LOGINVSI

White Paper

Boost your VDI Confidence with Monitoring and Load Testing

How combining monitoring tools and load testing tools offers a complete solution for VDI performance assurance

By Adam Carter, Product Manager, Login VSI

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Executive summary

The market for centralized Windows-based desktops, both Remote Desktop Sessions (RDS) and Virtual Desktop Infrastructures (VDI) continues to grow as more companies adopt the technologies for some or all of their workforce. There are several common reasons enterprises choose to adopt these technologies. These include simplified management, security and compliancy, and enabling mobile work styles. Several major vendors are now providing Desktop as a Service (DaaS) offerings, which provide a compelling solution for customers to deliver a desktop environment without large capital investments in infrastructure.

While the various technologies that comprise the VDI 'stack' continue to mature, deploying VDI or RDS still has several potential challenges that must be addressed in order to provide users with functionality that is as good or better than traditional PC environments.

A structured project approach, combined with the correct use of the best tools available in the industry today, will help organizations that are investigating, testing, migrating and using virtualized desktop environments to design, build and manage well-performing centralized desktop infrastructures at the lowest cost possible.

Many tools are available to help. They can help make better decisions during the project phases, and to help to keep out of trouble, during the resulting production phases. But which ones to choose, and when to best use them?

This white paper describes the VDI lifecycle – from the start of a new VDI project through to the ongoing operations of a production environment to create and ensure the best possible performance for the centralized desktop users.

About Login VSI

Login VSI provides proactive performance management software that provides IT departments with more predictable performance, higher availability and a better end user experience in complex centralized virtual desktop environments. Login VSI takes a unique and innovative approach to performance by simulating end users in order to get ahead of performance issues. Enterprises and governments use Login VSI and Login PI in all phases of their virtual desktop deployment—from planning to deployment to change management. As a result, virtualized desktop environments perform more predictable, are more operationally efficient and service happier and more productive end users. With minimal configuration, Login VSI products work in VMware Horizon View, Citrix XenDesktop and XenApp, Microsoft Remote Desktop Services (Terminal Services) and any other Windows-based virtual desktop environment. Today more than 700 organizations in health care, insurance, banking and government rely on Login VSI to support up to 200,000 end users in virtual desktop environments.

The VDI Stack

A VDI architecture consists of several components. When designing your VDI solution, there are several factors that go in to selecting the components to use. Some of these decisions may have been made already if you have standardized on particular vendors for components, or you may be open to evaluating several vendors to build a "best of breed" solution for your environment.
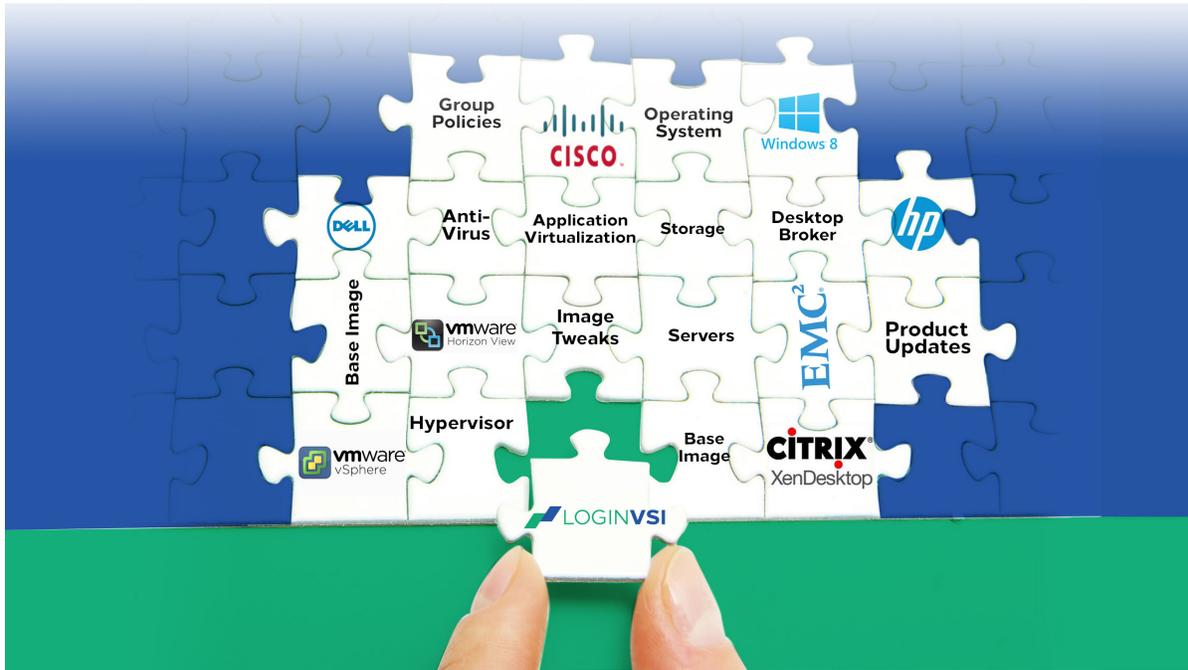
In either case, it's a complex stack of components, and changing any one of them may impact the performance of your solution. Here are some of the typical platform decisions that need to be made:

