



# Organizing for the Cloud

Providing additional value to the business by optimizing  
the IT operations organization for cloud

VMWARE WHITE PAPER

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## Executive Summary

Cloud computing represents a major opportunity for IT. At the same time it presents challenges. Lines of Business are already by-passing IT and going directly to external cloud providers. Running workloads on external cloud provider infrastructure isn't necessarily a bad thing but to regain control, IT must begin to think and act like a cloud provider. They must become service-driven which has far reaching implications. Moving forward, IT has the opportunity to "one-up" the cloud providers by becoming a Service Broker; making conscious decisions about the best location (internal private cloud versus external public cloud) at which to run workloads based on cost, quality of service, and risk. This allows IT to directly add value to the business in ways they haven't been able to previously. Adding business value doesn't stop there. IT also has the opportunity to become a Strategic Partner to the business by providing innovation that can drive business growth and directly impact the bottom line.

But how? To fully take advantage of cloud computing capabilities, IT must transform itself. This includes transformation from several perspectives as they relate to cloud: organizational, operational process and supporting tools, business management, and underlying software technology and architecture. When, not if, IT transforms itself it will enable business transformation.

While all of these perspectives need to be taken together in order to transition to a Service Broker and ultimately Strategic Partner, one of the most challenging is the IT organizational transformation. In this paper, we explore the "how" behind successfully transforming the IT organization for cloud. The organization implications of a new Cloud Operating Model are presented as well as a four step implementation roadmap highlighting the key activities and decisions needed along the way. Finally, we highlight key success factors that help you determine your progress during the journey to business transformation through IT transformation from an organizational perspective.

## Context

### Traditional Versus Cloud View of the IT Operations Organization

The capabilities provided by cloud computing present challenges to IT Operations but it also represents a major opportunity. By definition, cloud computing provides on-demand service delivery—and therein lies the opportunity. As a result, the IT operations organization has to become service-driven. Becoming service-driven has far-reaching implications that can't be supported by the traditional view of the IT operations organization (Figure 1).

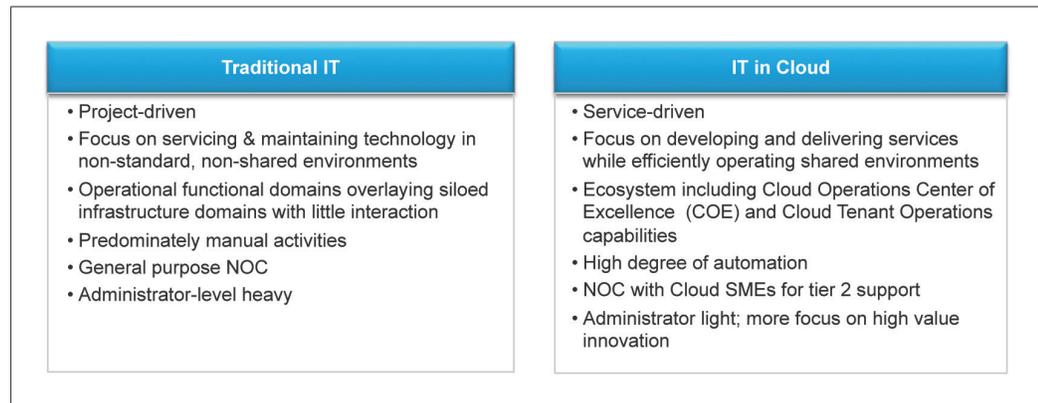


Figure 1. Traditional versus cloud IT operations organization

### Cloud IT Operations Organization and the Cloud Capability Model

#### Levels of the Cloud Capability Model

In working with global enterprises and service providers, VMware has found distinct patterns of IT organizations and their capabilities as they move to embrace cloud computing. VMware has used this insight to establish a Cloud Capability Model, helping IT identify opportunities for growth and evolution of technologies and architectures, organizational models, operational processes and financial measures. This Cloud Capability Model provides a path for IT to take greater advantage of existing systems, teams and resources, embrace third party cloud assets and providers, and extend IT standards for security, governance and performance into this new model for IT. Across the Cloud Capability Model, customers are able to break free from a situation where resources are exhausted by simply maintaining existing systems to an environment where IT is a clear strategic business partner, delivering new services and capabilities aligned to and in support of business goals.

Like the other key vectors (IT Business Management, Processes and Control, Software Technology and Architecture) of the cloud, the IT operations organization evolves along the capability model (Figure 2).

Standardize	Service Broker	Strategic Partner
<ul style="list-style-type: none"> <li>• <b>Description</b></li> <li>• Little to no change from Business as Usual for the IT operations organization</li> <li>• Some specialized roles for operating a virtualized environment</li> <li>• General recognition that a new operational and organizational approach is needed</li> <li>• <b>Example</b></li> <li>• IT is operating a virtualized environment with administrators from the Windows team</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Description</b></li> <li>• Cloud Infrastructure Ops COE is established and staffed</li> <li>• Cloud Tenant Ops is established and staffed</li> <li>• Ecosystem "champions" are identified with regular interaction cadence in place</li> <li>• <b>Example</b></li> <li>• Cloud Tenant Ops is actively designing and developing services based on demand as well as managing business unit environments in the Cloud</li> <li>• Cloud Infrastructure Ops COE is providing proactive Capacity Management based on historical trends and forward looking demand</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Description</b></li> <li>• Cloud Infrastructure Ops COE manages end-to-end all non-legacy infrastructure elements across the three layers of the Cloud stack, regardless of the physical location.</li> <li>• Cloud Infrastructure Ops COE provides operational functional domain capabilities thru instrumented, intelligent tools with automated remediation</li> <li>• <b>Example</b></li> <li>• Cloud Infrastructure Ops COE resources are up skilled to focus more on innovation and driving business value through Cloud</li> <li>• Cloud Infrastructure Ops COE is providing Cloud infrastructure in their private Cloud, a public Cloud, or a hybrid thereof based on the most cost effective placement of a service.</li> </ul>

**Figure 2.** Cloud IT operations organization implications across the Cloud Capability Model

At the standardization level, the IT operations organization is structured as it was for operating a physical environment. Some specialized skills may be in place for operating the virtualized environment. These skillsets are also being applied to early cloud initiatives such as on-demand self-service of development and test environments but are considered secondary skills within the existing Windows or Linux team. The key capability characteristic at this level is the recognition that the IT operations organizational structure, skillset mix, and the in-place processes must change. IT leaders realize the organization must become service driven to take full advantage of cloud computing.

At the Service Broker level, the organization has acted on this realization. They've implemented a Cloud Infrastructure Operations Center of Excellence (COE) to consolidate the appropriate skillsets and have created the necessary ecosystem to affect an integrated, cross-functional approach to cloud infrastructure operations. In addition, Cloud Tenant Operations roles have been established to drive:

- Customer relationship management
- Service governance and lifecycle management
- Service-related design, development, and release
- Management of tenant deployed services

By the Strategic Partner level, the IT operations organization has realized the benefits of intelligent tool-driven optimization of operational processes. In doing so, they can now free-up resources to focus on innovation using IT to create differentiating business value. This completes the transition to enable business transformation through IT transformation for cloud.

This white paper focuses on the first major step in the journey; IT operations organizational considerations at the Service Broker level.

## Business Impact

IT operations organizational changes at the Service Broker level enable companies to capture the efficiency, agility, and reliability cloud promises. This is made possible by making organizational adjustments to address two primary characteristics of the IT operations organization at this level: becoming service-driven and transitioning from a reactive role to a more proactive position within the IT organization. As described in the cloud IT operations and Cloud Capability Model section above, this is accomplished primarily through the establishment of Cloud Tenant Operations and a Cloud IT Operations COE. Cloud Tenant Operations is the “face” of service-orientation by providing customer relationship management and being responsible for and streamlining the service lifecycle. The Cloud Infrastructure Operations COE fosters proactivity through an integrated, cross-functional approach to cloud infrastructure operations coupled with optimizing and automating operational processes for cloud as well as deploying increasingly intelligent and purpose-built cloud management tools.

### Efficiency

#### Enhanced cloud operations effectiveness

Enhanced cloud operations effectiveness can be realized by both the Cloud Infrastructure Operations COE and Cloud Tenant Operations. As cloud-specific infrastructure and service operational management tools advance they, combined with remediation automation capabilities, will reduce the need for dedicated operations roles while changing the skillsets required. These roles will evolve to more of deep tool knowledge and its application to an operational functional area. For example, in the case of cloud infrastructure, instead of having an Availability Management role, Availability Management capabilities will be provided by a stronger focus on skills capable of instantiating proactive Availability monitoring best practices into purpose-built, intelligent toolsets.

The same would be true at the service operations level. For example, instead of having a service Performance Management role, the skills in Cloud Tenant Operations would instantiate end-to-end, proactive Performance Management best practices into its service management tools.

The end result of both can be as much as a 14 percent improvement in overall IT labor efficiency.

