Navigating your software-defined networking journey

Deploy SDN to meet business goals around agility, efficiency and security
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By now, most people are aware of what software-defined networking (SDN) is, and how it can help drive better business results. However, there is still some confusion about the best way to start pursuing the benefits of SDN.

Many organizations make the mistake of selecting a solution at the beginning of their SDN journey. In contrast, the most successful SDN implementations focus on business drivers first, and then identify a solution to meet those business drivers. With the help of a trusted SDN implementation partner, you can identify the SDN solution that is right for you, and then deploy it in a manner that meets your unique business goals.

SDN is designed to address networking needs that are poorly addressed by existing networks. It has revolutionized the way networks are conceptualized, designed, deployed and managed. In other words, SDN is arguably one of the most significant paradigm shifts the networking industry has seen in the last couple of decades.

Nevertheless, Organizations, as part of ongoing digital transformation efforts, are faced with the ever-changing nature of their enterprise applications, which are becoming more complex, dynamic, distributed and resource-intensive, in addition to being cloud-native. Also, the modern applications are containerized. While Containers allows for speed and agility for developing new services, the challenge is to deploy Containers in a scalable, manageable and secure fashion and to provide the underlying network infrastructure.

With the continued evolution of SDN technology, it is possible to provide seamless connectivity as well as security services for all types of end-points — Virtual Machines, Containers and Bare Metal — all using a single network overlay, abstraction and unified policy framework, regardless of where they are, be it Data Center, Remote Office, Branch or in Cloud.

Business drivers for SDN Organizations choose to pursue SDN for a number of different reasons. These business drivers typically fall into one of four main areas:

- Agility
- Efficiency
- Security
- Hybrid cloud integration

SDN use cases
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IBM services for SDN

Evolution of Software defined networking (SDN)
02 Business drivers for SDN

**Agility**
Many organizations have already dedicated significant time and resources to creating agile compute and storage environments but have failed to modernize their network environments in the same way. This is a mistake because the network forms the backbone of the entire IT infrastructure. Automating storage and compute environments without the network creates an agility bottleneck and prevents IT infrastructure from performing to its potential.

Organizations can get the agility they need to respond quickly to change and capitalize on modern innovation opportunities by adopting SDN.

**Efficiency**
Traditional network services are difficult and time consuming to manage, and frequently require error-prone manual processes. This leads to waste and prevents organizations from being as efficient and productive as they might be otherwise.

Transitioning to SDN can help organizations use their resources as efficiently as possible, freeing up funding to invest in innovation and digital transformation opportunities. In addition, automating manual processes allows employees to spend more of their time on high-value work.

**Security**
The risks of failing to properly protect your digital assets are clear: falling victim to a breach or failing to comply with regulations such as the General Data Protection Regulation (GDPR) could cost millions and permanently damage the organization’s reputation.

In many ways, an IT environment is only as secure as the network that underpins it. With SDN, there are various use cases that can help make your network more secure.

**Hybrid cloud integration**
With hybrid cloud, organizations can bring together the best of both worlds: gaining the flexibility and scalability of cloud services in some areas of the business, while maintaining the customization and control of on-premises operations in others. With hybrid cloud, these organizations can apply common policies across cloud and on-premises environments, making it simple and streamlined to manage the overall hybrid environment.

Adopting SDN can put an organization in a position to make the most of hybrid cloud for IT-as-a-service (ITaaS) offerings. Rather than building out the new services for themselves, the organization can simply turn on new cloud services when they’re needed and turn them off once they’re no longer needed. This allows them to replace huge up-front capital expenses with manageable operating expenses.
There are various use cases organizations can explore when they consider SDN. Again, the use cases an organization selects should be based on the unique needs of the business. Use cases the organization does not need can be left out of their SDN roadmap.

With that said, there are four critical use cases that should be included as part of most SDN adoption plans:

- **Software defined environment (SDE) integration**
- **Network management and provisioning**
- **Micro-segmentation and zero-trust policies**
- **Network service chaining**
We no longer live in a world where organizations can look at different elements of their IT infrastructure as distinct and separate silos. This is especially true for organizations that hope to pursue ITaaS with hybrid cloud. These organizations must have a fully integrated software defined environment (SDE) in order to meet their goals. For many of them, a modernized network environment is the final piece of the puzzle they are missing.