Storage: Will you use local storage, SAN, or network-connected storage? Solid state or spinning disks, or a hybrid? Is there a software accelerator that you'll run on top of the storage hardware?

Servers: Are you standardized on a particular hardware vendor for your storage? Do they already have a reference architecture for VDI solutions? Even if your vendor of choice has a reference architecture, understand how your environment differs from a generic reference architecture and how that may impact your performance or user density.

Hypervisors: There are several options for the virtualization layer. Customers may have standardized on one for their server workloads, but is it still the correct solution for client workloads, or should another standard be evaluated?

Operating Systems: Will you deploy a single VM per user, or use a shared technology like XenApp or RDS? What version of Windows will you deploy? This selection may be impacted by the support, performance, application compatibility, or functionality available in various versions.

VDI Provider/Broker: Beyond just the big three of Citrix, Microsoft, or VMWare, there are even more options available. Each brings a different set of management, provisioning, protocols, and deployment tools, in addition to different sets of features. Pricing and licensing is different for each as well.

When configuring your base or gold image for VDI, there are several additional components that must be considered.

Applications: Even amongst broadly adopted products, like Microsoft Office, the version you select may or may not be supported in a VDI/RDS environment. Different versions of the app may have different performance or compatibility that needs to be considered. As I will demonstrate later, Office 2013 typically sees a capacity reduction of over 20% as compared to Office 2010 on the same hardware.

Application Virtualization: Using App-V, ThinApp, or other technologies will impact how well the apps perform in your VDI environment. The configuration of things like shared content caching within these application virtualization technologies will further impact performance.

Anti-virus: The decision to include (or not include) antivirus in your gold images, or on your host hardware will impact performance. Configuring real-time scanning vs scheduled scanning will impact performance. There are several options for tuning antivirus that should be tested and evaluated as part of your base image planning.

Policies: Most customers have some set of group policies that are used to standardize and manage desktops. Some of these make sense for a virtual desktop, some do not. There are several settings like search indexing that will greatly impact the performance for users that should be configured by policy. There are services like Bluetooth that don't make sense to have enabled at all on a remote/virtual desktop, or firewall settings that may need to be changed for connectivity to the virtual environment to work at all.

Updates: Vendors constantly provide software updates that need to be evaluated for compatibility and performance impact before they are deployed. The VDI desktop isn't something that is deployed once and never touched again, there's ongoing management as the environment evolves.

The VDI Lifecycle

Very few IT projects end with deployment. Most projects follow a process of continual improvement that includes some or all of the following:

1. Envisioning
2. Planning
3. Testing/Validation
4. Deployment
5. Monitor
6. Identify Issues to fix/address
7. ... and start the cycle again

