How the Software-Defined Data Center Is Transforming End User Computing

The Essentials Series

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# Why Infrastructure Matters in Desktop and Application Virtualization

Years past have been touted as the "Year of VDI," or desktop virtualization, as if there was some magical fulcrum where, in that year, organizations everywhere would all throw out their old physical PCs and embrace virtual desktops. Needless to say, that event hasn't happened and probably won't. It's not that there is something flawed in the desktop virtualization vision. In fact, the desktop virtualization vision is valid and gets more compelling every day as the software and hardware that make it possible matures. Desktop and application virtualization now form a core pillar of most organizations' initiatives around desktop transformation—the evolution of client computing to embrace a wider range of delivery approaches including private and public cloud across an even wider set of use cases including remote offices, knowledge workers, designers, road warriors, contractors, and business partners/outsourcing. The migration to desktop virtualization for companies of every size and across every vertical is happening, month after month, day after day. The momentum builds as the expectations of the end users and the company executives grow in anticipation of greater workforce mobility, flexibility, and security from their desktop infrastructure. That momentum also builds as technology advances make desktop virtualization easier to deploy, higher performing, and simpler to manage.

The State of Desktop Virtualization

Thanks to the rising importance of business mobility, the BYOD trend, and improvements in the underlying technology, the rate of adoption of desktop virtualization is faster today than ever before. Virtual desktop infrastructure (inclusive of both desktop and application virtualization) is becoming foundational to end user computing strategy. And increasingly, that foundation is being built on a more agile, intelligent, high-performance infrastructure—known as the software-defined data center (SDDC).

The State of the SDDC

The SDDC vision extends the benefits commonly derived from server virtualization including the abstraction, pooling, and automation of compute capacity, to all the resources of the data center inclusive of networking and storage. With the SDDC in place, common IT infrastructure processes can be shortened from days to minutes or even seconds. For example, the process of provisioning a new virtual server that might have taken 5 days in the past (due to storage configuration, network configuration, and ancillary services) could be shortened to just a few minutes or even seconds, with cloud-like service elasticity, thanks to the SDDC's inclusion of all IT infrastructure services (see Figure 1.1).

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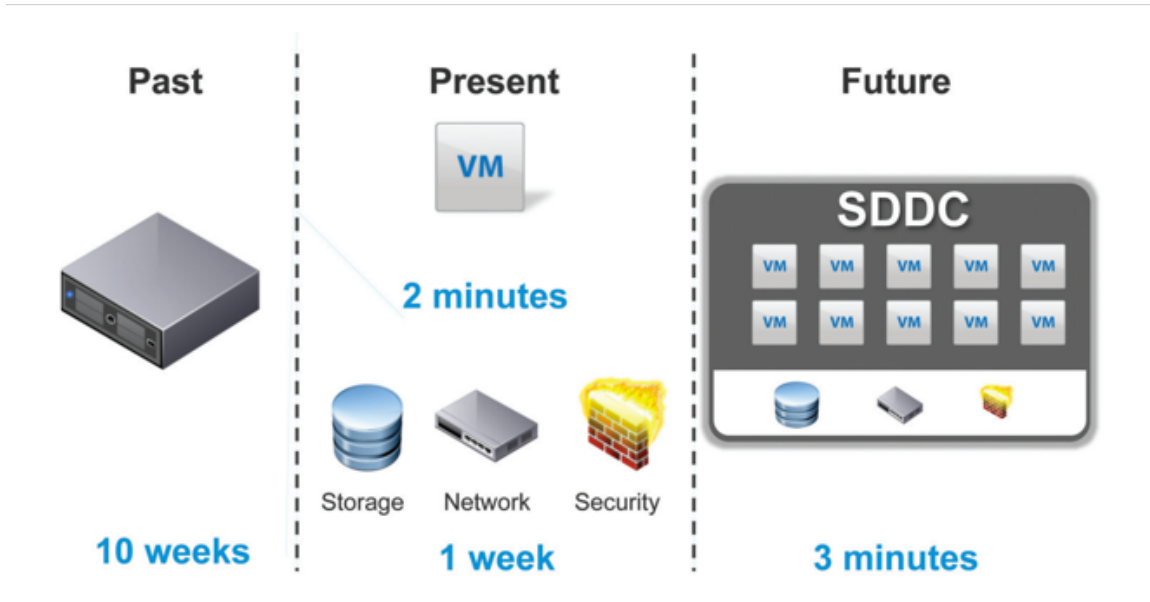
Figure 1.1: The SDDC Transforming Deployment (Source: https://www.vmware.com/files/pdf/accelerate/VMW_13Q1_BB_SDDC_020813_FINAL_LTR.pdf)

The vast majority of enterprises are already using VMware vSphere—86% of data centers will be virtualized by 2016 (Source: CIO Insight, Useful Virtualization Stats, Trends, and Practices, August 28, 2014), so they have already "abstracted and pooled," although many still need to automate. With more than 15 million applications already deployed into virtual infrastructures (Source: VMware blogs, Tribal Knowledge, September 8, 2014), enterprises are now looking for greater innovation in their data center to make IT a platform for true business agility. Thanks to the traction already seen with server virtualization and the prevailing desire among IT leaders to adopt cloud-like services capabilities, the SDDC vision is starting to take hold in the IT strategy and vision happening in enterprises around the world.

