The Total Economic Impact™ Of VMware NSX

Business Benefits And Cost Savings
Enabled By VMware's NSX® Platform

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Executive Summary

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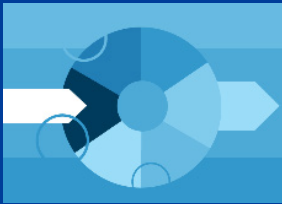ers, multiple clouds, branch locations, and edge devices. Applications now run at every point on this spectrum, and they are critical to businesses' ability to win in hyper-competitive marketplaces. Yet, even as business success has become more dependent on this new architecture and the amount of data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

To better understand the benefits, costs, and risks associated with a VMware NSX® implementation, Forrester interviewed several customers with multiple years of experience using NSX. At these organizations, their networks are virtualized with switching, routing, load balancing, and security posturing all defined with software. With these software-defined data centers running NSX, organizations gained the ability to quickly provision physical resources, optimize resource utilization, and provide security for internal network traffic.

Prior to deploying NSX, customers had delivered network resources through manual hardware provisioning, going through server hosts one by one. The inefficiency of this approach, however, left IT behind on rapidly evolving needs from the business. Scaling and security for internal network traffic were also deficiencies. Traditional network hierarchies that rely on standard perimeter defenses and reactionary patchwork internal security implementations are limited in protection for north-south data flows. Forrester's research indicates that internal incidents are the most common source of data breaches.[1] Forrester's Zero Trust principle suggests that all data flow should be bound to some form of security policy, preferably in the form of micro-segmentation, and centrally manageable for system administrators.

Interviewed organizations that chose to virtualize their networks with NSX were able to save significant capital expenditure on infrastructure and security appliances, reduce operational expenditures, and improve consistent network performance, all while improving the security of internal data flows — some of which were highly regulated.

Key Findings

Quantified benefits. A composite organization based on the interviewed organizations would experience the following risk-adjusted present value (PV) benefits totaling $13,224,972 over three years:

› **Capital expenditure avoidance for server and network hardware with NSX Data Center totaling $6,459,422.** By choosing a virtualization strategy, the composite organization forgoes an initial capital expenditure of $3.8 million to secure east-west traffic in its data center. Additionally, it avoids purchasing 19 host servers (at a cost of $25,600 each) in Year 1, 21 in Year 2, and 23 in Year 3. In each year, NSX Data Center also allows the organization to avoid the purchase of switches, load balancers, and additional security appliances to accommodate growth.

ROI
95%

Benefits PV
$11.9 million

NPV
$5.8 million

Payback
<12 months

› **Operational cost avoidance for decommissioned and avoided hardware totaling $741,336.** Operational costs including maintenance, patching, and support are calculated as a percentage of server costs. Owing to better utilization, the composite organization is able to retire 30% of its existing hardware infrastructure, which allows it to avoid the costs associated with upkeep.

› **System administrator time savings from IT and security automation totaling $3,160,044.** By implementing NSX Data Center, the composite organization improves workflows for system administrators by automating key resource allocation tasks, saving over 22,000 hours per year of administrator time by Year 3 of the 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 avoids these productivity losses.

Unquantified benefits. The interviewed organizations experienced the following benefits, which are not quantified for this study:
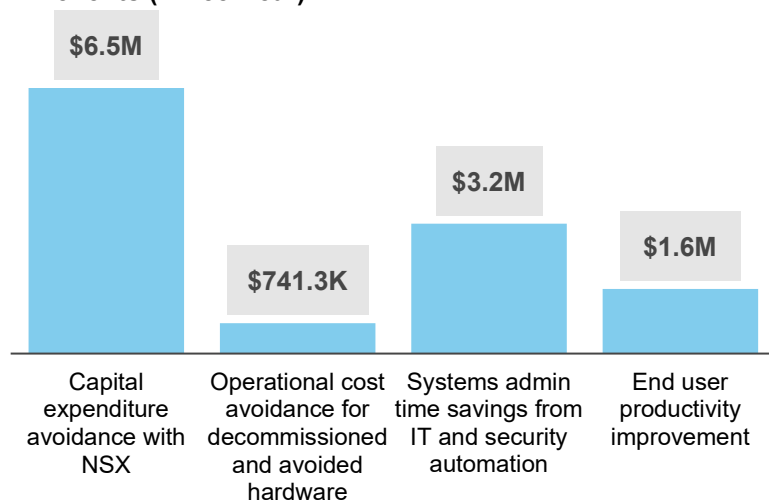
› **Improved time-to-market.** Inherent in an organization's improved ability to rapidly spin up resources such as virtual machines (VMs) and containers for the business is the ability to deploy products or services requiring these resources faster. Faster time-to-market for these products or services may yield accelerated revenue streams for an organization.

