

Upgrading to Citrix XenApp and XenDesktop 7.x?

5 Best Practices to Ensure Stellar
Post-Migration Citrix Performance



Citrix XenApp 6.5: Reaching End of Life

The clock is ticking on Citrix XenApp 6.5. End-of-life (EoL) process for XenApp 6.5 has already commenced and we are nearing the end-of-maintenance (EoM) period.



Support for Citrix XenApp 6.5 ends on June 30, 2018

Citrix customers will need to migrate their current Citrix XenApp 6.5 deployments to Citrix XenApp 7.x very shortly. While any software upgrade can be challenging for an organization, what makes this move from XenApp 6.5 to 7.x even more significant is the host of changes that Citrix has introduced in the 7.x releases. Among the many differences in Citrix XenApp and XenDesktop 7.x, the most important is the overall architecture revamp. Therefore, Citrix customers will not be able to do an in-place upgrade, but instead will need to set up a 7.x Citrix farm in parallel before migrating workloads from their Citrix XenApp 6.5 farm over to the new farm. This document highlights five key best practices that organizations migrating to Citrix XenApp and XenDesktop 7.x need to follow.

What's Changed in Citrix XenApp and XenDesktop 7.x? A Quick Round-Up.

The move to Citrix XenApp and XenDesktop 7.x involves many architectural changes and functionality enhancements. Key among these are:

- With v7.x, Citrix XenApp and XenDesktop technologies can now be delivered using one unified architecture (earlier versions required two separate infrastructures for XenApp and XenDesktop).
- The Citrix architecture has changed from IMA (Independent Management Architecture) in 6.x to FMA (Flexcast Management Architecture) in 7.x.
- Zone Data Collectors have been replaced by Citrix Delivery Controllers. XenApp servers are now grouped into Delivery Group and Machine Catalogs. The equivalent concept in the previous version was Worker Groups.
- The top-level object in the Citrix environment hosting applications and desktops is now a Delivery Site (this used to be a farm).
- Citrix StoreFront has replaced the Citrix Web Interface for web-based access.
- Citrix XenApp installation is much simpler. Only a Virtual Delivery Agent (VDA) agent needs to be installed on a server.
- The popular built-in monitoring tool, Citrix EdgeSight, is no more. It has been replaced by Citrix Director. In its initial releases, Citrix Director was primarily a helpdesk tool, providing session performance information. Later versions of Citrix XenApp and XenDesktop 7.x have introduced several enhancements to Citrix Director. While still mainly a helpdesk tool, Citrix Director now includes some alerting and graphing capabilities.

A recent survey by eG Innovations and DABCC revealed:

62%

of Citrix customers are still using Citrix XenApp 6.x

- 42% of Citrix customers on older versions of Citrix XenApp are considering migrating to 7.x in the coming year
- 37% of respondents still have older versions of Citrix XenApp that have reached end of life



In addition to these changes, there are several new capabilities to look forward to when moving to Citrix XenApp and XenDesktop 7.x. These include:

- Major improvements in HDX with high-performance GPU sharing, higher overall frame rates, multicast support, real-time media transcoding, improved flash redirection, and server-rendered rich graphics and video output
- Optimized user experience with adaptive transport enabled with Enlightened Data Transport (EDT) protocol. This new data transport mechanism is faster, more scalable, and improves application interactivity on WAN and internet connections. ICA virtual channels can now intelligently switch the underlying protocol between EDT and TCP to deliver the best performance.
- Improved caching in Citrix Provisioning Services (PVS)
- Profile management improvements
- AppLayering that simplifies the packaging, updating and delivery of applications
- Simplified workspace administration with Citrix Workspace Environment Management (WEM)
- Flexibility to deploy Citrix services in the cloud

Ensuring Performance Consistency is Critical for Business Success

The success of any Citrix 7.x migration hinges on the experience that users perceive, post-migration. User experience after the migration must be at least as good as, or better than what it was prior to the migration

But, given the significant changes between Citrix XenApp 6.5 and 7.x, ensuring performance consistency is not so simple. There are significant architectural, configuration, platform, and administrative changes. In addition, Citrix admins have to handle different tools for monitoring performance than previously – Citrix EdgeSight in XenApp 6.5 vs. Citrix Director in 7.x. Because not all the features of Citrix EdgeSight are available in Citrix Director, it is difficult to get a consistent measure of performance before and after the migration. To overcome these significant challenges, organizations must have an effective performance management strategy in place as part of their migration effort.

