White Paper

Desktop Virtualization: Reduce Costs, Improve Efficiencies with Proven VDI Solutions

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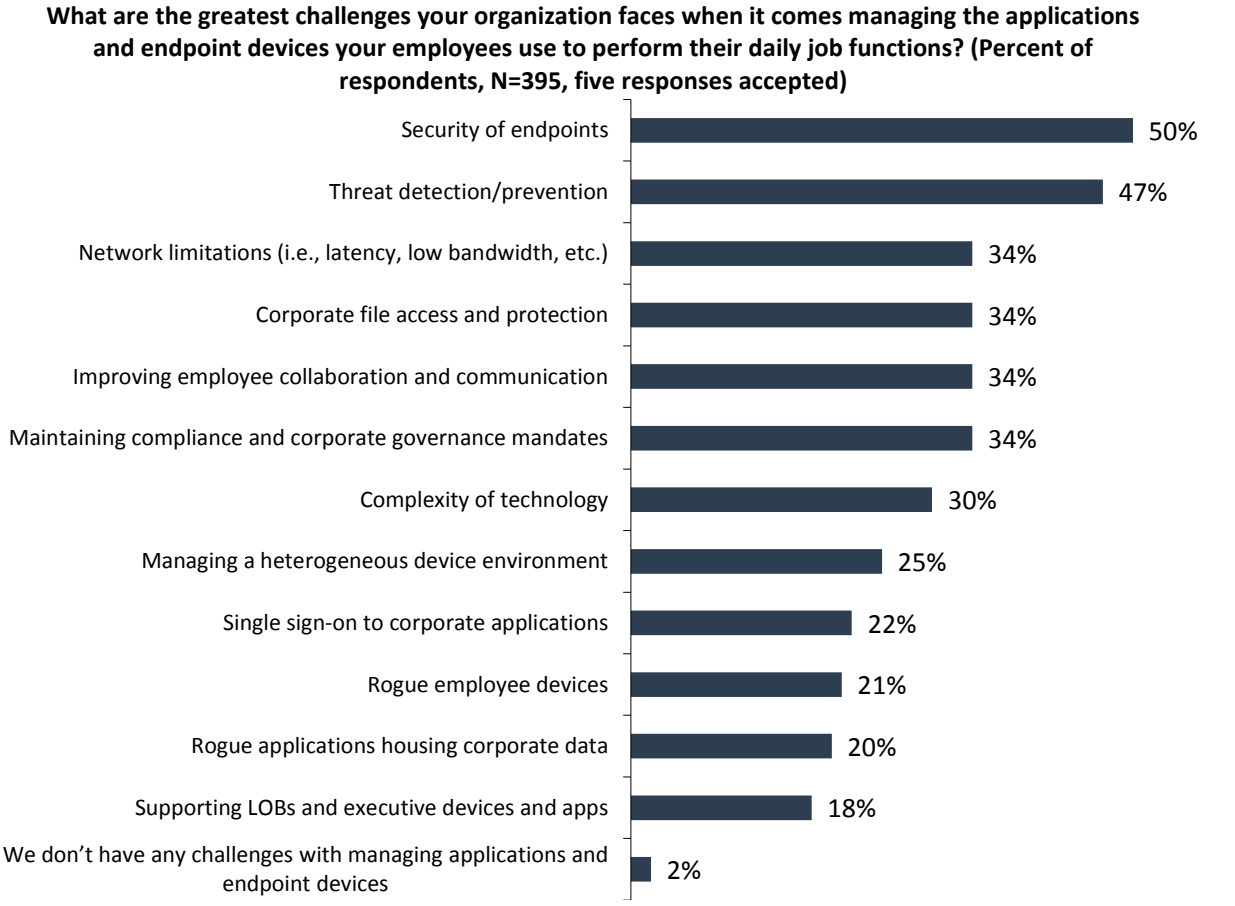
VDI Perception Shifts Toward Economic Leverage

VDI (virtual desktop infrastructure) has been around for a number of years in a market that is becoming increasingly crowded. Although many organizations may have historically perceived that this technology has limited applicability, over time, VDI has proven to be successful—providing positive outcomes for IT and employees, addressing security vulnerabilities, and delivering favorable economics back to the business.