› **Improved security.** Most security breaches can be attributed to internal sources, and securing east-west (internal) data flows can limit the impact of an incident. In 2019, the average cost of a security breach was $3.92 million, and organizations faced more than 25% chance of falling victim to a recurring material data breach on average, according to the Ponemon Institute.[2] Forrester did not factor the reduction in risk exposure that accompanies any major improvement in internal security into the ROI.

Costs. The composite organization experiences the following risk-adjusted PV costs:

› **License and support costs for NSX $5,819,461.** Over three years, the composite organization incurs costs of $5.8 million for licensing and support. It only purchases licenses 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 of $303,177.** For professional services as well as training (which accelerates implementation and production-readiness), the composite organization pays costs of $303,177.

Forrester's interviews with seven VMware NSX customers subsequent financial analysis found that the composite organization would experience benefits of $11,933,271 over three years versus costs of $6,122,638, adding up to a net present value (NPV) of $5,810,633 and an ROI of 95%.

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Benefits (Three-Year)
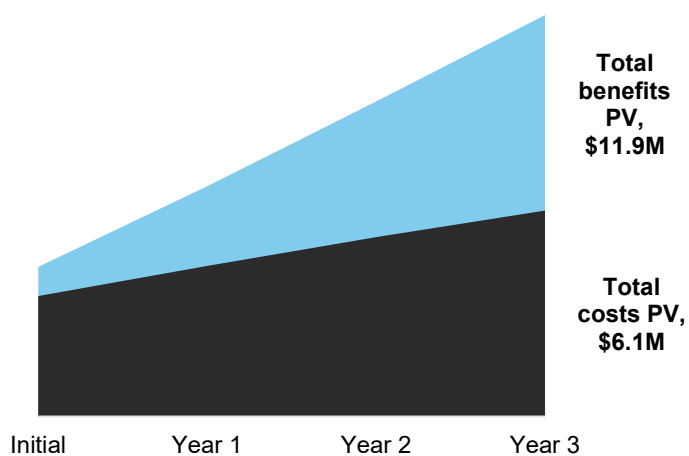
Benefit	Value
Capital expenditure avoidance with NSX	$6.5M
Operational cost avoidance for decommissioned and avoided hardware	$741.3K
Systems admin time savings from IT and security automation	$3.2M
End user productivity improvement	$1.6M

Financial Summary

Total benefits PV, $11.9M

Total costs PV, $6.1M

Initial · Year 1 · Year 2 · Year 3

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TEI Framework And Methodology

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing VMware NSX.

The objective of the 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 that NSX can have on an organization:

DUE DILIGENCE
Interviewed VMware stakeholders and Forrester analysts to gather data relative to NSX deployment.

CUSTOMER INTERVIEWS
Interviewed seven organizations using NSX to obtain data with respect to costs, benefits, and risks.

COMPOSITE ORGANIZATION
Designed a composite organization based on characteristics of the interviewed organizations.

FINANCIAL MODEL FRAMEWORK
Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewed organizations.

CASE STUDY
Employed four fundamental elements of TEI in modeling NSX's impact: benefits, costs, flexibility, and risks. Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

> The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

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The VMware NSX Customer Journey

BEFORE AND AFTER A VMWARE NSX NETWORK INVESTMENT

Interviewed Organizations

For this study, Forrester conducted seven interviews over three years with customers using VMware's NSX platform. The interviewed customers include the following:

ORGANIZATION	INTERVIEWEE	SCALE
Major US university	Information technologist	30,000 end users
Business services firm for Fortune 500 clients	Senior manager, cloud infrastructure	$2 billion annual revenue
US graduate-level educational institute	Network architect	4,000 end users
US utility company	Senior cloud administrator	$18 billion annual revenue
Global information services provider	Senior network engineer	$4 billion annual revenue
Global law firm*	Global product owner, core platforms	$1.7 billion annual revenue
UK telecommunications company*	Solutions architect	$16.7 billion annual revenue

*Most recently interviewed organizations (2020)

Key Challenges

The following key drivers prompted customer organizations to seek out new approaches to network management and security:

› **Risk of a large-scale breach.** Forrester's research indicates that internal actors are the most common source of a 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.[3]

› **Need to streamline 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."