#### Better infrastructure decision making

Establishing a Cloud Infrastructure Operations COE along with its ecosystem fosters better informed and integrated cloud infrastructure decision making. Having a single focal point for collective Cloud infrastructure expertise reduces the degree of interactions to make cloud infrastructure-specific decisions. The ecosystem of related functional groups (physical networking, storage, and security for example) with a “champion” for each drives the level of cross-functional interactions needed to improve overall infrastructure decisions related to the cloud infrastructure..

#### Increased focus on higher value initiatives

The increased focus on higher degrees of automation and intelligent toolset instrumentation, with their resulting gains in IT labor efficiency, enables IT cloud operations to begin freeing up resources from rudimentary tasks to innovation initiatives that add value to the business. This, of course, requires an enhanced skillset but in addition to adding business value provides a career path to the initial Cloud Infrastructure Operations COE and Cloud Tenant Operations members. In turn, this not only reduces attrition but makes participation in both the Cloud Infrastructure Operations COE and Cloud Tenant Operations an aspiration for others in the company. Doing so, helps assuage the cultural challenges that can arise from an increased focus on cloud computing.

## Agility

### **Faster incident resolution—when needed**

As mentioned, one of the key characteristics at the Service Broker level is proactivity. One of the goals behind effective proactivity is to reduce the number of incidents in a cloud environment through proactive monitoring and remediation. When realized and done well, there should be minimal need for faster incident resolution as the cause of a potential incident is detected and corrected before generating said incident. Until this is fully realized though, establishing a Cloud Infrastructure Operations COE as well as Tenant Operations, along with their ecosystems, provides the concentrated expertise and channels of communication needed to affect faster, cloud-related incident resolution for Cloud infrastructure and services respectively.

### **Faster response to business needs**

Cloud Tenant Operations provides the opportunity to streamline the service definition to service delivery process. This directly impacts the speed with which IT cloud operations can respond to changing business needs. Customer relationship managers can foresee business needs through their frequent interaction with the Line of Business (LOB) and quickly relay those requirements back to service governance for definition and analysis. Taking an agile approach to service design and development coupled with blueprint- and policy-based development methodology will greatly decrease the time to develop while increasing quality. Automating the release process and minimizing the impact of change management (if needed at all in some circumstances) all add up to a faster response to business needs.

## Reliability

### **Improved infrastructure deployment coordination**

Having a centralized, dedicated Cloud Infrastructure Operations COE and associated ecosystem breaks down the traditional walls between silos. The resulting close and regular interaction facilitates improved coordination of infrastructure component deployment. This makes for smoother running cloud infrastructure-related projects with a greatly increased probability of both success and on-time delivery.

### **More tightly integrated design decisions**

As for Cloud infrastructure deployment coordination, having a Cloud Infrastructure Operations COE regularly and frequently interacting with its ecosystem of related functional groups creates economies of scale and a holistic understanding of the infrastructure impacting the cloud environment. This also facilitates building reliability in at the architecture and design phases.

### **Improved ability to meet Service Level Agreements (SLAs)**

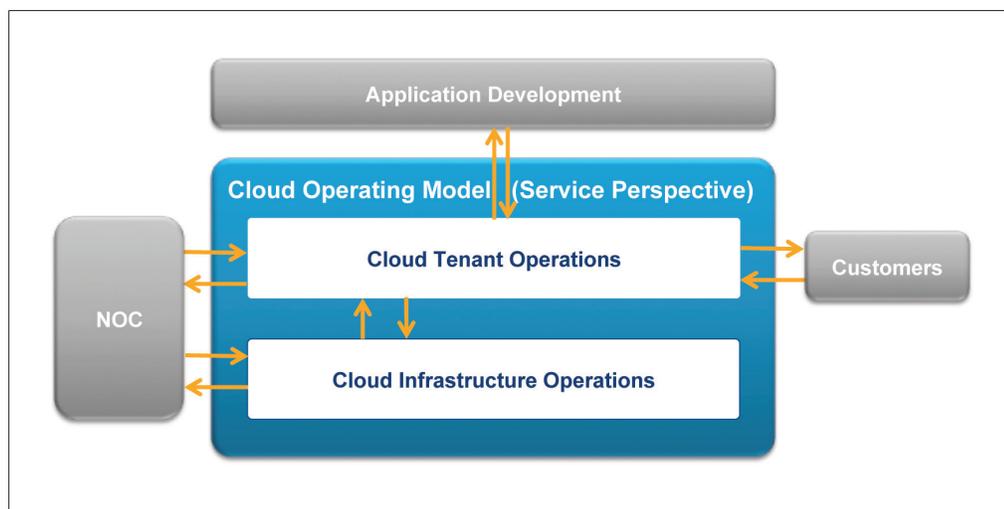
The Cloud Infrastructure Operations COE proactively manages the infrastructure while the Cloud Tenant Operations proactively manages at the service level as well as the customer's virtual environment within the cloud. This end-to-end proactive management leads to more and more potential incident creating situations being detected and remediated before they occur. Doing so dramatically lowers the occurrence of service, and ultimately customer, impacting incidents thereby allowing cloud operations to more easily meet their Operating Level Agreements (OLAs). Meeting OLAs directly supports successfully meeting the service SLAs with customers.

## Design and Implementation Considerations

Transforming the IT operations organization must be undertaken in a step-wise, evolutionary manner. The approach taken will vary depending on the size of the organization, its current structure, and the skillsets it currently contains. This section focuses on the design (charter, roles, and responsibilities) and implementation considerations as well as some of the big challenges IT may face along the way.

### Overview

The cloud operating model, from a service oriented perspective, is focused around two organizing concepts, Cloud Tenant Operations and Cloud Infrastructure Operations, and their relationships with Application Development, the Network Operations Center (NOC), and Customers (Figure 3).



**Figure 3.** Cloud Operating Model

Application Development, just as in a non-cloud environment, is responsible for designing, developing, integrating, and testing company bespoke applications and databases as well integrating and testing third-party applications. While it fills the same role in a cloud environment, what changes is the best practice guideline of embracing an agile approach to development coupled with modern, platform-as-a-service-based tools, as well as its tighter relationship to the cloud operating model; specifically Cloud Tenant Operations. This relationship will be explored later in the section entitled Organizational Interactions below. There can be multiple Application Development teams interacting with Cloud Tenant Operations.

For cloud, the best practice guideline for the NOC is to become a center for proactive cloud monitoring, event management, and remediation. From an organizational perspective this results in the requirement to add cloud-specific subject matter experts and to begin migrating tier two support responsibilities to the NOC. Instrumenting the NOC with purpose-built cloud management tools is critical to achieving this. Again, this relationship will be explored later in the section entitled Organizational Interactions below.

Cloud Tenant Operations is responsible for managing end-customer organization relationships as well as governing, developing, releasing, and operationally managing the services offered on the cloud infrastructure. Service offerings may include applications provided by an Application Development team. Cloud Tenant Operations is also responsible for managing the customer's virtual environment within the cloud.

Cloud Infrastructure Operations is responsible for architecting, engineering, deploying, and operationally managing the underlying logical and physical cloud computing infrastructure.

### Cloud Infrastructure Operations

Cloud Infrastructure Operations is responsible for architecture, engineering, deploying, and operating the underlying cloud infrastructure. For example, in VMware terms the underlying Cloud infrastructure is defined as VMware vCloud Director, its supporting components such as VMware vShield and VMware vCenter Chargeback Manager, as well as VMware vSphere and the physical infrastructure.

Operating the cloud infrastructure includes functional operational areas most impacted by or impactful on cloud. They are divided into these main categories:

- Infrastructure Architecture, Engineering, and Deployment
- Proactive Operations Management
- Integration and Automation Management

This level of operations is not restricted to just the cloud infrastructure as it applies to cloud service operations as well and, in this context, will be discussed further in the section on Cloud Tenant Operations.

From an organizational perspective, Cloud Infrastructure Operations benefits considerably by reorganizing. Traditional infrastructure operations consists of operational functional domains overlaying siloed infrastructure domains with very little cross-domain interaction unless required for a particular project or deployment.

#### Cloud Infrastructure Operations Center of Excellence

The Cloud Infrastructure Operations COE model defines cross-domain cloud infrastructure operations management accountability and responsibility within team roles across an organization. These team roles enable an organization to consistently measure, account for, and improve the effectiveness of its cloud infrastructure operations management.

The Cloud Infrastructure Operations COE is a dedicated team of cloud infrastructure operations specialists and an ecosystem of related functional groups which, taken together, form a Cloud Infrastructure Operations COE ecosystem (Figure 4). It serves as the focal point for all decisions and actions involving cloud infrastructure operations.

