

# A Primer on in-house IT Infrastructure



## In this Guide

### How much is Bad Architecture Costing You?

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### How to Prevent Latency from Crashing the Enterprise

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### Private cloud - in-house, hosted, or hybrid?

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# How much is Bad Architecture Costing You?

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However, the addition of each layer of technology caused more complexity. More complexity drove more cost, as well as the inability to change the IT infrastructure to adapt to changing business needs. In other words, we've created bad architecture that is clearly costing us a great deal of money, as well as lost business opportunities.

Cloud computing provides us with an opportunity to get some aspects of the architecture in a healthier state. However, like other technology, care must be taken to make sure that you leverage cloud-based platforms correctly. Discipline and planning remain key paths to success.

In many instances, businesses are paying 3 to 5 times the amount of money they should be spending on operations. Moreover, the costs around the lack of business agility due to the unnecessary complexity could be enormous, considering lost business opportunities, such as the inability to move into new markets in a timely manner.

We do know that the rise of complexity caused by bad architectures and a lack of planning causes a few things to occur:

- ▶ First, costs go up. Complex infrastructures are much more difficult and thus more costly to maintain. More staff is required, more technology, and more resources to operate these systems longer term.
- ▶ Second, efficiency goes down. Overly complex IT infrastructures are much less efficient, and thus can't meet the needs of the business. These sub optimal IT architectures require more resources for a diminishing return.
- ▶ Finally, lack of business agility. This means that the IT infrastructure is lacking agility, or the ability to adapt to the changing needs of the business because of the latency required to change things that are complex and thus difficult to change.

The use of cloud computing does bring certain benefits. Business agility becomes the primary reason to move to cloud computing, at the end of the day. While providers and analysts will point to the ability of cloud computing to reduce the need to purchase new hardware and software (OpEx), the ability to change the nature of the business is where enterprises typically find the value. This has been proven over and over again in the last several years, as we've been

standing up the first cloud instances.

Those in IT are quick to point out that bad architecture is just a function of the event-driven needs of the business. When IT focuses on solving a series of problems, that limits the time and resources to do the proper architecture and planning.

However, there is a high cost of not planning, and not spending time to think through the architecture. This includes those who create enterprise architecture for a Global 2000 company, or perhaps create the architecture for a single business-critical system. The end results, and costs, are the same. It's just a matter of scale.

# How to Prevent Latency from Crashing the Enterprise

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And this situation is only expected to get worse. According to market research firm Statista, worldwide data volumes are climbing at a compounded annual rate of about 30 %, which puts us on track to top 96 exabytes per month by 2016.

While finding the resources to process and store all this data is a challenge in itself, the impact on networking capability is what keeps most IT managers up at night. The overriding question: how to keep massive volumes of data from increasing network latency to unsustainable levels?

At its heart, this is a question of scale. While there is no doubt network resources can be ramped up to meet any need, just like any other information resource, the real challenge is to accomplish this without breaking the IT budget.

This is the primary reason why so many organizations are turning toward hosted infrastructure management services. Far from having to build an advanced network from grounds up, hosted bandwidth services provide instant access to a high-performance network architecture, offering broad scalability, as well as top-level uptime and availability.

Hosted network services come in many flavors, from local area networking to internet leased lines that provide web-based point-to-point connectivity between hosted and non-hosted entities. As well, there are numerous customer-premises options for both wireline and wireless connectivity.

When evaluating hosted network services, enterprise executives should note whether the potential provider offers state-of-the-art capabilities like continuous monitoring, packet-loss prevention and low-latency operations. In addition, they should be able to demonstrate adequate bandwidth protection through redundant network architecture and rapid acquisition of alternate data paths should a primary connection fail for some reason. This is particularly crucial for enterprises that deal with international delivery of mission-critical data or applications.

In most cases, the provider should offer a range of service plans as well, which are often built around rate- or volume-based pricing structures. These plans offer a variety of cost/performance benefits depending on your data and application requirements. The provider should also offer peering arrangements and other features designed to maintain maximum availability

and reliability.

It is also a good idea to take careful measure of the provider's own physical and virtual infrastructure. Do they provide redundant fiber links to the Internet? Do they have 10 Gb (at least) switching and cabling capacity, plus thorough monitoring of core routing and switching systems? And is there adequate device redundancy throughout the core, access and distribution levels?

