

# Spotlight On The Total Economic Impact Of A Virtual Cloud Network

As organizations prioritize digital transformation initiatives, many are finding that legacy networks are holding them back. To support new business models, cloud adoption, and an explosion in connected devices, modern networks must support interoperability across data centers, multiple clouds, branch locations, and edge devices. Applications now run at every point on this spectrum, and they are critical to businesses' ability to win in hyper-competitive marketplaces. Yet, even as business success has become more dependent on this new architecture, and the amount of data flowing across connections has increased, many organizations still lack a unified approach to management, automation, and security.

With the Virtual Cloud Network delivered on NSX technology, VMware aims to address these issues, allowing organizations to leverage a software abstraction to connect, operate, and secure end-to-end architectures that support applications wherever they may reside. The NSX family of products includes the following:

- › **NSX Data Center:** Network virtualization for the software-defined data center.
- › **NSX Cloud:** Networking and security for cloud-native applications.
- › **NSX SD-WAN by VeloCloud:** Cloud-based, software-defined WAN management.

To better understand the benefits, costs, and risks associated with an investment in a Virtual Cloud Network, Forrester interviewed five customers using VMware NSX Data Center for network virtualization as well as two customers using VMware NSX SD-WAN by VeloCloud to simplify WAN management across branch locations. Based on these interviews, Forrester concluded that deploying a Virtual Cloud Network has the following three-year financial impact: \$13.2 million in benefits versus costs of \$6.4 million, resulting in a net present value (NPV) of \$6.8 million and an ROI of 106%. This summary is a preview of a full TEI case study, which will be published in May 2018 and available for download on VMware.com.



**ROI 106%**



**Benefits PV  
\$13.2 million**



**Costs PV \$6.4  
million**



**Payback <6  
months**

Prior to deploying NSX Data Center, IT organizations at the interviewed organizations struggled to keep up with rapidly evolving business needs. The investment in NSX Data Center gave them the tools to meet developer demands while helping to save on capital expenditures, reduce operational costs, and ensure network performance, all

## SUMMARY

This is a Spotlight preview of results from a commissioned study, "**The Total Economic Impact Of A Virtual Cloud Network**," to be published in May 2018.

## METHODOLOGY

The objective of the TEI framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact of a Virtual Cloud Network, including interviews with Forrester analysts, VMware stakeholders, and seven current customers using Virtual Cloud Network components. Forrester constructed a financial model representative of the interviews using the TEI methodology.

## COMPOSITE ORGANIZATION

This analysis uses a composite organization, based on the interviewees, to present the aggregate financial analysis.

## RISK ADJUSTMENT

Forrester risk-adjusted the financial model based on issues and concerns of the interviewed organizations to account for uncertainties in benefit and cost estimates.

while maintaining security of sensitive data flows. Similarly, NSX SD-WAN by VeloCloud (NSX SD-WAN) customers faced high connectivity costs, significant amounts of downtime, and complex WAN configurations that required too much of their network engineers' time. With the investment in NSX SD-WAN, they were able to utilize commodity broadband at lower costs, ensure continuity of service at branch locations, and simplify the management of the WAN.

"[NSX SD-WAN by] VeloCloud is a key infrastructural capability that allows organizations to prioritize at the application level," said the chief information officer of a regional supermarket chain. "There's a level of guarantee on the availability of uptime and performance on the WAN."

The interviewed organizations also considered the NSX family of technologies instrumental to the "cloud journey" that they have embarked on, as one senior network engineer termed it.

