The quest to a software-defined data center (SDDC) begins with your organization’s hardware and extends to all elements of the infrastructure. Most firms today strive for an SDDC, but don’t fully understand the challenges involved. Many start down the path with good intentions, but then struggle to get everything up and running. They soon realize the importance of having the right partner to help navigate the process.

Wherever you are in your journey, you can count on one team - Dell EMC and VMware - to take you where you want to go. With the best-in-class combination of hardware and software, you’ll be positioned to meet your business needs, both now and in the future.
Introduction

Transforming and then managing a modernized data center is one of the most challenging yet critical roles for today’s IT leaders.

To remain competitive in a rapidly changing environment, IT leaders need a flexible and agile infrastructure that can adapt to meet increasing demands and emerging workloads. Most organizations are looking to streamline and simplify infrastructure management and maintenance. Many have embraced virtualization at some level, but struggle to determine the best mix of on-prem/off-prem virtualized environments. Others have gone through server consolidation, only to realize that their new environment isn’t as flexible as needed. These and other common challenges are the reasons for the shift to a more efficient software-defined data center (SDDC).

SDDC plays a crucial role in an organization’s data center transformation. Using the right SDDC solutions helps IT better address the heavy demands of data and applications. It’s also much easier to provision, deploy, monitor, and maintain in an SDDC environment, which greatly improves data center management.

Whether through SDDC, private cloud, or hyper-converged, IT must improve the time it takes to update applications, add new applications, and deploy new workloads. The key is using software to virtualize servers, storage, and networking, and to dynamically pull resources during deployment and ongoing management. Server refresh also plays a critical role in SDDC, because aging infrastructure hinders the ability to meet business end user demands. A common misconception is that hardware doesn’t matter in a software-defined data center – and that couldn’t be further from the truth!

What are you waiting for?

According to a recent study by Forrester, 95% of customers see value in SDDC as a long-term strategy, but only 27% have made significant progress in implementing SDDC technologies.¹

This eBook explores the benefits of software-defined data centers and the role hardware plays. It highlights how Dell EMC PowerEdge and VMware partner together to provide solutions to help organizations with their IT transformation. The ultimate objective is for you to make the best investments in your infrastructure now - so it can adapt and grow with your business in the future.

¹ Based on a Forrester Consulting Study commissioned by Dell EMC, “Why Faster Refresh Cycles And Modern Infrastructure Management Are Critical To Business Success”, May 2019. Results from a survey of 508 IT infrastructure technology decision makers. G19000034
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In an SDDC, all elements – servers, storage, and networking – are virtualized. For most IT environments, software-defined storage and software-defined networking are new as legacy SANs and switches still dominate the landscape.

The main purpose of an SDDC is to speed up the processes required to deploy hardware and applications. It significantly decreases the time required to deploy, process, and even handle routine maintenance. Additionally, SDDC helps to simplify management and break down the traditional silos that exist in historical data centers. Since IT is no longer limited by the physical attributes of the available resources, it can adapt and accommodate new demands as the business grows.

**Trend Toward Virtualization**

Virtualization transforms physical systems into a virtual environment by creating a logical version of a device or resource - anything from a server to an operating system. It works by layering software capabilities over hardware, creating a data center where all the hardware is virtualized and controlled through software.

Having everything integrated into a single control plane helps organizations increase scalability and improve efficiency. Without virtualization, traditional server utilization is typically less than 15% of capacity.

Modern software-defined compute, also known as virtualization, is the first step toward the software-defined data center.

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**SDDC begins with the server, and includes the following core components:**

- Virtualization
- Software-defined networking (SDN)
- Software-defined storage (SDS)
- Management and automation software
Benefits of a Software-Defined Data Center (SDDC)

A software-defined data center plays a key role in an organization’s data center transformation. It enables IT to quickly respond and meet business needs now, while positioning you for future growth. **Key benefits of an SDDC include:**

**Simplified Data Center Management:** SDDC makes it easier to provision, deploy, monitor, and maintain IT resources

**Automation:** Increased efficiency through automated processes

**Increased Service Delivery Speed:** Easy to configure, reconfigure, and keep secure

**Improved Security:** Relevant policies remain in place and automatically adjust to changes in the underlying physical environment of SDDC workloads

**Increased Scalability:** More easily scale to meet business demands

**Increased Agility and Low TCO:** Can have a direct impact on the company’s bottom line

**Improved IT Staff Productivity:** They can move faster and have time for other, more strategic tasks

Of course, moving toward an SDDC is a journey, and must be done strategically and based on your organization’s specific needs. It’s critical to have the right foundation in place in order to grow and meet future demands. Because there is no one-size-fits-all answer when it comes to SDDC, having the right partners in place helps you navigate the process and choose the right solutions for you.
Why Does Hardware Matter in SDDC?

