin using public cloud services may only use 10 – 15% of the capacity of the compute they are paying for, mature organizations at the optimization stage use the majority of the compute they have purchased. Because they continually optimize and their applications are built for an auto-scaling world, they can run close to full capacity and know they will simply scale-up when they need to.

Organizations would be wise to question the statement, "I put some applications in the public cloud and they are costing me way too much money." Often, this results from a situation where an organization "forklifted" an application to the cloud and it wasn't designed/optimized for a cloud environment. The key is to use the cloud the way it was designed to be used.

When to Migrate to the Cloud?

This section of the paper is divided into 4 sections: personnel management, return on investment, application management, and legal requirements.

Legal Requirements
The most obvious legal requirement to consider is data sovereignty. Many European nations are beginning to enact laws to ensure their citizens' data does not leave their borders. Similarly, some states within the USA are beginning to consider prohibiting the transmission of their citizens' data across state boundaries. As governments become more cloud centric the trend of governments protecting their citizens' data and companies' data will only increase.

From a security perspective, a cottage industry of vulnerability testers that has developed over the years. As cloud centric applications are developed they can be tested by trained hackers for vulnerabilities to ensure they are as secure as possible.

The last regulatory requirement we will focus on has to do with contractual agreements - or what the IT industry terms service level agreements (SLAs). If your public cloud based application goes down, and you have a standing SLA with your customer (either internal for enterprise or external for service provider), who is responsible? Understanding what level of SLAs an organization can offer based upon the SLA they have with a cloud service provider is pretty important. For example, if you are offering a 99.999% uptime guarantee while your cloud service provider is offering a 99.99% uptime guarantee, you are in a relatively compromised position.

Personnel

At the end of 2013 ScienceLogic did an in depth survey of over 1,000 IT professionals. Some of the results we found were rather striking. But perhaps the most striking find was that a full 50% of respondents who had cloud initiatives planned for 2014 identified lack of skillsets/education in cloud-based technologies as one of their core challenges moving into 2014. While this was some time ago and many IT professionals have "skilled-up" since then, there is still a significant gap in workforce knowledge when it comes to cloud computing technology.

While many public cloud offerings provide similar capabilities to those IT professionals work with on a regular basis (i.e. firewalls, etc), there are important differences. For example, AWS's DNS service – Route 53 – doesn't work the same as a traditional DNS server, similar, but with subtle and important differences. There is also a whole new set of terminology and best practices to be learned.

Another aspect related to personnel has to do with an age old problem in IT – siloed departments. If your security teams, network teams, systems teams, and apps teams are not working together during a cloud deployment, it will fail. All pieces of your public cloud based service need to work well together and should there be an issue, your teams must collaborate to quickly find the root cause of the issue.

Beyond the IT department, public cloud offerings now open up the opportunity for any other business unit to quickly launch a service. Discussions need to be had about how to manage "rogue" applications and services that weren't originally "blessed" by IT. Also, IT needs to consider tools that will help it quickly identify any new services and applications running in cloud environments.

Where to Migrate?

Public or Private

While much of this paper has discussed the public cloud environment, there is another cloud option, the private cloud. The first aspect to consider is where to migrate your applications and workloads. Much of the factors considered here were detailed in the previous sections of this paper. Specifically, when deciding whether to migrate to a public versus private cloud, organizations should consider the type of application, the level of security needed, and any data sovereignty issues at play.

Type of Cloud Service (IaaS, PaaS, SaaS)

A decision around type of cloud service is ultimately focused on the tradeoffs between level of control and operational overhead. Infrastructure as a Service (IaaS) is a standardized offering where compute, network, and storage are owned by a service provider and delivered on-demand. Platform as a Service (PaaS) can be thought of as an offering between IaaS and SaaS, in that it is simply a

platform with all of the tools and hooks developers need to quickly build applications. Finally, SaaS is exactly what its name implies — a piece of software that is delivered as a service to an organization. No underlying operational support is needed.

There is another question we have already touched on that goes into this decision: build or forklift? If the organization is considering forklifting an application and not seeking to build it from the ground-up, it's extremely important to consider whether the application is cloud-enabled. Is it best suited for cloud environments, and will it take full advantage of all of the powerful capabilities cloud environments natively provide? If the organization is looking at forklifting then IaaS offers the most control which, in turn, may make it the most suited environment for a forklift to the cloud. Alternatively, since PaaS extracts some of the underlying operational challenges not managed in IaaS but gives a true development environment for applications teams to create new applications, it may be the best suited environment for building applications. Further, is the organization simply seeking colocation in which case, as was previously mentioned, it may be much more cost effective to go with a traditional colocation provider.