The cloud is already making massively scalable storage and server resources available to business users across the globe, many of whom are side-stepping traditional IT procedures to acquire them. As we've learned from five decades of infrastructure development, data environments are only as effective as the weakest component allows them to be.

Unless and until the enterprise adopts the same service-based approach for networking that it does with the other major functions of the datacenter, full end-to-end scalability will forever be out of reach.

# Private cloud - in-house, hosted, or hybrid?

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That is understandable. A CIO considering a move to the cloud has three options – public cloud, private cloud, or hybrid cloud.

Most CIOs are reluctant to move their enterprise computing to a public cloud with all its implied vulnerability of being accessed by anyone with an internet connection. The private cloud, with its promise of dedicated resources and higher security, seems a much more attractive option for these CIOs. However, since not all computing resources and access in a company need to be controlled with the same rigor, a company could use a combination of private cloud for critical work and a public cloud for non-critical work – in other words, a hybrid cloud.

Let's look at the pros and cons of each of these options.

## **The technology perspective**

Within the private cloud, there are two variants - in-house or self-hosted private cloud, and a third-party hosted private cloud. Let's call them in-house private clouds and hosted private clouds for simplicity.

An in-house private cloud provides the greatest operational control, leverages existing investments in people and equipment to the maximum, and provides a dedicated on-premise environment that is internally designed, hosted, and managed. The IT infrastructure is completely under your control. The disadvantage is that it is no different from building and running your own datacenter with virtualization and provisioning added in – and building and running your own IT infrastructure is what you were trying to get out of in the first place.

There are some other issues that need to be factored in when it comes to in-house private clouds. Managing the IT infrastructure adds to your operational expense. Second, scaling the in-house private cloud to accommodate business expansion in terms of users or business units can be expensive and time-consuming. Third, while many virtualization service providers do provide management tools, the licensing costs of the software and upgrades are a recurring expenditure. And finally, keeping all this IT infrastructure up to date within implementation deadlines is always a challenge.

In contrast, a hosted private cloud can provide all the

cost-benefits of a public cloud and that too on non-shared infrastructure. A hosted private cloud is a dedicated environment that is internally designed, externally hosted, and externally managed. It combines the benefit of controlling the service and architectural design with the advantages of outsourcing. Hosted private clouds allow a company to focus on what they put in their private cloud and how they use it without having to worry on how to implement their private cloud. Think of it as using a utility such as power. An in-house private cloud is like getting your power from a generator. You need to buy the generator, keep it fueled, and keep it in good shape all the time. In contrast, a hosted private cloud is like plugging into a wall socket.

What if you have already invested in an in-house private cloud and are looking to expand it? In that case, a hybrid cloud is an attractive option. Hybrid clouds allow you to leverage your existing investment on in-house infrastructure and seamlessly integrate it with a hosted private cloud managed by a service provider. This allows you to retain complete control over mission critical applications on the in-house cloud, and connect them with the rest of the compute infrastructure on the hosted cloud.

## The governance perspective

Though ITSM and ITIL form the basis for governance in cloud computing, many other tools and technologies contribute to play a crucial role.

When it comes to hosted private clouds, the SLA becomes critical to set expectations with the service provider. The SLA should specify the resources (computing, storage, bandwidth) that the provider would commit to your private cloud. It should specify the expected level of availability, communication protocol for service interruptions, and financial compensation for outages. The SLA should include commitments towards normal monitoring such as usage and performance reports, and security and compliance reporting.

In an in-house private cloud, ITSM and ITIL become even more important since you (the company) are responsible for managing and monitoring the cloud infrastructure and performance. This is an involved task and includes managing various technologies - core cloud management software to monitor everything from virtualization to hardware and software performance; a cloud orchestration platform to facilitate metering and billing and to automate provisioning of pooled resources to users on demand; change management database for tracking the creation and deletion of virtual machines; a self-service portal where services (infrastructure, platform, software) can be chosen; and a chargeback system to meter consumption of cloud resources.

For most companies, managing an in-house private

cloud is just too much trouble. In fact, it goes against the whole concept of cloud computing where the promise is that someone else manages the IT and you manage your business. In such cases, a hosted private cloud is the obvious answer. In a few cases, the company may decide to go in for a hybrid cloud comprising a private and a public cloud to retain control of their most critical IT infrastructure, applications, and data. In that case, and perhaps only in that case, does an in-house private cloud make sense.