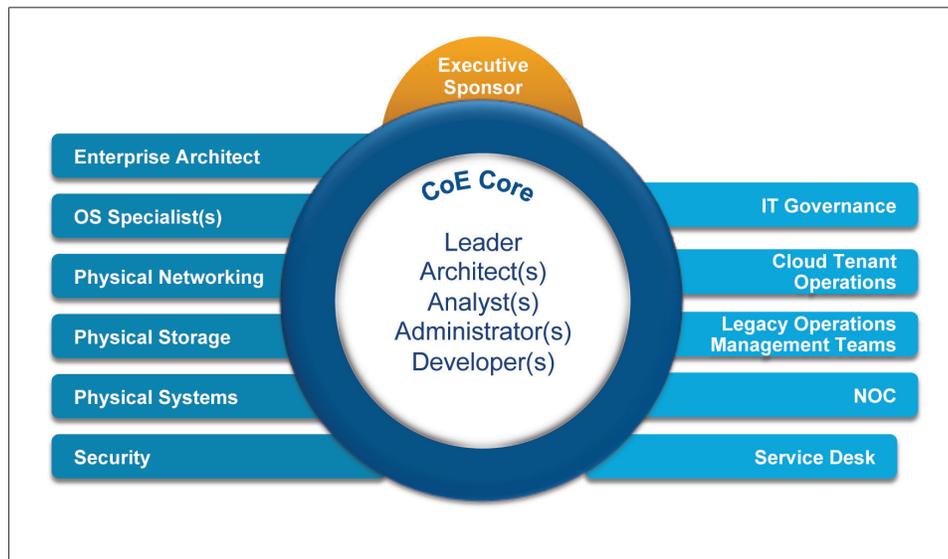


Figure 4. Cloud Infrastructure Operations Center of Excellence and ecosystem

As shown above, the Cloud Infrastructure Operations COE ecosystem includes the Executive Sponsor, IT Governance, Cloud Tenant Operations, Traditional Operations Management Teams, and the Service Desk. It also includes the other core IT teams: Enterprise Architect, OS Specialists, Physical Infrastructure teams (network, storage, systems), and the Security team. The organizational structure of Enterprise Architecture, OS Specialists, Physical Infrastructure, and Security are not addressed in this white paper.

The charter of the Cloud Infrastructure Operations COE is to:

Continually develop and implement innovative ways to architect, engineer, deploy, and proactively operate the Cloud Infrastructure in the most cost effective way possible while satisfying the Operating Level Agreements needed to provide the Quality of Service established for the services offered in the cloud environment.

The primary roles and responsibilities for members of the Cloud Infrastructure Operations COE follow. Cloud Infrastructure refers to both internally provided Cloud infrastructure or that provided by an external Cloud Provider.

### **Leader**

- Responsible for overall leadership of Cloud Infrastructure Operations COE
  - Has a direct line of communication to the Executive Sponsor
  - Is responsible for executing the cloud strategy as defined by the Executive Sponsor
  - Provides leadership and guidance to Cloud Infrastructure Operations COE members
- Responsible for overall services offered by Cloud Infrastructure Operations COE
  - Works with Cloud Tenant Operations regarding the planned cloud-based service offering portfolio as well as any portfolio changes
  - Actively promotes awareness of the impact the cloud infrastructure has on service offering and service level support and delivery
- Responsible for overall cloud infrastructure
  - Is responsible and accountable for making sure that the cloud infrastructure can support and continue to support the cloud-based service offerings and service levels
  - Coordinates and assists with planning cloud infrastructure initiatives
  - Facilitates development and maintenance of cloud infrastructure capacity forecasts
  - Manages the acquisition and installation of cloud infrastructure components
- Responsible for overall communications with other groups
  - Facilitates integration of the cloud infrastructure into existing, traditional IT operations management processes as needed, for example change management
  - Provides guidance to change management for changes related to the cloud infrastructure; may authorize low risk, low impact changes to the cloud infrastructure; lobbies on behalf of the Cloud Infrastructure Operations COE for pre-approved changes
  - Maintains management level relationships with the Cloud Infrastructure Operations COE ecosystem teams
  - Is involved in managing vendor relationships for cloud infrastructure components
  - Is involved in managing provider relationships with external cloud providers

### Architect

- Responsible for setting overall architectural standards for the Cloud Infrastructure Operations COE
  - Responsible for development and maintenance of cloud infrastructure architecture and design documents and blueprints
  - Responsible for creation and maintenance of the cloud infrastructure architecture roadmap
  - Works with enterprise architects to make sure that the cloud infrastructure architecture is aligned with company architectural standards and strategies
  - Develops and maintains operational guidelines for the maintenance and support of the cloud infrastructure
  - Develops and maintains the availability policy for the cloud infrastructure consistent with OLA requirements
- Responsible for applying architectural standards within the Cloud Infrastructure Operations COE
  - Responsible for including operational considerations in cloud infrastructure architecture and design
  - Works closely with storage and network groups to architect and design Cloud infrastructure extensions
  - Responsible for architecting and designing the Cloud layer in support of the planned Cloud-based service offering portfolio and any portfolio changes
  - Responsible for working with the IT Security team to make sure any architecture or design decisions address security and compliance
  - Responsible for architecting and designing solutions for cloud infrastructure integration points with ecosystem team systems
  - Develops software and hardware upgrade plans
- Acts as tier 3 support for Cloud Infrastructure Operations COE
  - Provides subject matter expertise to support build, configuration, and validation processes
  - Mentors and provides subject matter expertise to Cloud Center of Excellence core and ecosystem team members
  - Assists with tier 3 support to resolve issues related to cloud infrastructure

### Analyst

- Capacity
  - Responsible for the development and maintenance of the cloud infrastructure capacity forecast
  - Responsible for the day-to-day capacity and resource management of the cloud infrastructure
  - Responsible for working with the Tenants Operations team to understand the future cloud service demand forecast
  - Initiates requests for new cloud infrastructure components
- Performance
  - Responsible for tracking, analyzing, and reporting cloud infrastructure performance, usage, and other operational analytics
  - Assists with tier 3 support for issues related to cloud infrastructure capacity and performance.
- Configuration / Compliance
  - Works with the IT Security team to make sure that the cloud infrastructure aligns with IT security and compliance policies; assists in developing automated compliance policies
  - Maintains awareness of VMware software patches and their impact on the environment
  - Responsible for maintaining the cloud infrastructure Asset Management data
  - Responsible for validating billing metering data collected for the cloud-based service offerings

- Change
  - Assists with Change Management process as applied to the cloud infrastructure
- Event, Incident, and Problem
  - Actively evaluates events, incidents and problems looking for opportunities to promote to Operators, as well as, automated or interactive workflows to offload from Cloud Infrastructure Operations COE
  - Works with Service Desk or NOC to develop Run Book entries to handle events, tickets, or incidents
  - Works with developers and administrators to implement the cloud infrastructure-impacting workflows to handle events, tickets, and incidents

### **Administrator**

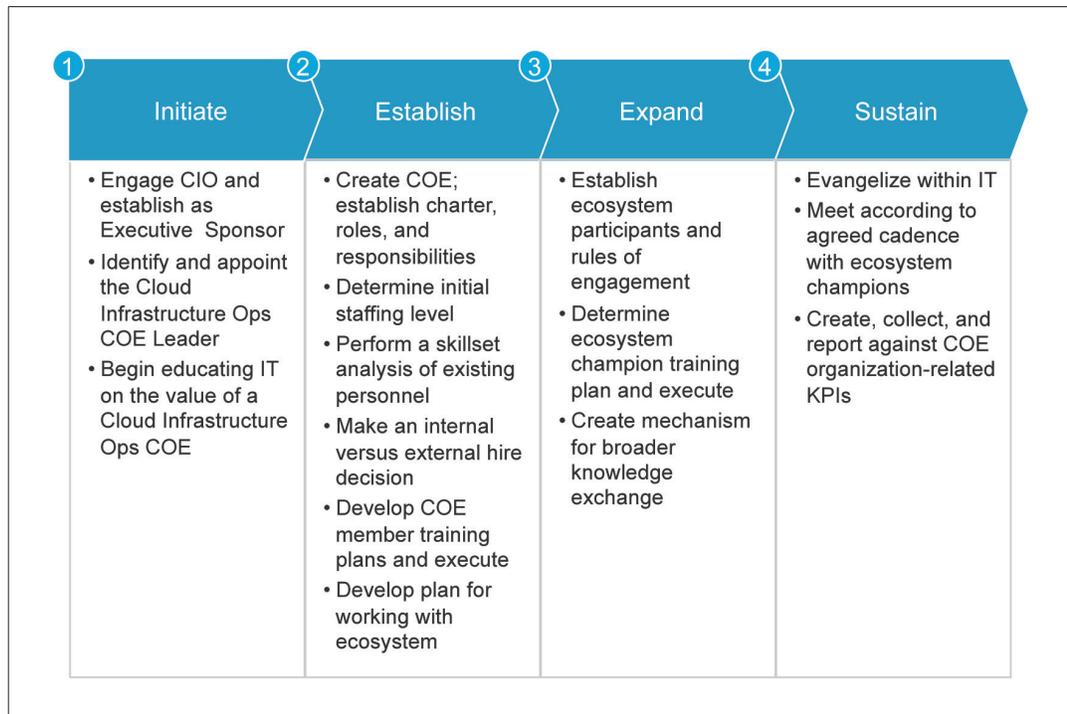
- Responsible for overall cloud infrastructure
  - Determines maintenance windows for the cloud infrastructure consistent with OLA requirements
  - Provides Tier 3 support of the cloud infrastructure
  - Responsible for working with developers and other teams to implement any required cloud integration with external systems
- Deploys and configures cloud infrastructure components
  - Executes the validation plan when deploying new infrastructure components
  - Works with Cloud Center of Excellence ecosystem team members to configure cloud infrastructure components
  - Creates, configures, and administers cloud provider-related components and cloud-specific operational management tools
- Configuration and Compliance
  - Responsible for auditing cloud infrastructure component configuration consistency.
  - Tests and installs cloud infrastructure patches
- Security
  - Develops and maintains cloud infrastructure user access roles
  - Works with the IT Security team to implement cloud-related security and compliance policies
- Event, Incident, and Problem
  - Confirms that the cloud infrastructure is correctly instrumented for monitoring and logging purposes
  - Works with developers to implement the cloud infrastructure-impacting workflows
  - Works with the NOC to develop cloud-specific remediation activities

