Software Defines the Infrastructure of a Future-Ready Enterprise

Debunking popular myths of a software-defined infrastructure

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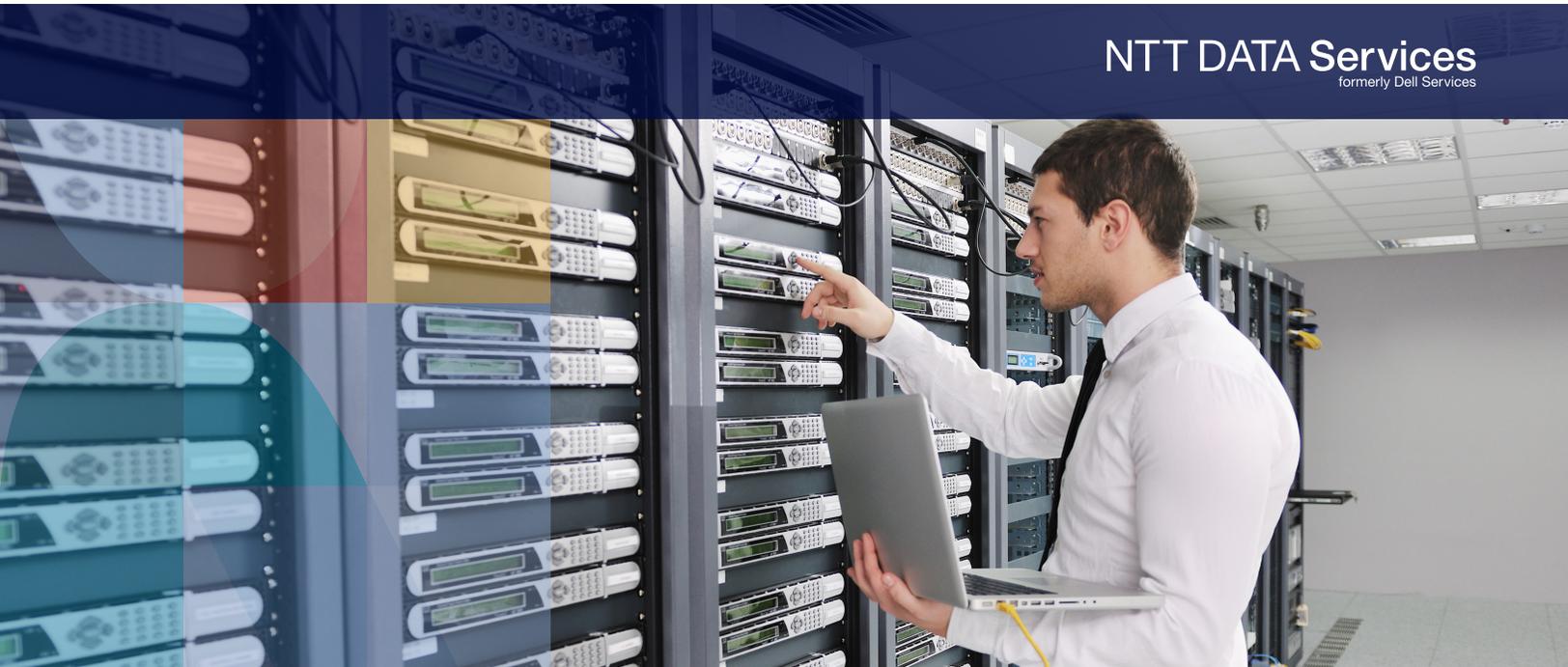
Every new technology is fueled by a vision, a new world of future possibilities that can hardly be imagined in our current state. The problem is that these visions tend to gloss over the often long and complex process of getting from here to there. Software-defined infrastructure (SDI), touted as the future of IT infrastructure, is expected to completely transform the infrastructure landscape, unlock critical intelligence and help deliver new services and powerful analytics needed to run on-demand technology for today's businesses and consumers. Amid all of the hype and excitement, this paper will help IT leaders to separate fact from fiction and provide a closer understanding of what SDI is actually all about (and what it's not).

