Cloud Operations: A New Model for Service Delivery

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Introduction

Cloud computing has quickly moved from being a concept to being deployed and used at a growing number of companies. In a recent VMware/IDG study, 20 percent of respondents reported that they are beyond the planning and piloting stages with cloud technology, and are now operating department- or enterprise-wide clouds in support of the business.[1] And that number of companies is growing.

As a result, the focus at many companies has shifted from how to implement a cloud environment to how to operate it effectively—identifying which approaches work well and which ones do not, and how to achieve results. And companies are clearly expecting results. In the VMware/IDG study, 49 percent of the companies operating cloud environments said they are using them to advance IT or business transformation initiatives.

To understand this emerging phase in the evolution of cloud computing, VMware conducted further research into how companies are using the private cloud environment in their businesses. This study—the VMware Cloud Operations and Usage Research—looked at organizations in a range of industries, from retail and high tech to pharmaceuticals and aerospace, that had gained significant real-world experience with operating a private cloud. On average, they had had been using the technology for more than a year, with some organizations having several years of experience.

In interviews with executives from these companies, a pattern quickly emerged: To get the most out of their cloud environments, these companies reinvented their service delivery models—the organization, processes, roles and policies used to provide IT service to the business. What's more, although the research included a variety of industries and use cases, most companies in the study had developed the same basic model.

The reason, respondents said, is that this model works. In everyday operations, it is helping them meet some of the key challenges they have encountered with cloud computing. And it is enabling IT to streamline cloud operations, respond with greater speed and flexibility and use the private cloud to deliver value to the business.

About the Research

The VMware Cloud Operations and Usage Research study included 12 organizations from a range of industries that had significant experience with cloud operations. A third-party organization conducted in-depth interviews with individuals in those organizations. The respondents held titles such as chief technology officer, director of IT infrastructure, head of datacenter operations and chief VM architect, among others. Those organizations were using cloud computing for various use cases, including:

• Revenue-generating product development and test

• Homegrown application development and test

• IT deployment of packaged software and test

• Customer support

• IT help desk

• Academic research

• Sales demos

In terms of experience, the organizations had been using cloud computing for varying time periods up to five years, with the average being about 13 months. The number of cloud users ranged from 100 to 8,000; organizations at the high end of that range were using a private hosted cloud model. The number of virtual machines in use ranged up to 5,000, but most organizations had between 300 and 500. The maximum number of images in use was 300, with the average being about 50.

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1 VMware-commisioned study conducted by IDG and CIO Customer Solutions Group, 2012.

New Challenges, Old Models

When VMware researchers asked IT professionals what goals they had for cloud computing, their answers were notably similar: They wanted to make it easier for the business to leverage IT resources. They wanted IT to be more responsive to the needs of internal customers. They wanted to make IT less of a barrier to business initiatives. In short, they wanted to increase the overall value IT delivers to the business.

However, as companies have gained experience with managing their cloud environments, they have run into three significant challenges. The first of these, they told researchers, is the need to intimately understand and closely manage the interrelationships across IT silos, including server, storage and network domains. This is critical because cloud computing requires a more integrated, holistic approach than other environments. IT groups today typically lack the organizational structure and processes needed to support such an approach.

Companies have also encountered strong resistance to change—some from application developers in the business units who worry about the cloud limiting their input into technology-procurement decisions, and some from IT staff who worry about job security with the cloud-based automation of day-to-day tasks.

Finally, many companies struggle to keep up with the exponential increases in demand for cloud computing that are coming from their internal customers. This demand is the direct result of the technology's success in the organization; as users become familiar with it, they become advocates who encourage their colleagues to adopt it.

The Traditional IT Service Delivery Model

These companies have realized that traditional IT service delivery models do not address these challenges—and in some ways, they even exacerbate them. With those traditional models, the IT organization provides the business with a complete technology platform that includes infrastructure, middleware, tools, applications and so forth. To enable this broad platform, IT is typically organized into various teams that focus on their respective components of the platform—creating the silos that hinder effective cross-domain integration.

To deliver the platform to the business, the traditional model may use a middleman, often called an IT business analyst, to work between IT and the business. This role may report into IT or into the line of business; either way, this person is responsible for representing the consolidated needs of the business users and working with IT to make sure those needs are correctly translated and built into a solution that meets users' needs. But this can be a tough job, because translating business needs into IT requirements is not easy, those business requirements are constantly changing, and the middleman is often competing for the attention of a time-constrained IT organization. Thus, the middleman often becomes something of a bottleneck in the process.

Another common approach used in traditional models requires no middleman. Instead, business users go directly to IT with their needs. IT typically uses complicated, rigorous processes to understand and prioritize the resulting flood of individual requests. This creates a great deal of low value-added work for IT while limiting its ability to respond quickly to the business.