Hardware Plays an Important Role in a Software-Defined Data Center

A major misconception when it comes to SDDC is that the hardware doesn’t matter anymore. But this belief couldn’t be further from the truth. In fact, despite having the term “software” in the name, it’s clear that hardware plays a critical role in a software-defined data center.

Why?

For one thing, the SDDC runs on hardware – which means it can be constrained by the capacity and limitations of the physical devices. The SDDC must operate within the boundaries of the resources available, including bandwidth, processing power, memory, and storage. The performance of the software depends heavily on the performance and reliability of the hardware it’s running on. Power consumption is another consideration.

If you’re trying to maximize efficiencies with an SDDC, older servers can greatly hinder the process. They limit virtualization and containerization capabilities, making it hard for your organization to be agile and keep up with growing needs. A modernized infrastructure is needed to effectively support emerging workloads.

Latency is a major issue for workloads that require large amounts of parallelized computation – particularly if the compute and memory aren’t physically close together. Modernized servers are designed specifically to support these types of emerging workloads. On average, 13% of servers purchased next year will be used toward predictive analytics, machine learning, or deep learning, and 67% will be used to support emerging technology workloads including IoT, additive manufacturing, computer vision, predictive analytics, and edge computing.¹

Modern servers help companies deliver greater reliability, performance, speed, and scalability. Improved management features and increased reliability help IT achieve greater operational efficiencies in managing their data centers.

With the right infrastructure in place, SDDC allows you to customize your workload placement based on what is best for your business. You can adopt a more agile, secure, and scalable network by embracing the software-defined data center.

¹ Based on a Forrester Consulting Study commissioned by Dell EMC, “Why Faster Refresh Cycles And Modern Infrastructure Management Are Critical To Business Success”, May 2019. Results from a survey of 508 IT infrastructure technology decision makers. G19000034
From chip to hardware to VM, Dell EMC and VMware work together to ensure the performance, efficiency, and security of your infrastructure deliver value to your bottom line.

Dell EMC is #1 in hyper-converged (HCI) systems with an unmatched offering of HCI solutions, all based on the Dell EMC PowerEdge server platform. VxRail appliances are jointly engineered by Dell EMC and VMware and are the only fully integrated, preconfigured, and tested HCI appliance powered by VMware vSAN technology for software-defined storage (SDS).

VMware is a leader in providing both the virtualization and management products that support SDDC, and in integrating them into a cohesive solution. The VMware architecture for the SDDC empowers companies to run hybrid clouds and to leverage unique capabilities to deliver key outcomes that enable efficiency, agility, and security.

**Dell EMC PowerEdge Servers**

Dell EMC PowerEdge servers are constructed to be adaptable and optimized with VMware. For example, **PowerEdge MX** bridges traditional and software-defined data centers with unequal flexibility and agility. Designed specifically for SDDC, the PowerEdge MX7000 chassis is a modular, software-defined infrastructure that can dynamically assign, move, and scale shared pools of compute, storage, and fabric with greater flexibility and efficiency.

**Dell EMC vSAN Ready Nodes**

Dell EMC vSAN Ready Nodes are pre-configured and validated building blocks that reduce deployment risks, improve storage efficiency, and let firms quickly and easily scale storage as needed. Dell EMC vSAN Ready Nodes are built on Dell EMC PowerEdge servers that have been pre-configured, tested, and certified to run vSAN. Each Ready Node includes just the right amount of CPU, memory, network I/O controllers, HDDs, and SSDs that are best suited for vSAN.