You can see this cycle play out in everything from large undertakings, like companywide desktop upgrades, to monthly security patching of deployed desktops. Login VSI has two products specifically designed to take you through this cycle.
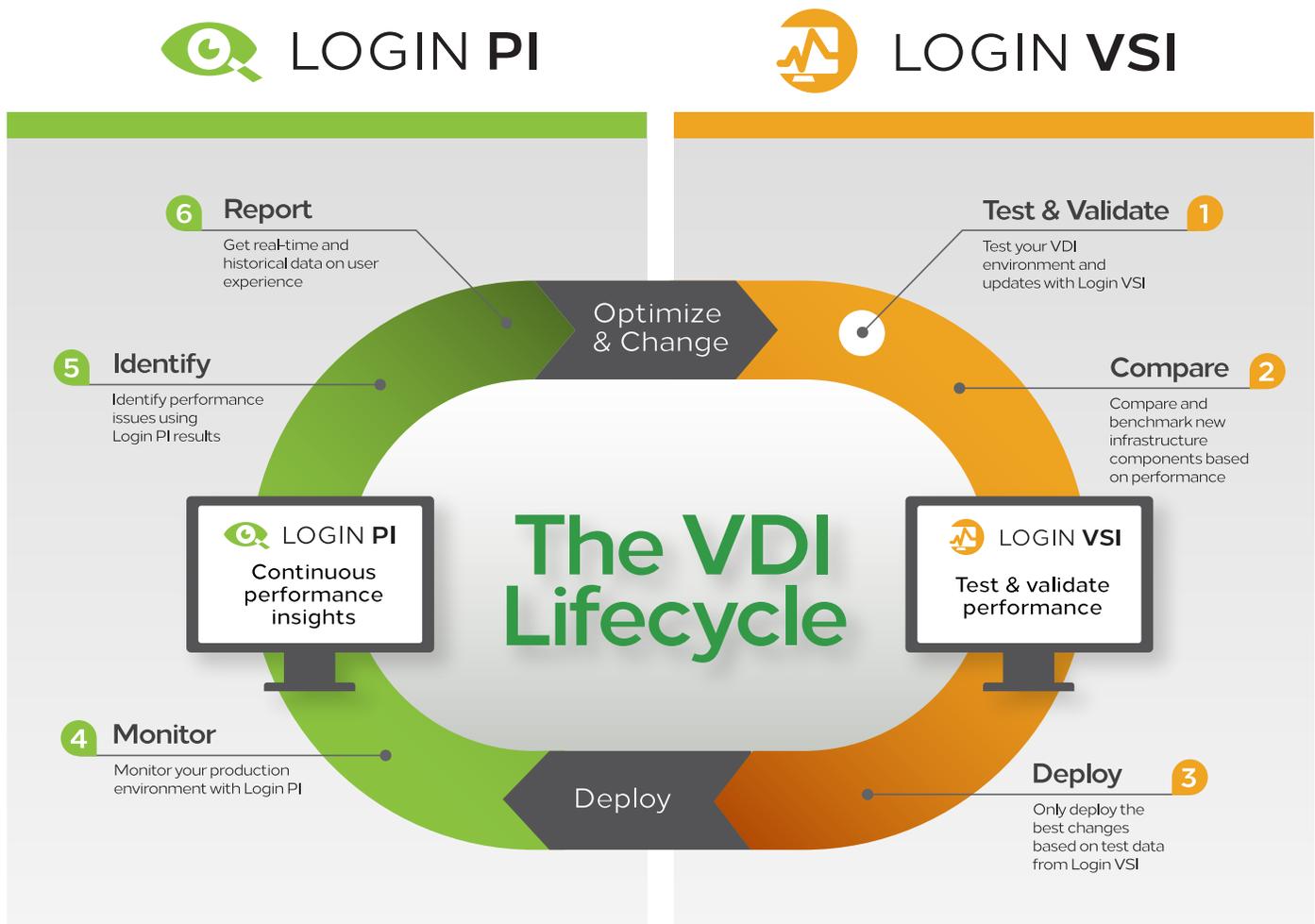
From its inception, Login VSI was created with the goal of filling a key gap in the testing and validation phases of VDI projects. It also quickly gained traction as the easiest way to determine the impact of changes in a VDI environment. Examples include: "how does the version of Microsoft Office in our environment effect user density?" or "what is the impact of enabling antivirus real-time scanning in client VMs?".

Login PI provides insights into VDI performance once the project moves into the production phase of the project. Where Login VSI can simulate large numbers of users in a lab environment, Login PI works with a smaller set of virtual users in your production environment to verify that the performance there matches the expectations set in the lab. Using both products together provides IT with coverage throughout the VDI lifecycle:

1. Test & Validate

The first phase in the VDI lifecycle starts with a change. This change might be a move from physical to virtual desktops, an upgrade of the OS used in client VMs, or a change to the underlying storage technology in use. Regardless of the scale of the change, the first step is to implement it in a lab environment, and use Login VSI to predict the end-user performance that can be expected from the change. Run a test with Login VSI and use the performance analyzer to check the results.

