Software-defined data center (SDDC) has the potential to deliver enormous business value to organizations of any size and type. SDDC is an IT infrastructure that extends virtualization concepts such as abstraction, pooling and automation to all elements of the data center. Businesses can achieve significant cost savings, greater agility, simplified operations and rapidly accelerated time to value for new applications and services.

SDDC enables a modernized approach to infrastructure deployment, designed to meet the challenges of today’s era of digital transformation and “always-on” businesses. Gartner has characterized SDDC as “crucial to the long-term evolution of an agile digital business.” IT leaders should recognize, however, that the transformation to SDDC is a journey and not a quick-fix solution.

This white paper discusses what IT teams can do now in order to put together a long-term “future-ready” strategy for evolving their data centers. We also discuss Dell’s vision for SDDC as well as Dell’s unique value proposition in helping organizations make the transition to SDDC seamlessly and successfully.

1  “Gartner Says the Future of the Data Center is Software-Defined,” Gartner, Inc., Sept. 24, 2015
An Overall Vision for SDDC

Digital transformation is one of the most critical, defining challenges—and opportunities—facing businesses today. Over the next two years, two-thirds of Global 2000 CEOs will put digital transformation at the center of their growth and profitability strategies, according to IDC. Furthermore, IDC predicts the scale-up of digital business strategies will drive more than half of enterprise IT spending over the next two years, rising to 60% by 2020.2

The process of digital transformation makes IT a vital partner to the business. This means organizations will rely on technology to not only run their core businesses, but also to reach their customers and provide a rich and interactive experience from anywhere at any time. In this environment, organizations must evolve both their operating models and IT infrastructure to stay ahead of the demands of an “always-on” global environment. This requires infrastructure that enables innovation, is flexible to scale as needed, and provides value to the organization in the form of lower total cost of ownership (TCO) as well as reduced operational and investment risk.

To meet these demands, IT leaders are embracing new data center models. What started with server virtualization—software-defined compute—is now expanding to include software-defined storage and software-defined networking. Until now, networking and storage have both lagged behind compute in virtualization deployments. In most legacy data centers, networking and storage are still managed by separate teams. In some cases, particularly in networking, they are also hampered by continued reliance on proprietary solutions that restrict choice and limit innovation. Furthermore, networking and storage are still typically dependent on costly, risky and time-consuming manual tasks for provisioning and ongoing operations.

Extending virtualization to storage and networking means that organizations can reap many of the same benefits as server virtualization. By isolating and abstracting the management functions of storage and networking, IT teams can reduce the costs and complexity of deploying and managing fixed, proprietary networking and storage solutions. Also, with the virtualization of storage and networking, IT can broaden the benefits of automation to enable major improvements in business agility.

But virtualizing networking and storage is not enough in itself to meet the demands of today’s data center environments. It is just as important to take that critical next step—which is deploying an SDDC architecture that allows you to seamlessly orchestrate activities across compute, networking and storage.

When a new virtual machine is added, for example, the corresponding storage and networking provisioning should take place automatically, without the need for human intervention. If there is a problem with an application’s performance, IT should be able to have a complete, single-pane-of glass view of the entire infrastructure so that it can isolate and fix the problem. Better yet, IT should be able to use advanced analytics within the control plane software to proactively fix the problem before it affects the performance of even a single application. SDDC makes all of this—and more—possible if you have the right tools and technologies in place.

Defining SDDC Partner Attributes

For many organizations, the path to SDDC is not clear. There are a tremendous number of choices and competing emerging technologies.

In developing a strategy for evolving to SDDC, it is important to understand your own environments and develop a plan that meets your needs. In addition to technological issues, there will also be cultural challenges in addressing silos that have been built up in data centers.

---

2 “IDC Predicts the Emergence of “the DX Economy” in a Critical Period of Widespread Digital Transformation and Massive Scale-Up of 3rd Platform Technologies in Every Industry” IDC, Nov. 4, 2015
through the years. There will also be issues surrounding the timing of moving business critical applications to new infrastructures and how to effectively virtualize storage and networking platforms.

It is crucial to recognize that evolving to SDDC is not something that needs to happen immediately, but instead should happen as part of a carefully planned evolutionary process. You should make sure that you are working with a technology partner that allows you to move at your own pace. To ensure success, you must deploy elements of SDDC in a strategic manner that allows you to address the specific challenges of your organization—whether they are technological, cultural, budgetary or anything else.

In addition to focusing on SDDC as a journey, there are several other critically important considerations in choosing your primary technology partner in making this transition. These are:

- **Expertise and technology leadership across all of the critical elements of SDDC.** This means software-defined networking and software-defined storage in addition to software-defined compute. The concept behind SDDC is that all of those key elements are integrated and managed as one, with a single control plane software tool. If you are working with different vendors for each aspect of the infrastructure, you may still have to deal with separate silos and management platforms, limiting the benefits of SDDC orchestration and integration.

- **An open model, particularly for networking.** One of the great opportunities of SDDC is to be quick and agile in leveraging technology innovation, wherever and whenever it takes place. An open model is essential in this type of environment, whereby you are not limited to the products of a single vendor. This is particularly true in networking, where proprietary models have been roadblocks to modernization. With the advent of software-defined networking (SDN), IT teams can leverage a centralized programmable network that can dynamically provision resources to meet changing business requirements. With open networking, organizations can select a preferred hardware vendor and preferred operating system vendor and choose from a vast array of software solutions.