Why traditional methods don't work

Traditional infrastructure management is no longer sufficient for future-ready enterprises. For example:

- A global ecommerce company with millions of transactions a year is heavily dependent on its IT ecosystem and needs to scale operations depending on the season/sales. The traditional rack-and-stack method of managing IT infrastructure resources is less effective when faced with hundreds of thousands of assets across multiple data centers and locations — and can cost the company greatly to maintain.

- A bank with operations across all continents and millions of customers wants to provide personalized services for a customer-centric operation model. They require a robust IT infrastructure that supports the transformation from a transaction-centric model to an application- or workload-aware model. This means that the bank needs to move away from traditional infrastructure approaches that are less agile and seldom address concerns about managing distinctive workloads or increased storage, performing richer analysis of transaction data and handling sudden spikes in volume.

- Telecommunications companies today have millions of customers exchanging information and communicating with each other through a multitude of networked devices. It's critical for these companies to be prepared to manage surges in voice and/or data traffic that constantly exert pressure on the backbone of the infrastructure. Revamping traditional methods of infrastructure management helps automate traffic management, improve bandwidth engineering and tailor the network according to customer needs.

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Thanks to a silent revolution over the last decade, it's now possible to virtualize and automate a majority of the operating environment, including the server, storage and network, using an SDI.

An SDI is an end-to-end abstraction layer of an enterprise's infrastructure resources, such as storage, compute and networking, that is controlled, managed and governed using software. It includes virtual and physical resources, governed by a set of pre-defined policy frameworks.

SDI is the foundation for building agility into the way companies deliver IT services for a future-ready enterprise. It allows traditional data center users to scale their existing infrastructure seamlessly. It provides interoperability, enabling organizations to implement solutions on any hardware regardless of the original equipment manufacturer. And all of these benefits add up to provide options for not only lowering costs, but also significantly improving speeds and reducing the complexity of provisioning, deploying and maintaining infrastructure resources.

Myths and misconceptions of SDI
Though SDI is an exciting concept with a lot of market buzz surrounding it, not everyone is on board with transforming the traditional approach to infrastructure management.

On one hand, there are estimates of increasing demand for SDI solutions. According to a 2015 report from MarketsandMarkets, the software defined data center market is expected to grow from $21.78 billion in 2015 to $77.18 billion in 2020 — at an estimated compound annual growth rate of 28.8%.[1] But on the other hand, implementation has been slow. Gartner estimates that there have been only 500 to 1,000 mainstream deployments of software-defined networks (SDN), a key element of SDI, globally.[2]

One of the possible reasons for this could be that amid all of the hype and excitement, it's getting difficult to separate fact from fiction. Read on to demystify some of the popular myths of SDI by taking a closer look at what SDI is and why it matters.

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While advancements in digital, Internet of Things (IOT), analytics and cloud technologies grab headlines — and chief information officers' attention — these cutting-edge technologies need to be supported by corresponding advancements in infrastructure and operations.

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Myth #1: SDI is the same as virtualization

One of the most popular misconceptions of SDI is that it's just another form of virtualization. But virtualization is only a small part of SDI.

The SDI architecture includes several layers of functionality on top of existing virtualization capabilities that include:

- Virtual and physical resource pools of enterprise infrastructure
- A service design that manages workloads
- A deployment and runtime environment that allocates resources to accommodate workload changes

SDI acts as an IT facility where the elements of the infrastructure — namely computer, networking, storage and security — are virtualized and made available as a service. It helps organizations ensure that infrastructure resources are effectively planned, provisioned and managed through policy-driven automation, hardware abstraction and simplified management layers. While

SDI is a fully functioning infrastructure ecosystem, virtualization is only a means to an end by helping to enable SDI technology and services.

Myth #2: SDI presents significant security challenges

Security concerns have always slowed the adoption of any new technology. When new concepts like SDI emerge, it's only natural to expect some raised eyebrows. 2015 saw several cyberattacks that caused serious monetary and reputation damages as well as data loss.

