



*Kaviza White Paper*

# **Shared-Nothing VDI vs Traditional Shared VDI**

How to pick the right solution  
for your organization

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## Executive Summary

A primary reason to implement desktop virtualization (aka VDI) is to eliminate the inefficiencies and costs of operating and managing PCs. Any VDI solution will accomplish that goal, but the upfront acquisition costs and the time required to generate a return on investment (ROI) vastly differ.

Traditionally, VDI has been designed as an extension to server virtualization, requiring the same type of datacenter setup, along with expert resources to implement and manage. The architecture is best suited for CPU-intensive workloads while desktop workloads are IO-intensive. This mismatch causes degraded user performance and drives up infrastructure costs.

Traditional VDI also requires high upfront investment and a long ROI cycle. If nothing else, these alone may be prohibitive – particularly for organizations wanting flexibility to deploy virtual desktops in phases. Anyone looking for an easy, cost-effective solution to incrementally grow their virtual desktop deployments will find that the fastest, and lowest-cost, solution is a shared-nothing VDI model.

Shared-nothing VDI truly is the next generation of VDI. Designed specifically for desktop virtualization with minimal infrastructure needs, it delivers high availability and scalability without the need for expensive components such as shared storage.

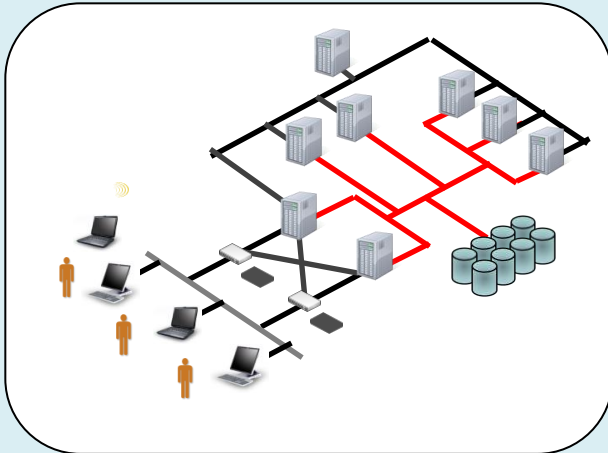
This white paper gives you an overview and cost-benefit comparison of both approaches, and provides three key criteria to use when evaluating which solution best fits your needs.

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## Overview of Two VDI Approaches

### Traditional VDI: Many moving parts

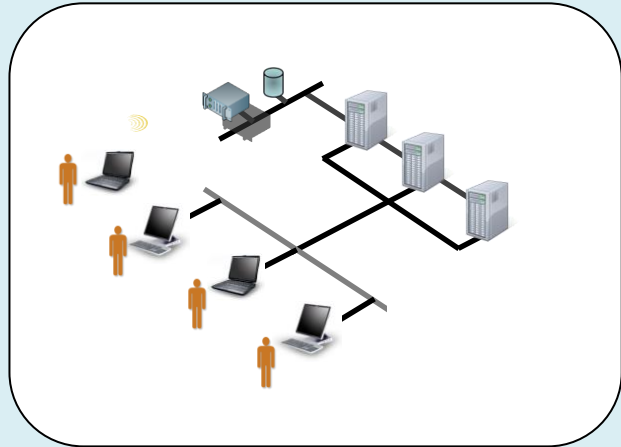


Traditional VDI is designed as an extension to server virtualization.

It adds a connection broker in front of a traditional server virtualization setup requiring management servers, shared storage, virtual desktop hosts, and high-speed interconnects.

Traditional VDI relies on shared storage to deliver high-availability.

### Shared-Nothing VDI: Integrated



Shared-Nothing VDI is a single integrated package that can be deployed on off-the-shelf servers.

It integrates the moving parts of VDI (load balancer, connection broker, management server and provisioning server) into a single all-in-one solution.

As the name implies, this does not require shared storage to maintain the state of running virtual desktops, and hence can provide high availability and on-demand scaling with inexpensive Direct Attached Storage (DAS).

## Three C's to consider when choosing your VDI

As with most technology, the most important VDI comparison considerations in fall into three "C" categories: Cost, Complexity, and Completeness.

- **Cost:** With VDI, both hard and soft (or direct and indirect) costs need to be factored in when determining your ultimate project ROI:
  - **Infrastructure costs:** Make sure you extrapolate beyond the pilot deployment to assess the costs associated with high availability in the production environment. Assess upfront the cost of the physical servers, storage and the infrastructure needed on an ongoing basis.
  - **Cost of scope expansion:** Do you plan to start small? Traditional VDI solutions are not cost-effective on a small scale, requiring several hundred desktops or more to achieve cost-effectiveness. Desktops are typically refreshed in phases, as certain events occur – e.g. PCs



reaching end-of-life. Most companies have pre-allocated budget for such activities. But traditional VDI solutions require a larger budget due to the upfront infrastructure they need.

It is important to factor in the possible scope creep with traditional VDI solutions if you find yourself needing to virtualize on a large scale simply to amortize the upfront costs – this is disruptive to users, and can delay deployment as a larger budget would be needed.

- **Cost of human capital/resources:** It is important to also estimate the cost of the expertise needed to deploy and manage the VDI solution. Will you need to expand your current team, or can you find a solution that will make use of your existing resources? Will you need to hire new resources just to deploy your VDI?
- **Complexity:** Since a virtual desktop is replacing a PC, it should be easier to set up and manage than a PC. Ask yourself: What is your company's desktop IT expertise? Is this the team that will deploy the VDI solution? Do they have the skill set and expertise needed to set up and manage the environment?

Traditional VDI solutions require specialized expertise in storage and server virtualization which can be expensive to acquire, particularly for SMEs. Shared-nothing VDI can be set up quickly.