Here are five performance management best practices to consider during Citrix migration.

Best Practice #1: Benchmark User Experience

It is important that Citrix administrators benchmark user experience on the Citrix XenApp 6.5 platform before migration. This sets a reference point for comparison and determine whether there are any deviations in user experience standards after the migration.



Synthetic monitoring tools that simulate specific scenarios for user logon, application launch and access are well suited to provide a consistent measure of performance before and after performance. They impose the same workload on the pre- and post-migration infrastructure and, therefore, provide a reliable comparison.





Time taken for user logon, application enumeration, application launch, step-wise response time within the application, etc., are just a few of the metrics that should be captured and analyzed. Synthetic monitoring can be set up and executed from different strategic locations in the infrastructures, so performance from these specific locations can be assessed.

Since the migration to Citrix XenApp/XenDesktop 7.x is often not performed in-place, there may be differences in the hardware configurations, software settings and resources allocated to the servers and desktops. That is, overall there are likely to be many changes in the infrastructure used for Citrix XenApp/XenDesktop 7.x as compared to the

When performance problems are detected post-migration, an often-asked question is “what changed from the previous infrastructure to the current one?” But, asking

this question after migration is often too late – the resource usage levels and the workload on each and every tier of the infrastructure must be measured pre-migration for proper assessment. This establishes baselines that can be compared with the post-migration infrastructure to determine why user experience issues are happening: Is the infrastructure undersized? Has the workload changed? Are new applications deployed causing performance bottlenecks?

Best Practice #3: Track Performance of Every Citrix and Non-Citrix Tier

Citrix XenApp and XenDesktop are amongst the most performance-sensitive workloads in enterprise networks today. And the infrastructure supporting them is multi-tier and heterogeneous. There are multiple Citrix tiers involved (XenApp, XenDesktop, StoreFront, NetScaler, License Server, PVS, etc.), and there are supporting infrastructure tiers (virtualization, storage, network, Active



Citrix logon simulation tools help benchmark user experience

Best Practice #2: Baseline Resource Usage Patterns

Citrix XenApp 6.5 has been mainly deployed on Windows Server 2003 and 2008, in some cases even on physical machines. Citrix XenApp 7.x does not support Windows Server 2003 and older versions of 2008 and 2008 R2. This means that the migrated environment will be running on newer versions of Windows Server operating system,

such as 2012 and 2016. Further, virtualization of Citrix is the norm today, rather than an exception, introducing another significant variable. Also, it is highly likely that given the change in operating systems used, the versions of the client applications published via Citrix may also be different.



Identify abnormal resource usage patterns with auto-baselines

infrastructure that supported Citrix XenApp 6.5. Changes in the performance of the underlying infrastructure supporting the Citrix service delivery can also impact the user experience.

Directory, profile servers, etc.), and all work in tandem to deliver the Citrix service. A performance bottleneck in any one of these tiers will impact Citrix performance for the end-user.



Citrix administrators have often struggled with having to use multiple different tools and management consoles every day. Even with Citrix EdgeSight, administrators could only use the tool to track the session servers in the infrastructure, and other tools were required for monitoring StoreFront, PVS, NetScaler and so on. With Citrix EdgeSight no longer available in Citrix XenApp and XenDesktop 7.x, Citrix administrators will need to look for third-party monitoring tools that provide monitoring for all the Citrix and non-Citrix tiers that support the Citrix service. Ideally, such holistic monitoring will help them quickly determine, when a problem comes up, the location of the root-cause: is it in the network, or the application, or Citrix, or the virtualization or storage tiers?