With both of these approaches to linking IT and the business, the result is often delays and difficulty in providing the business with needed solutions. Business users are frustrated by not getting what they want quickly; IT organizations are frustrated by mounting workloads and the struggle to keep up with changing business requirements. In this environment, people want as much control over their IT systems as possible in order to do (and keep) their jobs, and they resist any changes that might threaten this control. It is a model where complexity, and the time and effort needed to manage the interfaces between the business and IT, make it hard to keep up with growing demand from the business.

A clear symptom of the problem is the increasing presence of "rogue" users. These are either technically savvy users or business users who go around IT to acquire or develop their own IT capabilities. Technically savvy users will often purchase equipment and build environments on their own, while business users in general are likely to buy third-party offerings such as Amazon or Dropbox cloud services. Too often, then, IT loses control over significant portions of the company's technology landscape, which increases complexity, costs and security risks.

These issues have been troubling enough with traditional computing, and they are only more so with the advent of the cloud. As a result, they have been the driving force behind the development of a new service delivery model for private cloud environments that streamlines the interactions between IT and the business.
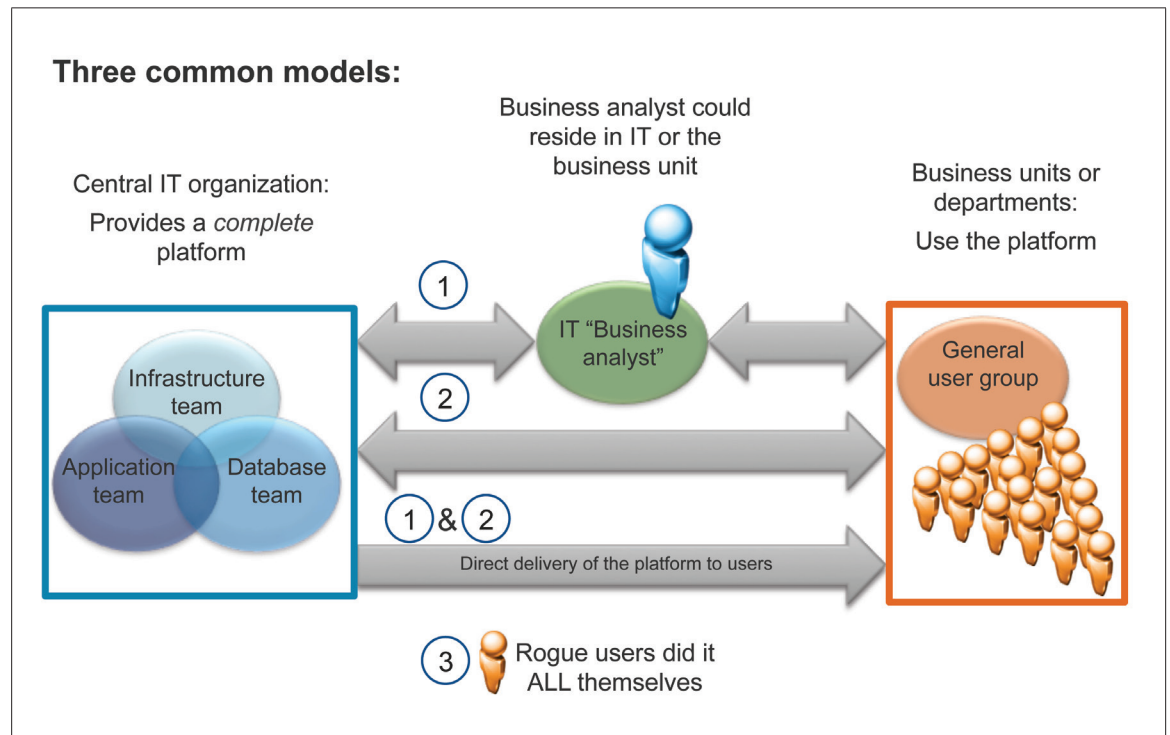

Figure 1. The "traditional" service delivery model: **before the cloud**

Rethinking the Service Delivery Model

All the companies in the research study developed a new IT service delivery model that redefined several basic IT roles and the division of work between IT and the business units. Although the specific organization structure varied from company to company, the new model encompassed three primary teams and/or roles:

• An IT "cloud team"

• Super Users

• General user body

The Cloud Team

The heart of this model is the cloud team, a small group of five or six people who are part of the central IT organization, and act as a center of excellence for cloud skills and knowledge. (These teams go by various names at their respective companies; the term "cloud team" was applied by VMware researchers.) In the research, it was clear that companies look for "smart" IT professionals to be on these teams—people who are highly skilled and experienced, with cross-IT domain experience. This competence level is regarded as key because of the challenges and complexities involved in working across IT silos in a cloud environment. Team members are chosen to ensure that different areas of IT, such as servers, storage, security and networks, are represented. At the same time, companies look for people whose experience and knowledge extend beyond their core domain. A team member who specializes in servers, for example, must also have experience in other areas, such as networking and/or storage, as well.