> "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, all the VMs, and all those different components. With NSX, 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*

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- **Limited support for containers.** Prior to implementing NSX, customers faced challenges around security and connectivity for containers in their previous environments, which increased risk and drove up security costs while adversely affecting IT productivity for the personnel tasked with management.

Key Results

The interviewees described the following key results from the investment in NSX:

- **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. One interviewee said, "We were able to go from concept to deployment of [a] new part of the application in the private cloud in about two weeks." Another interviewee noted that provisioning VMs or IP addresses could now be done in minutes.

- **A limited attack surface.** NSX Data Center's virtual firewall capabilities allowed customers to protect internal data flows, essentially creating micro-segmentation around each workload. The ability to assign security policy at a granular level (i.e., to individual VMs or containers) offered peace of mind at a time when data handling is scrutinized by regulatory bodies and large-scale breaches can become front-page news.

- **Infrastructure cost reduction.** The hardware-agnostic NSX platform allows interviewees flexibility in hardware choice while reducing the need to choose altogether. The telecommunications interviewee told Forrester that their organization reduced its hardware infrastructure and associated costs by 30% despite significant growth in the years since implementing NSX.

Composite Organization

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization is representative of the eight companies that Forrester interviewed and is used to present the aggregate financial analysis in the next section. The composite organization that Forrester synthesized from the customer interviews has the following characteristics:

Description of composite. The composite organization is a US-based professional services organization with approximately $2 billion in total annual revenue. A significant portion of the organization's service delivery relies on its key virtualized and physical infrastructure.

Deployment characteristics. The following description aims to provide context for the deployment of VMware NSX:

> "Because of the built-in NSX [Data Center] firewall and load balancing capabilities, we can really rethink our approach to network design, and journey into some areas that would not have been possible before."
>
> *Senior network engineer, global information services provider*

> "From our previous environment to NSX, our provisioning time has gone from months to minutes for VM provisioning."
>
> *Solutions architect, telecommunications company*

Key assumptions
- $2 billion in total annual revenue
- 8,000 VMs running on 300 hosts

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- › **Virtual network.** Prior to the deployment of NSX, the organization relied on 8,000 virtual machines running across 300 hosts (some proprietary) to support mission-critical applications. Without a centralized approach to network management, the organization struggled to keep up with the demands of the business. In the absence of automation, it took time and effort to provision secure and segmented networks. Although it used software and hardware protection at the perimeter, its internal security was lacking.

- › **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 and offers developers access to them alongside private cloud resources. The organization is a heavy user of containers with over 100,000 for managing the security and networking aspects of its container environment with NSX.

Analysis Of Benefits

QUANTIFIED BENEFIT DATA AS APPLIED TO THE COMPOSITE

	Total Benefits						
REF.	**BENEFIT**	**INITIAL**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**TOTAL**	**PRESENT VALUE**
Atr	Capital expenditure avoidance with NSX	$3,499,200	$1,130,400	$1,213,920	$1,236,960	$7,080,480	$6,459,422
Btr	Operational cost avoidance for decommissioned and avoided hardware	$557,280	$69,696	$74,304	$78,912	$780,192	$741,336
Ctr	Systems admin time savings from IT and security automation	$0	$1,002,456	$1,288,872	$1,575,288	$3,866,616	$3,160,044
Dtr	End user productivity improvement	$393,120	$432,432	$475,675	$523,228	$1,824,455	$1,572,469
	Total benefits (risk-adjusted)	$4,449,600	$2,634,984	$3,052,771	$3,414,388	$13,551,743	$11,933,271

Capital Expenditure Cost Avoidance For Server And Network Hardware With NSX

In legacy environments, network resources were significantly underutilized, with an average compute utilization of approximately 15%. With NSX Data Center, customer organizations were able to improve utilization, which allowed them to retire some legacy resources. It also helped customer organizations to avoid capital expenditures for multiple categories of networking hardware:

› Due to NSX Data Center's built-in distributed routing, switching, and load-balancing capabilities, customers were able to avoid purchasing infrastructure components such as switches and load balancers.

