



ALCATEL-LUCENT ENTERPRISE DATA CENTER SWITCHING SOLUTION

Automation for the next-generation data center

A NEW NETWORK PARADIGM

What do the following trends have in common?

- Virtualization
- Real-time applications
- Mobile devices
- Automation

They all contribute to the tremendous pressure on today's existing network infrastructure – a pressure not alleviated by simply throwing more bandwidth at the problem.

What's needed is a new network paradigm: the application fluent network. An application fluent network understands the unique requirements of each application, user, device and conversational context to automatically adapt the network to ensure optimal performance.

Introducing the Alcatel-Lucent Enterprise Data Center Switching Solution – delivering on Alcatel-Lucent's vision of the application fluent network.



The Alcatel-Lucent Enterprise Data Center Switching Solution

Alcatel-Lucent helps enterprises address the challenges facing today's data center network while delivering a high-quality user experience for real-time applications, greater agility in deploying new applications, easy adaptation to existing virtualization infrastructures, seamless integration of public cloud services, and reduced data center costs.

Alcatel-Lucent's breakthrough solution starts with a unique blueprint for application fluent data center switching. This blueprint brings together innovations that together create an extremely scalable, high-performance, resilient and real-time intelligence.

BEST OF INTEROP 2011

The Alcatel-Lucent Enterprise Data Center Switching Solution

won the 2011 Best of Interop award in the data center and storage category presented by InformationWeek Analytics.



"The ever-expanding IT environment found in today's increasingly virtualized data centers is truly in need of forward-thinking concepts like Alcatel-Lucent's new Data Center Switching Solution."

STEVEN HILL, LEAD JUDGE
BEST OF INTEROP 2011

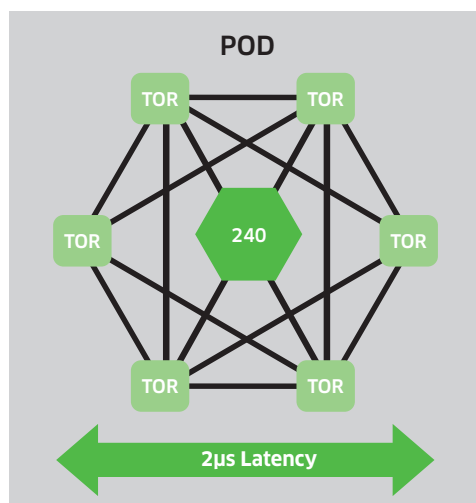


Figure 1: Alcatel-Lucent Pod for advanced data center switching fabrics

APPLICATION FLUENCY

Application fluency enables enterprises to transform and maximize their networks to deliver virtualized services and provide real world scalable solutions. This is achieved with:

- Application intelligence
- Performance-aware zero-touch virtualization mobility
- Converged data and storage networks
- Automation
- Service chaining and orchestration
- Cloud interconnections

With our fabric, applications are managed as services.

Application intelligence enables the network to:

- Fluently understand the unique requirements of each application to enable high-quality application delivery (prioritization, switching, provisioning, quality of service [QoS], security)
- Automatically adapt the network to dynamically optimize delivery and performance, and manage automation of virtual machine movement
- Ease IT efforts to support server virtualization and allow organizations to reap greater virtualization benefits

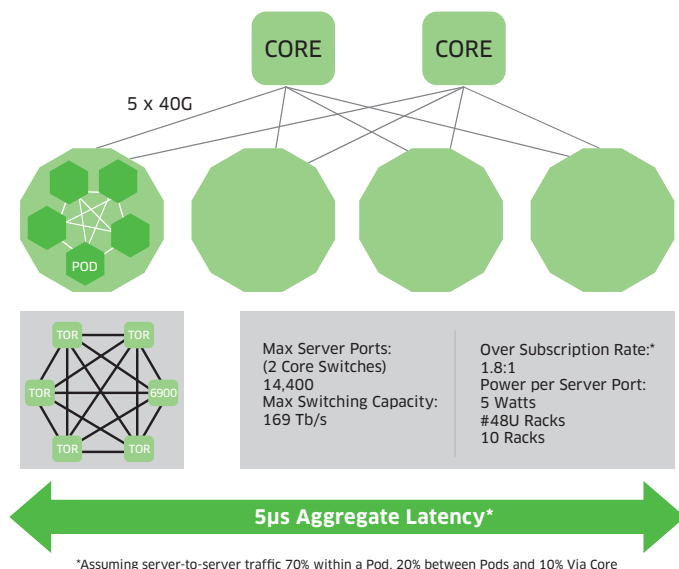


Figure 2: The Alcatel-Lucent Enterprise mesh architecture for data centers

MESH ARCHITECTURE ENSURES HIGH PERFORMANCE

Low latency and high performance for all data is assured through server-to-server connections in a unique, direct-connect mesh architecture that does not rely on a core switch to carry traffic. The mesh is composed of networked “pods” (Figure 1) connected to each other and to switches to bring together more than 14,000 server-facing ports with aggregate end-to-end latency of less than five microseconds (Figure 2). This foundation technology provides a complete fabric with auto-configuration for small data centers that can easily scale to large data centers.