With SDI's abstraction and policy-based management capabilities, organizational information and the IT ecosystem can become more secure in the long term. Conventional firewalls are designed to work in relatively non-dynamic environments where security is firmly coupled with network layer components such as IP addresses, ports and protocols. But businesses of the future will need security that adapts to environments where the infrastructure resourcing and provisioning dynamically

adjusts in response to changing demand for services.

SDI defines policies based on business process parameters including the application, user and content. This allows internal and perimeter traffic to be routed through one central firewall. As a result, an ecommerce company with an SDI environment can have a specific security policy for its servers that supports customers' sensitive information, such as credit card information and other transaction details, regardless of the location of the resources. This means better control of security as it dynamically adjusts compute, storage and network resources according to changing business requirements.

At the same time, when any of these resources are removed, the security policies associated with those resources are also removed. This custom approach makes it more secure than traditional infrastructure management as it protects systems based on their unique parameters.

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Myth #3: SDI leaves legacy infrastructure behind

Some chief information officers (CIOs) feel that legacy systems are hindering their growth trajectory. According to research commissioned by Control Circle and conducted by Vinson Bourne, nearly 80% of CIOs claim they are struggling to align technical and business objectives due to dependence on legacy infrastructure.[3]

SDI has the potential to transform complex and expensive legacy environments into cost-effective, agile environments with highly utilized resources and cloud-ready infrastructure. A full SDI implementation must incorporate both legacy resources and virtualized resources.

As we progress in this journey, CIOs will find SDI offerings that don't incorporate aspects of the legacy system into the overall solution. But these offerings will remain incomplete and less efficient without combining legacy elements into the SDI design framework. By including existing physical legacy infrastructure, SDI also overcomes one of the major barriers to cloud adoption — the incompatibility of many legacy architectures and applications with existing cloud environments.

Myth #4: SDI is a hardware killer

Another popular myth is that SDI will completely replace hardware. This couldn't be further from the truth. After all, what would software run on without hardware?

SDI is a software layer that utilizes standardized (yet powerful) system hardware as resources. It pools together all on-premises and off-premises infrastructure setups, including legacy resources, under one manageable umbrella. The hardware capability of the infrastructure resources is virtualized, allowing the underlying layers to be managed through pre-defined policies. Hardware is crucial to the SDI approach.

In fact, SDI essentially removes the need for expensive and proprietary solutions completely. Organizations can choose commodity hardware and improve business results at a much lower cost. NTT DATA believes there are substantial opportunities for hardware innovation using SDI.

Myth #5: SDI is another name for a workload-centric IT infrastructure

A future-ready enterprise can constantly evolve to meet new business needs and workloads. However, many organizations struggle as their IT infrastructure can't keep up. These inefficient systems are built on technology-centric silos and need to be aligned with key workloads to drive greater simplicity and efficiency. A Forrester report estimates that "static virtual servers, private clouds and hosted private clouds will together support 58% of all workloads in 2017, more than double the number installed directly on physical servers."[4]

An SDI can be engineered around these workload-centric architecture principles. It provides the means to automate infrastructure resources that complement different workloads. SDI also has the ability to execute multiple workload-centric architectures at the same time, allowing organizations to effectively manage the solution using a dedicated policy framework for security, bandwidth, resources and isolation. While SDI is not the same thing as a workload-centric infrastructure, it can certainly help organizations achieve their workload goals.

Conclusion

SDI promises to revolutionize the way future-ready enterprises will plan, procure and manage infrastructure resources. It provides a unified architecture that brings together legacy systems, cloud computing and workload-centric architectures under a single, manageable roof.

As CIOs adopt SDI, they will have a number of approaches to choose from; they can either embrace these capabilities through standard solutions or utilize a customizable option. The standard approach enables a quick, reliable and easy route to a software defined environment, but it can restrict its capabilities with rigid proprietary tools and processes. A custom solution can be a long and intensive process, but it includes the authority to pick, choose and assemble the infrastructure resources based on an organization's preference.

Both approaches have their merits, but the most important thing is that CIOs utilize a trusted partner to define which SDI implementation approach is suitable for their unique business environment and objectives.

NTT DATA can help you move toward an SDI environment — enabling you to design, implement, train and manage resources that drive business outcomes and prepare your organization for the future.

References:

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