



Conquer App Management Challenges

On-Demand Application Delivery with XenApp



Executive Summary

Traditional application deployment and management techniques are fraught with difficulties. They are a major drain on IT manpower and budgets, perpetuate an inherently insecure operating model, and suffer from a degree of complexity that will only get worse with increasing user mobility and the proliferation of client devices. And although enterprise software distribution, configuration management systems, and other similar solutions often help with this situation, particularly in terms of efficiency and thoroughness, the gains they provide are simply not enough. Complexity, compatibility, security, and a lack of support for third-party users remain as significant issues—not to mention that these solutions do relatively little to help IT departments address other prevailing trends, challenges, and imperatives, such as those pertaining to business continuity, agility, growth, and regulatory compliance.

On-demand application delivery, an alternative approach to application management enabled by Citrix® XenApp™, offers today's enterprises a better way forward. By combining application and session virtualization with a robust, centrally controlled delivery infrastructure, XenApp ensures users can quickly and easily obtain the applications they need in practically any situation—from any location, with any device, and at any time of day. At the same time, XenApp also reduces the cost of application management by up to 50%, practically eliminates issues with application compatibility, and significantly improves the posture and capabilities of today's enterprises relative to data security, regulatory compliance, business continuity, and the ability to support a highly mobile and increasingly distributed workforce.

The Application Management Dilemma

Traditional, distributed application deployment and management, which entails installing, maintaining, and supporting a set of applications on each individual computing device, has become extremely complex and costly—and is completely unable to keep up with the rapid pace of change and other, pressing business issues.

Manual, De-Centralized Approach is Severely Broken

A significant percentage of organizations—with disproportionately greater representation among small-to-medium enterprises—still rely on a completely manual, de-centralized approach to application management. IT administrators physically go from user to user with a stack of media and install the required applications on each individual device—or, in some instances, have the devices shipped to them instead. With the exception of self-updating software, the same process also applies for upgrades, patches, and ongoing support.

That such an approach is time-consuming, inefficient, and costly is fairly obvious. Some of the other significant issues with it include the following:

- **Mounting complexity** – The matrix of builds that needs to be managed and maintained becomes unwieldy even with just a handful of different operating systems, devices, applications, and versions of the same. Short of mandating a standard client environment, there is little option other than to manage each device as a completely unique system.

- **Prone to errors** – Because it is a manual process and because of the diversity mentioned above, installation errors and issues with software and hardware incompatibility are inevitable.
- **Inherent insecurity** – Typically, upgrades and patches are not installed in a timely manner and users are configured with administrator privileges—that way they can fix things and/or add applications themselves if necessary. Moreover, by residing directly on user endpoints, sensitive data and application code is left in a highly exposed position where it can easily be lost or stolen.
- **Poor coverage for mobile users** – Along with field-based personnel, mobile users complicate and increase the cost of manual application management even further. There is simply no good option: management must wait until users and administrators are physically together for other reasons, administrators must travel to users individually, devices must be shipped to administrators, or users must take care of their systems themselves.

And let's not overlook the productivity and lost opportunity costs due to users not getting access to the latest and greatest applications in a timely manner. With a purely manual approach, rollouts of new applications can literally take months.

Traditional Software Management Solutions are Only Marginally Better

Not surprisingly, many organizations have turned to enterprise software distribution, configuration management systems, and other related tools to alleviate the burden of application deployment and management. Although these solutions are helpful in some areas, they still fall short in many others.

Centralized control and automation yield significant improvements in efficiency, timeliness, and cost of ownership. Security is even improved, albeit just incrementally, given that more timely software updates do nothing to change the fact that sensitive information continues to reside on individual endpoints.

On the downside, though, complexity remains a major issue. Individual tools are unlikely to provide coverage for anywhere near all of the permutations and combinations of devices, operating systems and applications most enterprises will encounter. And incompatibility issues will cause failures that often require administrator involvement (i.e., manual effort) to correct. Support for distributed users also remains challenging, as the remedy for low-bandwidth, high-latency connections typically entails an investment in local instances of management tools and/or on-site support personnel.

High-Level Business Trends and Imperatives Further Raise the Bar

Traditional software management solutions fall short in other ways too. In many cases they do too little—or even nothing at all—to account for other prevailing trends, challenges, and business objectives.

- *IT efficiency and cost reduction* gains are hampered by limited coverage and incompatibility issues.