### **Developer(s)**

- Works with Cloud Infrastructure Operations CoE ecosystem teams to implement any required cloud integration with other applications
- Develops, tests, and deploys cloud-impacting automation workflow
- Evangelizes to and mentors Cloud Infrastructure Operations COE ecosystem teams about cloud integration and automation
- Develops and maintains cloud integration and automation workflow documentation and standards
- Works with Cloud Infrastructure Operations COE member and ecosystem team to establish integration and automation monitoring
- Works with Cloud Infrastructure Operations COE members and ecosystem team to establish automated event or incident remediation wherever possible and appropriate
- Provides tier 3 cloud integration and automation workflow support

## Implementing a Cloud Infrastructure Operations COE

Like any transformation, successfully implementing a Cloud Infrastructure Operations COE requires a clear process. This is especially true in this case because of the potential for a negative perception of the impact it will have on people. This section focuses on the process an organization would follow to prepare for and then implement the Cloud Infrastructure Operations COE. Major steps include: initial setup and buy-in, establishing and staffing, expanding into the ecosystem, and sustaining the momentum (Figure 5).



**Figure 5.** Cloud Infrastructure Operations COE implementation process

### Step 1: Initiate

The following steps outline the activities undertaken to initiate the creation of a Cloud Infrastructure Operations COE. These activities include engaging the executive sponsor, identifying and engaging the Cloud Infrastructure Operations COE Leader early in the process, and educating the IT organization.

#### *Engage CIO and establish as Executive Sponsor*

Involving and gaining the CIO's early sponsorship of the initiative is instrumental to the success of implementing a Cloud Infrastructure Operations COE. The CIO must champion the initiative and be its key sponsor, as the formation of the Cloud Infrastructure Operations COE is critical to a successful cloud implementation and continued operation. Active sponsorship from the CIO conveys the relevance and importance of the initiative. This can be realized by the CIO establishing the messaging around the importance of creating a Cloud Infrastructure Operations COE and socializing that message with other key stakeholders throughout the organization and company as a whole.

#### *Identify and appoint the Cloud Infrastructure Operations COE Leader*

Identifying and appointing the Cloud Infrastructure Operations COE Leader is a key step early in the implementation process. This is important so the Leader is involved as early as possible in all decision making relative to establishing the Cloud Infrastructure Operations COE. By doing so, the Leader will accept ownership from the beginning; building the team and creating the dynamics necessary for a smoothly running and successful team.

***Begin educating IT on the value of a Cloud Infrastructure Operations COE***

Educating IT this early in the process can serve two key purposes. The first is to generate understanding and excitement about the upcoming transition. The second is to begin assuaging fears about job security. As tools advance and more operational functions begin moving into the Cloud Infrastructure Operations COE, this will naturally cause some anxiety among those currently responsible for the operational functions. By beginning the education process early on, these individuals can begin improving their skillsets. The incentive to do so is either they could be good candidates for moving into the Cloud Infrastructure Operations COE over time or they will have more time to focus on higher value activities directly impacting the IT organizations added value to the business. This is also an effective way to manage down legacy IT operations as the cloud grows in importance to the enterprise and expands its footprint; by re-assigning the appropriately skilled resources to the Cloud Infrastructure Operations COE.

**Step 2: Establish**

The following steps outline the activities undertaken to establish the Cloud Infrastructure Operations COE. These activities include defining it specifically within the context of the company, determining initial staffing levels, performing skillset analysis of internal candidates, making hiring decisions, developing individual training plans, and planning for the ecosystem.

***Create COE: establish charter, roles, and responsibilities***

While this white paper offers a Cloud Infrastructure Operations COE charter as well as the responsibilities for each role, these need to be personalized to the company's IT organization. The charter and responsibilities can evolve over time as the cloud continues to mature. Different companies will find themselves at different levels, or between levels, of the Cloud Capability Model. This may impact the initial charter and responsibilities. The initial skillset requirements will be directly impacted by the agreed responsibilities.

***Determine initial staffing levels***

Staffing levels depend on the size and scope of the existing or planned cloud environment as well as its projected rate of growth. Typically a single individual in each role is sufficient initially. This decision is impacted if a cloud environment already exists. Regardless, staffing of each role can be impacted by the following factors:

- The scope, complexity, and projected rate of change of the infrastructure: Architect, Administrator
- The number of underlying, hypervisor-based hosts in the cloud management cluster(s) as well as those hosting customer workloads (resource groups): Administrator
- The initial and projected number, scope, and capabilities of associated cloud software infrastructure components implemented: Administrator
- The initial and projected number, scope, and capabilities of associated cloud management application components implemented: Analyst, Administrator
- The number and nature of the functional groups included in the ecosystem (touch points): Architect, Analyst Administrator
- The number of initial and projected automation initiatives: Architect, Developer
- The projected amount of initial and on-going integration required: Architect, Developer
- Leave time. Full-time staff must have adequate backup for training, holidays, vacation, and sick time: All roles

***Perform skillset analysis of existing personnel***

Based on the responsibilities defined for each role, the cloud software infrastructure components deployed, the cloud management applications deployed, the automation tools utilized, the nature of the integration that must occur, and the functional groups comprising the ecosystem, a skill matrix can be defined for each role. Once skill matrices are created, role-specific job descriptions can be developed. When complete, these can be used to identify internal candidates and assess them against the skill matrices as well as post job requisitions for external candidates.

***Make an internal versus external hire decision***

To be successful, members of the Cloud Infrastructure Operations COE must be dedicated resources. One caveat is the possibility that the Cloud Infrastructure Operations COE could take on responsibility for the virtualized environment as well. A key factor, then, for determining internal candidates is involvement in any existing cloud initiatives and/or involvement in the current virtualized environment. These are clearly prime candidates for the Cloud Infrastructure Operations COE.

As with most positions, it is generally advantageous to transfer or promote from within the company. If internal candidates are identified but they have only been involved on a part time basis with current cloud initiatives or the virtualized environment, and they have other significant responsibilities a couple of options include: backfill their current jobs with new hires or hire consultants to backfill their current jobs while their responsibilities are transitioned to other positions. Another possibility is the existence of internal candidates who lack some of the key skills required but otherwise would be a good fit for a role. In this situation an option is to temporarily hire a consultant with the requisite skills for the Cloud Infrastructure Operations COE role while the internal candidate receives training. An advantage to this approach is that part of that training could be working side by side with the consultant to accelerate their experiential knowledge. Failing all of these scenarios, hiring from outside the company is a fallback position.

***Develop COE member training plans and execute***

Once individuals are hired for the Cloud Infrastructure Operations COE, individual training plans can be developed to fill any gaps in knowledge that might exist. The degree of training required will depend primarily on the cloud software infrastructure components and management tools deployed. While it would be ideal to find someone with the requisite skills for every tool, as with most positions this may be setting too high of an expectation.

***Develop plan for working with ecosystem***

As the activities to staff and train the Cloud Infrastructure Operations COE member's progress, the functional groups to comprise the ecosystem should be identified and the plan for working with them developed. Figure 4 included earlier in the white paper identifies the typical functional groups to include in the ecosystem. There could be others depending on the makeup of a specific IT organization.

The plan for working with the ecosystem should address:

- The goals and objectives of working with a particular functional group.
- The scope of the interaction between the functional group and the Cloud Infrastructure Operations COE. This can be done by identifying functional group "tiers" which defines the required level of involvement at each tier.
- The responsibilities of the functional group "champion." These responsibilities should include being: an active liaison with the Cloud Infrastructure Operations COE, an active evangelist for the cloud back into their team, and being committed to regular meetings with the Cloud Infrastructure Operations COE
- The frequency with which the functional group champion and their counterpart(s) in the Cloud Infrastructure Operations COE should meet and what the typical agenda for the meeting should be.

