

The Economics of Virtual Networking

A business case primer for the non-technical executive

As an IT executive, you know why your company needs a virtualized network. You know you won't be able to deliver, improve, or fix customer experiences rapidly enough to keep up with your competitors—or your company's own developers, most likely. But you also know that your boss or your boss's boss may not understand all this. Whether the key decision-maker is the CTO, CFO, or CEO, here is a guide to providing the dollars and cents reasons why virtual networking is a wise investment.

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ERNEST LEFNER
FORMER SENIOR VICE PRESIDENT
OF NETWORKING AND ARCHITECTURE
BANK OF AMERICA

A virtualized network directly impacts business

First, the basics. On a virtualized network, it takes minutes to make a change—say, to add capacity to an e-commerce site for a Thanksgiving weekend promotion. On a non-virtualized or “physical” network, the same change could take days or weeks as network engineers manually reconfigure switches. That was an annoyance in the past. Now that “every company is a software company,” the stakes are higher—especially since companies are building software far more quickly than ever before. Most companies have already virtualized their servers, so they can quickly create pools of compute power to support a given application, and many are using an approach to development called DevOps, which reduces the cycle time to deploy new applications. At most companies, the network remains the weak link that slows down the innovation train.

“At this point, there's no reason not to virtualize the network other than fear,” says Ernest Lefner, former Senior Vice President of Networking and Architecture for Bank of America. “You have to go from building infrastructure that was designed to never change to infrastructure that is designed to fail fast and adapt. It's about serving the customer, not the needs of an IT organization that wasn't built to move quickly.”

The startup costs are not prohibitive

For most companies, virtualizing the network is more about shifting how you spend IT dollars, rather than spending more. Companies do need to buy network virtualization software, but that software allows them to slash the amount they need to spend on traditional networking and computing hardware. “It's not money saved, as much as money diverted,” says Cliff Grossner, executive director of research at IHS Markit, a market research firm. Typically, the break-even on virtual networking projects is less than 20 months, according to the VMware Networking and Security Business Unit, which does economic modeling on data provided by more than 3,000 customers.

It saves money

Network virtualization is more cost-effective for a number of reasons. It decreases the number of servers and networking switches a company needs, and often lets them use cheaper alternatives. It automates a broad range of common, inefficient manual processes. “Initially, most CTOs only care about ‘what will it save me,’” says Lefner, who is also co-founder of the ONUG, a user group for networking executives. “If you're doing a full transformation from legacy to fully virtualized, CTOs should see a 40 percent reduction in the overall cost of IT infrastructure.”

VMware internal data supports this claim. In an analysis prepared for this article, a \$6.6 million investment in network virtualization technology will yield a return of \$14.4 million over 3 years. Two-thirds of the gain was attributed to reduced investment in hardware, with the remainder due to a decline in operating costs due mostly to increased automation.

NETWORK VIRTUALIZATION BENEFITS

- Decreases the number of servers and networking switches needed
- Enables the use of off-the-shelf server and switch alternatives
- Automates many common, inefficient manual processes

NETWORK VIRTUALIZATION WITH INTEL® ARCHITECTURE

Intel® Architecture (IA) provides a foundational, industry-standard hardware infrastructure that supports extensible virtualized networking and security functions for VMs and containers.

The 2nd generation Intel® Xeon® Scalable processor data-centric platform delivers up to 1.58X performance improvement over the previous generation of Intel® Xeon® Scalable processors for network workloads.¹

The platform also supports up to twice the number of subscribers for virtualized SD-WAN services, and up to five times more virtual network function (VNF) capacity when complemented with Intel Quick Assist Technology and Intel Ethernet 800 Series Ethernet controllers, thus reducing both cost and complexity as more functionality can be managed with fewer inputs.²

Why it reduces capital spending

There are two tiers of savings. For starters, a virtualized network shifts many specialized tasks—for example, load balancing—from expensive physical devices into the virtual software. This allows companies to focus on building a physical network that is resource-optimized and as simple, fast, and resilient as possible.

The bigger hardware savings are on the server side. Even if a company virtualizes all its servers, they are confined to particular segments of the network. Virtualizing the network does away with these zones, so workloads can be assigned to any server anywhere on the network. This eliminates wasted capacity on servers left to twiddle their thumbs in zones where not much is going on.