2. Compare

Use the results of a test to compare performance to that of previous tests. Is the performance better, the same, or worse? For example, changing the version of Microsoft Office from 2010 to 2013 can result in up to a 20% decrease in user density. Other changes, like excluding files in the base image from antivirus scans, may significantly increase density. It's important to keep results from previous tests and configurations to use in comparing performance to compare measurements and determine if there's value in implementing the change.
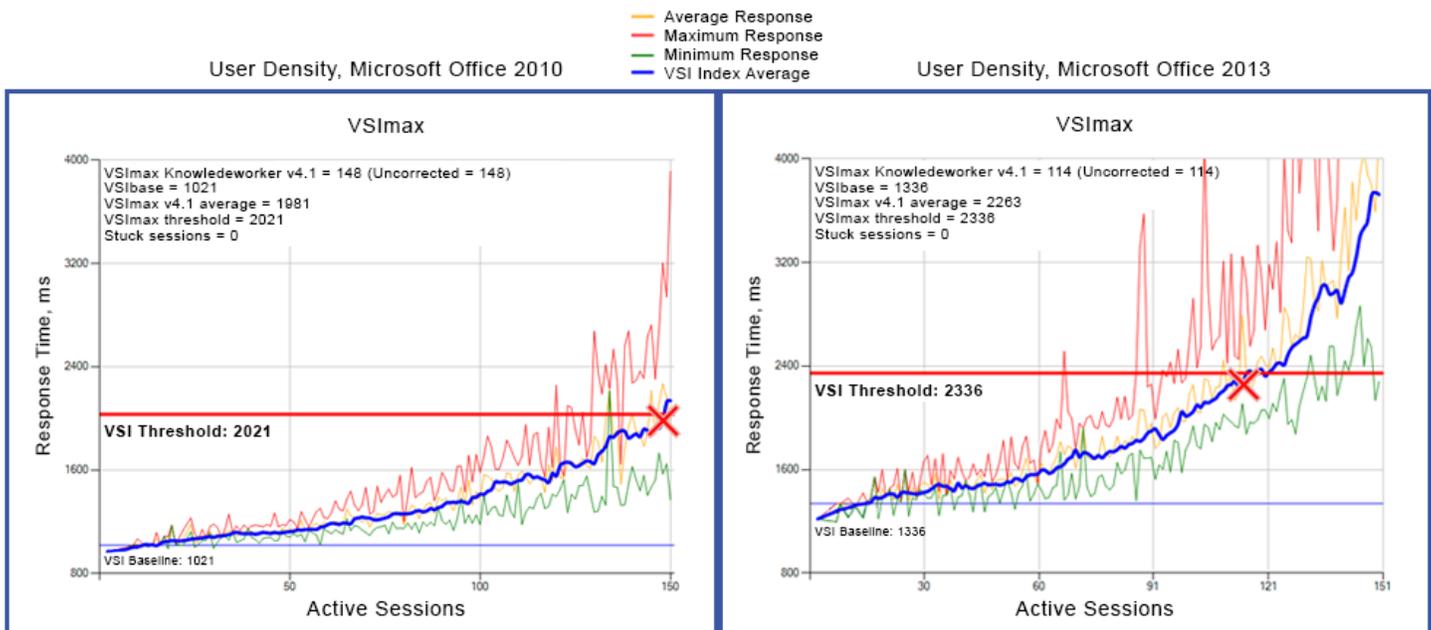
Moving from Microsoft Office 2010 to Microsoft Office 2013 can reduce performance by 20%.

3. Deploy

With the results of tests before and after the change has been implemented, the next step is to decide whether to deploy the configuration change into the production environment. If the tests indicate that the change will result in improved performance or density, the decision to deploy is an easy one. If testing indicates that the change results in a reduction in performance, then the decision may be not to deploy, and the process goes back to Step One, or other mitigation (like purchasing additional hardware to offset a reduction in user density) will need to be implemented before the change can be rolled out in production.