› Commodity hardware was viable to the organizations more frequently due to interoperability with NSX, saving further cost.

› By choosing a microsegmentation strategy to secure internal traffic, customers were also able to avoid making significant investments in security appliances.

› By shifting loads to NSX away from traditional firewalls, the telecommunications interviewee estimated a 40% reduction in their organization's physical firewall deployment despite sustained growth.

For the composite organization, Forrester assumes the following:

› The composite organization started out with a base of 300 host servers.

› Without NSX Data Center, the number of servers required to meet end user demand for network resources would grow by 10% each year. With NSX Data Center, the organization requires 30% fewer new servers.

The table above shows the total of all benefits across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of more than $11.9 million.
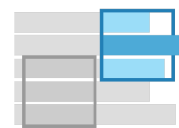
With NSX Data Center, the composite organization reduced total hardware infrastructure spend by 30%.

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› By choosing a virtual firewall strategy, the composite organization avoids a significant initial purchase of security appliances, and avoids further investment in security appliances as demand for network resources grows.

The following risks may affect this benefit category:

› An organization's resource utilization rate prior to the deployment of NSX Data Center.

› The maturity of an organization's approach to internal security prior to the deployment of NSX Data Center.

An organization's resource utilization rate prior to the deployment of NSX Data Center may impact this benefit category. To account for this risk, Forrester applied a 10% risk adjustment to this benefit category, yielding a three-year, risk-adjusted total PV of $7,177,136.

Impact risk is the risk that the business or technology needs of the organization may not be met by the investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for benefit estimates.

Capital Expenditure Cost Avoidance With NSX Data Center: Calculation Table						
REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
A1	Total existing host servers with previous solution		300	330	363	330
A2	Host server growth with previous solution	Baseline: 300		30	33	30
A3	Host server growth required with NSX			19	21	19
A4	Reduction in server requirements with NSX	A2-A3		11	12	11
A5	Cost per host server prior to NSX implementation			$25,600	$25,600	$25,600
A6	Host server savings with NSX	A4*A5		$281,600	$307,200	$281,600
A7	Infrastructure purchase cost avoidance — switches, load balancers	Existing research		$456,000	$523,200	$456,000
A8	Security appliance purchase avoidance for east-west traffic	Existing research	$3,888,000	$518,400	$518,400	$518,400
At	Capital expenditure avoidance with NSX	A6+A7+A8	$3,888,000	$1,256,000	$1,348,800	$1,256,000
	Risk adjustment	↓10%				
Atr	Capital expenditure avoidance with NSX (risk-adjusted)		$3,499,200	$1,130,400	$1,213,920	$1,130,400

Operational Cost Avoidance For Decommissioned And Avoided Hardware

By paring down infrastructure and using it more effectively, NSX Data Center customers also avoided significant costs for infrastructure maintenance.

For the composite organization, Forrester assumes the following:

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- The cost of maintenance, patching, and support for existing host servers is equal to 10% of the initial purchase price.

- When it began using NSX Data Center, the composite organization decommissioned 30% of its 300 existing servers, which had a purchase of $25,600 each.

- In years 1, 2, and 3, it decommissioned 10, 12, and 14 servers, respectively.

- The cost of maintenance, patching, and upkeep for the security appliances that the composite organization avoided purchasing by pursuing a virtual firewall strategy is equal to 10% of the security appliance initial purchase price.

The following risk factors may affect the benefits realized by other organizations that deploy NSX Data Center:

- The efficiency with which organizations carry out maintenance, patching, and security prior to the NSX Data Center deployment.

- The speed with which an organization is able to decommission servers carried over from the pre-NSX environment.

To account for these risks, Forrester applied a 10% risk adjustment, yielding a three-year, risk-adjusted total PV of $741,336.