Transforming a network from a collection of walled neighborhoods to a single entity also reduces the torrent of “east-west” traffic that travels between servers within a company—say, when your online grocery app checks with another server to confirm your credit rating, and another that will assign a delivery driver. Without network virtualization, all of these server-to-server connections first need to go through a switch that figures out which zone the destination server is in, and how best to get it there. With virtualization, there’s no middleman. Traffic flows nonstop.

This is a big deal. These efficiencies, along with the ongoing increase in the price/performance ratio of computers, means companies can often cut in half the number of servers they need.

Why it reduces operating expenses

Most companies spend the vast majority of their IT dollars on daily operations and maintenance rather than on innovation. The complexity of managing networks has traditionally been a sizable reason why. Companies had to employ armies of network administrators to monitor and manually configure network equipment as traffic patterns changed and new services were rolled out.

Network virtualization technology automates many of these tasks. According to VMware data, companies that have done little to modernize their IT operations may need one such person for every 10 servers. At a typical company, that person may be able to watch over 40 or so servers. At the most sophisticated shops, such as the big Wall Street firms, the ratio rises to one person for every 800 machines, while administrators at hyperscale cloud providers such as Google and Microsoft watch over thousands at a time. This is possible only with automation, from virtualization and other types of technologies.

“I always hear CTOs asking, ‘how can I be more like the cloud providers?’” says Lefner. Virtualizing the network is a great way to start, he says.

1 Intel Corporation. “*Pandemic Drives a New Era of Tech Collaboration.*” 2020.

2 Intel Corporation. “*New Intel Portfolio Delivers Advanced Performance, NFV Optimization, Memory for Data Centric Era.*” Dan Rodriguez, April 2019.

“Virtualizing the network is an essential step on the way to the cloud.”

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It sets you up for the cloud

The ability to outsource IT jobs to public cloud services such as AWS or Microsoft Azure is one of the great all-time innovations in corporate IT. But the cloud is not always the cheapest or smartest option. To take best advantage, IT shops need to maintain the flexibility to move IT jobs to the most appropriate infrastructure. While AWS makes it simple to launch new services without any glitches, at some point it becomes cheaper to deliver that application on the company’s own infrastructure rather than continue paying a monthly fee. Should customer demand spike for some reason, it’s no big deal to add capacity with AWS temporarily—or to switch to another cloud provider that’s offering a better price.

Without a virtualized network, such flexibility is impossible, says Grossner. “You can’t even think about things like hybrid cloud and multi-cloud. Having an unautomated network when everything around it is orchestrated by machines would be like tying yourself to a lead boat anchor.”

Virtualizing the network is an essential step on the way to the cloud, says Lefner. Otherwise, the only option is to move everything “and let your infrastructure die on the vine.” The main reason is that people who run legacy physical networks rarely have the software skills to manage a “multi-cloud” operation. “It’s too much of a skill-set change,” he says. “Operationally speaking, no IT operation could handle that.”

As part of a complete set of software-defined services—including compute, storage, security, and cloud management to run enterprise apps—network virtualization delivers a single integrated solution that is easy to operate, enables greater business agility, and drastically simplifies the path to the hybrid cloud.

It’s not just a one-time savings

Network virtualization is an essential step in moving from a hardwired, hardware-centric IT infrastructure to software-defined data centers that can be continually updated, in ways that have significant business impact.

For example, sophisticated IT shops periodically assess themselves to see if they can lower their costs. VMware NSBU has helped thousands of companies through this process. On average, these customers consolidate from 1,354 servers to just 130, by replacing aging machines with fewer, more powerful models. The number of sockets—a measure of physical networking capacity—falls from 3,134 to 260. Simplifying the infrastructure pays off on the operating side, cutting the cost of labor by \$3.3 million on average.

Companies with virtualized, software-based infrastructure are also far better positioned to embrace game-changing new technologies as they come along. While lots of companies want to simply outsource to the cloud, “I usually advise them to do the hard, upfront work on their own environment,” says Coby Litvinsky, director of business strategy for NSBU. “Because you’ll get tremendous value down the road.”

Network virtualization with VMware NSX delivers a completely new operational model for networking defined in software, forming a cornerstone of VMware Cloud Foundation™, and providing IT with the tools to keep up with everchanging business demands. IT has the freedom and flexibility to quickly deploy any application—whether traditional or cloud native—anywhere, with the ability to freely move workloads between private and public cloud environments, all while reducing overall TCO.