**Quantified benefits.** The following are representative of the quantified benefits experienced by the companies Forrester interviewed:

- › **Capital expenditure avoidance for server and network hardware with NSX Data Center.** In legacy environments, network resources were significantly underutilized, with average compute utilization at approximately 15%. With NSX Data Center, customers saw dramatic improvements in utilization, allowing them to avoid purchasing numerous servers to accommodate growth. Those they did purchase were of the commodity type, since NSX operates independent of underlying infrastructure. The virtualization strategy also allowed customers to avoid purchasing security appliances to protect internal data flows.
- › **Operational cost avoidance for decommissioned and avoided hardware.** By paring down infrastructure and using it more effectively, NSX Data Center customers also saved on infrastructure maintenance costs.
- › **System admin time savings from IT and security automation.** NSX Data Center saved administrators time by making workload provisioning, network management, and security policy assignment more efficient processes. One interviewee said: "We would surely need a lot more people to manage the network if not for NSX."
- › **Reduced WAN connectivity costs.** By switching to an SD-WAN architecture, the customers reduced the costs of connectivity while improving the quality of service to branch locations. Previously, they relied on expensive T1 connections, along with a 3G failover, but are now able to utilize commodity broadband links.
- › **Reclaimed losses from downtime.** Previously, downtime contributed to significant losses in sales and employee productivity at customers' branch locations. The NSX SD-WAN by VeloCloud solution took downtime to near zero, according to customers, and allowed them to avoid further losses.
- › **Time savings in managing the WAN.** Each of the customers using NSX SD-WAN by VeloCloud reported significant time savings, owing in large part to how easy the cloud tools made it to manage the network. "The cloud tools really save a lot of time on the management side of keeping the network running," said the chief technology officer of a holding company with diverse businesses.

**Unquantified benefits.** The benefit of improved security — a direct result of a microsegmentation strategy — has not been factored into this analysis:

Most security breaches can be attributed to internal sources; securing east-west (internal) data flows can limit the impact of an incident. In 2017, the average cost of a security breach was \$3.62 million, and organizations faced, on average, a 28% chance of falling victim to a recurring material data breach, according to the Ponemon Institute.<sup>1</sup> The reduction in risk exposure that accompanies any major improvement in internal security has not been factored into the ROI.

"When the product line was being built out, normally that would have been anywhere from a three- to six-month process to allocate all the storage, allocate all the VMs, and all those different components, and they were able to go from concept to deployment of the new part of the application in that private cloud area in about two weeks."

-- Senior network engineer,  
global information services  
provider



## The Virtual Cloud Network Customer Journey

For this study, Forrester conducted seven interviews with customers using a Virtual Cloud Network and the associated NSX family of products. The interviewed customers include the following:

ORGANIZATION	INTERVIEWEE	SCALE	NSX PRODUCT(S)
Major US university	Information technologist	30,000 end users	NSX Data Center
Business services firm for Fortune 500 clients	Sr. manager, cloud infrastructure	\$2 billion annual revenue	NSX Data Center
US graduate-level educational institute	Network architect	4,000 end users	NSX Data Center
US utility company	Sr. cloud administrator	\$18 billion annual revenue	NSX Data Center
Global information services provider	Sr. network engineer	\$4 billion annual revenue	NSX Data Center
Holding company with diverse portfolio businesses	Chief technology officer	\$100 million annual revenue	NSX SD-WAN by VeloCloud
Regional supermarket chain	Chief information officer	\$1 billion annual revenue	NSX SD-WAN by VeloCloud

## Key Investment Drivers And Results

The interviewed organizations shared the following investment drivers:

- › **Risk of a large-scale breach.** Forrester’s research indicates that internal actors are the most common source of data breach, and without a firm policy to regulate east-west traffic in the data center, organizations left themselves exposed to a large-scale incident.<sup>2</sup>
- › **Streamlining the development process.** IT operations teams wanted to get out of developers’ way and leave them to do what they do best. As one customer put it, the goal was “to have developers build, deploy, and move their environments to different tiers or categories of development with as little intervention as possible.”
- › **High costs to support the WAN.** Customers relied on expensive T1 and multiprotocol label switching (MPLS) links to connect branch locations, and they were looking for easy opportunities for cost savings. At the same time, they were also seeking an easier solution to manage, as the previous WAN management tools were cumbersome and inefficient, according to interviewees.
- › **Business disruption at branch locations.** With previous WAN configurations, customers experienced frequent periods of downtime, which brought business operations to a halt. Customers saw direct losses in revenue and employee productivity, and the effort it took to bring networks back online added to costs. While they knew downtime damaged their brands, it was difficult to quantify.

