Design Your Cloud Strategy for Long-term Success

Delivering every type of enterprise workload as a cloud service through a standardized hybrid cloud architecture
IT leaders are redefining cloud strategies from basic infrastructure and platform delivery to an all-encompassing IT-as-a-Service (ITaaS) model offering new levels of efficiency and agility. To realize the full benefits of ITaaS, though, your cloud needs to be architected to support the full range of workloads in your enterprise—including both cloud-native apps and services, and traditional enterprise apps.

Business initiatives like bring-your-own device (BYOD) and telework are driving the need for anywhere, anytime, any device access to applications and services. In response, IT organizations are rethinking the way they deliver applications, data and services, and exploring how to evolve their underlying infrastructure. ITaaS, the next step in the cloud computing journey, leverages cloud technologies to deliver a complete suite of on-demand IT services through a simple self-service portal to end-users.

Choosing the right cloud architecture to enable ITaaS poses a potential pitfall for IT organizations. Most cloud deployments start with narrow use cases, and it is all too tempting to select an architecture that fits just those scenarios. This leads to problems down the line, when the architecture proves ill-suited for handling other types of enterprise workloads.

This paper discusses the two types of workloads that matter most in today’s enterprises—cloud-native apps and services, and traditional enterprise apps—and how both can be managed and delivered within a unified environment. By providing a single orchestration platform for both traditional and cloud-native workloads, Citrix CloudPlatform helps you address the full range of needs today while laying a flexible foundation for future success.

Increasing IT agility and efficiency through ITaaS

As the speed of business continues to accelerate, more CIOs recognize that they need to be able to deliver services more quickly, flexibly and efficiently. By providing a more consumer-like, self-service experience for users and business units, IT can enable a more effective response to business needs while stemming the unauthorized, unmanaged use of third-party systems, a practice known as shadow IT. This calls for a new approach to IT—a paradigm shift that involves both business transformation and technology.

With ITaaS, the focus of IT shifts from building and operating enterprise applications to aggregating and delivering a variety of both in-house and third-party cloud services, including enterprise applications as well as cloud-native apps and mobile apps. This strategy can drive significant value for both IT and the enterprise, including:

The University of Sao Paulo

The University of Sao Paulo (USP) uses Citrix CloudPlatform to enable self-service IT provisioning from anywhere, on any device. Researchers can access the highly available, high-performance resources they need in minutes. Students are provided resources within a separate zone in the USP cloud designed for cloud apps, games and other next-generation workloads. CloudPlatform helps USP meet the needs of its more than 100,000 students, faculty, staff and researchers today while providing a clear path for continued evolution.
• **Greater efficiency**, as IT moves from managing individual silos of IT for different business units to acting as an internal provider of shared services for lines of business across the enterprise

• **Increased agility** to support emerging business needs quickly and effectively through standardized processes

• **Faster time-to-value** for new services and functionality

• **Improved flexibility** for people to access the apps they need, the way they need them, which enables a better user experience and the consumerization of IT

The move to ITaaS is the natural extension of an evolution already well underway at most companies—one from traditional architectures and processes to a modern, service-based approach to IT. The first step is the virtualization of servers, apps and desktops to increase flexibility and enable centralized management and delivery. Next, services delivered from the virtualized enterprise datacenter are complemented with cloud solutions such as SaaS, IaaS and DaaS, further enhancing efficiency and agility. Now, leading IT organizations are seeking to complete their transition to a shared services ITaaS model by implementing a standardized cloud architecture.

To ensure the success of your move to ITaaS, you need to make sure the cloud architecture you build can correctly handle both types of essential enterprise workloads—both traditional enterprise applications and cloud-native apps and services. Often, IT organizations focus narrowly on the initial use case for their cloud architecture, without giving enough thought to how to make it extensible to handle other types of workloads as well. This results in architectures that are good at handling either cloud-native apps or traditional enterprise workloads—but not both. Without the ability to aggregate and deliver both types of cloud service through a single, flexible foundation, much of the value and impact of ITaaS is lost.
Two types of workloads, two architectural models

IT organizations rearchitecting their environments to support the move to ITaaS typically begin with one of two distinct types of projects:

- Delivering cloud-native apps and workloads such as Big Data and analytics, web-scale apps, disaster recovery systems, collaboration and social media platforms, and test and development apps
- Making the delivery of traditional enterprise application workloads such as CRM, ERP and productivity apps from virtualized datacenters more cloud-like

Each of these initiatives has its own distinct characteristics and architectural requirements. Cloud-native workloads are tailored for the architecture of the cloud, which comprises pools of good-enough commodity compute and storage designed for low cost and massive scale. Built for hardware that isn’t expected to be resilient, these apps are created with the intelligence to handle the failure of any given node simply and efficiently. ITaaS initiatives focused on this next generation of apps aim to make them more easily available to the people who rely on them.

Initiatives focused on enterprise app workloads have a different objective. When enterprise datacenters are virtualized, runtime operations usually remain largely traditional, revolving around service tickets, approval workflows and long lead times to deliver a virtual server. Rework remains high and customer satisfaction lags, leading users to turn to unmanaged relationships with third-party public cloud providers. This shadow IT scenario can easily undermine both security and compliance. In response, IT organizations are working to enable cloud efficiency and self-service through extensions to server virtualization that provide runtime orchestration and automation of these workloads.