For organizations looking for ways to improve employee productivity while simultaneously reducing costs, it's essential to put aside outdated notions about desktop virtualization linked to VDI delivery models. The technology has advanced and, as a result, IT is able to address a full spectrum of use cases. The perceived association of complex infrastructure has radically changed as systems now have smaller footprints, are software driven, and are economically viable. Flash storage architectures and hyperconverged infrastructure are compelling examples that have not only made VDI perform better, but also execute on a simplified platform that is easy to manage. As design approaches, features, and optimization methodologies improve, the overall implementation costs of desktop virtualization solutions shrink, while target use cases continue to grow.

Desktop virtualization addresses a number of common business challenges, which include enabling mobile workstyles without compromising security, streamlining desktop management efforts, and enhancing the end-user experience through self-service access to applications and desktops. In fact, according to ESG research, organizations continue to seek answers to the myriad of challenges when it comes to managing applications and endpoint devices (see Figure 1).[1] The promising news for businesses is that VDI can help address many of these challenges and help reign in control while providing a high-quality experience for employees.

Figure 1. Challenges with Application and Endpoint Device Management



Source: Enterprise Strategy Group, 2015.

[1] Source: ESG Research Report, *Security, Productivity, and Collaboration: Trends in Workforce Mobility*, to be published.

VDI Myths Busted

VDI has historically had the reputation of being complex and expensive. Implementations had limited scale and were driven by limited use cases. But technology has advanced rapidly and businesses are now reaping the benefits via cost savings for a variety of use cases that include:

- **Economies of scale**. Businesses have taken initial VDI implementations limited to a subset of users and turned them into de facto standards for a broader set of users based on the validated quality of user experience and the simplified IT infrastructure choices. While initial implementations produced benefits, recent protocol enhancements have improved end-user experience and simplified IT deployment choices—enabling IT to seek additional end-users for VDI delivery, simplifying IT management, and leveraging modern IT infrastructure at improved economics of scale.
- **Reduced PC refresh costs**. Until recently, many enterprises believed that replacing physical PCs, laptops, and thin clients each year was less expensive than implementing desktop virtualization. While this may have been the case several years ago, it's no longer accurate. Now, the cost and resources required to perform a PC refresh annually can be overwhelming to the business, and can become one big IT headache when it comes to securely and easily migrating files, provisioning applications, eliminating downtime, and reducing impact to worker productivity.

  With VDI, organizations are able to avoid upgrade or hardware acquisition costs associated with a refresh by extending the use of current hardware, and eliminating countless IT hours spent on the initiative—thus positively affecting the bottom line. VDI has the additional benefit of helping to eliminate downtime and providing workspace access in disaster recovery scenarios.

  Additionally, during the transition to VDI, IT also has the opportunity to simplify the way applications are delivered and files are managed. IT can further dissect the workspace to independently deliver the desktop image coupled to applications and data that are unique to the user. This creates an environment that is easier to manage and maintain for IT, and a consistent experience for the end-user.
- **Centralized desktop management**. With VDI, IT administrators can more efficiently manage user desktops, settings, and IT policy from a central point. Because administrators no longer need to manage physical devices, they're freed up from routine and labor-intensive tasks, allowing them to spend valuable time on more important matters, such as improving workforce productivity or supporting revenue-producing initiatives.
- **Improved security, reduced risks, and compliance**. With information security being a top priority among enterprises, having a simplified, centralized means of network management can allow IT to effectively see all activity on the network in real time.[2] Should a potential threat arise, the administrator can immediately take appropriate action. With VDI, organizations can keep business-critical and sensitive data safe, since VDI hosts the desktop image in the on-premises data center, not on an end-user's device (that can be lost, stolen, or hacked). Additionally, different industries must meet a variety of compliance standards including HIPAA, SOX, FISMA, PCI, DIACAP, and COBIT. VDI helps organizations more easily meet compliance.

In general, VDI simplifies the following:

- **Patching processes**. By installing patches to a master image that IT maintains (so that it can be shared among many users), IT can ensure that all end-user desktops are up to date and in sync.
- **Desktop configurations**. User settings are configured when a machine is first deployed, but not always afterward. This can lead to security and compliance lapses, especially in regulated industries such as health care and finance. With VDI, IT can specify system configurations settings to the master VDI image all at once. That way, when an end-user launches a VDI session, he automatically receives updated settings.