“The VeloCloud interface is so slick and easy to use that we can instantly make changes and push them out live. You can make [traffic and bandwidth] changes in seconds. It’s fast, and it’s easy to use. The tools save a lot of time on the management side of keeping the network running.”

-- Chief technology officer,  
holding company with diverse  
portfolio businesses



The interviewed organizations achieved key investment results:

- › **Streamlining the development process.** In legacy environments, provisioning infrastructure could take weeks, which impacted developer timelines. With NSX Data Center, what was once a three- to six-month process is now one that takes weeks. “We were able to go from concept to deployment of [a] new part of the application in the private cloud in about two weeks,” said one interviewee.
- › **A limited attack surface.** NSX Data Center’s virtual firewall capabilities allowed customers to protect internal data flows, essentially forming a microperimeter around each workload. The ability to assign security policy at a granular level (i.e., to individual VMs) offered peace of mind at a time when 1) data handling is scrutinized by regulatory bodies and 2) large-scale breaches can become headline news.
- › **Simplified WAN management.** NSX SD-WAN by VeloCloud’s cloud tools create significant time savings for administrators, according to interviewees. “The cloud tools really save a lot of time on the management side of keeping the network running,” said the chief technology officer of a holding company that manages diverse businesses. “It requires very little time and effort.”
- › **Near-zero downtime at branch locations.** Customers using NSX SD-WAN by VeloCloud reported that they experience near-zero downtime at branch locations. When minor disruptions do occur, the response is automated, and network administrators rarely intervene. But the biggest benefit is to the business, which can ensure continuity of its operations.

## Composite Organization

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an ROI analysis that illustrates the areas financially affected, covered in greater detail in the full study. The composite organization has the following characteristics:

**Description of composite:** The composite organization is a US-based retail holding company with multiple brands under management and approximately \$2 billion in total annual revenue. Many brands have both an online and brick-and-mortar presence. Owing to the nature of its business, the company manages significant amounts of data subject to the Payment Card Industry (PCI) Data Security Standard. In its most recent acquisition, the company purchased a regional chain of retail stores with more than 40 locations and combined revenue of more than \$100 million.

**Company characteristics:** The following description aims to provide context for the deployment of a Virtual Cloud Network with key components of the NSX family of products:

- › **Virtual network:** Prior to the deployment of NSX Data Center, the organization relied on 3,000 virtual machines, running across 300 hosts, to support mission-critical applications. Without a centralized approach to network management, it struggled to keep up with the demands of the business. In the absence of automation, it took time and effort to provision secure, segmented networks. Although it used software and hardware protection at the perimeter, its internal security was lacking.
- › **WAN:** Upon the acquisition of the chain of markets, the organization sought to reduce costs associated with managing the WAN across the branch locations. It also wanted to improve uptime and service quality. Prior to deploying NSX SD-WAN by VeloCloud, each branch was equipped with two T1 links along with a 3G failover. Despite the high costs of these links, downtime exceeded more than 0.75 operating days at each location.



### Key assumptions

- \$2 billion in total annual revenue
- 3,000 VMs running on 300 hosts
- 40 recently acquired branch locations

- › **Cloud:** Though its transition to the public cloud is still in early stages, the composite organization does have a presence on major cloud computing platforms, to which it offers developers access alongside the private cloud resources. Additionally, some developers at the organization work with containers, but the organization is seeking a better strategy for managing the security and networking aspects of the container environment prior to offering these capabilities more broadly. It is exploring new capabilities offered by the NSX family of products to meet its evolving needs.

## A Virtual Cloud Network Improves Security, Increases Operational Efficiency, And Ensures Network Uptime

The benefit impact experienced by the composite organization is based on the past and current experiences of the seven interviewees. Over three years, the composite organization achieved risk-adjusted present value (PV) total benefits of \$13.2 million.