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
**Operational Cost Avoidance For Decommissioned And Avoided Hardware: Calculation Table**
B1	Servers decommissionable from previous solution		90	10	12	14
B2	Maintenance, patching, and support of existing hosts	10% of server cost	$230,400	$25,600	$30,720	$35,840
B3	Maintenance, patching, upkeep of infrastructure and security appliances w/o NSX	10% of infrastructure cost	$388,800	$51,840	$51,840	$51,840
Bt	Operational cost avoidance for decommissioned and avoided hardware	B2+B3	$619,200	$77,440	$82,560	$87,680
	Risk adjustment	↓10%				
Btr	Operational cost avoidance for decommissioned and avoided hardware (risk-adjusted)		$557,280	$69,696	$74,304	$78,912

Systems Admin Time Savings From IT And Security Automation

NSX Data Center saved administrators time by automating workload provisioning, network management, and security assignment processes. One interviewee said, "We would surely need a lot more people to manage the network if not for NSX." Another interviewee echoed this sentiment, noting that VM and IP address provisioning, which is historically a time- and labor-intensive process, decreased in some

Over **22,000** personnel hours saved through automation by Year 3.

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cases from months to minutes. Yet another organization estimated that an average resource allocation request took upwards of three weeks.

For the composite organization, Forrester assumes the following:

› In Year 1, system administrators save a total of 14,560 hours (seven FTEs at 2,080 hours per year) on tasks that include workload provisioning, network management, and security policy administration.

› Time savings increase by one-half FTE (1,040 hours) in each subsequent year.

› The organization realizes this benefit by not hiring additional system administrators at a fully loaded hourly rate of $81 and reallocating existing network administrators to other tasks when available.

The maturity of an organization's existing network automation and security practices may impact this benefit category. To account for this risk factor, Forrester applied a 15% risk adjustment, yielding a three-year, risk-adjusted total PV of $3,160,044.

"IP address allocation is critical for our TV streaming platform, which we run on NSX. We recently had a requirement for 1,000 additional IP addresses that we were able to allocate in one day. That would have taken us weeks if not months in the past without NSX."

Solutions architect, telecommunications company

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
Systems Admin Time Savings From IT And Security Automation: Calculation Table						
C1	Workload provisioning automation savings in hours			2,080	3,120	4,160
C2	Network management automation savings in hours			8,320	10,400	12,480
C3	Security posturing/policy automation savings in hours			4,160	5,200	6,240
C4	Total hours of administrator time savings	C1+C2+C3		14,560	18,720	22,880
C5	Hourly cost of systems admin, fully loaded			$81	$81	$81
Ct	Systems admin time savings from IT and security automation	(C1+C2+C3)*C5	$0	$1,179,360	$1,516,320	$1,853,280
	Risk adjustment	↓15%				
Ctr	Systems admin time savings from IT and security automation (risk-adjusted)		$0	$1,002,456	$1,288,872	$1,575,288

End User Productivity Improvements

Prior to an investment in NSX, interviewees' IT organizations frequently provisioned resources that underperformed because of the inexact and manual process with which the companies allocated them. Rectifying performance issues took time, forcing end users to work with suboptimal resources and hampering productivity. NSX Data Center enabled administrators to quickly provision resources able to support end user workflows. In addition, the businesses suffered from slower-than-ideal resource allocation for resources such as VMs or IP addresses. This affected their ability to execute on time-sensitive initiatives or opportunities. Interviewed organizations also noted end-user productivity improvements as a result of faster resource allocation, as personnel such as developers experience significantly reduced downtime from lengthy resource allocation processes.

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For the composite organization, Forrester assumes the following:

› Initially, the organization required the equivalent of 3,200 VMs to meet daily end user demand.

› Each year, end user demand for VMs increased by 10%.

› Over the course of the year (260 working days), 5% of these VMs failed or experienced degraded performance.

› Each period of failure or degraded performance lasted 15 minutes, during which end user productivity was hampered.

The following are potential risks that may affect this benefit category:

› The accuracy with which network administrators can provision resources that allow end users to perform their jobs.

› The frequency with which end users experience performance degradation and the extent to which it impacts their workflows.

To account for these risks, Forrester applied a 10% risk adjustment, yielding a three-year, risk-adjusted total PV of $1,572,469.