**OpenManage Integration for VMware vCenter® (OMIVV)**

OMIVV is designed to streamline the management processes in your data center environment. It consolidates key PowerEdge server management tasks in the VMware vCenter® console, dramatically reducing complexity, speeding deployment, and minimizing risk. Users can manage up to 10 vCenters and 1,000 servers using a single OMIVV plug-in.

**Dell EMC VxRail**

Dell EMC VxRail is the leading hyper-converged solution and the only vSAN-powered appliance jointly engineered with VMware. It provides a single point of support for appliance software and hardware. VxRail consolidates compute, storage, and virtualization with end-to-end automated lifecycle management and offers deep integration with VMware tools. Additionally, it automates network setup with SmartFabric Services, further simplifying and accelerating deployment.
### VMware Cloud Foundation

VMware Cloud Foundation™ is an integrated software stack that bundles VMware vSphere® (compute virtualization), VMware vSAN (storage virtualization), VMware NSX® (network virtualization), and VMware vRealize® Suite (cloud management and monitoring) into a single unified platform that supports any application and provides flexible control. Workloads can be deployed and managed in physical, virtual, and cloud environments with a unified management experience.

Firms can deploy Cloud Foundation easily with PowerEdge and networking switches, or add NSX and Cloud Foundation to Dell EMC vSAN Ready Nodes on PowerEdge MX, and get software-defined infrastructure in one flexible chassis.

Together as one team, Dell EMC and VMware deliver a robust portfolio of SDDC infrastructure and solutions. Through 17 years of partnership and thousands of joint customers, we have emerged to lead the industry across servers, storage, virtualization, SDS, converged and hyperconverged systems, and cloud IT infrastructure.

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### VMware vSphere

As the foundation for VMware’s complete software-defined data center platform, vSphere is the starting point for building a software-defined data center. You can seamlessly extend virtualization to storage and network services and add automated, policy-based provisioning and management. vSphere also allows you to support new workloads and use cases while keeping pace with the growing needs and complexity of your infrastructure. Advanced security capabilities fully integrated into the hypervisor and powered by machine learning provide better visibility, protection, and faster response time for security incidences.

vSphere helps you run, manage, connect, and secure your applications in a common operating environment across the hybrid cloud.

### VMware vSAN

VMware vSAN is a core building block for the SDDC. It powers industry-leading hyperconverged infrastructure (HCI) solutions with a vSphere-native, flash-optimized storage for private and public cloud deployments. vSAN delivers high performance while lowering the cost and complexity of traditional storage.

vSAN allows IT to deliver desktop services to end users by running virtual machines on consolidated clusters in the data center. It runs on industry-standard x86 servers and components that help significantly lower TCO compared to traditional storage.

vSAN helps organizations evolve their data center without risk, control IT costs, and scale to address tomorrow’s business needs.

### VMware NSX

VMware NSX Data Center delivers virtualized networking and security entirely in software, completing a key pillar of the SDDC. It enables the virtual cloud network to connect and protect across data centers, clouds, and applications.

### vRealize Suite

vRealize Suite is a hybrid cloud management platform that helps IT enable developers to quickly build applications in any cloud with secure and consistent operations. It provides developer-friendly infrastructure (supporting VMs and containers) and a common approach to hybrid and multi-cloud, supporting major public clouds.
Conclusion

IT leaders understand the importance of an SDDC, and how the right solutions enable them to handle massive amounts of data, application growth, traditional and emerging workloads, and security demands. The challenge is choosing and implementing the best solutions for your organization. Together, Dell EMC PowerEdge servers and VMware can help you along your SDDC journey, providing infrastructure and support every step of the way.

Services and Support

With more than 1,800 VMware-certified Dell EMC support professionals, you have a single point of contact for your hardware or software questions. This means that almost all calls are handled by Dell EMC without the need to transfer you to VMware.

Additionally, IT staff can get up to 66% faster deployment with Dell EMC ProDeploy Services,* which can include software installation and configuration of the OS, firmware, and VMware hypervisors.

To learn more about how Dell EMC PowerEdge and VMware can help you on your journey to SDDC, visit our PowerEdge server page or check out the brochure, Choose your path to the hybrid cloud.

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* Principled Technologies Report commissioned by Dell EMC, “Bring new systems to production readiness faster and with less effort from in-house administrators,” November 2017