Total Benefits							
REF.	BENEFIT	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Atr	Capital expenditure avoidance with NSX Data Center (brownfield)	\$4,374,000	\$1,413,000	\$1,517,400	\$1,546,200	\$8,850,600	\$8,074,278
Btr	Operational cost avoidance for decommissioned and avoided hardware	\$802,180	\$95,486	\$98,879	\$102,611	\$1,099,157	\$1,047,797
Ctr	Systems admin time savings from IT and security automation	\$0	\$470,703	\$517,773	\$569,535	\$1,558,012	\$1,283,724
Dtr	End user productivity improvements	\$393,120	\$432,432	\$475,675	\$523,228	\$1,824,455	\$1,572,469
Etr	Reduced WAN connectivity costs	\$0	\$345,600	\$345,600	\$345,600	\$1,036,800	\$859,456
Ftr	Reclaimed losses from WAN downtime	\$0	\$137,700	\$137,700	\$137,700	\$413,100	\$342,440
Gtr	WAN management time savings	\$0	\$18,018	\$18,018	\$18,018	\$54,054	\$44,808
	Total benefits (risk-adjusted)	\$5,569,300	\$2,912,940	\$3,111,046	\$3,242,892	\$14,836,177	\$13,224,972

- › **Capital expenditure avoidance with NSX Data Center totaling \$8,074,278.** By choosing a virtualization strategy, the composite organization forwent an initial capital expenditure of \$4.9 million to secure east-west traffic in its data center. Additionally, it avoided purchasing — at a cost of \$32,000 each — 19 host servers in Year 1, 21 in Year 2, and 23 in Year 3. In each year, NSX Data Center also allowed the organization to avoid the purchase of switches, load balancers, and additional

security appliances to accommodate growth.

- › **Operational cost avoidance for decommissioned and avoided hardware totaling \$1,047,797.** Operational costs, including maintenance, patching, and support, are calculated as a percentage of server costs. Owing to better utilization, the composite organization was able to retire 37% of its existing servers, which also allowed it to avoid the costs associated with upkeep.
- › **System admin time savings from IT and security automation totaling \$1,283,724.** By implementing NSX Data Center, the composite organization improved workflows for network administrators, saving over 6,000 hours of administrator time each year over the three-year period included in this analysis.
- › **End user productivity improvements totaling \$1,572,469.** Periods of severe underperformance and network unavailability would have cost the composite organization 11,000 hours (at an average cost of \$42 per hour) of end user productivity over a three-year period. By enabling administrators to efficiently provision resources, the organization avoided these productivity losses.
- › **Cost savings for WAN connectivity of \$859,456.** The switch to an SD-WAN architecture allowed the composite organization to trade expensive T1 links with a 3G failover for commodity broadband links with a 4G failover, saving \$800 per location, per month.
- › **Reclaimed losses from downtime totaling \$342,440.** Prior to deploying NSX SD-WAN by VeloCloud, the composite organization experienced 0.75 days of downtime at each of the 40 branch locations it acquired. Each day cost \$8,000 in lost revenue, on which the company earned a 20% gross margin, as well as \$1,500 in lost employee productivity and \$2,000 in internal effort to restore the network.
- › **Time savings in managing the WAN totaling \$44,808.** At the 40 branch locations acquired by the composite organization, the previous WAN environment required the attention of two IT managers and three network administrators; each committed 10% of his or her time to managing the network. With NSX SD-WAN by VeloCloud, managing the WAN required 35% less effort than prior to the deployment, creating significant savings.

“VeloCloud is a key infrastructural capability that allows organizations to prioritize at the application level. There’s a level of guarantee on the availability of uptime and performance on the WAN,”

-- Chief information officer,  
regional supermarket chain



## Virtual Cloud Network Costs Include Deployment, Training, And Licensing For NSX Data Center And NSX SD-WAN By VeloCloud

The composite organization experienced four categories of cost associated with the Virtual Cloud Network investment. Over three years, it experienced risk-adjusted PV total costs of \$6.4 million.