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
End User Productivity Improvements: Calculation Table						
D1	Active VM user usage across the enterprise, per year	4,000 VMs daily at 80% utilization	832,000	915,200	1,006,720	1,107,392
D2	Frequency of degradation occurrences with prior solution	5% of VM degrade / fail	41,600	45,760	50,336	55,370
D3	Duration of average performance degradation leading to lower end user productivity, in hours	1/4 hour per degrade / fail	10,400	11,440	12,584	13,842
D4	Average hourly wage of end user, fully loaded	$42/hour	$42	$42	$42	$42
Dt	End user productivity improvement	D3*D4	$436,800	$480,480	$528,528	$581,364
	Risk adjustment	↓10%				
Dtr	End user productivity improvement (risk-adjusted)		$393,120	$432,432	$475,675	$523,228

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Unquantified Benefits

› **Improved time-to-market.** Inherent in an organization's improved ability to rapidly spin up resources such as VMs and containers for the business is the ability to deploy products or services requiring these resources more quickly. Faster time-to-market for these products or services may yield accelerated revenue streams that Forrester did not factor into this analysis. The telecommunications interviewee noted that time-to-market for products has improved as a result of the efficiencies delivered by NSX. They said: "Time-to-market for new products at [our organization] has significantly improved. Our developers are no longer waiting for infrastructure or resource allocation tasks to complete, so they can spend more time developing."

› **Improved security**. This is a direct result of a microsegmentation strategy that 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 2019, the average cost of a security breach was $3.92 million, and organizations faced, on average, over a 25% chance of falling victim to a recurring material data breach, according to the Ponemon Institute.[4] Forrester did not factor the reduction in risk exposure that accompanies any major improvement in internal security into the ROI.

Flexibility

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 NSX and later realize additional uses and business opportunities, including the following:

› **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 they can efficiently provision complex networks regardless of the underlying topology and components. One customer said this flexibility was a key reason her organization chose NSX.

› **Supporting digital transformation.** Several interviewed organizations are aggressively pursuing digital transformations. With these initiatives, they expect to see greater demand for cloud resources across their enterprises. Forrester has not factored this growth 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 and 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. Requesting new features pushes teams to their limits and expands their skill sets.

"Time-to-market for new products at [our organization] has significantly improved. Our developers are no longer waiting for infrastructure or resource allocation tasks to complete, so they can spend more time developing."

Solutions architect, telecommunications company

Moving forward, customers expect to realize efficiencies from being able to manage security across the private and public cloud environments using 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.

› **Expanding containers.** One interviewee reported that while a growing number of their organization's 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 Data Center makes executing on this strategy easier, as it supports automated network provisioning and security for 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, the organizations expect to realize efficiencies from being able to manage security across the private and public cloud environments using the NSX management console.

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Analysis Of Costs

QUANTIFIED COST DATA AS APPLIED TO THE COMPOSITE

Total Costs

REF.	COST	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Etr	License and support costs for NSX Data Center	$3,287,650	$986,295	$1,019,171	$1,055,336	$6,348,452	$5,819,461
Ftr	Deployment and training costs for NSX Data Center	$295,009	$0	$9,884	$0	$304,893	$303,177
	Total costs (risk-adjusted)	$3,582,659	$986,295	$1,029,055	$1,055,336	$6,653,345	$6,122,638

License And Support Costs For NSX

Organizations only purchased licenses for the hosts that serve their virtual networks, and prices are tied to the number of CPU sockets on a system. VMware offers ongoing support at a percentage of total license costs.

For the composite organization, Forrester assumes the following:

› Each year, demand for virtual network resources increases by 10%.

› The annual cost of ongoing service and support is equal to 25% of the initial cost of licenses.

VMware supplied license and support cost estimates and customers confirmed them. Therefore, Forrester did not apply a risk adjustment to this cost category. The composite organization incurs three-year license and support costs of $5,819,461 in PV.

> The table above shows the total of all costs across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total costs to be a PV of more than $6.1 million.

License And Support Costs For NSX: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
E1	NSX license cost		$2,630,120	$263,012	$289,313	$318,245
E2	NSX service and support		$657,530	$723,283	$729,858	$737,091
Et	License and support costs	E1+E2	$3,287,650	$986,295	$1,019,171	$1,055,336
	Risk adjustment	0%				
Etr	License and support costs (risk-adjusted)		$3,287,650	$986,295	$1,019,171	$1,055,336

Deployment And Training For NSX

Customers paid for professional services and training for systems administrators, which helped to accelerate implementation and production readiness.

For the composite organization, Forrester assumes the following:

› There is a one-time cost for professional services.

> Implementation risk is the risk that a proposed investment may deviate from the original or expected requirements, resulting in higher costs than anticipated. The greater the uncertainty, the wider the potential range of outcomes for cost estimates.

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- There is an initial cost for VMware training, and the organization incurs an additional cost for training in Year 2 because of churn and the need to train new employees.