**Step 3: Expand**

Once the Cloud Infrastructure Operations COE is established and staffed, the next step is to expand to the functional groups identified as part of the ecosystem. These activities include establishing the ecosystem participants and champions as well as the rules of engagement, determining and implementing the specific training plan for each functional group champion, establishing the communication cadence with each, and establishing a mechanism for broader knowledge dissemination within the IT organization.

### *Establish ecosystem participants and rules of engagement*

This step consists of having an initial meeting with each of the identified ecosystem functional groups. The Cloud Infrastructure Operations COE leader, architect, and other members involved in regularly communicating with the functional group typically participate in the initial meeting. Ideally the CIO will have already communicated the importance of the functional groups participation to the success of the cloud initiative. The meeting agenda revolves around the plan developed in Step 2 as it pertains to that functional group as well as to identify that functional group's champion and agree to a cadence for meetings.

### *Determine ecosystem champion training plan and execute*

Once champions are identified for each of the Cloud Infrastructure Operations COE ecosystem functional groups, a training plan specific to each champion can be developed. This is to make sure the champions have the appropriate level of cloud (and possibly virtualization) knowledge necessary to fulfill their responsibilities. The extent of training required will depend on the functional group. For example, a champion for one or more of the legacy operations functional groups may only need an introductory level base of knowledge. A champion for the physical network functional group may need, and desire, a deeper understanding of virtual networking as it applies to cloud. As a result, this training can range from formal training classes, to workshops hosted by members of the Cloud Infrastructure Operations COE or an appropriate third party (e.g. technology provider, system integrator, or consultant).

### *Create mechanism for broader knowledge exchange*

The final activity in this step is to create an on-line mechanism for easy access to the accumulating body of Cloud Infrastructure Operations COE virtualization and cloud-related knowledge, roadmaps, plans, and initiatives. Access to such knowledge is supplied for various reasons such as on-going education, transparency, and evangelizing cloud within IT. Consideration should also be given to making this available outside of IT.

## **Step 4: Sustain**

Now that the Cloud Infrastructure Operations COE has been initiated, established, and expanded, all of the pieces are in place for successful, on-going cloud initiatives and operations. The last step is to execute and sustain momentum. In addition to executing the responsibilities for each role, these activities include evangelizing, working with the ecosystem champions, and measuring progress.

### *Evangelize within IT*

In addition to the on-line mechanism for cloud knowledge exchange, members of the Cloud Infrastructure Operations COE should actively evangelize cloud and what they're doing through brown-bag lunches and continuing education workshops (including bringing in vendors for vendor-specific content). A Cloud Infrastructure Operations COE monthly newsletter as well as internal blogging should also be considered.

### *Meet according to agreed cadence with ecosystem champions*

Based on the original plan developed and meetings held for working with Cloud Infrastructure Operations COE ecosystem functional groups begin the regular cadence of agreed meetings. Again, these will vary by tier. For example, the appropriate member(s) of Cloud Infrastructure Operations COE should meet more frequently with the functional groups such as networking, storage, and security. They would meet less frequently with the IT Governance or legacy operations functional groups.

### *Create, collect, and report against COE organization-related Key Performance Indicators (KPIs)*

Establishing a Cloud Infrastructure Operations COE evolves IT's role and introduces new goals that should be monitored and evaluated. OLAs provide an objective set of metrics to evaluate performance regularly (e.g. service availability, incident support response time). In addition, the Cloud Infrastructure Operations COE should be accountable for efficiency and proactivity targets. These should include, for example: amount of labor to complete processes, incident reduction, and capacity utilization (both under and over), all measured over time to indicate improvement.

### Cloud Tenant Operations

Cloud Tenant Operations is central to governing, developing and providing cloud service offerings. It incorporates Service Governance and Lifecycle Management, Service Design and Development Management, Service Operations, Provisioning Management, and Consumer Management. Services could be deployed to an internal, Private Cloud, to an external cloud provided by a cloud provider, or both in the form of a Hybrid Cloud. Example services can include Infrastructure as a Service (IaaS) including the customer’s Cloud-based virtual environment itself in a multi-tenant Cloud environment, Platform as a Service (PaaS), and Software as a Service (SaaS). Cloud Tenant Operations is depicted in Figure 6.

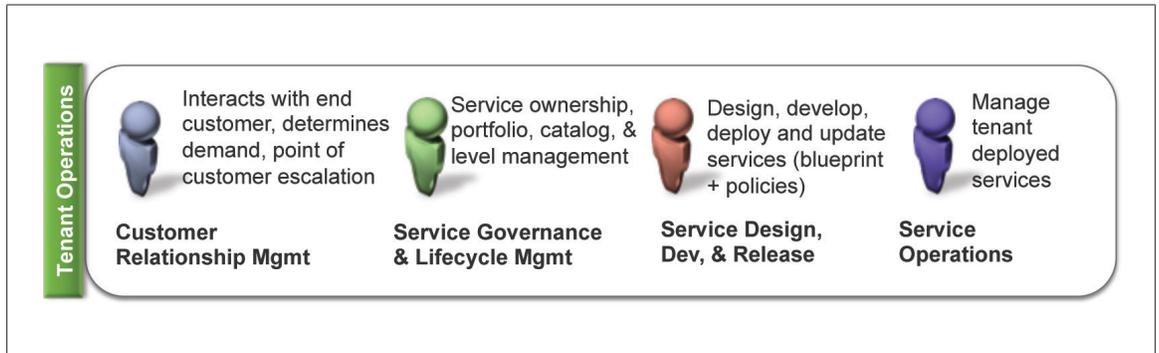


Figure 6. Cloud Tenant Operations

There can be more than one Cloud Tenant Operations organization within an enterprise. If the enterprise has a private cloud, there will always be at least one Cloud Tenant Operations organization in IT but if a LOB is large enough, it may warrant having its own Cloud Tenant Operations. The decision to have a LOB-based Cloud Tenant Operations depends on the number of LOB-specific services, the frequency of offering new services, and their desire to take on this responsibility. It also depends heavily on the culture and philosophy of the enterprise.

Like the Cloud Infrastructure Operations COE, Cloud Tenant Operations also has an ecosystem (Figure 7).

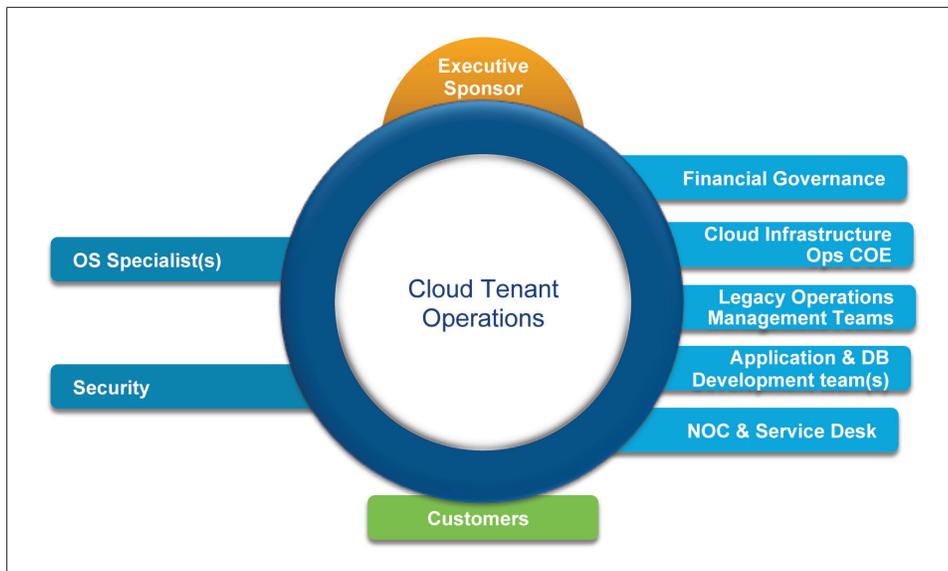


Figure 7. Cloud Tenant Operations and ecosystem

The charter of Cloud Tenant Operations is to:

Continually develop and implement innovative ways to govern, design, develop, release, provide access to, and proactively operate the portfolio of cloud services provided to customers while actively maintaining customer relationships and Quality of Service.