- Achieving *regulatory compliance* is aided by a better understanding of the organization's software inventory, but not in terms of controlling and demonstrating how information resources are actually utilized (or not).
- *Agility*—which is a critical differentiator, especially for smaller enterprises— is only incrementally improved. Availability of new applications and capabilities in a more timely fashion—within days or weeks instead of months—is still not the same as having access to them immediately.
- Practically no contribution is made toward ensuring *business continuity*, supporting an increasingly *mobile workforce*, or growing the business by accommodating *geographic expansion* and *mergers* and *acquisitions*.

On-Demand Application Delivery with XenApp

An alternative approach to application management, on-demand application delivery not only addresses the shortcomings of traditional techniques and tools, but also accounts for a wide range of other important enterprise objectives as well. Enabled by Citrix XenApp, this ideal combination of capabilities is based on managing applications in the datacenter and delivering them as an on-demand service to users anywhere using virtually any device including PCs, Macs, Linux, thin clients and smartphones. Stated another way, the keys to this approach are:

- Completely centralized management, maintenance, and control of applications;
- Application delivery, which refers to the ability to offer both online and offline application access through a combination of application hosting and application streaming; and,
- The on-demand nature of the service, which ensures users can obtain immediate access to applications when and where they need them.

The net result is that XenApp reduces the cost of application management by up to 50%, dramatically improves business agility, and significantly strengthens application and data security—all while providing users with a better-than-installed experience.

As for how these capabilities and benefits are specifically attained, the answer is that XenApp combines multiple types of virtualization technology with a multi-faceted and centrally controlled delivery infrastructure.

Virtualization Technology Forms a New Foundation

At its core, XenApp relies on a combination of application and session virtualization for many of the strengths and advantages it has compared to traditional application management solutions. Indeed, uncoupling applications from the operating systems and hardware on which they run significantly reduces compatibility issues while also delivering a tremendous degree of portability and flexibility.

Application Virtualization

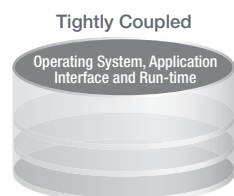
Application virtualization improves the manageability and compatibility of applications by isolating them from the underlying operating system through virtual redirection. With application virtualization, applications are not installed in the traditional sense. Instead, they are packaged in a way that provides each application with its own isolated runtime environment where it will operate using its own virtualized (i.e., copied) instance of necessary system services, settings and data [and all requests to the underlying operating system are proxied]. When a user requests an application, the corresponding package is then streamed—that is, sent over the network in a way that it allows it to run even as the sending process is in progress—to the user’s endpoint. Added benefits of this approach are that it provides access to applications when users are offline and enables organizations to more fully leverage endpoint computing power.

“Application virtualization” defined

Optimizing an applications run time by isolating it from the host operating system.

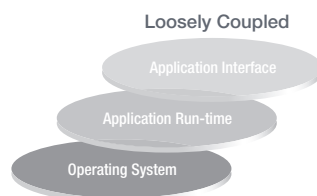
Traditional installed applications

- Tightly coupled and rigid run-time environment
- Updates installed to each machine
- Potential app compatibility issues
- Decentralized data



Virtualized applications

- Loosely coupled environment
- Updates installed once on centralized servers
- No inter-app conflict
- Centralized data



Session Virtualization

A significant differentiator for XenApp, session virtualization is a second delivery method that includes a number of attractive characteristics. With session virtualization, applications are either:

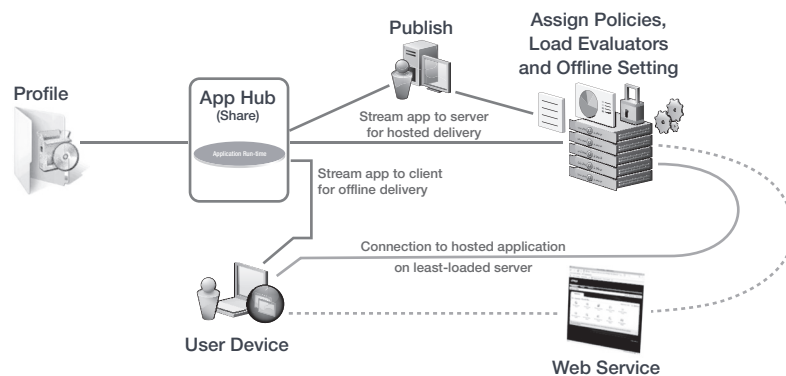
- Installed or streamed to centralized Windows Servers running Remote Desktop Services—a configuration referred to as server-hosted applications, or
- Implemented within a virtual machine that is then run on a centralized blade PC, dedicated PC, or as part of a virtual desktop infrastructure (VDI) implementation—a configuration referred to as VM-hosted applications.

