

# Converging clouds: Citrix solutions to unify, bridge and build cloud services



## Cloud computing changes everything

Enterprise IT organizations have long been focused on delivering consumable business services to end users, including employees, partners and customers. However, with the emergence of cloud computing, the way services are delivered has completely changed.

The consumerization of IT is letting today's users connect to IT services using an array of access devices—from desktops, to tablets, to mobile phones. Pervasive network connectivity, both wired and wireless, is driving anytime, anywhere access for mobile and remote workers. Multi-tenant data centers are more efficient and are powering entirely new business models. Elastic compute architectures are enabling web-like applications that automatically scale in response to fluctuations in demand.

New methods for computing are transforming the IT industry and improving the way people and businesses work. This is the Cloud Era and it is built on a completely different set of assumptions than past generations of IT. In fact, many of the exceptions from the PC Era now represent the norm in the Cloud Era.

The Cloud Era now assumes:

- Mobile rather than fixed
- Personal rather than corporate
- Wireless rather than wired
- Cloud rather than premise
- App stores rather than suites

As the Cloud Era takes hold, the traditional ideas of computing as we once knew them are obsolete.

## A new perspective for the Cloud Era

New technologies and new approaches to IT are meant to increase efficiency, lower costs and provide new ways to deliver value. Yet IT seems to grow more complex with every major shift in technology. Without careful selection of solutions, services and products, enterprise organizations can find themselves struggling with the pressure of innovation and change. In order to keep up, IT and business leaders need new perspectives—fresh ways of understanding and responding to the evolving landscape.

Citrix offers a holistic view of the Cloud Era, one that unites the two fundamental forces impacting IT today: mobile workstyles and cloud services. Please see Figure 1.

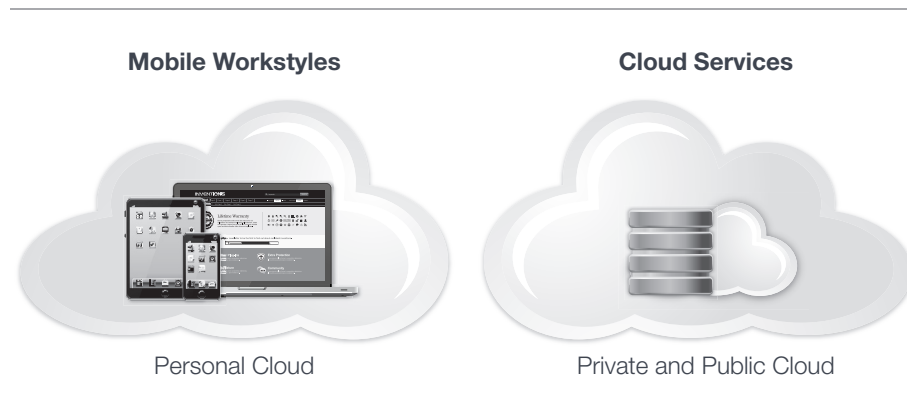


Figure 1. A new perspective for the Cloud Era.

In the Cloud Era, mobile workstyles and cloud services are highly interdependent. Powerful mobile devices, backed by even more powerful cloud services, are connecting sales teams with prospects, delivering critical status information to executives and putting everything from email and business apps to streaming video in the hands of users. Together, mobile workstyles and cloud services empower employees, customers and partners to work together anytime and anywhere.

While two clouds are displayed in Figure 1, there are actually three important clouds to consider in this model:

- 1. Personal cloud.** The personal cloud encompasses mobile workstyles and is the new desktop for users, bringing together the applications, data and collaboration capabilities they use daily in both their work and personal lives. It empowers users to work and collaborate the way they wish—anywhere, anytime and on any device, including Windows, Mac, tablets and smartphones.
- 2. Private cloud.** The private cloud is the collection of on-premise infrastructure, desktops, applications and data delivered on demand by enterprise IT. Private clouds can also be hosted off-premise. In this case, a service provider offers a portion of its public infrastructure for exclusive use by a single customer, also known as a tenant.
- 3. Public cloud.** The public cloud is the collection of off-premise, multi-tenant infrastructure, storage and computing resources, as well as SaaS applications and data, which are delivered on demand by external cloud service providers. Public clouds allow multiple customers, or tenants, to share the underlying resources with each paying only for the resources it consumes.

Hybrid clouds are formed when private and public clouds are closely integrated, delivering IT services with the security, control and agility users demand. Since enterprise IT organizations are focused heavily on hybrid clouds, they are represented as a single, converged cloud in Figure 1.

### Benefits of a converged cloud strategy

Public and private clouds both provide a number benefits. These include rapid provisioning, self-service, flexibility, agility and elasticity. At the same time, each type of cloud offers unique advantages of its own. Enterprise IT organizations that

follow a converged cloud strategy get the best of both worlds by selecting which applications and which usage scenarios fit best in their private cloud and which fit best in a public cloud.