The primary roles and responsibilities for members of Cloud Tenant Operations follow:

### **Leader**

- Provides leadership and guidance to Tenant Operations' members
- Has a direct line of communication to the executive sponsors
- Maintains a working relationship with the Cloud Infrastructure Operations Leader
- Actively promotes awareness of Tenant Operations team to end-user organizations
- Maintains management level relationships with the Tenant Operations ecosystem teams
- Assigns Cloud Service Offering responsibilities to Service Owners

### **Customer Relationship Manager**

- Responsible for establishing and maintaining a working relationship with one or more end-user organizations.
- Determines and collects end-user organization service offering business requirements. Works with the designated Cloud Service Owner to translate the business requirements into a Cloud Service Definition
- Works with the customer to determine their service demand pipeline—both new and retiring services; works with Service Portfolio Manager to build this into the portfolio and the Service Analyst to include the demand pipeline in the capacity forecast
- Responsible for end-user organization issue escalation

### **Service Owner**

- Responsible for overall definition and delivery of the cloud service offering(s) for which they are responsible
- Works with Cloud Consumer Relationship Managers to collect end-user requirements and translate them into a Cloud Service Definition
- Works with IT Financial Management to determine a price for a cloud service offering, and determine whether multiple prices are appropriate if the cloud service offering is provided in multiple service tiers
- Provides the required information to Service Catalog Management to correctly set up the service catalog offering
- Develops SLAs and OLAs for the cloud service offering(s) for which they are responsible; also, negotiates updated SLAs and OLAs as the service offering is updated; reports on SLA attainment
- Manages development and enhancement efforts as well as works with cloud Service Architects on their cloud service offering based on the Cloud Service Definition
- Keeps actively informed about tier 3 support and escalations for the cloud service offering(s) for which they are responsible
- Makes sure that the service levels are met through corresponding OLAs with Cloud Infrastructure Operations
- Works with the Service Portfolio Manager to assess the demand for their services and progresses the retirement of their services when required
- Regularly monitors and reports on service level attainment for their cloud Service Offering(s)

### **Service Portfolio Manager**

- Develops and maintains cloud Service Portfolio policy including the criteria for acceptance and rejection
- Manages the portfolio of cloud services and works with IT management to develop the cloud service offering strategy used to determine what services should be included in the overall portfolio and to make sure the service offering strategy aligns with IT strategy
- Proactively identifies potential cloud service offerings based on demand information gathered from Cloud Consumer Managers or other sources such as requests coming in through the Service Desk

### **Service Catalog Manager**

- Manages the cloud service offering catalog and makes sure that all of the information contained in the catalog is accurate and up-to-date
- Maintains the Consumer Self-Service Catalog portal information

### **Service Architect**

- Defines a cloud service offering based on the requirements provided by the Cloud Service Owner after it's determined that a particular cloud service offering is to be included in the Cloud Service Portfolio. This involves translating cloud business requirements into technical requirements that can be used to architect a cloud service offering.
- Provides tier 3 cloud service offering support as needed

### **Service Developer**

- Works with the Cloud Service Architect to understand cloud service offering technical requirements
- Works with the Application Development team(s) to incorporate bespoke or third-party applications into cloud service offerings as needed
- Develops new cloud service offering components into blueprints, or constructs blueprints from existing cloud service offering components, for automatic provisioning
- Releases cloud service offerings into production
- Develops and maintains cloud service offering blueprint documentation
- Works with the Cloud Service Analyst and Application Development to define service monitoring
- Works with Cloud Service Analyst and Application Development to establish automated event remediation wherever possible and appropriate
- Works with Cloud Service Analyst and Application Development to make sure security, operations, and chargeback metering capabilities are built into cloud service offerings
- Provides tier 3 cloud service offering support if needed
- Develops service-related as well as service integration workflows
- Develops customizations for and maintains the on-line Consumer Self-Service Catalog capability

### **Service QA**

- Develops test plans as well as tests and accepts services as fit for release to production as well as post-release validation, whether developed in-house, third party developed, or SaaS-based
- Develops test plans as well as tests and accepts service-related as well as service integration workflows as fit for release to production as well as post-release validation
- Develops test plans as well as tests and accepts on-line Consumer Self-Service Catalog capabilities as fit for release to production as well as post-release validation
- Responsible for ensuring the service desk is trained to support the services put into production

### **Service Analyst**

- Develops and maintains service capacity forecasts
- Responsible for the day-to-day capacity and resource management of services
- Works with the IT Security team to make sure that services align with IT security and compliance policies; assists in developing automated compliance policies
- Initiates requests for new or expanded service capacity
- Assists with tier 3 support for issues related to tenant deployed services
- Monitors and analyzes service performance, availability, usage, and other operational analytics
- Makes sure the NOC is able to proactively support released services
- Works with Service QA to release services into production as well as coordinating any required change management. This responsibility will decrease over time as the release process is automated and services consisting of previously released components are considered pre-approved from a change management perspective.

### **Service Administrator**

- Administers tools used by Cloud Tenant Operations to govern, develop, and operate services
- Administers customer cloud environments
- Provides tier 3 cloud service offering support
- Administers customer vApps and application(s) contained therein, if offered as a service; this will not apply to development and test customers in all likelihood.

## **Implementing a Cloud Tenant Operations Organization**

Like for the Cloud Infrastructure Operations COE, establishing Cloud Tenant Operations requires a clear process. The process for establishing Cloud Tenant Operations (Figure 8) is very similar to that for the Cloud Infrastructure Operations COE. The primary differences include: the skills required within Cloud Tenant Operations, the fact that a Cloud Tenant Operations instance could exist within a business unit, and the nature of some ecosystem participants.

From a sequencing perspective, the Cloud Infrastructure Operations COE is typically implemented first to optimize the deployment and start-up operations of the Cloud environment. That said, whether the Cloud Infrastructure Operations COE is implemented first or whether it's implemented in parallel with Cloud Tenant Operations can depend on the desired "time to value" for the initial delivery of services as well as supporting budget.

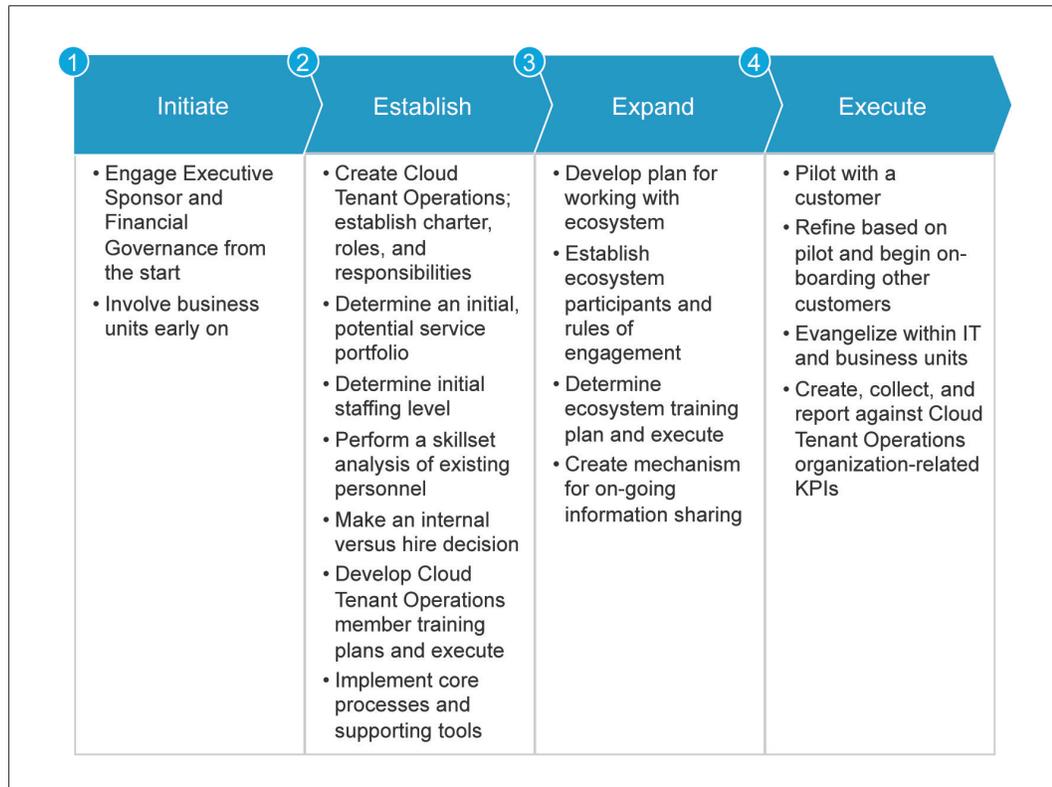


Figure 8. Cloud Tenant Operations implementation process

### Step 1: Initiate

The following steps outline the activities undertaken to initiate the creation of Cloud Tenant Operations. These activities include engaging the CIO and Financial Governance and involving the business units.

#### *Engage Executive Sponsor and Financial Governance from the start*

Involving and gaining early sponsorship of the initiative is instrumental to the success of implementing Cloud Tenant Operations. In most cases this includes the CIO but if a business unit has its own Cloud Tenant Operations an executive sponsor must be identified and involved. Active executive sponsorship conveys the relevance and importance of the initiative.