The primary distinction from application virtualization is that in this case the applications are hosted and run in a centralized location, as opposed to on endpoint devices. Users remotely access them via a client-side software agent or ordinary web browser and interact by exchanging mouse, keyboard, and screen updates over the network. This way, performance is enhanced, particularly for “chatty” client-server applications and, most importantly, sensitive applications and data never leave the datacenter.

The XenApp Delivery Infrastructure

Application and session virtualization are unquestionably big pieces of the solution, but the biggest difference maker for XenApp is the supporting infrastructure that is provided to control, optimize, and secure the delivery of applications and/or application sessions to users and their devices. By streamlining operations and administration, bolstering security, expanding the scope of applicability of the solution, guaranteeing a seamless, high-performance user experience, and delivering applications with 99.999 percent availability, the XenApp delivery infrastructure maximizes the benefits of what would otherwise be little more than an intriguing and incrementally useful set of technology.

Intelligent application delivery



Single Instance Management

One of the greatest strengths of application virtualization and the XenApp delivery infrastructure is that they neutralize the complexity associated with traditional application management, dramatically reducing administrative effort and, in turn, application TCO.

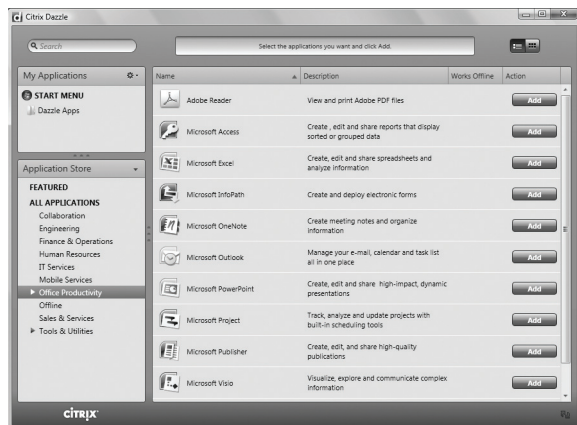
With XenApp, IT administrators are able to centrally configure, store, and maintain a single image for each application, despite the inevitable variation in endpoint devices, operating systems, and their configuration state. Similarly, they only need a single “golden” server image to manage and dynamically provision XenApp servers. In addition, new applications, upgrades, and patches need only be implemented and tested once. A simple re-publication of the updated resources then makes them available to users whenever they start their next session.

Dynamic Delivery and Self-Service Applications

Because XenApp supports both application and session virtualization, users have access to their applications whether or not they are connected to the network. Not only that, but embedded system intelligence coupled with configurable access controls enable automatic selection of the most optimal and secure virtualization method for delivering each application. Pre-configured policies deliver set levels of access based on the user scenario, device capabilities, network performance, connection location, and security profile.

In addition, Citrix Dazzle, the first self-service storefront for enterprise applications, provides corporate employees with 24x7 access to the applications they need to work. Offering a rich, intuitive user experience—similar to using Apple iTunes—that requires little training, Dazzle helps self-service IT become a reality. Users obtain simple access to applications and define their own experience while IT ultimately remains in control.

Citrix Dazzle

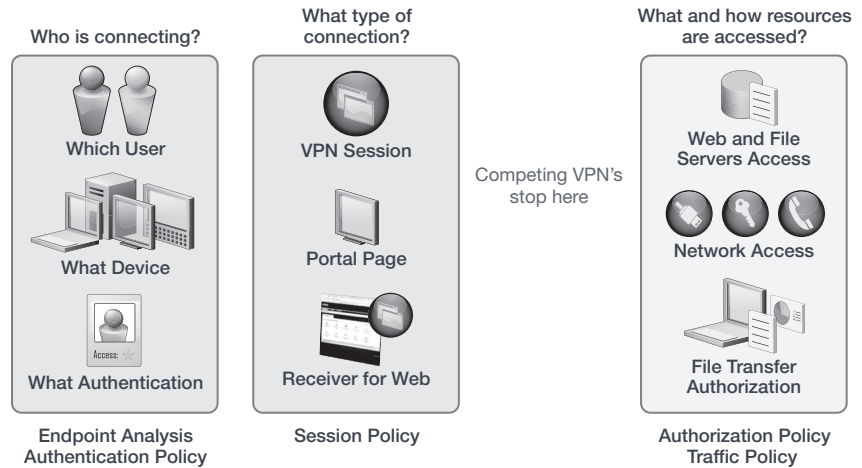


Secure by Design

The availability of hosted delivery options means that sensitive applications and data need never leave the datacenter. This is in contrast to having to rely on the integrity and security of an endless variety of endpoint devices, as well as their owners and operators. Having granular control, however, is the real key to balancing usability with support for regulatory compliance and security objectives.