- Each system administrator requires 120 hours of training.

- There is an opportunity cost associated with training system administrators, which is calculated with respect to their fully burdened hourly rates of pay.

- It takes two months for system administrators to reach full productivity levels, and they work at a 50% rate of productivity during the two-month ramp-up period.

The following risk factors may affect costs incurred by other organizations:

- The existing skill sets of systems administrators and the level of training they require.

- The amount of churn among system administrators, which results in the need to train new employees.

To account for these risks, Forrester applied a 10% risk adjustment, yielding a risk-adjusted total cost of $303,177 in PV.

Deployment And Training For NSX: Calculation Table						
REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
F1	VMware design and deployment of professional services		$200,000			
F2	VMware training services program		$8,250		$4,125	
F3	Cost of system admin per hour		$81	$81	$81	$81
F4	Cost of system admin training, initial	120 hours per admin, three admins	$19,440		$4,860	
F5	Cost of system admin ramp-up period	50% productivity for two months, three admins	$40,500			
Ft	Deployment and training for NSX	F1+F2+F4+F5	$268,190	$0	$8,985	$0
	Risk adjustment	↑10%				
Ftr	Deployment and training for NSX (risk-adjusted)		$295,009	$0	$9,884	$0

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Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)

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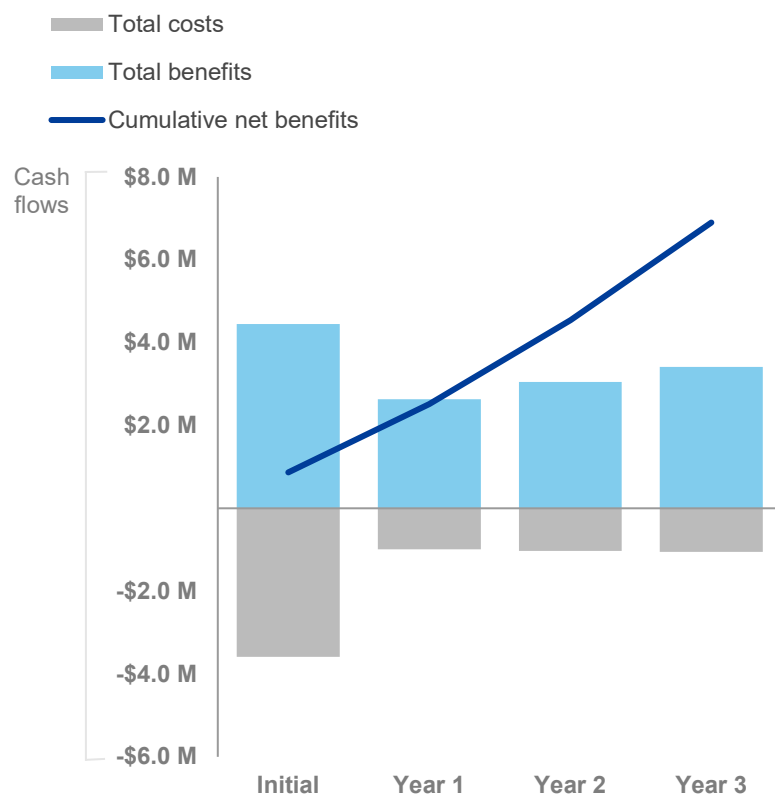
The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Table (Risk-Adjusted)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	($3,582,659)	($986,295)	($1,029,055)	($1,055,336)	($6,653,345)	($6,122,638)
Total benefits	$4,449,600	$2,634,984	$3,052,771	$3,414,388	$13,551,743	$11,933,271
Net benefits	$866,941	$1,648,689	$2,023,717	$2,359,052	$6,898,398	$5,810,633
ROI						95%
Payback period						<12 months

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VMware NSX

The following information is provided by VMware. Forrester has not validated any claims and does not endorse VMware or its offerings.