## Total Costs

REF.	COST	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Htr	License and support costs	\$3,287,650	\$986,295	\$1,019,171	\$1,055,336	\$6,348,452	\$5,819,461
Itr	Deployment and training	\$295,009	\$0	\$9,884	\$0	\$304,893	\$303,177
Jtr	Cost of deployment and ongoing management of SD-WAN environment	\$78,750	\$0	\$0	\$0	\$78,750	\$78,750
Ktr	Cost of SD-WAN software and hardware	\$0	\$92,232	\$92,232	\$92,232	\$276,696	\$229,367
	Total costs (risk-adjusted)	\$3,661,409	\$1,078,527	\$1,121,287	\$1,147,568	\$7,008,791	\$6,430,755

- › **License and support costs for NSX Data Center of \$5,819,461.** Over three years, the composite organization incurred costs of \$5.8 million in PV for licensing and support. Licenses are only purchased for the hosts that will serve the virtual network, and prices are tied to the number of CPU sockets on a system. Ongoing support is offered at a percentage of the total license costs.
- › **Development and training costs for NSX Data Center of \$303,177.** For professional services as well as training, which accelerated implementation and production readiness, the composite organization paid costs of \$303,177 in PV.
- › **Deployment and management of the NSX SD-WAN by VeloCloud solution costs of \$78,750.** The composite organization contracted with a third-party systems integrator to deploy NSX SD-WAN by VeloCloud at each of its branch locations. The modest costs demonstrate the ease with which NSX SD-WAN by VeloCloud was deployed, but they owe also to the geographic density of the branch locations.
- › **Monthly costs for access to SD-WAN software and hardware totaling \$229,367.** VeloCloud customers incur monthly charges for the rental of the VeloCloud Edge SD-WAN appliances and gateways as well as access to the VeloCloud Orchestrator cloud platform. The composite organization requires one Edge appliance at 38 of its 40 locations, and the remaining high-volume locations require two appliances.

## Investment In A Virtual Cloud Network Today Can Create Future Opportunities

The value of flexibility is clearly unique to each customer, and the measure of its value varies from organization to organization. There are multiple scenarios in which a customer might choose to implement a Virtual Cloud Network and later realize additional uses and business opportunities, including:

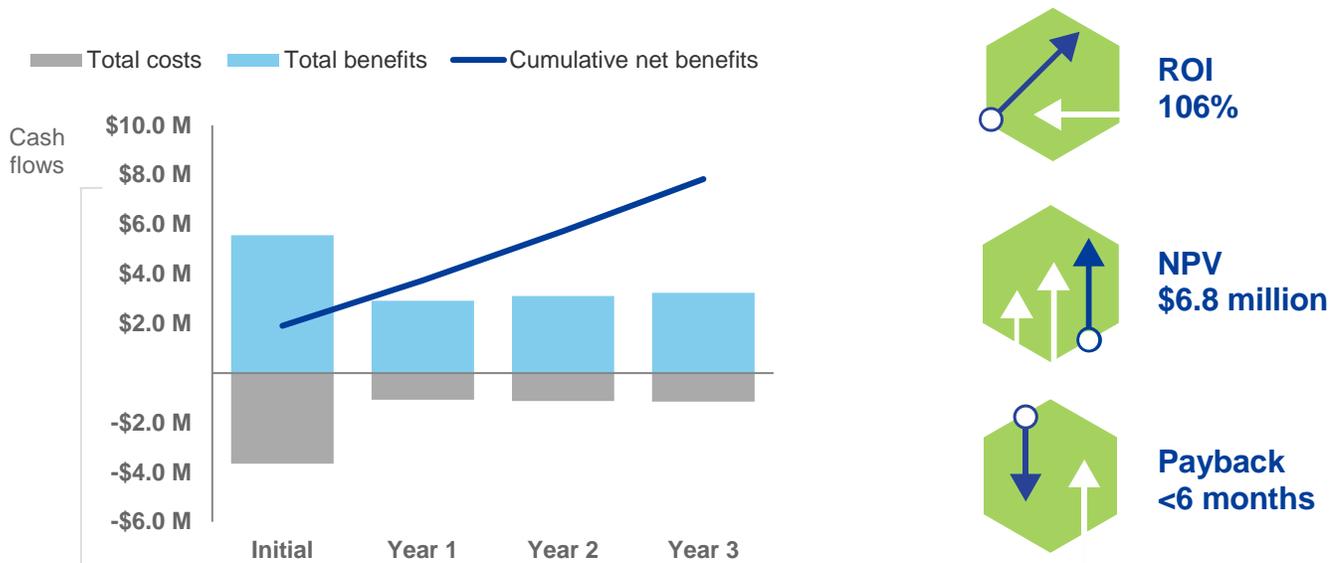
- › **Building with the NSX Data Center RESTful API.** The NSX Data Center RESTful API makes NSX extensible, enabling an integrated experience across VMware products and partner solutions. IT organizations retain flexibility and can efficiently provision complex networks, regardless of the underlying topology and components. One customer said that this flexibility was a key reason her organization chose NSX.