[2] Source: ESG Research Report, *2015 IT Spending Intentions Survey*, February 2015.

- **Workplace productivity**. With the growing "bring your own device" (BYOD) trend, end-users expect to be able to access the data they need anytime, anywhere, and from almost any device. Whether employees are using corporate-sanctioned devices or their own personal devices to access corporate data, IT must be prepared to manage access securely.

  VDI provides a consistent, secure means for employees to work anywhere, thereby increasing productivity. With VDI, the end-user's virtual desktop looks just like her desktop, performing the same way. End-user satisfaction and productivity are enhanced since the user still maintains control over her settings and applications.

- **BYOD**. In certain organizations, BYOD expenses (think employee-owned devices) fall on the shoulders of the employee. In this scenario, organizations do not incur the substantial costs of corporate-owned devices, reducing corporate expenses, and helping to lower the number of calls to the Help Desk.

- **OS migration**. Those organizations that didn't seize the opportunity to go VDI with the last migration from Windows XP to Windows 7 are getting a reprieve with the latest Windows migration. The migration from a Microsoft Windows 7 environment to Windows 10 is upon us, providing organizations with a great economic incentive to revisit VDI, if for no other reason than the fact that this move can be costly without VDI. From time and labor costs to potential downtime due to security issues and incompatible applications (all negatively affecting user productivity), the process can be an IT nightmare.

  On the other hand, with VDI, organizations can reduce the expense of migration with pretested application compatibility, streamlining deployment, improving security, and maintaining a steady and enhanced level of user productivity.

Additional Opportunities for Businesses to Reduce Costs

Whether an organization is in the early stages of its VDI maturity adoption, or is a VDI leader, now more than ever before, organizations are exploring numerous opportunities that enable IT to streamline operations, improve security, and enhance user productivity—*all while reducing costs*. Additional use cases where VDI can be potentially valuable in reducing costs inside the organization include the following:

Multi-hypervisor Adoption (SW)

A number of organizations are still paying a premium for the hypervisor they originally standardized on, when they may not need to at all. In fact, the same organizations may be able to run VDI on a much more economical hypervisor that would still provide the same performance, features, and reliability as the organization's original hypervisor choice. How? Businesses can use alternative hypervisors that deliver a quality end-user experience without complexity, and that combine storage, compute, and virtualization in a single modular appliance. These alternative hypervisors offer the benefits of the cloud to support legacy applications while using a much more favorable licensing model. In some cases, the hypervisor is included in the infrastructure, as in a hyperconverged infrastructure.

Hyperconverged Infrastructure (HCI) Solution (HW)

A hyperconverged infrastructure provides organizations with a simple, turnkey solution, leveraging X86 servers. An HCI solution is pre-certified, pre-designed, easy to operate, and has been proven to perform well at scale. With HCI, organizations can start off small, and incrementally scale up or out, as the needs of the business change.

What this all means is that IT doesn't require expertise in server, storage, and networking, since those things are already included in the investment.

With a hyperconverged infrastructure, organizations can:

- Eliminate infrastructure silos and the need for separate components.
- Perform data processing with a single-policy engine.

- Scale efficiently while being virtualization-ready.
- Centralize management and policies, with mobility at the virtual machine level.
- Save on acquisition, deployment, management, and support costs, as well as reduce complexity, interoperability issues, and operational expenses.

Thin Client Advancements

Ceptor, an ultra-small, full-featured client device that transforms an HDMI monitor into a thin client, and Raspberry Pi, a credit-card sized, single-board computer are disrupting the thin client market and price point. How? Full featured PCs may no longer be required in use cases that don't demand local compute capacity and raw performance at the endpoint. The industry has introduced great protocol improvements for older devices as well, so organizations can get more life out of their existing thin client devices (thin wire technology).

The same applications and the same desktop environments are needed, just in different endpoint scenarios. Endpoints are no longer just laptops, endpoints, or tablets. These applications and desktop environments must be able to go out to endpoint devices that have zero footprint and zero-operating systems on them, and project an end-user workspace environment, or a VDI image, to them.