The cloud team's primary responsibility is to deliver Infrastructure as a Service (IaaS) to the business, rather than a complete solution that also includes middleware, applications and tools—a significant departure from the traditional IT role. The team creates virtual data centers for business users and constructs the service catalogs and basic images—comprised of operating system, networking, storage and, at times, security resources—to be made available to the business. It also manages computing capacity for user groups, and ensures that the cloud infrastructure is available and performance meets the business units' desired service levels.

The cloud team is also responsible for coordinating cloud-related work across silos and managing the interrelationships between the various IT teams and technologies involved—which makes the cross-discipline makeup of the team critical.

Super Users

The IaaS images created by the cloud team are delivered to a specific type of user in the business—the Super Users. (This name, too, was assigned by VMware researchers and not by the respondents themselves. In practice, these Super Users have titles such as "org admins" or "VDC admins.") Super Users are users in the business who have an interest in and knowledge of technology, are able to understand it quickly, and are in position to help their business unit peers use cloud computing resources. Thus, in a group of developers, a Super User could be a lead developer who is responsible for helping other developers use cloud images and templates to complete their work assignments. There may be one Super User or a small team of Super Users, depending on the organization, and Super Users may be located at the business unit level or within a specific department, such as the product development team.

It is important to note that the Super User is not the same as the traditional business analyst/middleman. Super Users are actual end users and part of the business, not just separate "translators" of business needs for IT. But they also have the technical skills needed to manage and work with the cloud images. In that sense, they have a foot in both the IT and business worlds.

Super Users enhance the infrastructure-only images provided by the cloud team into Platform as a Service (PaaS) images that their business unit and/or department can use to conduct its daily work activities. Super Users basically add whatever tools are needed by the business team. For developers, this might mean development frameworks, web services, data services and so forth. For customer support operations, it might be application software and messaging services.

Once they create these platform images, Super Users place them back into the original services catalog created by the cloud team, or they create a new services catalog. In either case, it is then their job to maintain these platform images, stay abreast of the requirements of their business unit or department and make changes and improvements as needed.

Super Users are also responsible for allocating capacity within their business group—an activity that is the responsibility of IT under the traditional model. In the new model, IT simply gives the Super User certain parameters for capacity, and the Super User then allocates resources within those parameters, determining how many virtual machines to allocate to a given platform, how many images users can access, how long they can access them, and so forth.

The General User Body

This group is made up of the consumers of the PaaS images built by the Super Users. They are the people doing the work of the company—product developers, customer service engineers, etc.—who reside in the business unit and use the platform images to perform their daily jobs. These general users may self-provision images from service catalogs, or they may rely on Super Users to do it for them.

In the new service delivery model, these users no longer interact with IT. Instead, they work with the Super Users to define requirements for the platform, providing more business input for the process and keeping Supers Users up to date on changing business needs. With this approach, both parties are "speaking the language of the business," helping to streamline the translation of business needs into platform requirements—while at the same time reducing the flood of requests flowing into IT.
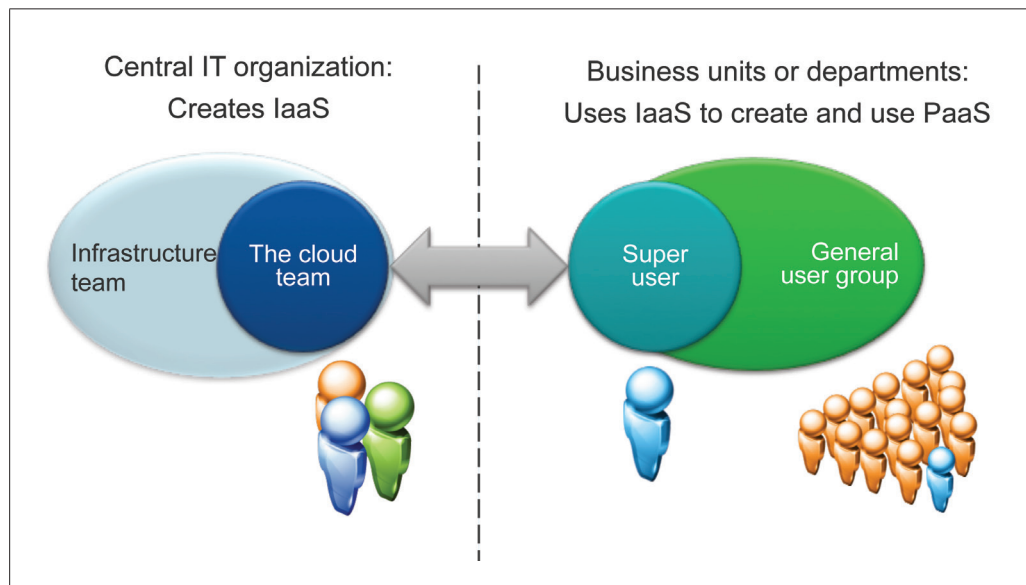

Figure 1. The Cloud Service Delivery Model

Addressing the Three Key Challenges

This new service delivery model helps companies overcome the three key challenges they face with cloud computing.