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for a future additional investment. This provides an organization with the "right" or the ability to engage in future initiatives but not the obligation to do so.

- › **Supporting digital transformation.** Several interviewed organizations are aggressively pursuing digital transformations. With these initiatives, they expect to see greater demand for cloud resources across the enterprise. This growth has not been factored into the ROI analysis discussed in this study. However, these customers — as well as others pursuing digital transformation initiatives — may see accelerating returns on an investment that allows them to provision network resources securely and efficiently.
- › **Growing teams, growing skills.** While efficiency is often associated with lower headcount, interviewees stated that their IT organizations are expanding as demand for their services continues to grow. In turn, this demand creates new jobs and new opportunities. Requests for new features push teams to their limits, expanding their skill sets.
- › **Transitioning to containers.** One interviewee reported that while a growing number of its developers are anxious to work with containers, it needs to firm up a strategy for managing the security and networking aspects of the container environment. NSX will make executing on this strategy easier as it automates the process of provisioning and securing container environments.
- › **Scaling up use of the public cloud.** The organizations interviewed for this study leverage both private and public cloud resources. As the latter becomes a bigger part of the infrastructure, they expect to realize efficiencies from being able to manage security across the private and public cloud environments using the NSX console.
- › **Ensuring network stability.** NSX SD-WAN by VeloCloud customers reported near-zero downtime, helping them to reclaim revenue that would otherwise be lost. The current analysis considers the benefits of deploying NSX SD-WAN by VeloCloud across a small part of an organization's footprint; large organizations may benefit from scale, particularly where each hour of downtime is measured in millions of dollars.

## Financial Summary

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment in Virtual Cloud Network. Forrester assumes a yearly discount rate of 10% for this analysis.



## Disclosures

The reader should be aware of the following:

- › The study is commissioned by VMware and delivered by Forrester Consulting. It is not meant to be a competitive analysis.
- › Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in a Virtual Cloud Network from VMware.
- › VMware reviewed and provided feedback to Forrester. Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning.
- › VMware provided the customer names for the interviews but did not participate in the interviews.

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### ABOUT TEI

Total Economic Impact™ (TEI) is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders. The TEI methodology consists of four components to evaluate investment value: benefits, costs, risks, and flexibility. <https://go.forrester.com/consulting/content-marketing-consulting/>

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# VMware NSX: Delivering The Virtual Cloud Network