On-premise private clouds rely on capital investments—whether new or existing—in data centers and infrastructure. Once these investments have been made, the incremental costs of running an application in a private cloud is often substantially less than running an equivalent workload on a public cloud. From an ROI perspective, this makes it important to achieve and maintain a high level of resource utilization in private clouds before moving applications to a public cloud.

Private clouds are also commonly used when direct control is needed. While private clouds don't necessarily have greater reliability or security than public clouds, governance requirements sometimes mandate that sensitive data, as well as applications that access that data, remain on-premise. Some applications may also have dependencies on shared IT services or shared data that must remain on-premise.

Public clouds are well suited for a number of other scenarios, particularly when the private cloud is operating at capacity. The underlying concept here is based on owning just enough infrastructure so that it can be kept busy consistently. Then, rather than owning more infrastructure that would often sit idle, additional demands can be met through a public cloud. In this scenario, applications that only run periodically are great candidates to run in a public cloud. Test, demo and training environments aren't used continuously, so they also fit well within public clouds.

Public clouds provide seemingly unlimited scale, making them appropriate for situations with unpredictable demand. For example, product launches and promotional events can generate surprisingly high website traffic. These can be some of the most important times for business success and IT must be ready to serve all prospective customers. Similarly, seasonal demands—from holiday shopping to tax season—may be best met by taking advantage of public cloud resources.

### **Citrix solutions for cloud services**

The Cloud Era holds tremendous promise for those who embrace it. Yet cloud computing is not just a product to be unboxed and installed in a data center. When used to its full potential, cloud computing goes well beyond scalable, elastic computing. It lets users work when and where they want, from any device. It supports innovation by providing inexpensive compute power for experimentation. It enhances business agility, enabling fast response to changes in business conditions.

While cloud computing offers many possibilities, enterprise organizations have already made very large technology investments. This means efficient adoption of cloud computing must leverage existing technologies and services, making them better rather than simply replacing them. Citrix has a range of solutions for mobile workstyles and cloud services that do just that. Please see Figure 2.

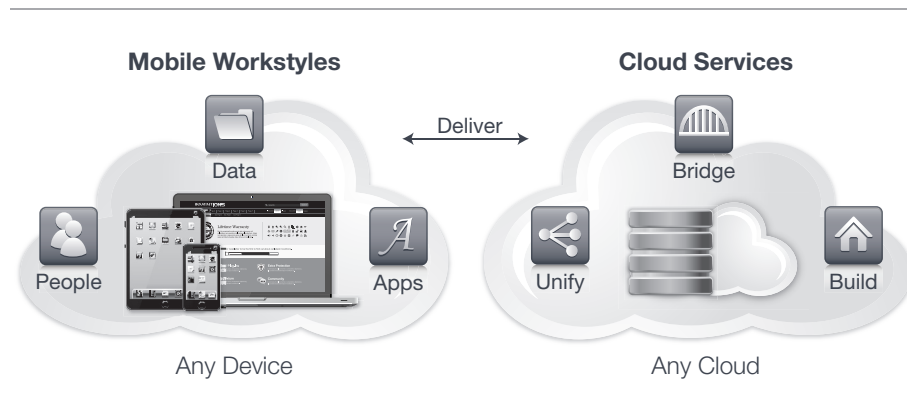


Figure 2. Citrix solutions for the Cloud Era.

As shown in Figure 2, Citrix powers mobile workstyles through solutions that address people, data and apps. Citrix also powers cloud services through solutions for unifying, bridging and building cloud environments. Since users demand a seamless, reliable, high performance experience from the desktop to the data center to the cloud, Citrix also offers solutions that support the delivery of all IT services, whether on-premise or off-premise.

Infrastructure solutions for cloud services—in the categories of build, bridge, unify and deliver—are highlighted below.

## Build

When building an infrastructure as a service (IaaS) cloud, it is important to understand that server virtualization alone does not make a cloud. However, since virtualization is an important part of IaaS clouds, investments in virtualization technology are not wasted on the path to cloud computing. IaaS clouds take virtualization to the next level and provide capabilities such as automation, APIs and self-service interfaces.

Citrix solutions for building clouds let enterprise IT organizations build private clouds the way public clouds are built. In fact, Citrix cloud solutions power 4 of the 5 world's largest clouds today. Offerings such as Citrix XenServer and Citrix CloudStack deliver the flexibility, performance and scale these clouds demand. Citrix XenServer is a complete server virtualization platform built on the powerful Xen hypervisor. Citrix CloudStack is an enterprise class, open source software platform that pools computing resources to build highly scalable and elastic public, private and converged IaaS clouds.

With CloudStack, enterprises and service providers can quickly and easily build cloud services within their existing infrastructure without the overhead of integration, professional services and complex deployment schedules. CloudStack's hypervisor agnostic architecture gives enterprises the freedom to choose the right hypervisor for their workloads including Citrix XenServer, Oracle VM, KVM and vSphere.