Even the smallest of enterprises knows that the future of the data center is in smarter and faster software and there are many good reasons for that—greater efficiency, flexibility, agility, and cost savings are all gained with a software-defined approach: By upgrading an already virtualized data center to an SDDC, enterprises can slash their capital expenditures by 58% (Source: VMware blogs, Tribal Knowledge, September 8, 2014).

So how does the SDDC impact desktop and application virtualization?

VDI Design Considerations

As enterprises move to VDI, three key challenges consistently emerge:

- The significant upfront investment associated with infrastructure CAPEX as well as the protracted cycle time incurred in the design, procure, build, integrate, and test disciplines necessary before putting a solution into production

- The reduced flexibility and lack of capacity elasticity found in traditional siloed data center architectures that are hardware-defined instead of software-defined, resulting in inflexibility to business demand

- The increased security threat resulting from the proliferation of virtualized users now sitting on the trusted side of the data center firewall and co-resident with other mission-critical server workloads such as Oracle, SAP, and Exchange

Desktop Virtualization: Dedicated Infrastructure or SDDC?

Some might recommend de-risking VDI by purchasing a dedicated server, storage, and virtualization stack. Although this approach offers some predictability in performance, it is also extremely inefficient, costly, and unneeded. In addition, it exacerbates the dilemma of growing silos of infrastructure that are managed separately, resulting in inefficient scaling, longer lead times for service turn-up, and escalating CAPEX. Clearly this approach takes organizations even further from the ideal of cloud-like service elasticity.

SDDC, in comparison, offers an evolved, intelligent, cloud-like approach to delivering the infrastructure that is exactly suited to the unique demands of VDI. VDI workloads are dynamic and resource hungry. User behavior that drives VDI resource consumption is largely unpredictable, unlike its server-workload cousins. VDI workloads need more security, agility, and performance than do traditional workloads. Let's look at the attributes needed by VDI and what that the SDDC offers in response. The following list highlights the capabilities of the SDDC:

- **Unified management.** Single point of management for all resources in the data center for ease of troubleshooting and maintenance

- **Efficiency.** More efficient use of resources that are virtualized, distributed, and balanced across the infrastructure, accessible to any workload that needs it

- **Automation.** Greater automation in provisioning, deployment, and configuration for reduced time to service

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- **Cloud-like elasticity and economics.** Thanks to greater automation, resource sharing, and distributed intelligence, capacity can grow in fine-grained increments that offer a cloud-like "pay as you grow" approach

- **Improved security.** Through software-defined network security and policies, security is persistently and pervasively extended in an automated manner across the virtual infrastructure

- **Simplified cloud adoption.** Workloads can be easily transitioned to a public or hybrid cloud, and back, as needed, based on use case or business demand

VDI workloads are well-mapped to these capabilities, offered by the SDDC, as much as or even more so than server workloads. It's no wonder that SDDC solutions in the marketplace often cite VDI as a primary use case.

With these capabilities, desktop and application virtualization implementations built on SDDC benefit from:

- Better performance, allowing desktops and applications to tap into the consolidated capacity across the infrastructure

- Automated turn-up of desktop capacity, inclusive of compute, storage, and network/security

- Simplified manageability from device to data center to desktop virtual machine

- Centralized security policy that places every desktop virtual machine in its own virtual network firewall for persistent security that follows desktop workloads across the infrastructure

- A holistic platform for workspace services delivery that ensures desktop and application access across any combination of virtual, cloud-hosted and traditional physical desktop

Summary

Desktop and application workloads shouldn't be relegated to an infrastructure island. Although these workloads require special infrastructure design compared with traditional server workloads, that doesn't mean that dedicated server and storage hardware is required, especially for organizations looking to leverage a cloud-like model for their architecture with greater service elasticity and economics. VDI workloads need the attributes of the SDDC as much as, or more than, any other workload in the data center. After all, when you think of desktop virtualization, you think of efficiency, agility, security, and cloud infrastructure—all of which are tenets of the SDDC. Bottom line, when deploying desktop and application virtualization, ensure that you leverage an architecture that's built on the SDDC.

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