Financial Governance must also be included from the start. This is necessary to begin the process of establishing cloud service-based financial management. The IT Financial Management (ITFM) for Cloud white paper included in this series of cloud value driver white papers provides a significant level of detail related to cloud service-based financial management.

#### *Involve business units early on*

Including business units early in the process serves two key purposes. The first is to begin the education process as early as possible regarding the transition to a service orientation and how it affects the business units. The second is to help the business units determine if they want to utilize IT's Cloud Tenant Operations or establish their own. Having business units utilize IT's Cloud Tenant Operations is certainly preferred, due to economies of scale, but a business unit could be large enough and need to offer a significantly large number of services that having their own Cloud Tenant Operations is warranted.

**Step 2: Establish**

The following steps outline the activities undertaken to establish the Cloud Tenant Operations. These activities include defining it specifically within the context of the company, analyzing demand and creating a likely initial service portfolio, determining initial staffing levels, performing skillset analysis of internal candidates, making hiring decisions, developing individual training plans, and planning for the ecosystem.

***Create Cloud Tenant Operations: establish charter, roles, and responsibilities***

While this white paper offers a Cloud Tenant Operations charter as well as the responsibilities for each role, these need to be personalized to the company's IT organization or business unit. The charter and responsibilities can evolve over time as the cloud continues to mature. The initial skillset requirements will be directly impacted by the agreed responsibilities.

***Determine an initial, potential service portfolio***

The composition and staffing levels of the initial Cloud Tenant Operations team depends heavily on service offering projections. Because of this, an effort should be undertaken to survey the current service opportunities as well as additional short term service opportunities based on cloud capabilities. This should include both IT-based services and business unit service requirements. In this way an initial service portfolio of potential services can be identified which will help drive initial staffing levels.

***Determine initial staffing levels***

Staffing levels depend on the projected scope as well as the number and frequency of changes for cloud-based services. Based on these dependencies, a single individual can fill more than one role initially. Staffing of each role can be further impacted by the following factors:

- The number of customers supported and number of projected unique services affecting each: Customer Relationship Manager, Service Owner, Service Architect, Service Developer, Service QA
- The size of the initial, potential service portfolio and service projections: Service Owner, Service Portfolio Manager, Service Catalog Manager, Service Architect, Service Developer, Service QA. For instance, the Service Portfolio Manager and Service Catalog Manager could be a single full-time staff person
- The extent to which Cloud Tenant Operations will offer customer environment and deployed service administration: Service Administrator
- The number, sophistication and capabilities of the tools for monitoring and operating services: Service Analyst, Service Administrator
- The initial and projected number, scope, and capabilities of associated cloud management application components implemented: Analyst, Administrator
- The number and nature of the functional groups included in the ecosystem (touch points): Service Architect, Service Analyst
- The number of initial and projected service automation initiatives: Service Architect, Service Developer, Service QA
- The projected amount of initial and on-going service-level integration required: Service Architect, Service Developer, Service QA
- Leave time. full-time staff must have adequate backup for training, holidays, vacation, and sick time: All roles

***Perform skillset analysis of existing personnel***

Based on the responsibilities defined for each role, the service-level management tools deployed, the service-level automation tools utilized, the nature of the service-level integration that must occur, and the functional groups comprising the ecosystem, a skill matrix can be defined for each role. Once skill matrices are created, role-specific job descriptions can be developed. Once complete, these can be used to identify internal candidates and assess them against the skill matrices as well as post job requisitions for external candidates.

***Make an internal versus hire decision***

Unless the company is already delivering services to customers and has established service governance capabilities, the customer relationship management and service governance-related roles (Service Owner, Service Portfolio Manager, and Service Catalog Manager) will likely be filled by external candidates. These roles are specific to offering services and as such, require skills not easily trained for. This is especially true if offering services is new to the company since these roles will also be establishing the initial processes and making recommendations on supporting tools.

The same can be true for Service Architects and Service Developers as well. Architecting, designing, and developing a service requires different skills than, say, application development. For instance, cloud-based services can include multi-tier, multi-virtual machine packages optimized for cloud-based consumption. They could be simple IaaS services or they could be sophisticated PaaS or SaaS services. A good source for these roles, though, could be existing virtualization administrators with more than simple virtual machine creation and deployment capabilities.

Service QA, Service Analysts, and Service Administrators, could be easier to fill with internal candidates. An Application QA person could be expected to fill a Service QA role with minimal additional technical training. This is equally true for a virtualization administrator in the role of Service Administrator. An individual responsible for monitoring and operating a virtualized environment could be a reasonable candidate for Service Analyst, though this person might need to be trained on end-to-end service monitoring and operations. In all three cases, the hardest training components could be establishing the service mindset. This can be a difficult transition due to the increased pressures of meeting SLAs and more directly supporting customers.

If internal candidates are identified the same options identified for internal Cloud Infrastructure Operations COE members:

- Backfill their current jobs with new hires or hire consultants to backfill their current jobs while their responsibilities are transitioned to other individuals or roles.
- Temporarily hire a consultant with the requisite skills for the Cloud Tenant Operations role while the internal candidate receives training.

***Develop Cloud Tenant Operations member training plans and execute***

As individuals are hired for the Cloud Tenant Operations roles, individual training plans can be developed to fill any gaps in knowledge or capabilities to fulfill all of the role's responsibilities that might exist. Ideally, any form of extensive training would be restricted to the cloud service development tools used (Service Architect, Service Developer, Service QA) and service-level management tools deployed (Service Analyst, Service Administrator). Training an individual to have a service-oriented mindset is challenging and taken into consideration when interviewing candidates.

***Implement Cloud Tenant Operations-related processes and supporting tools***

As staffing and initial training of the Cloud Tenant Operations member's progress, the requisite processes and supporting tools should be implemented. Engaging consultants with the requisite skills to help implement the initial processes and supporting tools will help accelerate Cloud Tenant Operations start-up and should be seriously considered.

**Step 3: Expand**

Once Cloud Tenant Operations is established and staffed, the next step is to expand to the functional groups identified as part of the ecosystem. These activities include developing a plan for working with the ecosystem, establishing the ecosystem participants and rules of engagement, determining and implementing the specific training plan for each functional group, and establishing a mechanism for ongoing information dissemination within the IT organization as well as the business units.

*Develop plan for working with ecosystem*

As the activities to staff and train the Cloud Tenant Operations member's progress, the functional groups to comprise the ecosystem should be identified and the plan for working with them developed. Figure 7 included earlier in the white paper identified the typical functional groups to include in the Cloud Tenant Operations' ecosystem. There could be others depending on the makeup of a specific IT organization and the way business units are defined within the company.

The plan for working with the ecosystem is similar to that for the Cloud Infrastructure Operations COE with a couple of key exceptions: the plan for interacting with customers should be done separately as it has very different requirements; with the exception of customer relationship management, the interactions are much more service dependent and therefore more "project-based" versus frequent, on-going communication; and due to the more project-based nature, champions are not specifically identified.

*Establish ecosystem participants and rules of engagement*

This step consists of having an initial meeting with each of the identified ecosystem functional groups. The Cloud Tenant Operations leader, architect, and service portfolio manager typically participate in the initial meeting. Ideally the executive sponsor will have already communicated the importance of the functional groups participation to the success of offering cloud-based services. The primary purpose of the initial meeting is to begin educating, establishing relationships along with their rules of engagement, and to understand what additional training or education a functional group might require, increasing the effectiveness of the relationship.

*Determine ecosystem training plan and execute*

Once the educational needs of each functional group are identified, a specific training plan for each can be developed. This could range from basic cloud capabilities, to what it means to consume "services," to showback/chargeback expectations and general reporting expectations. As part of the overall start-up of offering services, additional, more broad-based training such as interacting with the on-line Consumer Service Catalog will be necessary and should be explicitly accounted for. Any of the aforementioned training could range from formal training classes, to workshops hosted by members of Cloud Tenant Operations.

*Create mechanism for on-going information sharing*

The final activity in this step is to create mechanisms for on-going communication of Cloud Tenant Operations activities. This could range from a newsletter to an on-line site providing service-related information and statistics.

**Step 4: Execute**

Now that Cloud Tenant Operations has been initiated, established, and expanded, all of the pieces are in place for successful, ongoing cloud customer relationship management, service governance, development, and operations. The last step is to execute and sustain momentum. In addition to executing the responsibilities for each role, these activities include: evangelizing, pilot Cloud Tenant Operations with a single business unit, expand to additional business units, and measuring progress.

*Pilot with a customer*

Implementing a Cloud Tenant Operations team and offering cloud-based services is both transformative and disruptive. In most cases it represents a complete paradigm shift for supplying and consuming IT. As with any change of this potential magnitude, the best practice guideline is to begin with a pilot including a single, "friendly" customer. Identify the most receptive customer candidate and begin working with them to identify, define, build, and deploy some small number of services their end users regularly consume—preferably some "low hanging fruit" services that are reasonably simple to define, develop, and monitor/operate. Run this pilot for some period of time to understand what's working and what's not working both within the Cloud Tenant Operations team as well as their interactions with the functional groups within the ecosystem—most importantly the customers.