XenDesktop 7.x must be factored in prior to migrating. Make sure you have determined how you will get these critical reports, post-migration.

“The key use case for a 3rd party monitoring tool is the integration of components from Citrix and other vendors. For example, many Citrix environments reside on VMware for the hypervisor. Director won't show issues that occur when a VMware host has a NIC issue.”

Jo Harder, TVP Strategy, March 2017

Best Practice #4: Stay Ahead of User Complaints After Migration

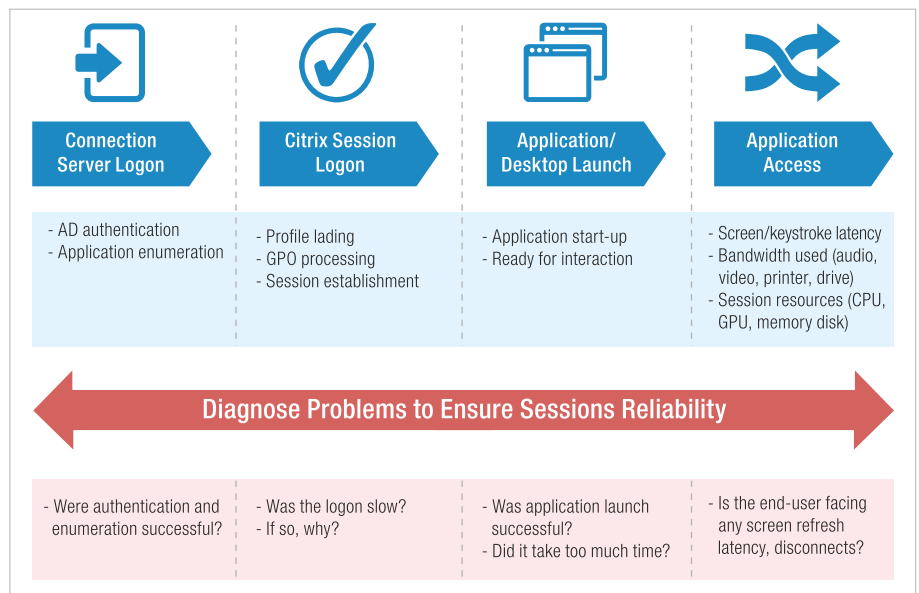
As explained above, user experience will determine the success of any Citrix deployment initiative. More than ever before, Citrix administrators are aware of the necessity to monitor the user experience. Post-migration, this is the only way to stay ahead of user complaints. Admins must monitor user experience, detect user experience issues proactively and fix them before users notice problems and complain. Synthetic monitoring via simulations is useful for detecting issues that affect the entire user population at once, but such catastrophic problems are not a common occurrence. More often, issues like slow logon times, screen freezes, and session disconnects affect a subset of the user population – for example, specific Active Directory groups, subnets in the network, clients from specific geographic locations, etc. The only way to be proactively notified of these problems is by proactively monitoring the real user experience.

Compared to Citrix XenApp 6.5, Citrix XenApp and XenDesktop 7.x provide more capabilities to track user experience. Real user logon times, breakdown of logon time



Using multiple tools makes problem diagnosis challenging

In many domains, Citrix administrators have used Citrix EdgeSight to deliver reports (to customers or management) detailing Citrix usage – who logged in, when, what applications did they access, what resources they used, etc. But the lack of such built-in reporting capabilities in Citrix XenApp and



Different aspects of Citrix user experience that need to be tracked

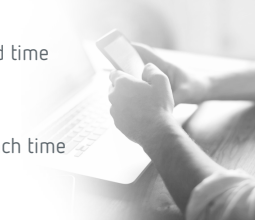


into different stages of the logon process, brokering failures, application crashes, screen refresh latencies and network latency between the server farm and the client terminals are just some of the user experience metrics that must be tracked in real-time. Citrix Director now provides a subset of these metrics out of the box. But for comprehensive visibility into all aspects of user experience, look for thirdparty monitoring tools from a number of Citrix technology partners.