It's crucial to think beyond the laptop and desktop environments. We're seeing advancements like Ceptor and Raspberry Pi used in corporate environments in scenarios as simple as data collection. Even these devices can be thought of as VDI landing points onto which apps and desktops are projected for end-users.

Desktop Usability

Desktop virtualization technology is making VDI more applicable for every industry across the board. But for organizations to stay current, integrations with PC peripheral devices are essential for security, productivity, and cost efficiency. For example, industries such as health care and the public sector can integrate with biometrics and smart card readers to work with VDI images for better security at the endpoint—often a leading driver in these industries. The support for peripheral devices such as multi-monitor environments and interoperation with financial services devices like the Bloomberg keyboards found on trading floors has opened the door for increased opportunities. We have also seen great strides forward with the usability features on tablets like the iPad connected to a mouse running a fully functional Windows desktop.

Linux VDI

Many organizations are under the assumption that Linux VDI is just for Linux developers, but a Linux virtual desktop can be used by a variety of end-users. IT can leverage aging hardware, reduce licensing costs, and take advantage of the opportunity to support a heterogeneous environment as part of a VDI implementation. When used with the latest delivery protocols, users will be able to enjoy performance and bandwidth efficiency from any device over any network. And without the expense of Windows licensing, organizations can cut costs, favorably affecting the bottom line.

Bring Your Own Device (BYOD)

A growing number of organizations are embracing BYOD. This can translate into considerable cost savings for businesses. With employees using their own devices for work, organizations can not only reduce the cost of their infrastructure, but also reduce the pervasive need for company-owned devices, thereby lowering capital expenditures and operational expenses.

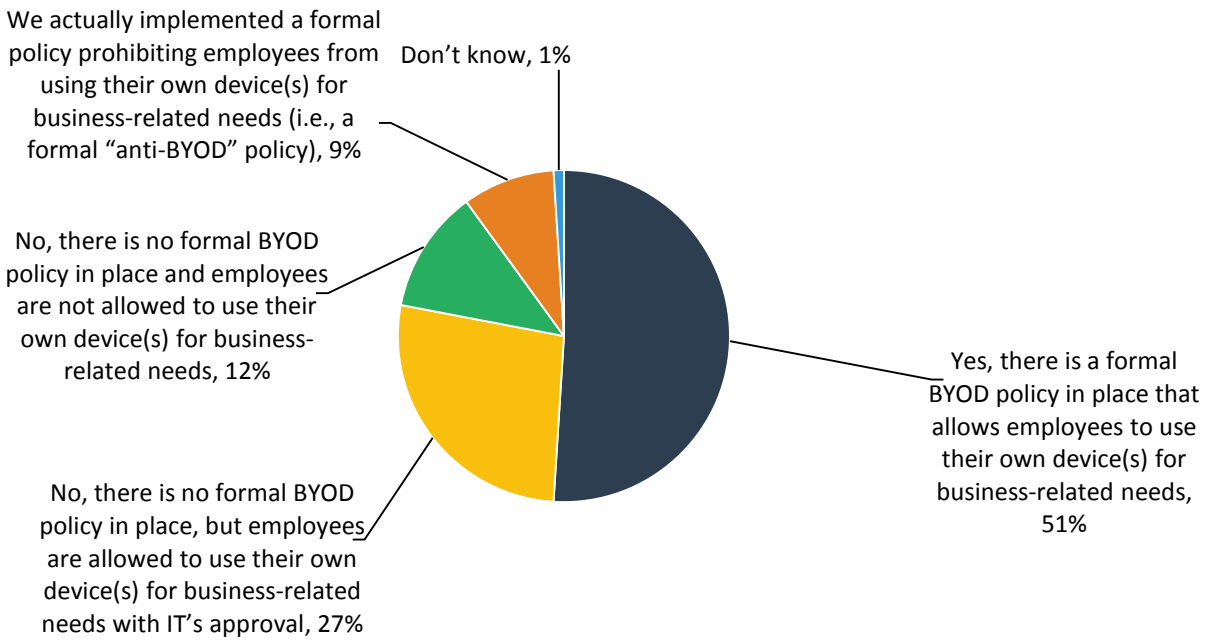
The fact that employees can work anywhere, at any time, and on almost any device has yielded tangible results. In fact, organizations that have implemented formal BYOD policies are more likely to see increased productivity and higher satisfaction among mobile employees when the organization provides them with access to secure, easy-to-use collaboration solutions and mobile applications.