Each of these types of initiatives is straightforward enough in itself. The challenge comes when you try to address both—and encounter two equally problematic scenarios:

- If you only build for cloud-era workloads, how will you extend this architecture to support your traditional enterprise apps? Since the typical enterprise datacenter houses mission-critical applications that power day-to-day business operations, they are designed to avoid failure, relying on largely static racks of high-priced, fully redundant, specialized hardware designed for 99.999 percent uptime. Moving enterprise apps out of this resilient execution architecture into one designed for cloud-era apps simply isn’t an option.
- Conversely, if you design primarily for server virtualization workloads, how will you achieve optimal cost efficiency for your cloud era workloads? Over time, traditional workloads will evolve to become more distributed and less dependent on traditional architecture, eventually becoming cloud workloads—making it even more important to have an architecture designed for cloud era workloads.

This dilemma is reflected in the types of cloud orchestration platforms on the market, which typically fall into two categories:

- Those enabling an extension of server virtualization, such as VMware vCloud and Microsoft Private Cloud
- Those designed for only cloud workloads, such as Amazon Web Services and Microsoft Azure
Supporting separate private clouds for each workload style would be grossly inefficient and costly, as well as limiting your ability to modernize traditional workloads. What you need is a single orchestration layer that lets you address both traditional and cloud-era workloads.

**Implementing a two-workload architecture with Citrix CloudPlatform**

Citrix CloudPlatform, powered by Apache CloudStack, provides the flexible foundation you need to handle both emerging and legacy workloads. As the only open and flexible cloud orchestration platform to build, manage and deliver hybrid clouds, CloudPlatform lets you orchestrate and automate existing workloads and infrastructure, while providing a path to the future through support for next-generation commodity cloud architectures. The solution has been proven in over 200 production deployments of more than 40,000 servers at scale.

An open-source software platform that pools datacenter resources to build public, private and hybrid clouds, CloudPlatform is unique in its support for both types of workloads in a single orchestration platform. This gives IT the flexibility to meet the scalability and reliability requirements of each type of application in the environment—enterprise or cloud-native. For traditional enterprise apps running on proprietary infrastructure, CloudPlatform supports scalability to tens of thousands of users with 99.999 percent uptime. For cloud-native apps and services running on commodity infrastructure, CloudPlatform supports scalability to millions of users and provides resilience for architectures designed to assume failure.

CloudPlatform simplifies the implementation of hybrid clouds by abstracting the network, storage and compute nodes that make up a datacenter and enabling them to be delivered as a simple-to-manage, scalable cloud infrastructure. To handle both types of workloads, CloudPlatform lets enterprises organize their private cloud into multiple availability zones, each comprising resources in one or more physical datacenter. Within each availability zone, IT can designate the appropriate combination of hypervisor, storage and networking configurations to support a given workload. Each availability zone can also offer multiple, distinct levels of service, differing in reliability, scalability, security, compliance, performance, cost and other dimensions.

**Supporting traditional workloads**

For traditional workloads, IT can create availability zones designed for high availability and fault tolerance dictated by the recovery point objective (RPO) and recovery time objective (RTO) of each application. These availability zones should be built using enterprise-grade infrastructure components, which can include repurposed components of the existing datacenter:

- A commercially supported hypervisor such as Citrix XenServer or VMware vSphere
- High-performance SAN devices for VM image storage
- Traditional physical network infrastructure components such as firewalls and layer 2 switches
- VLANs to isolate traffic among servers and tenants
- VPN tunneling for secure remote and site-to-site access through existing network edge devices
Supporting cloud-era workloads

The availability zones for cloud-native apps and services can be designed to minimize cost rather than to ensure traditional enterprise reliability. Commodity and open-source components can be used:

- An affordable hypervisor such as XenServer, Xen or KVM
- Inexpensive local disk or NFS volumes for VM image storage
- Layer 3 security groups to provide multi-tenant isolation, as needed

Availability zones for cloud-era workloads often incorporate software-defined networking (SDN); CloudPlatform supports any OpenFlow-compatible virtual switch. Because of the architectural similarity and API compatibility between these availability zones and the Amazon Web Services (AWS) public cloud, third-party tools developed for AWS with proven integrations with CloudPlatform are readily available.

Both cloud era and traditional availability zones across multiple geographies can be combined within a single private cloud and managed through a single pane of glass.

Realizing the full benefits of ITaaS

While ITaaS can reduce overall costs and help IT shift costs from capex to opex, many customers emphasize other types of benefits as much or more than narrowly defined ROI.

Efficiency

IT can orchestrate, manage and deliver both traditional and cloud-era workloads through a single pane of glass, reducing both expense and staff overhead. By automating the orchestration of VMs, storage and network resources, IT can deliver better service, more easily. Line-of-business developers can provision their own apps quickly and easily, without having to get IT involved, providing a standardized, authorized alternative to shadow IT with a consumer-like experience.

Agility

IT can provision new cloud-era apps and services quickly and easily to address emerging needs while continuing to support traditional enterprise workloads.

Time-to-Value

By offering self-service VMs to users, IT can free them from the time-consuming traditional workflows used to provision physical machines while empowering them to meet their own needs.

Flexibility

IT gains the ability to handle diverse traditional and cloud-era workloads on a single platform, offering multiple levels of service differentiated by reliability, scalability, security, compliance, performance, cost and other dimensions. Traditional enterprise applications can be evolved to cloud services gradually, through a staged approach, within the same environment.
Conclusion

As the next step in the transformation of IT, ITaaS offers new levels of efficiency and agility for IT while empowering people and business units to provision their own apps and services quickly and easily. Citrix CloudPlatform provides the flexible foundation needed to realize the full benefits of ITaaS, enabling IT to support both traditional and emerging workloads through a single, standardized cloud architecture. Enterprise workloads and cloud-era apps can each be provided with the optimal infrastructure for their distinct requirements and cost models, while being managed in a unified environment through a single pane of glass. In this way, IT can continue to support existing workloads while fully leveraging the innovation of the cloud.