Some useful KPIs to track real user experience in a Citrix XenApp/XenDesktop 7.x infrastructure include:

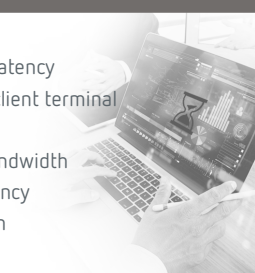
Logon time metrics

- User logon time
- User profile load time
- GPO processing
- LDAP bind time
- Application launch time
- Disconnects




HDX channel metrics

- Screen refresh latency
- Latency at the client terminal
- I/O line speed
- Audio/video bandwidth
- Framehawk latency
- I/O compression



Session resources

- CPU
- Memory
- Handles
- Page faults
- I/O reads and writes
- Resource usage by each published application



Best Practice #5: Right-Size the Infrastructure for Maximum ROI

As a result of the many changes in the Citrix infrastructure – hardware, operating system, virtualization platform, Citrix stack, client applications and so on – sizing guidelines established for earlier versions of the Citrix stack will no longer hold true. For example, bigger does not mean better in a virtual infrastructure: Citrix XenApp servers with excessive CPU and memory resources may not perform better than ones that are right-sized.

For Citrix administrators, the changing landscape introduced by a migration presents both a challenge and an opportunity.

Analyzing the performance of an infrastructure after it is fully operational is of limited use and is often too late – processes and procedures are already in place and any change can be disruptive to normal operation, after the fact. During the migration process, organizations have an opportunity to build in the correct instrumentation and analytics right from the start. Analysis of performance at the initial stage can reveal bottlenecks or potential avenues for optimization which, if done right, can save the organization resources and money. For example, organizations can use baselining to determine ways to load balance the infrastructure to avoid having all of the resource-intensive applications on a common set of servers.

With more modern tools and technologies at their disposal, Citrix administrators can establish new baselines that can improve the utilization levels of the infrastructure, without compromising user experience, and thereby deliver better ROI for the organization.

How eG Enterprise Enables Seamless and Successful Citrix 7.x Migration

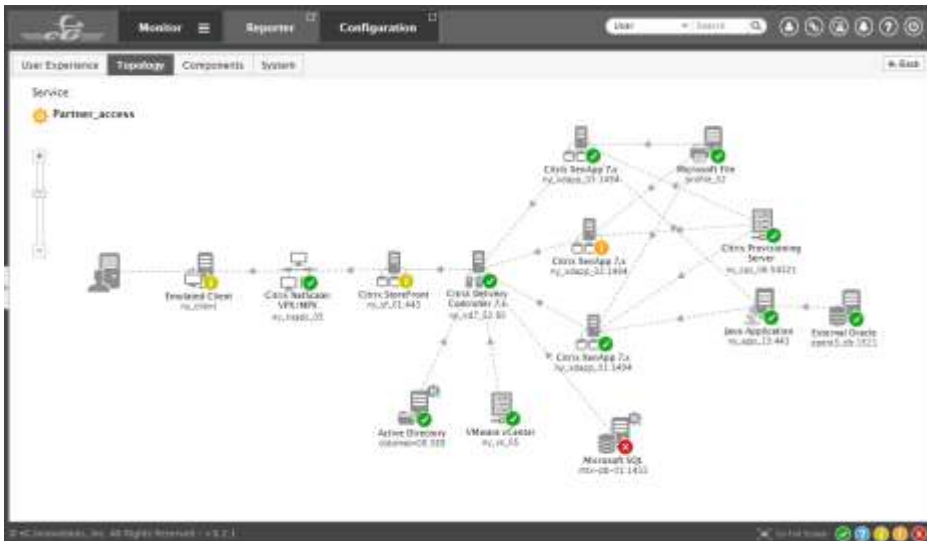
eG Enterprise from eG Innovations is a Citrix Ready-certified performance management solution for Citrix infrastructures.

