



IT Architecture | Delivery | Support | Management

HOW VIRTUALIZATION IS DRIVING CHANGE IN THE DATA CENTER

WHITEPAPER

ABSTRACT

Today's data centers are undergoing significant change, and many IT pros are unsure how to prepare their infrastructures for virtualization and cloud computing. This resource follows the evolution of the data center and explains how companies can maximize the value of their virtual and cloud environments. Explore the role of the network and get answers to frequently asked questions concerning the current state of your peers' facilities, new design requirements, and more.

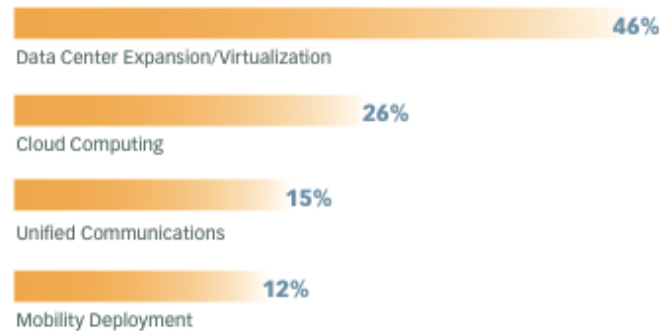
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EVOLUTION OF THE DATA CENTER

Today, many IT departments are consolidating and virtualizing business applications, servers, storage, and even networks in order to reduce costs and complexity while increasing scalability and agility for the business. These changes are evident in a recent poll from IDG, which suggests that 46% of firms with 500 or more employees feel that virtualization initiatives are going to have the biggest impact on organizations' networks. Further, demands are changing as the traditional server-to-client (North/South traffic) is rapidly changing to server-to-server and server-to-storage (East/West traffic). To maximize the value of these new virtual infrastructures, IT departments must deliver resources with more simplicity, security, flexibility, and automation at a lower cost—and the new network must accommodate virtualization and cloud computing in the data center.

Planned data center expansions and virtualization initiatives are expected to have the biggest impact on organizations' networks (among firms with 500+ employees)



Source: Juniper Networks Whitepaper "The New Data Center"

RKON REENGINEERS DATA CENTER FOR DENSITY, SMALLER FOOTPRINT, AND REDUCED COSTS

RKON is one of many companies that had to rethink and reengineer their network and data center architecture in order to drive more business value and productivity. As a managed services and cloud provider, RKON knew that in order to accommodate the growing needs of clients looking to virtualize their environments, they needed to adopt their own virtual network and infrastructure. Their drivers for the project included more density, reduced footprint, and reduced costs. It was also important that the new design was modular, scalable, and easy to duplicate. The ease of being able to scale to size would create agility and cost savings that they could eventually pass on to their clients.

Q&A WITH RKON CTO AND LEAD ARCHITECT ABOUT "NEW" DATA CENTER

Marc Malizia (CTO, RKON Technologies) and Jonathan Weber (Lead Engineer, RKON Technologies) in discussion with Lindsay Ambrose, June 2011.

LINDSAY AMBROSE: What did your legacy Data Center network look like?

JONATHAN WEBER: Right now at our data centers, we use Citrix XenServer for our hypervisor and we have multiple production bonds, a back-up bond, a storage bond, and a management bond. Ethernet-wise, we chewed up 10 ports per host.

LINDSAY AMBROSE: What requirements did you have for your new Data Center Design?

JONATHAN WEBER: We wanted to reduce the network mess; in doing so, we decided we were going to standardize to 10-Gb connectivity. We looked at where the standard was going—all of the network, server, and storage vendors were moving to SFP+ modules, so that is the direction we headed. We wanted something that was stackable, scalable, and a Pod design so once it got bigger, we could easily duplicate.

LINDSAY AMBROSE: What is the value or ROI with your new Data Center Design?

MARC MALIZIA: Density—everything we did was about keeping it simple so we could cut down on cabling (10 1Gb links down to 1 10Gb link), reduce rack space footprint, increase speed, and reduce power: it was all about density. For us in the managed service space, rack space is expensive, so the more server workloads we can fit into a footprint, the more savings we can pass down to customers. What used to take 8U is now taking 2U of rack space, cutting it down by 75 percent.