Moving to Production

Once the change has been validated, it can be confidently deployed into production. At this point, Login PI becomes the tool to monitor production performance and confirm that the solution performs as expected based on the lab testing and validation.

4. Monitor

Login PI adds automated virtual users to the production VDI environment to simulate user login and app launches in production. The virtual user runs on a schedule defined by IT, and tracks how long the login process and app launch times are. It writes the results to a database, and can alert administrators when the virtual user is not able to log on, or if login times or app launch times are above established baselines.

5. Identify

Login PI can identify performance issues before end users notice them, enabling IT to proactively address issues. The virtual Login PI user can run constantly in the environment, alerting IT to issues that occur outside normal working hours so they can be addressed before real users begin accessing the system at the start of their work day.

In addition to seeing the results in the Login PI console, the system can also be configured to push the alerts to other common management consoles, so IT doesn't need to check the Login PI console to learn the current performance status of the production environment.

6. Report

Login PI stores all the test results in a single database, which can be queried directly, or exported for use in other analysis tools. The built in charts can be quickly used to identify outage periods, or trends like particular times of day when performance suffers, or steadily increasing application launch times. The data can be used to prioritize future changes in the environment, which then feedback in to Step One of the VDI lifecycle and the process starts again.

How does end user experience monitoring differ from traditional monitoring?

Traditional monitoring tools capture specific metrics on the target environment. Some common metrics include:

- % of CPU utilization
- RAM usage
- Disk IOPS

While these can indicate how much load the host hardware is under, there's not a direct correlation between hardware load and end user experience. For example, monitoring might report that CPU is at 100%, but users currently on the system may not be seeing an impact in their usage. In another example, monitoring might show that disk I/O is very high, but if the storage is configured with very high read-ahead caching, the high I/O might actually be a good thing, as the system is pre-loading content before the user requests it, which actually leads to a better end user experience.

Because Login PI is measuring normal end-user activities, and comparing the results of those transactions against historical results, Login PI is able to demonstrate what the net experience is for real end users, regardless of how the hardware under the covers is actually performing.

Better Together

Login VSI: Industry-Standard Testing for Virtualized Environments

Login VSI is the de-facto industry standard for VDI performance testing, load testing and benchmarking. Login VSI is recognized as the industry standard for VDI testing by both leading IT-analysts and the technical community. Login VSI is used by all leading VDI infrastructure vendor (including server, storage, CPU and software vendors). More than 100 reference architectures and validated designs are published based on Login VSI data, and this vast number is still growing fast. For an overview of available papers go to www.loginvsi.com/white-papers.

Login VSI is built by experienced consultants and architects sharing a vast experience gained in over 10 years of hands-on virtual desktop projects. Login VSI is 100% vendor independent, and comes with four industry standard workloads that make testing very easy to execute. Login VSI is used to test virtual desktop environments like Citrix XenDesktop and XenApp, Microsoft VDI and Remote Desktop Services, VMware Horizon View or any other Windows based VDI or server based computing solution.

Login PI: Real-World Performance Insights on Virtual Desktops

Existing VDI monitoring tools can tell you what your CPU utilization is, or how many IOPS of throughput you're getting from your storage. But those metrics don't tell you what you care about most: are users able to log in to their virtualized desktop, and does it perform as well as expected?

Login PI gives real-world performance insights by simulating real users and real user tasks. The virtual user logs in and launches common applications, recording how long it takes for the tasks to complete. The system then watches for any large discrepancies in the results and can generate alerts. The alerts can be push to existing monitoring or reporting consoles. This enables IT to have a single dashboard to monitor the health of their environment instead of switching through multiple apps or consoles to determine what's happening in the environment. The data Login PI captures can be used to create reports to show service uptime and to identify performance trends.

Conclusion

As mentioned in the introduction, a structured approach, combined with the use of the best tools available will help organizations that are investigating, testing, migrating and using virtualized desktop environments to design, build and manage well-performing end-user infrastructures at the best cost possible.

Login VSI, Inc.
3945 Freedom Circle
Suite 670
Santa Clara, CA 95054
Phone: +1 408 899 7418

Login VSI B.V.
De Entree 11-13
1101 BH Amsterdam
The Netherlands
Phone: +31 20 342 0280

LOGINVSI