By enabling capabilities like powerful automation, rapid provisioning, resource pooling and multi-tenancy, enterprise IT organizations are transforming traditional data centers into more elastic and economical private clouds.

## Bridge

With the focus on converged clouds, it is important for enterprise IT organizations to connect to the growing array of public cloud services in the simplest way possible—without sacrificing security. At the same time, in order to gain the benefits of a converged cloud, there must be some transparency between public and private clouds. Without it, separate clouds become independent islands, unable to work together or share resources. Citrix enables the enterprise to build converged cloud solutions by connecting their data centers to external clouds using Citrix CloudBridge.

CloudBridge connects enterprise data centers to external or hosted cloud services, making the public cloud a secure extension of the enterprise network. CloudBridge sits at the “back door” of the enterprise data center, where it enables enterprises to transparently shift workloads to the cloud while maintaining control and keeping sensitive data assets like databases and corporate directories safely on-premise. Enterprises can augment their data centers with the infinite capacity and elastic efficiency offered by cloud service providers.

The network is one of the most important infrastructure elements of cloud environments. Networks must not only support bridging to external clouds, they must provide reliable, scalable and high-performance access to internal clouds. Citrix provides solutions for enterprise cloud networks, letting enterprise IT deliver all apps and services with high performance, security and availability. Products like the industry leading Citrix NetScaler support Citrix solutions for enterprise cloud networks.

NetScaler makes cloud-based services run faster by offloading application and database servers, accelerating application and service performance, and integrating security. NetScaler combines high-speed load balancing and content switching, data compression, content caching, SSL acceleration, network optimization, application visibility and application security on a single, comprehensive platform.

Together, CloudBridge and NetScaler create a cloud optimized service delivery fabric that spans converged clouds.

## Unify

Cloud services deliver much of their business value through the applications they support. With increasingly mobile workstyles, users must be able to connect to both internally-hosted and externally-hosted applications. Citrix delivery solutions enable a single-pane for provisioning and management while providing users with simple access to the IT services they need to be productive.

Products like Citrix CloudGateway offer a unified storefront for accessing data and applications. CloudGateway aggregates, controls and delivers all applications—Windows, web, SaaS and mobile—to any device, anywhere. Users get a single, intuitive, self-service interface to access all of their business apps, and IT gains a comprehensive single point of aggregation and control for all apps and users.

Citrix delivery solutions extend beyond cloud services to mobile workstyles, as shown earlier in Figure 2. With these solutions, users can utilize their desktops and applications through a unified and seamless experience on any device.

## Deliver

Work is no longer a 9-to-5 activity that happens only within the walls of the corporate office. Work is wherever inspiration happens and people need 24/7 access to the right IT capabilities to be productive. To meet these demands enterprise IT organizations must deliver desktops, applications, data and IT services on-demand, whether on or off premise, seamlessly and securely to anyone, anywhere on any device with the best performance and experience.

Citrix solutions give IT the ability to centralize, virtualize and deliver desktops, applications and data with greater control, security, and efficiency and ultimately lower operating costs. For example, Citrix XenDesktop is a desktop virtualization solution that transforms Windows desktops and applications into an on-demand service. With XenDesktop, enterprise IT can securely deliver individual Windows, web and SaaS applications, or full virtual desktops, to PCs, Macs, tablets, smartphones, laptops and thin clients.

Today's users don't just want access to services; they demand performance, availability and security. To meet these demands, Citrix provides solutions that optimize delivery performance. Once again, Citrix NetScaler powers enterprise cloud networks, creating a safe and responsive service delivery fabric.

## Conclusions

The Cloud Era is forcing enterprise IT organizations to reevaluate IT strategies, causing them to search for lower costs, greater capacity and improved agility. Yet cloud computing is more of a landscape than a single mountain top. Rather than one product to install or even a single solution to deploy, cloud computing touches on the broader aspects of IT.

Citrix offers an industry leading set of solutions that power mobile workstyles and cloud services. These are open solutions, built on a different set of assumptions than the PC Era. They support a broad range of services, regardless of the underlying technologies. They are designed to leverage existing investments, not push more expensive hardware.

Look to Citrix as your enterprise begins to embrace the Cloud Era.



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Citrix Systems, Inc. (NASDAQ:CTXS) is the leading provider of virtualization, networking and software as a service technologies for more than 230,000 organizations worldwide. Its Citrix Delivery Center, Citrix Cloud Center (C3) and Citrix Online Services product families radically simplify computing for millions of users, delivering applications as an on-demand service to any user, in any location on any device. Citrix customers include the world's largest Internet companies, 99 percent of Fortune Global 500 enterprises, and hundreds of thousands of small businesses and prosumers worldwide. Citrix partners with over 10,000 companies worldwide in more than 100 countries. Founded in 1989, annual revenue in 2010 was \$1.87 billion.

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