### *Refine based on pilot and begin on-boarding other customers*

As the pilot winds down, a post-mortem should be conducted and lessons learned documented. These lessons learned can be translated into prioritized, actionable refinements. A period of time should be taken to implement and validate the highest-priority refinements with the pilot customer. Once the changes are validated as successfully satisfying the lessons learned, additional customers can be on-boarded. This should be done in a step-wise fashion to make sure the processes and supporting tools scale while providing time to adjust as necessary. On-boarding can be slowed down or accelerated as a result.

### *Evangelize within IT and business units*

In addition to the mechanisms identified for on-going information sharing, members of the Cloud Tenant Operations team should actively evangelize about cloud-based services, their benefits, and how the transition is positively impacting the company. This can be done through brown-bag lunches and continuing education workshops as well as blogging.

### *Create, collect, and report against Cloud Tenant Operations' organization-related KPIs*

In its customer-unit facing role, Cloud Tenant Operations progress must be monitored and evaluated. Service-level agreements (SLAs) provide an objective set of metrics to evaluate performance regularly (e.g. service availability, service-affecting incident support response time). While typically not included in SLAs initially, some additional metrics to track include, for example, time to take a service from business need validation to production, and deployed service end-to-end performance. Like the Cloud Infrastructure Operations COE, Cloud Tenant Operations should be accountable for efficiency and proactivity targets. These should include, for example: amount of labor to complete processes, service-affecting incident reduction, and service development times (especially as blueprint- and policy-based service development matures), all measured over time to indicate improvement. Finally, since this a customer-facing team, customer satisfaction surveys should be taken regularly as well.

## **Organizational Interactions**

Effective organizational interactions are critical to the success of both the Cloud Infrastructure Operations COE and Cloud Tenant Operations. Three key organizational interactions are described in this section: those between Cloud Infrastructure Operations COE and Cloud Tenant Operations; those with the Service Desk and the NOC; and the interactions between Cloud Tenant Operations and Application Development.

The NOC interacts with Cloud Tenant Operations and Cloud Infrastructure Operations for tier three support as needed. This interaction will be further described in the Cloud Tenant Operations and Cloud Infrastructure Operations sections below.

### **Cloud Infrastructure Operations COE and Cloud Tenant Operations**

The relationship between Cloud Infrastructure Operations COE and Cloud Tenant Operations is symbiotic. As a result, each must be continuously aware of what the other is planning and doing. For example, the Cloud Infrastructure Operations COE must always be aware of project service demand in order to plan for capacity. Trending information is important to capacity planning but with the extremely dynamic nature of Cloud, forward looking demand is equally as important. The reverse is also true. For example, Cloud Tenant Operations must be aware of cloud networking capabilities in order to correctly and efficiently architect customer cloud environments. Regular communication, both interactively and via shared tools or at least tool dashboards, is critical to the success of both.

### **Service Desk and NOC**

Both the Service Desk and NOC will interact with Cloud Infrastructure Operations COE and Cloud Tenant Operations. Initially these interactions may be more frequent as infrastructure-related tier 2 and service-related tier 2 support will be provided by the both Cloud Infrastructure Operations COE and Cloud Tenant Operations respectively. Even initially the Service Desk should interact predominately with Cloud Tenant Operations as they will be in the best position to triage service-impacting incidents; calling in the Cloud Infrastructure Operations COE only if needed. Service Desk interaction will be dramatically reduced as Cloud Tenant Operations tools mature to be more proactive and predictive.

As NOC tools mature for cloud, one option is to have more cloud SMEs be part of the NOC team allowing tier 2 support to begin migrating there. This, coupled with more proactive and predictive tools being used within both the Cloud Infrastructure Operations COE and Cloud Tenant Operations will reduce the interaction to strictly tier 3 support in extreme cases as the frequency of service-impacting incidents will reduce dramatically.

### **Cloud Tenant Operations and Application Development**

Cloud Tenant Operations interacts with Application Development teams from three perspectives: application development team as a customer, a service development partner, and production operations support.

The first perspective involves an Application Development team as a customer of Cloud Tenant Operations. In this case the Application Development team will consume a service, either virtual resources in which they deploy a development environment or perhaps in the form of PaaS. Cloud Tenant Operations will monitor the environment, probably for availability only but will also be involved in the release of the application as ultimately all applications will be delivered as a service in a cloud environment.

For service development, Cloud Tenant Operations will interact with an Application Development team if a custom application is needed to provide the service. Application Development is seen as a partner (as well as a customer as defined above) in the service development process. Cloud Tenant Operations will work with Application Development to make sure the application is properly instrumented for meaningful monitoring, security, and metering (for showback/chargeback). In addition, the two teams will work closely together in releasing the resulting service into production. This would represent a DevOps relationship as typically defined.

The final perspective is production operations. In this case, Cloud Tenant Operations will interact with an Application Development team, if needed, in a tier 3 support capacity for applications that were developed as a result of the service development described above.

## Key Success Factors

Implementing Cloud Infrastructure Operations COE and Cloud Tenant Operations is both a transformative and disruptive process, however, there are a few key factors that can help a company achieve a successful outcome and avoid pitfalls.

### Active Sponsorship for the Transformation at the Executive Level

The executive sponsor(s) must take an active role in the transformation. They should have a well-defined cloud strategy clearly articulated within the organization, actively communicate and enforce a cloud-first deployment policy with customers, and support the implementation of services to support the policy. The executive sponsor(s) must also break down the walls that typically exist between IT functional groups, especially as they relate to the Cloud Infrastructure Operations COE. Finally, they must actively reinforce the service-oriented mindset both within IT as well as evangelizing it outside of IT, especially with the business units.

### Establish the Ecosystems and Educate

Both in the case of the Cloud Infrastructure Operations COE and Cloud Tenant Operations, effective ecosystems are critical to success. Without an active ecosystem both will become an island unto itself and will fail. Education is key to creating an effective ecosystem. Care must be taken to make sure that the functional groups comprising the ecosystems are not only continuously educated on the importance of their role but also continuously educated to ensure they have the requisite level of knowledge to successfully fulfill their role.

### Plan for a Pilot-Based Launch and Scale Up

This applies primarily to Cloud Tenant Operations. To be viable long-term, the initial Cloud Tenant Operations launch must be well managed. The recommended approach is to begin with a pilot implementation including a friendly business unit. This allows Cloud Tenant Operations to validate their approach in a “live fire” situation but affords the opportunity to evaluate and refine before scaling up. Once Cloud Tenant Operations and the pilot business unit agree the interactions and processes are running smoothly, additional business units can be on-boarded. As previously mentioned, this should be done in a step-wise fashion to account for any scale-up challenges. To further mitigate risk, Cloud Tenant Operations should start with a small set of standard services and expand both the number of services and offering custom services when they’re confident they can do so without adversely impacting service development or service operations.

## Next Steps

Once the IT organization has decided to optimize for cloud operations for cloud a number of steps are recommended.

### **Assess Organizational Readiness**

One potential pitfall on the road to optimizing the organization for cloud operations is readiness. Many organizations discover that they have underestimated—sometimes dramatically—the investment needed to move from their current organizational structure and mindset to one optimized for operating a service-driven cloud environment. Early readiness assessment is essential to crafting a transition plan that minimizes risk and provides cross-organizational visibility and coordination.

### **Determine Degree of Change Needed**

Once the organizational readiness assessment is complete, IT leaders should understand the degree of change required to transition the organization to one optimally structured and skilled for operating a service-driven cloud environment. They should undertake skillset assessment of their IT staff generally but specifically determine if one of their existing staff is qualified and suitable for the Cloud Infrastructure Operations COE lead role as well as someone to manage and lead Cloud Tenant Operations. Having those critical roles filled early in the process is critical to the overall success of the transition.

### **Prepare the Organization for Change**

IT leaders should then prepare the organization for the change. As is known all too well, organizational change of this type is disruptive and is often met with resistance. To help overcome this, the CIO has to not only embrace and drive the transition but socialize and evangelize it within IT and stakeholders external to it.

## Why VMware for IT Transformation?

The move to the cloud is a foregone conclusion for many organizations today, but the path forward is often unclear. What is the current state of my infrastructure? How do we begin to move forward? What are the right technology choices for implementing our cloud? Most importantly, who can help us achieve our goals?

VMware has built some of the largest and most successful public and private clouds in the world. Now VMware is using that experience to bring to market a complete solution that includes a full suite of software products as well as the services you need to gain the maximum benefit from cloud computing. This combination of software and expertise, delivered via services and education to customers of all sizes across all industries, is unique to VMware and its global ecosystem of partners.

To learn more about the VMware cloud solution, visit [www.vmware.com/cloud](http://www.vmware.com/cloud)