Purposebuilt with years of domain expertise acquired from addressing monitoring needs of some of the largest Citrix deployments in the world, eG Enterprise delivers actionable performance insights that enable Citrix admins to achieve a smooth migration to Citrix XenApp and XenDesktop 7.x:

- Use built-in synthetic monitoring tools to benchmark user experience and conduct performance assessment pre- and post-migration
- Continuously track real user experience metrics in both XenApp 6.5 and 7.x platforms, and be the first to know when end-users are affected
- Monitor every layer and every tier of the Citrix site and supporting infrastructure with out-of-the-box monitoring models and intuitive web-based dashboards
- Understand relationships between the various tiers using automated infrastructure discovery and dependency mapping



Custom dashboards provide Citrix farm-wide views



End-to-end topology views help with root cause diagnosis

- Auto-correlate performance across the Citrix and non-Citrix infrastructures and pinpoint the root cause of problems in just minutes
- Leverage built-in reports to compare and analyze performance before and after the migration
- Use predictive analytics to forecast capacity needs and get actionable insights

for infrastructure rightsizing to achieve maximum performance from the migrated 7.x environment

Simplify Citrix performance management with eG Enterprise, your key to a smooth and successful migration from Citrix XenApp 6.5 to 7.x.

Next Steps

For more information, please visit www.eginnovations.com/citrix

Email us at info@eginnovations.com

Get the [Free Citrix Logon Simulator](#) to proactively detect logon issues during 7.x migration process.



Live Demo

Request a personal walkthrough to learn first hand how eG Enterprise can help improve performance and operations in your business environment.



Free Trial

15-days of free monitoring and diagnosis, in your own infrastructure. Try it and learn exactly how eG Enterprise helps you ensure a great end-user experience and improve IT operations.

Category	Metric	Value
Session Resources	CPU usage for user's processes (%)	5.4977
	CPU time used by user's sessions (s)	21.8908
	Memory usage for user's processes (M)	0.1046
	Virtual memory of user's processes (MB)	32.19
	Page faults for user's processes (Faults/sec)	0
	Handles used by user's processes (Number)	60
	I/O reads for user's processes (KB/sec)	0
HDX Channel	I/O writes for user's processes (KB/sec)	0
	Screen refresh latency - last (Seconds)	0
	Screen refresh latency - avg (Seconds)	0.003
	Screen refresh latency - deviation (Seconds)	0.003
	Client network latency (Seconds)	0.0013
Network	Input bandwidth usage (%)	0
	Output bandwidth usage (%)	0

Deep-dive visibility into ICA virtual channels



About Citrix Ready

Citrix Ready identifies recommended solutions that are trusted to enhance the Citrix Delivery Center infrastructure. All products featured in Citrix Ready have completed verification testing, thereby providing confidence in joint solution compatibility. Leveraging its industry-leading alliances and partner ecosystem, Citrix Ready showcases select trusted solutions designed to meet a variety of business needs. Through the online catalog and Citrix Ready branding program, you can easily find and build a trusted infrastructure. Citrix Ready not only demonstrates current mutual product compatibility, but through continued industry relationships also ensures future interoperability. Learn more at citrixready.citrix.com.

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About eG Innovations

eG Innovations provides the world's leading enterprise-class performance management solution that enables organizations to reliably deliver mission-critical business services across complex cloud, virtual, and physical IT environments. Where traditional monitoring tools often fail to provide insight into the performance drivers of business services and user experience, eG Innovations provides total performance visibility across every layer and every tier of the IT infrastructure that supports the business service chain. From desktops to applications, from servers to network and storage, eG Innovations helps companies proactively discover, instantly diagnose, and rapidly resolve even the most challenging performance and user experience issues.

eG Innovations' award-winning solutions are trusted by the world's most demanding companies to ensure end user productivity, deliver return on transformational IT investments, and keep business services up and running. Customers include 20th Century Fox, Allscripts, Anthem Blue Cross and Blue Shield, Aviva, AXA, Biogen, Cox Communications, Denver Health, eBay, JP Morgan Chase, PayPal, Southern California Edison, Samsung, and many more. eMark Office and in other countries. All other marks are the property of their respective owner(s).

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