LINDSAY AMBROSE: Why did you choose Juniper over Cisco?

JONATHAN WEBER: With the Juniper EX4500 series, the density is there; it has 40 SFP+ ports per switch. Cisco simply does not offer something that is stackable similar—the density, scalability just isn't there. We understand that most everyone is familiar with IOS and converting to a new operating system is a challenge. However, Junos runs on the routers, switches, and firewalls. We also decided to stay away from Cisco Nexus series because it doesn't run Cisco IOS and it would create a large switching footprint that we just don't need.

LINDSAY AMBROSE: Do you believe that the traditional data center was designed for virtualization?

JONATHAN WEBER: No, in the past, the only real thought was about power. Today, virtualization allows for the pooling of resources (network, storage, and otherwise), which allows you to distribute the resources East/West—thus, creating higher resource utilization, which leads to a decreased footprint and unnecessary power usage (as with the traditional data center).

LINDSAY AMBROSE: What do you feel are the industry-wide drivers for the new data center?

MARC MALIZIA: It is about simplifying—getting more throughput, with less physical ports. Essentially, the question is how do you reduce your cost per port and how do you reduce your footprint? For example, one of our clients built out a new data center five years ago that was probably 5000 sq. feet. They weren't virtualizing five years ago. So they built this new facility that they were going to grow into. They actually have a smaller footprint now than they had five years ago. So they never grew into what they thought they needed and eventually required less space than when they originally moved in.

LINDSAY AMBROSE: How have drivers for data center evolved as we move away from the more traditional design?

MARC MALIZIA: The biggest constraint that people used to have in their facilities was space and power. Now, when you design a data center or environment, it is about the lowest cost per switch port or how do I reduce my cost per port? Virtualization is definitely helping companies reduce both their cost per port and their footprint.

LINDSAY AMBROSE: How does the new data center design help you better serve your clients?

JONATHAN WEBER: We wanted something that was going to be modular and scalable. The ease of being able to scale to size creates agility for clients, and from a cost perspective, we deliver more value. Our time to deliver has decreased and our overall costs are down—which leads to a more cost-effective and on-demand solution for our clients.

NEXT STEPS FOR YOUR REDESIGNED DATA CENTER

As organizations consider virtualization and all of the potential operational efficiencies they could gain, they need to ask themselves one simple question—Is my data center network ready for virtualization? Failure to evolve the data center network as organizations work on virtualizing servers, desktops, and user profiles could lead to performance issues and bottlenecks that could eventually reduce the operational efficiencies gained with virtualization, decrease performance of applications, and inevitably increase support costs.

As server, storage, and desktop virtualization continue to take off inside the data center, a simpler approach to data center networking—beyond the traditional 3-tier architecture—must evolve as well. Organizations are looking at a new “simplified” architecture design that require a smaller number of devices and interconnects.

Juniper Networks simplifies data center network architectures by collapsing the traditional 3 tier down to 2 or even 1. This simplistic approach to networking helps organizations reduce their total cost of ownership and provides them with the performance, scalability, and agility the new data center is demanding.

5 Questions

Every CIO Should Ask

To modernize the network as part of the “new” data center, CIOs should ask the network team these foundational questions:

1. How do we get traffic across the data center today?
2. How optimized is application traffic?
3. How can we better connect the data center in a way that is efficient and reliable?
4. Are there ways to simplify and automate key network tasks?
5. Is our current vendor properly incentivized to help us evolve our network?

Source: Juniper Networks Whitepaper “The New Data Center”

ABOUT RKON

We specialize in the architecture, delivery, support, and management of Virtualization, Security Infrastructure, and Network Infrastructure. We care about providing our clients with world-class IT services, support, and long-term relationships. We strive to provide superior client satisfaction while offering solutions that secure, scalable, and highly available—on site or in the cloud.

Looking to move your data center to a private cloud? We have enabled many IT departments to refocus on adding value to the business while we supply the on-demand computing platform. Please visit www.rkon.com to learn more about our capabilities.

ABOUT JUNIPER NETWORKS

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at www.juniper.net.