While BYOD isn't going to make sense for every business and every employee, IT leaders and business professionals should be focusing on supporting initiatives that can leverage employee-owned devices. Certainly, security risks need to be identified and addressed, but the advantages for employees, IT, and—ultimately—the business can be significant. Most organizations start with standard business productivity applications and file sync and share solutions that are protected with enterprise mobility solutions, and quickly discover how they can turn employee-owned devices into productivity machines and lower physical endpoint costs for the organization.

According to ESG research (see Figure 2), more than two-thirds (78%) of IT decision makers report that their organizations allow employees to leverage non-company provided devices in some capacity, with 51% indicating the existence of a formal bring-your-own-device (BYOD) policy.[3]

Figure 2. Existence of Formal BYOD Policies

Does your organization have a formal bring-your-own-device (BYOD) policy in place that allows employees to use a non-company provided (i.e., personal) endpoint device (e.g., laptop, smart phone, tablet, etc.) to perform their primary job function(s)? (Percent of respondents, N=395)



Source: Enterprise Strategy Group, 2015.

End-to-end Organizational Benefits

The benefits of VDI are enjoyed throughout an organization—from IT, through end-users, to the business.

With VDI, IT can reap the benefits of operational efficiency and higher cost savings by spending less time dealing with the complexities associated with system integration, upgrades, provisioning, troubleshooting, and maintenance, and spending more time focused on revenue-producing activities. This is possible because VDI can provide:

- Centralized desktop management.
- Reduced PC refresh costs.

[3] Source: ESG Research Report, *Security, Productivity, and Collaboration: Trends in Workforce Mobility*, to be published.

- Improved security from overall visibility into the end-user computing environment, including application usage and performance, as well as licensing.
- Simplified OS migration, deployment, and ongoing maintenance.

With VDI, end-users enjoy an enhanced user experience and greater productivity by way of consistent access to applications, operating system updates, and the latest security patches as well as a seamless experience doing business anywhere, anytime, on almost any device.

As a result, the business receives improved operating efficiencies—streamlined business processes, increased IT productivity, and higher user satisfaction. VDI makes it possible for organizations to extend hardware refresh cycles; shift the costs of endpoints from the organization to the end-user (with BYOD); enjoy greater network and application security; and more easily meet government and industry regulatory compliance.

New Opportunities/Use Cases Created by VDI

VDI is a delivery model that must be thought of as an overall workspace delivery strategy. As part of that strategy, organizations need to ensure that the VDI delivery model is integrated with other mobility initiatives including enterprise mobility management (EMM), corporate file sync and share, and communication and collaboration initiatives, giving IT a holistic means to manage and maintain control of the network.

From an end-user perspective, every experience must be a good one, not just when it comes to VDI, but across an organization's overall mobility strategy. If an end-user is using different applications from different locations, on different devices, he should still be able to expect the same high-quality experience.

The Bigger Truth

As organizations continually try to do more with decreasing resources, staffs, and budgets, IT is searching for viable technologies that provide greater infrastructure flexibility and easier management than that of a physical desktop environment—not to mention technology that can reduce CapEx and operational costs across the board. Enter VDI…again. Sound too good to be true? At one time, perhaps, but not anymore.

VDI has been around for a number of years, and it has come a long way, proving, via a number of use cases, that it can offer a viable, cost-effective solution to a variety of industry challenges.

What is VDI capable of? Reducing PC refreshes and upgrades? Yes. Enabling workforce mobility without compromising security? Yes. Improving the end-user experience, not only with VDI, but also across an organization's mobility strategy? Yes. What about simplifying desktop management, OS migration, and deployment? Yes, yes, and yes.

Organizations that are serious about increasing their infrastructure usability, while at the same time looking to reduce CapEx and operational costs, would do well to put aside their outdated notions about VDI, and take a hard look at this technology. With VDI, not only will IT be able to spend less time on the complexities of system administration and maintenance of the status quo, but they'll also be able to spend more time focusing on important initiatives like increasing user productivity and growing the business.

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