Intelligence is integral to this switching fabric. It enables automatic virtualization mobility, application recognition, automation and provisioning. It also provides ease of connectivity for Ethernet, FCoE and Fibre Channel to increase bandwidth and reduce costs. And it delivers high performance application experiences to all end users thanks to its direct-connect architecture.

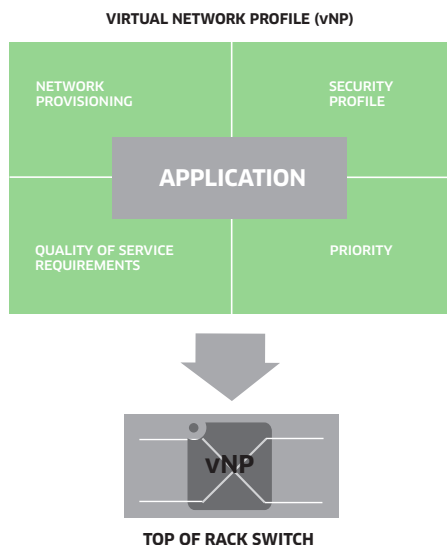


Figure 3: Network analytics enable optimization

PROGRAMMABILITY IMPROVES APPLICATION DELIVERY

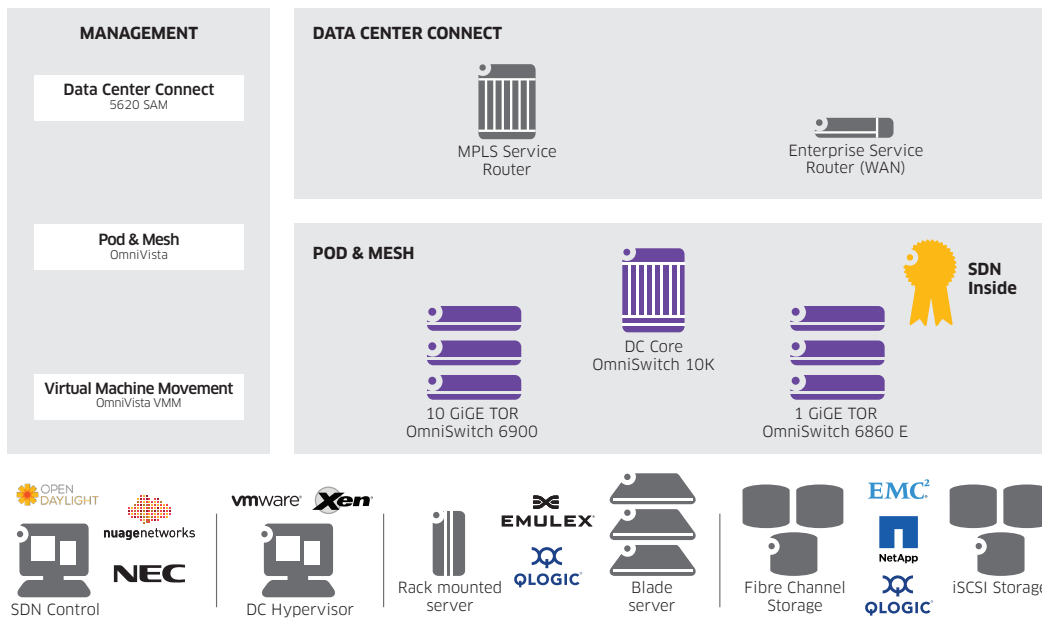
The ability to link application and network control layers enables an orchestrated optimization of application delivery performance and provides increased visibility to the application world. Alcatel Lucent Enterprise plug-ins translate business requirements into fabric policies to take advantage of the full benefits of the coordination capabilities of a Software Defined Networking (SDN) controller.

NETWORK ANALYTICS INFORMS OPTIMIZATION

The ability of the network to recognize, react and fine tune the performance of compute resources, such as virtual machines are simple using Virtual Network Profile (vNP), (Figure 3) built-in application recognition and policy enforcement. To unleash the workload optimization capabilities couple network capabilities with Network Management VM utilization analytics for streamline performance and network efficiency.

SINGLE PLATFORM ENABLES END-TO-END MANAGEMENT

The Alcatel-Lucent OmniVista™ 2500 Network Management System (NMS) works with the full data center solution to automate changes. It is a single, cohesive platform that allows enterprises to monitor network activity from end-to-end, automatically provisioning and managing devices. The OmniVista 2500 NMS provides data centers with the ability to streamline a virtual infrastructure and physical network under one roof, enabling location troubleshooting operations and network provisioning automation for a virtual machine life cycle.