To strengthen the coordination and management of work across IT silos, the dedicated, multidiscipline cloud team acts as a focal point for approaching the cloud infrastructure as an integrative whole, rather than separate IT domains. At the same time, having Super Users complete the platforms with additional software and tools helps reduce the involvement of some IT teams, simplifying the process.

To help overcome resistance to change, the new model addresses users' need for control and job security. Respondents made it clear that IT professionals, once they have experience with the new model, are ready to keep moving forward with the cloud environment. They no longer have to contend with a flood of user requests or the complexities of changing business requirements. After using and operating the cloud, their fear of job loss diminishes because the cloud still requires active management and creates demands—in areas where IT staff has core competencies and feels capable and confident. What's more, the shift to cloud computing opens up new career paths for IT professionals, which further reinforces their sense of job security.

Meanwhile, business users who traditionally worried about losing control over technology choices now find that they actually have more control. Super Users have choices when it comes to creating PaaS images, and general users are now working with solutions tailored by Super Users, with general user input. And respondents report that once business users experience the new approach, those users are relieved that they are no longer involved in hardware and software procurement or vendor management, which used to take up a great deal of time for the business.

Overall, the new model means that both IT and the business no longer have to do tasks that they felt were a drag on their time and attention—and that helps create a positive attitude toward change.

The most important factor in overcoming resistance to change, however, has been the value achieved by the shift to the cloud environment, respondents said. The new model positions IT to achieve its key goal of maximizing the value it provides to the business. Now, IT can enable the business, without having to "know" the business. Part of the value IT delivers is greater speed: Survey participants reported that general users are able to access the technology they need in a matter of minutes or hours versus days and months, and they have seen faster response to change requests. And part of it is greater flexibility and control, as IT gives the business the ability to choose and shape the technology tools to meet its needs.

Finally, the new model helps companies keep pace with the growing demand driven by the success of cloud computing in their organizations. That's important, respondents said, because they view this growing demand as a positive development, and don't want to stifle it. The new model provides a simple process for linking IT and the business, with clearly defined roles for both, that allows each group to focus on what it does best. The model enables the business to be responsible for a solution's success among users, while IT can control the underlying infrastructure and manage security and costs. Overall, it minimizes delays, overlap in responsibilities and back-and-forth interactions, making it easier to extend cloud computing to more and more users.

Asking the Right Questions

As more companies have gained experience with their private cloud environments, the conversation has shifted from general questions about implementation and deployment to specific questions about operating effectively. In managing their cloud environments, companies should ask:

• Have we designed roles and responsibilities to address the challenges of change management, control and technical complexities? Do we have the right skills in place to ensure performance meets commitments?

• Can a dedicated cloud team help us simplify operations and management of the cloud? How can we justify the creation of such a team? What skills are needed on the team?

• Can we simplify operations by embracing the Super User model? Should we consider designating Super Users and delineating responsibilities between Infrastructure as a Service and Platform as a Service activities?

• Who in our organization would be good Super Users? Who might become role models?

• What process and policies should we establish to govern growth while encouraging adoption and providing value?

• How do we manage the interactions between the cloud team, super users and the general user group? How much of that process can we automate to save time and money? How much can we automate to maintain control and further simplify processes?

Continuing the Journey

This new service delivery model was developed through companies' real-world experience with deploying and operating cloud computing, and it offers valuable guidance for companies pursuing their own private cloud initiatives. But respondents made it clear that this is not the end of the story. Cloud computing is still a relatively new business tool, and it will continue to evolve—and the right approaches and best practices needed to maximize operations will continue to evolve along with it.

While this service model is proving to be effective in meeting today's challenges, a number of respondents noted that over time, new challenges and opportunities might arise requiring a different approach. For example, some speculated that as the cloud becomes a more widespread, mainstream technology, the dedicated cloud team will no longer be needed—at that point, virtually all of IT would be a cloud team. Others pointed out that the growing scale of cloud computing might eventually require the re-establishment of the traditional IT silos. This would in turn require new approaches to working across silos to ensure the integrated perspective that is needed for the effective management of cloud computing.

The right approach to cloud operations will continue to evolve in the coming years. But the experience of today's cloud operators—and the new service delivery model they have developed—provides a valuable foundation for moving ahead, adapting to new realities and using the cloud to enable the business to succeed.

For more information on the VMware cloud usage research and evolving approaches to cloud operations, visit www.vmware.com/services/cloud-operations-services/