- **A clearly defined framework that offers unparalleled choice for each step of the journey.** You want to be able to transition to the software-defined future in the least disruptive way possible. That means working with a vendor that gives you different models of deployment. For example, converged infrastructures and hyper-converged infrastructures can be utilized as self-contained building blocks that offer a modular model for deploying SDDC. Organizations can use a converged infrastructure or hyper-converged infrastructure for a specific application or workload—good examples include hybrid cloud, test and development and desktop virtualization—without impacting the rest of the infrastructure. This enables IT teams to gain experience with SDDC while at the same time delivering measurable value from their infrastructure investments.

- **Industry leadership in x86 servers—because these are the foundation of SDDC.** It is impossible to overstate the importance of your x86 server environment in ensuring the success of an SDDC deployment. With SDDC, all infrastructure management is moving to the software-defined compute environment. It is not an area where you can afford to take any risk. You need a partner that provides best-of-breed technology, with unified management platforms and the highest levels of customer service and support. You need to be able to leverage servers that offer the highest levels of performance, scale and density.
A broad partner ecosystem. While it is important to work with an infrastructure partner that has a comprehensive product line across all aspects of the data center, it is also important to recognize the value of a broad partner ecosystem. For example, virtualization is a critical element of SDDC, so you want to work with a vendor that has close relationships and partnership agreements with the leading hypervisor providers, specifically VMware and Microsoft. You want unified management platforms that are deeply integrated with solutions such as vSphere and Hyper-V.

A Framework for Delivering SDDC

When you consider the key criteria you should be looking for in a technology partner, there will be very few vendors that will be able to deliver all the attributes you require. In fact, you will probably realize quite quickly that Dell is providing levels of leadership in SDDC that are unmatched by any other vendor. Part of the reason for this is that Dell offers the broadest product line across software-defined compute, networking and storage—and by far the strongest position in one of the most critical elements of SDDC, namely x86-based servers. Dell is also a leader in providing choice in unified management platforms, SDDC control plane software, converged infrastructure and hyper-converged infrastructure solutions.

But Dell's strength in SDDC goes beyond its products and is, in fact, a reflection of the company's history and core values. Dell has always been a proponent of industry-standard and open platforms, and SDDC is an extension of this model. That's why it is a natural outgrowth of Dell's philosophy and vision to create and support a framework for SDDC that enables customers to follow a flexible path, allowing them to build an SDDC on their terms, either in stages or all at once.

The Dell SDDC framework comprises three elements: (1) software-defined compute, such as convergence and hyper-convergence; (2) software-defined networking; and (3) software-defined storage. Within each element Dell offers choice so that customers can match Dell solutions to their business needs, not the other way around. Underpinning all of this, Dell offers a comprehensive management framework with Dell Active System Manager (ASM), which allows customers to combine each element, ultimately evolving the data center into an automated SDDC.

The Dell framework is comprehensive, representing a consistent approach across the entire product line, as follows:

- **Software-defined compute**: This includes density-optimized servers, such as the PowerEdge R730xd and the PowerEdge C-Series. It also includes converged infrastructures such as the FX architecture, M-Series blade servers and PowerEdge VRTX shared platform, as well as hyper-converged solutions such as Dell Engineered Solutions for VMware EVO:RAIL and Dell XC by Nutanix.

- **Software-defined storage**: Dell is the market leader in flash storage and provides a range of software-defined solutions through integration with VMware VSAN, Microsoft Storage Spaces, Red Hat Ceph, Nexenta, Scality and Nutanix. Dell solutions enable software-defined policy management for critical feature options such as deduplication, replication, thin provisioning, snapshots and backup.

- **Software-defined networking**: Dell provides open networking solutions that achieve SDN via disaggregation. This approach, offering customers flexibility, choice and innovation, can be accomplished in three ways: Disaggregation of operating system and hardware; disaggregation of virtual networking and physical networking; and disaggregation of the control plane and data plane.
Taking the Next Step

The transition to SDDC is a journey—one that IT teams will need to take in order to deliver on their vision for next-generation IT as a service models. With SDDC, IT can deliver levels of cost savings, agility, simplicity and integration that are absolutely essential to supporting and enabling digital transformation. For most organizations, the question is not whether to embark on the journey, but how to do so most efficiently and at a pace that is appropriate to the other challenges facing their IT departments.

Dell offers a vision for SDDC that provides unparalleled choice, packaged simply, to allow customers to plot a fast and assured path to their software-defined future in the least disruptive way possible. Organizations need IT flexibility, the capability to innovate in response to new business requirements, and measurable value from the time and money invested will benefit from an SDDC built from modern, highly efficient, standardized x86-based solutions.

In the software-defined era, compute is more important than ever and Dell is the world's premier provider of high-performance, dense and scalable x86 servers. Dell offers the broadest portfolio of architectures and designs that scale for every environment and workload. In addition, Dell supports open solutions and a broad ecosystem of alliances and partnerships with leading vendors across the entire spectrum of software-defined solutions. If your organization is ready to explore how SDDC can help you now and in the future, please contact Dell at www.dell.com/convergedsolutions for more information.