- **Completeness:** It is important to know your core requirements for VDI and assess whether a solution meets those needs. Some of the traditional VDI solutions require additional components and higher-priced versions of their offerings to deliver key features such as high-availability.

These are the commonly-requested core features that make up a complete VDI solution:

- **Dynamic provisioning:** Do you have to statically provision desktops on each host server or does the VDI software dynamically provision and load-balance the workload? The approach used impacts your management overhead, particularly as you scale.
- **High-Availability:** Not all VDI solutions provide high-availability. To minimize disruption to end-users, it is important to ensure redundancy and high-availability in the event of a failure of the management server or one of the host servers. Understand how important this feature is to you — and whether and how the VDI solution you are evaluating supports this.
- **Scaling:** How will the VDI solution scale as your deployment grows? What are the inherent bottlenecks in the architecture that you need to be aware of? Traditional VDI solutions rely on shared brokers and shared storage that can create bottlenecks as you scale and may require additional servers or a large scale upgrade. They may also require that you initially over-provision the shared storage for future growth leading to additional upfront costs.
- **End-User Experience:** The various VDI solutions rely on different protocols to stream the virtual desktops to users. These protocols vary in their support for multimedia redirection, USB and peripheral devices, graphics support, WAN support, and the ability to adapt dynamically to network and end-point conditions. It is important to understand your end-users' workloads and needs, and evaluate how a particular solution will fit your needs.



## How the two types of VDI rank against the Three C's

	Traditional VDI	Shared-nothing VDI
Cost	<p>Traditional VDI solutions take longer to deliver ROI because of the high upfront investment.</p> <p>Up to several hundred desktops are required before you start to see ROI.</p>	<p>Shared-Nothing VDI can fit within an existing PC refresh budget.</p> <p>Some shared-nothing VDI can generate ROI with as few as 25 desktops.</p>
Complexity	<p>Traditional VDI has an extensive footprint, with many moving parts. You need specialized virtualization expertise in storage and servers to deploy and manage these solutions.</p> <p>It is easy to underestimate the complexity of this architecture, particularly when used in a production environment where multiple load balancers, connection brokers, and higher end shared storage solutions like SANs with high-speed interconnects are required.</p>	<p>Because the architecture has been purpose-built for virtual desktops, shared-nothing VDI is simple and can be managed by existing PC administrators.</p> <p>Shared-nothing VDI bundles dynamic desktop provisioning, load balancing, high-availability, user management, and desktop management into a single appliance. Users connect via a browser session or a small Java client; the existing Ethernet is sufficient for a new deployment.</p> <p>A few basic user templates contain the operating system, line-of-business applications, and settings can be managed – and patches prepared – while the desktops are still in use.</p>
Completeness	<p>Traditional VDI solutions vary in their level of support for the core features outlined under Completeness – and many require upgrades to higher-end versions of their offerings for some of these features.</p> <p>It is important to verify which features are built-in versus which features require custom deployment configuration.</p>	<p>The integrated architecture of shared-nothing VDI delivers the core features such as dynamic provisioning, high-availability and on-demand scaling without requiring additional components or shared storage.</p> <p>Shared-nothing VDI is ideal for phased deployments, with no rip-and-replace required. As you add more desktop host servers, you won't encounter centralized bottlenecks.</p> <p>Since no data or applications are stored at the client endpoints, shared-nothing VDI reduces the risk of data loss or security breach. PC disaster recovery requires a simple template refresh.</p>



## Component cost comparison

Next-generation shared-nothing VDI is ideal especially for organizations looking for easy cost-effective solutions that deliver demonstrable short-term ROI.

The table below compares the costs of deploying traditional VDI versus next-generation shared nothing VDI. Access via repurposed PCs is assumed in both cases.

	Traditional Shared VDI (VMware View)	Shared-Nothing VDI (Kaviza VDI-in-a-box™ with Citrix HDX)
<b>Servers:</b>		
VM Hosts	\$22,500	\$15,000
Management server	\$30,000	-
<b>Storage w/ interconnect:</b>	\$35,000	-
<b>Total Hardware</b>	<b>\$87,500</b>	<b>\$15,000</b>
<b>Software:</b>		
VDI software	\$25,000	\$15,400
MS Server OS	\$10,560	-
MS VDA	\$10,000	\$10,000
<b>Total Software</b>	<b>\$45,560</b>	<b>\$25,400</b>
<b>Total for 100 virtual desktops</b>	<b>\$133,060</b>	<b>\$40,400</b>
<b>Per desktop</b>	<b>\$1,330</b>	<b>\$404</b>

## How to recognize true Shared-Nothing VDI

Some traditional VDI solutions can run without requiring shared storage, but in this configuration they do not provide core functionality such as high-availability, dynamic desktop provisioning and on-demand scaling. This limits the usefulness and extensibility of such solutions.

A true shared-nothing VDI architecture should deliver the complete set of core features described here, and should be simple and low-cost. Shared-nothing VDI accomplishes this by redesigning the VDI stack to eliminate the excess infrastructure and shared storage limitations of traditional approaches.

## Conclusion

When considering a VDI solution, check if it meets the Three C's – is it cost-effective for your unique deployment needs, does it eliminate complexity and can it be deployed by your desktop IT staff, and is it a complete solution with the core features you need?

## For More Information

For more information on the Kaviza Shared-Nothing VDI architecture and the all-in-one, easy-to-use, affordable VDI-in-a-box, please go to <http://www.kaviza.com>, or call us at 1.888.350.5801.

If you have any feedback or comments on this white paper, email us: [info@kaviza.com](mailto:info@kaviza.com)