With XenApp, built-in endpoint scans and policy controls take into account each user's role, device characteristics, and network conditions to dynamically determine which applications and data they are authorized to access, along with which delivery methods are available to them. Policies can also be implemented that define where users may store and print sensitive information. In addition, support for centralized password management, multi-factor authentication, encrypted delivery, and comprehensive activity auditing capabilities further minimize the potential for loss or theft of data.

How advanced access control works



Any Device, Anywhere

Another major strength of XenApp is its broad applicability and, therefore, comprehensive support for an increasingly mobile workforce and the consumerization of IT. By leveraging Citrix Receiver, a single, auto-updating client, applications can be delivered to over 30 different operating systems. These include Windows, Mac, Linux, and Unix devices, along with legacy DOS PCs, the latest NetBooks and any of thousands of thin-clients and smart terminals available on the market today. Even users on iPhone, iPod Touch, Windows Mobile, Android and EPOCH devices can access Windows and UNIX applications delivered via XenApp. The net result is the ability to deliver any application to any device, anywhere, a characteristic that solidifies XenApp as the most complete application management solution on the market today.

High-Definition User Experience

With virtualized applications and the XenApp delivery infrastructure, users are assured of a familiar, consistent, and always-on application experience regardless of their access scenario. In addition, superior performance is guaranteed by Citrix HDX, a set of network and display optimizations and performance-boosting technologies which deliver high performance over any network, including low bandwidth and high latency WAN connections. Users enjoy better reliability and higher availability than a traditional PC, even when using multimedia, real-time collaboration, and 3D graphics, all while consuming up to 90 percent less bandwidth compared to alternative solutions. Webcam and VoIP support, improved audio, 3D graphics support, and the ability to use USB peripherals freely make XenApp a highly functional solution for every user.

Enterprise-Class Infrastructure

Without the ability to ensure the availability of XenApp services and to control them in a scalable manner, all else would be marginalized. To this end, XenApp includes a comprehensive management system that enables centralized control, rapid provisioning, workflow automation and system-wide performance monitoring and analysis. At the datacenter end of the equation, intelligent load and capacity management features automatically

distribute access sessions to optimize server performance and allow reservation of resources for high-priority activities. At the same time, end user performance is monitored and, if necessary, corresponding sessions are recorded for further analysis to help meet applicable service level objectives. Finally, automated session, server, and datacenter failover ensure high reliability, delivering 99.999 percent application availability.

Application Management with XenApp

The bottom line is that on-demand application delivery—as enabled by Citrix XenApp – transforms application management from a liability into a strategic asset. The combination of application virtualization, session virtualization, and a robust, centrally controlled delivery infrastructure helps IT directors achieve the right balance. Bridging the gap between business and user needs, XenApp provides:

- The most cost-effective way to manage and deliver applications to users;
- The strongest protection for sensitive data, proprietary information, and intellectual property;
- The greatest degree of user and device flexibility while still retaining control;
- The best user experience and performance on any network; and,
- The highest levels of reliability and application availability.

Not only does XenApp resolve the tactical challenges of traditional application deployment techniques and management tools, it also serves as an enabling platform for a wide variety of strategic objectives, including:

- **Business continuity.** On-demand app delivery ensures displaced employees can access their applications from any web-enabled device, while transparent re-direction to an alternate datacenter allows seamless recovery from a site-level outage.
- **Workforce mobility.** Being able to provide access to applications with any device, from anywhere, at any time makes supporting any number of mobile users a trivial exercise.
- **Regulatory compliance.** Having granular control over who has access to which information resources and how they can use them goes a long way toward achieving compliance with most regulations. Being able to rapidly patch and update applications that operate on sensitive data doesn't hurt either.
- **Geographic expansion / mergers and acquisitions.** Even as organizations consolidate servers and datacenters to boost IT efficiency and reduce costs, many are also adding or acquiring remote offices to improve their ability to capture and retain customers. With XenApp, arming associated users with the tools they need requires nothing more than a web browser and a valid network credential.



And these examples only begin to scratch the surface. The flexibility and control afforded by on-demand application delivery and XenApp ensures their applicability to countless other enterprise scenarios and objectives, both now and in the future.

To find out how on-demand application delivery can resolve application management challenges and help transform your business, visit www.citrix.com.



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About Citrix

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