



The journey to software-defined

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Reaching the nirvana that software-defined promises – responding more rapidly to business demands with higher performance and lower cost – is more like a marathon than a sprint with a few hurdles along the way, but the rewards are quantifiable. The end state is not only worth the effort but essential in remaining in the race and staying competitive.

Software-defined refers to the control and operation of IT that uses software technologies and automation.

Applications and infrastructure are tightly coupled in a software-defined environment.

Based on the application requirements, IT processes including infrastructure control, management, provisioning, and configuration are automated.

When IT operational requirements change in real time, software-defined infrastructure (SDI) enables changes to occur as needed.

Driving forces for SDI adoption

With effective deployment and execution of software-defined infrastructure investments, organizations improve their agility to more rapidly respond to business demands and deliver higher performing applications at lower costs.

With SDI, operations are streamlined with policy driven automation. This automation can:

- Accelerate application and service deliver
- Improve the productivity of application development teams

- Reduce human error
- Increase security and compliance
- Improve reaction time to performance and availability issues
- Eliminate manual reconfiguration with centrally administered software updates
- Make trouble shooting easier
- Enable automated diagnosis and potentially remediation with the incorporation of AI

More effective use of IT resources can also be achieved by better matching capacity with demand. The reuse and redeployment of resources can significantly reduce capital expenses.

The challenges in transitioning to software-defined

SDI requires new skills and adds administration and management complexity. Non-programmable infrastructure (e.g. physical network routers, switches, and physical servers) continues to operate, along with programmable, software-defined infrastructure. Organizations are dependent on perpetual licensed applications as well as subscription-based applications to run their businesses. 451 research reported that nearly one in five organizations had over 75% of their applications running on traditional on-premises infrastructure and over half (55%) put their legacy application count between 51 and 75%. Managing within this hybrid infrastructure is now the norm, creating complexity in the technology, organization and management.

Improving or, at a minimum, maintaining availability across this hybrid environment is challenging. The Uptime Institute's Global Data Center Survey of 2018 found that the number of respondents experiencing IT downtime incidents or service degradation increased from 2017 to 2018. Almost 80% said their recent outage was preventable with on-premises power failures, network failures, and software or IT systems errors being the most common primary causes.

Software-defined is a paradigm shift in how organizations build and deploy infrastructure. 451 research found that the greatest barrier to SDI adoption was the lack of internal skills. Many of these skills are not traditionally found in data center staffing. This only adds to the staffing difficulties experienced by the majority of IT organizations. Networking staff are typically focused on layers 1 to 4 and scripting and design is the mainstay of the application staff.

“SDI workers must understand that new projects must demonstrate results in days rather months. **They need to be comfortable with the idea of millions of users, billions of applications, and trillions of things.**”

Mark Harris, Pluribus Networks, VP of Marketing

New skills demand more holistic knowledge of data center systems – an understanding of how multiple vendor solutions that cross the technology stack work together and operate in unison. It requires a combination of skills and knowledge across both infrastructure and applications, as well as a need for a clear awareness of business context and associated outcomes. This typically calls for cross training and upskilling for in-house IT data center staff.

What's needed to successfully transition to SDI

There are a few essential ingredients for effective implementation and management within today's complex, IT landscape that includes SDI:

- End-to end visibility of the health and performance of your IT estate for software and hardware
- Services or tools to simplify administration of software lifecycle management and improve governance.
- Skills and expertise to:
 - Leverage and optimize your operations using the full value of your SDI investments and its automation capabilities
 - Integrate with existing processes and tools

End-to-end visibility

An essential element in reducing the complexity of managing a hybrid environment is having a window into your IT landscape with readily accessible views of the health and performance across your environment. The capacity to view both dashboard summaries and drill down to detailed service and asset lifecycle reports on demand is critical. This provides you with the self-service ability you need to improve IT decision making and access real-time visualization of key performance indicators. The capability of having a consolidated view of key information across vendors for hardware and software improves and simplifies the asset lifecycle management process. It eliminates the challenges of different interfaces, features and functions across vendors.

Software governance and lifecycle management

Data security and compliance governance has become a board level concern. To improve data security and ensure that compliance demands are sustained requires implementation and monitoring of software standards. Services and tools are available that support notification of non-compliance as well as automated remediation.

¹ [Realities of Enterprise Modernization: Urgency Mounts for a Clear Path to Cloud, 451 Research and Skytap, June 2019](#)

² [Uptime Institute Global Data Center Survey, Uptime Institute, 2018](#)

³ [451 Research Presents 2016 Software Defined Infrastructure \(SDI\) Outlook](#)

⁴ [Realities of Enterprise Modernization: Urgency Mounts for a Clear Path to Cloud, 451 Research and Skytap, June 2019](#)

“No matter the cloud strategy, technology leaders must prioritize self-service and the ability for developers and operations teams to rapidly access secure, sanctioned infrastructure with minimal provisioning to streamline change management and eliminate deployment bottlenecks.

Enterprises also need to plan to protect against the unintended consequences for workload degradation or even failure. Applications and workloads should be crafted to easily and readily shift to alternative execution venues when needed.”

452 Research and SkyTap

Skills and expertise

Few organizations have the skills and expertise needed to deploy and integrate new technology solutions into their business. Many require assistance in supporting, optimizing, and managing their IT operations in whole or in part as they are not positioned to absorb the complexity of software-defined infrastructure. The key is to understand your existing internal skill set, train employees based on the skill gap, and hire expertise where it is lacking.

The ability to integrate SDI into existing processes and in-place technology investments is a key dependency in reducing complexity, improving overall IT operational efficiency, and securing the overall IT environment. This requires the skills and knowledge to leverage the universal language of open APIs (application programming interfaces).

Many organizations are being driven to programmable infrastructure - due to vendor refresh and end of life assets - without the skills and expertise to take advantage of SDI benefits. Others are unable to effectively implement and manage the automation and orchestration capabilities of programmable infrastructure with their existing in-house resources. For these organizations and others, leveraging a service provider to support them while upskilling their staff on an ongoing basis is the answer.

Service providers role in your journey

Service providers can help manage hybrid environments by providing a single source for technical support. They can augment the necessary skills and expertise to compensate for any in-house capabilities gaps. The right service provider can de-risk transformational change and deliver a more efficient operating environment.

To be successful in achieving these objectives, the provider should be able to demonstrate their capabilities to:

- Support and manage a hybrid IT landscape
- Effectively use automation to enable
- Integrate with existing IT systems Large, global teams of network experts with exceptionally strong capabilities in SDI to support deployment, integration, and optimization into your environment
- Use security practices within all of their operations
- Deliver ongoing innovation to their clients

To improve the return on your SDI investment and simplify license administration, governance and support search out service providers who have the following capabilities:

- Near real-time visibility across vendor software licenses with views available on usage, performance, vulnerability, compliance and incident management
- Automation and orchestration capabilities that provide rapid diagnostics, proactive notifications and predictive insights
- Consistent, global multi-vendor technical incident management support
- Large, global teams of network experts with exceptionally strong capabilities in SDI to support deployment, integration, and optimization into your environment

These capabilities will help you reduce operational complexity and improve the visibility and availability of your programmable infrastructure, while upgrading your security and compliance posture across technologies and vendors. Consideration should also be given to a vendor that gives you the level of flexibility and support you require to supplement your in-house staff.

Conclusion

Software-defined infrastructure will become the future standard. Transitioning to SDI is not a question of if but when and how fast. The return in value including scalability, efficiency, and agility to respond is worth the effort, but be prepared for the execution challenges in order to gain all of the operational benefits SDI can deliver.



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