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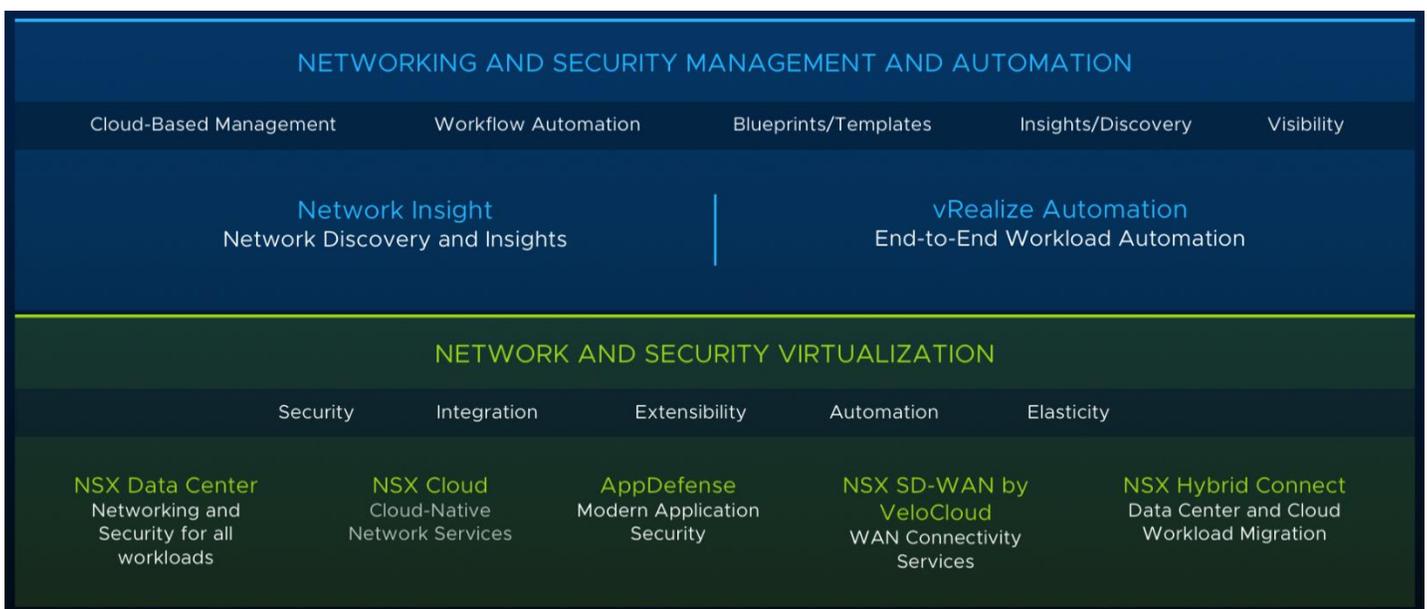
The Virtual Cloud Network is a vision for the future of networking to empower customers to connect and secure applications and data, regardless of where they run — from edge to edge. Virtual Cloud Networking is the category of next-generation networking service technology increasingly being adopted across IT organizations to provide a digital fabric that helps unify a hyper-distributed world.

- › A Virtual Cloud Network enables organizations to embrace a virtual fabric as the software-defined architecture for connecting everything in a distributed world, representing a significant advancement in enterprise networking.
- › Security is architected-in, not bolted on. This is key as the old rule of “perimeter security” evolves from being a perimeter around a data center to one that is application and data-centric — and intrinsic to the entire cloud fabric.
- › All of this can only be done in software, consistent networking from end-to-end. A Virtual Cloud Network is a ubiquitous software layer from data center to cloud to edge infrastructure that provides customers with maximum visibility of and context for the interaction among users, applications, and data.

The VMware NSX portfolio delivers on the vision of the Virtual Cloud Network, enabling organizations to connect, secure, and operate an edge-to-edge architecture, and delivers networking and security services to applications and data through a common operating environment.

VMware’s approach to delivering the Virtual Cloud Network:

- › Enables designing and building the next-generation policy-driven data center that connects, secures, and automates traditional (hypervisor) as well as new microservices-based (container) applications across a range of deployment targets (data center, cloud, branch, etc.).
- › Embeds security into the platform, compartmentalizing the network through microsegmentation and automatically detecting and responding to security threats.
- › Delivers a WAN solution that provides full visibility, metrics, control, and automation of all endpoints.
- › Integrates with VMware’s management, analytics, and automation platform to build a full closed loop cycle on defining, deploying, monitoring, and taking business action.



## Endnotes

<sup>1</sup> Source: “2017 Cost of Data Breach Security: Global Overview,” Ponemon Institute, June 13, 2017 (<https://www.ponemon.org/library/2017-cost-of-data-breach-study-united-states>).

<sup>2</sup> Source: “Best Practices: Mitigating Insider Threats,” Forrester Research, Inc., November 2, 2017.