Local Provider or Global Provider
Another decision you will inevitably have to make is whether you want a local cloud provider or a global cloud provider. Most readers will be familiar with AWS, Azure, IBM SoftLayer, Verizon Terremark Cloud, and Rackspace compared with your local managed service provider. The mega-cloud vendors will often offer services that allow you to view some of the performance and availability in your public cloud environment, but typically the data available is not kept for long and it is not granular or comprehensive enough for many production applications. To provide granular visibility into

these environments, many organizations will deploy external monitoring solutions, such as ScienceLogic's hybrid IT monitoring platform. Either way, the responsibility for ensuring the applications and services are running at peak performance and availability rests with the organization deploying the cloud-based applications. Alternatively, a managed service provider, such as Datapipe, will provide managed services for cloud-based environments often in both the mega-vendor clouds and in the managed service provider's own cloud offering. The MSP is responsible for the performance and availability of the applications and services in this instance.

Finally, consider the global reach you will need with your application/service. Near the beginning of this whitepaper we discussed the growth of mobile and the specific high-growth areas across the globe. If you need a global footprint and want access to those "growth markets" then a mega-vendor cloud offering may make sense – provided they have data centers in your target markets. This will help to address any data sovereignty and potential latency concerns. If you simply need to provide these applications locally, for corporate headquarters for example, and desire a high-touch service, your local managed service provider may make great sense.

Who to Ask for Help

The good news is, organizations do not have to do this on their own. There are technologies, service providers, and resources available to help an organization migrate to a cloud environment.

Third Party Technologies
This paper has touched on this already, but several third parties can migrate server workloads between different virtual, physical, and cloud-based environments. Two examples mentioned already

MIGRATION

are Racemi and Oracle's GoldenGate. If you want a product to help migrate servers across different types of technologies, these vendors may be a good place to start.

One other third party to consider is ScienceLogic's hybrid IT monitoring platform. It will automatically discover your entire infrastructure (both onsite and in public cloud environments), map dependencies across elements, and apply the correct monitoring policies to all aspects of your environment. It provides built-in cloud migration reports that tell organizations which workloads are prime for migration, and once migrated, will continue to monitor those workloads to ensure peak performance and availability.

Consulting Partners

If you are seeking an organization that will walk you through the entire migration lifecycle and do much of the heavy lifting for you, you may want to consider bringing in a third party consulting partner. Often, they can scope out an engagement that will take you from A – to – Z, or anywhere in between. One consulting organization you may want to consider for this is Accenture.

Do-It-Your-Selfers

If you aren't interested in using a third party consulting partner to help you in this process, you'll likely still want more detail on best practices for migration. To that end, we've provided a few documents that will be useful to read. They discuss this process from both AWS and Azure's perspectives and provide extra context for your decisions. Please find the Azure resource **here** and the AWS resource **here**.

Conclusion

In conclusion, migrating to the cloud is not an easy task, but with the right tools, right resources, right planning, and right personnel, it can be done.

Regardless of where you lie within the cloud migration cycle, ScienceLogic can help you at every stage. By automatically discovering and monitoring your entire infrastructure (both onsite and off) and providing built-in migration reports, ScienceLogic can help you identify workloads prime for migration, and monitor them before, during, and after migration to ensure you succeed with the cloud.

Schedule a **demo** today and see how ScienceLogic and help you ensure your cloud migration is a success!

About ScienceLogic

ScienceLogic delivers the next generation IT monitoring platform for the network of everything. Over 20,000 global Service Providers, enterprises, and government organizations rely on ScienceLogic every day to significantly enhance their IT operations. With over 1,500 dynamic management Apps included in the platform, our customers are able to intelligently maximize efficiency, optimize operations, and ensure business continuity. We deliver the scale, security, automation, and resiliency necessary to simplify the ever-expanding task of managing resources, services, and applications that are in constant motion.

ScienceLogic won InfoWorld's 2013 Technology of the Year award, Red Herring's Global 100 Award, Deloitte's Technology Fast 500™, and MSPmentor 250, among other worldwide recognitions of excellence. For more information, visit www.sciencelogic.com.

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