In a traditional IT environment, resources are assigned manually. Not only does this make it more difficult for the organization to adapt to change, it also creates a time-consuming chore for employees whose efforts would be better spent elsewhere.

With SDE integration, IT administrators can manage the entire IT environment from a centralized orchestrator. This contributes to greater agility and efficiency, as the distribution of resources throughout the IT environment can be automated. SDE helps the organization respond to changing priorities quickly.
SDN can provide advanced network management capabilities, allowing for greater programmability and visibility throughout the entire network. SDN can efficiently deploy analytics to help identify issues that might arise in the network before they get the chance to negatively impact performance. SDN empowers organizations to quickly provision new business apps whenever they are needed, supporting greater agility throughout the organization.
SDN enables micro-segmentation to support greater application security. Unique, granular security policies can be assigned to each application so that appropriate levels of security are applied across the entire network. This could include zero-trust policies, where the network assumes that all users and access requests are not trustworthy until it establishes otherwise. This can help limit the damage caused by data breaches, since a vulnerability in one application will not spread throughout the network.

While micro-segmentation has clear security benefits, it can also dramatically increase the complexity and cost of managing the network. With SDN, this does not have to be the case. SDN enables micro-segmentation with none of the potential drawbacks by maintaining a centralized topology view that can provide visibility and management capabilities across the environment.
Network service chaining is not a new idea, but SDN offers a new and better way to make it happen. Traditionally, building a chain of network services has been a very time-consuming and inefficient process. This is because it relied upon IT teams to manually cable network devices together in a certain sequence, and then configure a dedicated hardware device to support the chain.

In addition, the entire chain would have to be reconfigured to increase capacity every time there was an increase in application loads. Businesses experiencing fluctuating levels of demand throughout the year would have to build enough capacity to handle the maximum level of demand, and therefore pay for capacity they do not need during the rest of the year.

With SDN, organizations can use the controller to configure and reconfigure service chains quickly and easily, without the manual processes. Service chaining allows them to adjust capacity up and down as demand fluctuates, so they are not stuck paying for unneeded capacity. In addition, network function virtualization allows businesses to run functions on more affordable commodity hardware, rather than requiring a dedicated hardware device.
04 Identifying an SDN partner

Today, there is great complexity due to a myriad of approaches towards adoption of SDN, architectures, evolution of standards and its implementation, as well as a range of products from traditional vendors and new entrants. So, in order to make sure your SDN initiative ends up meeting your business requirements, it is important to work with a trusted partner.

– Your SDN partner should be able to identify the right product for you, based on the requirements of your organization.
– The partner must be able to provide unbiased advice and have good working relationships with all the leading vendors in the space.
– A partner should have a proven reference architecture. In addition to being able to identify the right product for your organization, they also should have demonstrated expertise and experience with actually deploying SDN products to address business drivers.
– An SDN partner should be a leader in cloud technology. To help you capitalize on the potential of cloud services, the partner must be able to integrate networking, compute and storage in a single integrated environment. In doing so, they can help your organization create a business case for ITaaS offerings.
– Finally, your SDN partner should offer you the opportunity to experience the technology first-hand before you move forward with adopting it.
IBM services for SDN

IBM is a leader in SDN services and can assist you with consulting, deployment and managed services.

Consulting
IBM consulting services for SDN are based on proven methods that drive consistent, standardized results. They cover the entire SDN adoption process, including the initial strategy, requirements, planning, architecting, creating technology roadmaps, getting business buy-in, and making final recommendations for which technology would best meet the needs of the business.

IBM Client Innovation Centers allow you to get first-hand experience with SDN technology before you make a final decision. This allows you to feel confident about the product you choose.

Deployment
IBM expertise, experience and vendor partnerships help ensure your SDN deployment achieves results. We are able to manage the deployment in a manner that best meets the needs of your business, whether that means using agile or waterfall project management techniques.

Our deployment services include building your new networking environment, validating and testing it, and handing the finished environment over to your operations team.

Managed services
IBM managed services for SDN can help ensure your new network will continue to work as intended going into the future. IBM can provide ongoing support services directly, or help you maintain your network for yourself.

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