READY FOR CURRENT AND FUTURE DEMANDS

The Alcatel-Lucent Enterprise Data Center Switching Solution lets enterprises meet current needs while preparing for the future with no costly hardware change-outs. With this solution, your enterprise is ready for:

- IEEE 802.1aq Shortest Path Bridging
- Native Fibre Channel Connectivity
- Programmability for SDN Control
- OpenFlow™ support and OpenStack™ Integration

Figure 4. Alcatel-Lucent Enterprise Data Center Switching Solution

A Complete Solution for the Data Center Network

Alcatel-Lucent Enterprise's complete solution for data center networking includes the Pod/Mesh Technology, Programmability, WAN Connect and Management stacks, as well as Analytics as shown in Figure 4. The mesh, includes Alcatel-Lucent's market-leading OmniSwitch™ 10K Modular LAN Chassis, the OmniSwitch 6900 and the OmniSwitch 6860E. It can scale linearly, both in architecture and in pricing model, to connect from under 100 to over 10,000 servers. And it delivers all the new requirements of virtualized workloads:

- **Performance:** Low latency, 10 and 40 GigE multipath connectivity
- **Automation:** The network automatically adjusts as a virtual machine is moved within and between data center sites
- **Scalability:** Pay-as-you-grow business model and direct connect architecture, which enables cost-effective small to very large deployments with no rip and replace requirement

- **Converged Management:** Visibility and performance tools that link application level views with network topology for improved troubleshooting capabilities enabled for SDN with a strong vision enabled by standards-based RESTful Application Programming Interfaces (APIs) for participation in open SDN ecosystems
- **Storage Convergence:** Enables storage model of choice for customers (iSCSI, FCoE, Fibre Channel)

The management stack includes the OmniVista 2500 NMS for full network management and OmniVista 2500 Virtual Machine Manager (VMM) for fabric management.

The Alcatel-Lucent solution also provides IP interconnect of data center sites. The service routers provide MPLS connectivity allowing the seamless extension of Layer 2 domains between data center sites.



Enjoy the Advantages of an Application Fluent Network in the Data Center

DELIVER A HIGH-QUALITY USER EXPERIENCE

Alcatel-Lucent's application fluent fabric provides any-to-any connectivity with low latency, low power consumption and overall switching capacity needed to deliver optimal performance for real-time, mission-critical applications. The pod and mesh technology includes built-in automation for configuration and dynamic adjustment of application traffic flows, simplifying the complexity of the network.

GROW YOUR BUSINESS FASTER AND MORE EFFICIENTLY

The Alcatel-Lucent Enterprise Data Center Switching Solution helps you increase agility and speed when deploying new services and applications. Automation of fabric configuration across your entire data center provides ease of deployment for all data center architectures, including SDN architected data centers. A pay-as-you-grow business model and direct connect architecture

enable enterprises to start with a "right sized" initial deployment and grow as needed. With an application-fluent approach to network virtualization, IT teams enjoy automated virtual machine movement. For larger enterprises, specific corporate departmental data centers can be partitioned to create virtual data centers and reduce complexity. Looking ahead, enterprises of all sizes can achieve seamless co-existence with cloud-based services, thereby simplifying cloud service delivery to corporate networks.

REDUCE DATA CENTER COSTS

Alcatel-Lucent's market-leading, low power consumption delivers lower energy costs to any enterprise. Alcatel-Lucent also helps lower operational costs by treating applications as complete services to simplify data center management. Finally, a virtualized network infrastructure helps reduce equipment and space costs.



Choose Alcatel-Lucent Enterprise for Your Next-Generation Network

With its unique application fluent approach and visionary data center switching blueprint, Alcatel-Lucent Enterprise delivers a complete solution for modernizing the data center network. Alcatel-Lucent Enterprise's Data Center Network Solution lets your enterprise:

- Leverage built-in automation to dynamically adjust treatment of application traffic flow and follow virtual machine movement within or between data center sites
- Prepare for SDN leveraging a strong vision and standards-based approach for participation in open SDN ecosystems
- Prepare for the future with Alcatel-Lucent's innovative data center fabric. The pod and mesh direct-connect architecture delivers low latency, automated configuration, high density and a long term sustainable design. Plus our standards-based approach means no lock-in to a specific vendor

No other vendor offers the depth of experience and expertise Alcatel-Lucent Enterprise has delivering large-scale switching solutions for service provider and data center clouds. Turn to a partner with the vision and innovation to help your organization take its data center network into the future – from network virtualization to SDN.

Turn to Alcatel-Lucent Enterprise

To find out more about how the Alcatel-Lucent Enterprise Data Center Switching Solution can help your enterprise transform its data center network, click [here](#) or contact your Alcatel-Lucent Enterprise account manager.

<http://enterprise.alcatel-lucent.com/>