VMware NSX is a full-stack Layer 2-to-Layer 7 networking, security, and analytics virtualization platform that uses a software-defined approach to extend networking and security across data centers, clouds, and application frameworks. By building these networking and security functions into the virtualization layer in the infrastructure, NSX brings networking and security closer to where the applications run, whether it's virtual machines (VMs), containers, or bare metal servers. Like the operational model for VMs, networks can be provisioned and managed independent of the underlying hardware.
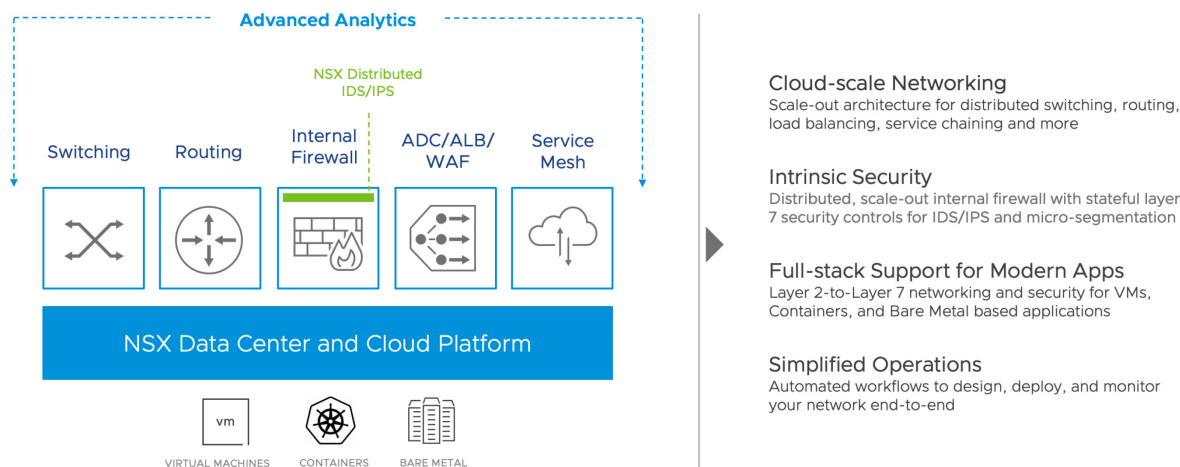
NSX empowers organizations to achieve capex and opex savings, faster time-to-market, and comprehensive security.

- **Faster time-to-market**: NSX is designed to help enterprises gain a whole new level of high productivity never achieved before with traditional networking. It replicates the one-click public cloud experience on-premises while enterprises maintain full control of their networks and policies. Creating a network take seconds with a highly streamlined workflow. By abstracting the network in code, enterprises can minimize and extend the life cycle of their hardware. Furthermore, NSX includes full stack L2 to L7 functions from switching and routing to load balancing, firewalling, policy management, application layer service mesh, and analytics, allowing organizations to achieve cloud-class Day 0, Day 1, and Day 2 operations.
- **Cost savings:** NSX significantly improves infrastructure utilization by decoupling workloads from traditional networking constraints of VLANs and enabling VM and IP mobility. Organizations can leverage NSX to minimize traffic traversal to the top-of-rack switches by suppressing east-west traffic across racks. This increases longevity of physical appliances and avoids network refreshes. This also reduces the operating expenses for perimeter appliances and network monitoring and troubleshooting while improving network efficiency.
- **Comprehensive security:** The VMware service-defined firewall includes the NSX-distributed firewall, IDS/IPS, and NSX Intelligence. It uses a scale-out security architecture that eliminates the throughput constraints of traditional security appliances. It provides absolute coverage for east-west traffic with no network blind spots while being operationally simple to deploy and manage. NSX is service-aware and leverages the knowledge of running workloads to radically reduce the computational overhead on the host and support full workload mobility. NSX Intelligence provides topology, flow visualizations, and automated policy recommendations to simplify microsegmentation workflows and policy compliance.

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Appendix A: Total Economic Impact

Total Economic Impact 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.

Total Economic Impact Approach

Benefits represent the value delivered to the business by the product. The TEI methodology places equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization.

Costs consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.

Flexibility represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.

Risks measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.

Present value (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.

Net present value (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.

Return on investment (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.

Discount rate

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.

Payback period

The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.

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Endnotes

[1] Source: "Future-Proof Your Digital Business With Zero Trust Security," Forrester Research, Inc., October 4, 2019.

[2] Source: "Best Practices: Mitigating Insider Threats," Forrester Research, Inc., May 31, 2019.

[3] Source: "2019 Cost of Data Breach Security: Global Overview," Ponemon Institute (https://www.ibm.com/security/data-breach).

[4] Ibid.

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