Product Assessment

Alcatel-Lucent Mesh

Market: Business Technology and Software
Class: Data Center Switching Infrastructure
Report Date: March 21, 2014
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■ Summary

Current Analysis® Product Ratings

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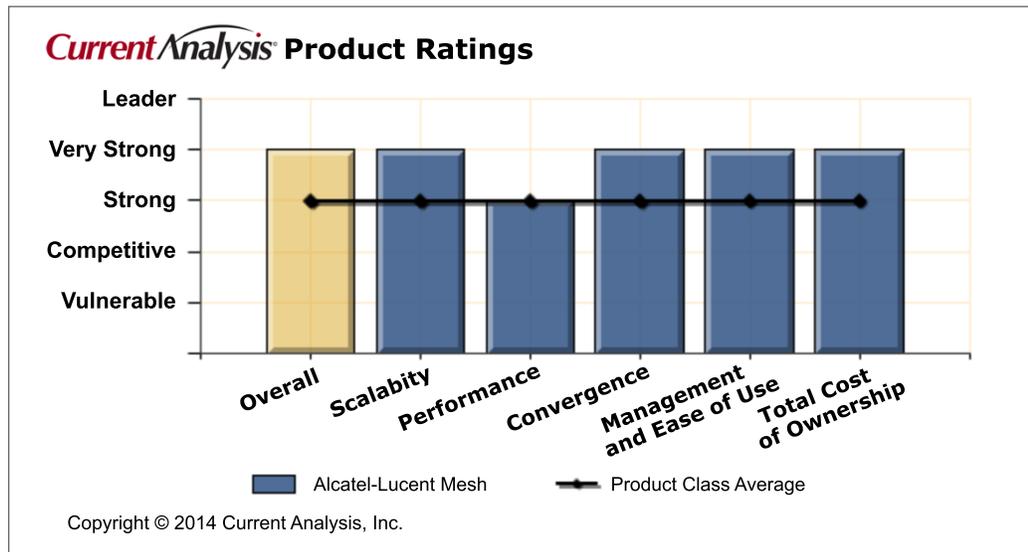
Competitive Strengths

• 'Application Fluent Networking' is ALU-E's centerpiece for LAN-to-data center application networking.

• Integration with Citrix lets ALU-E deliver virtual desktops quickly and reliably.

• ALU-E is improving new training and mentoring, which will help its channel partners sell, implement, and support ALU-E's products and services.

• Alcatel-Lucent's mesh and pod architecture is flexible and robust with plenty of scale.

• Demonstrated SPB interoperability and a RESTful interface are the foundation of Alcatel-Lucent's SDN plans.

Competitive Weaknesses

• The divestiture of Alcatel-Lucent Enterprise will lead to customer uncertainty.

• While ALU-E is still building its channel, the company has limited support partners in certain geographies.

• Alcatel-Lucent has limited brand awareness in North America, which is an inhibitor to growth in the region.

Alcatel-Lucent Mesh *(Continued)*

Current Perspective: Very Strong

Alcatel-Lucent is very strong in the data center with both the scale and market presence to weather any storm. It continues to post gains in revenue and is seeing growth in markets around the globe. However, Alcatel-Lucent is selling an 85% stake in the Enterprise business unit, which includes UC&C and networking, to investment firm China Huaxin, which should close in 2014. Alcatel-Lucent Enterprise (ALU-E) will be incorporated in Europe and its R&D centers will remain where they are. ALU-E intends to retain its branding for the foreseeable future, but the sale will cast doubt on the company's ability to execute on its strategy. Getting out from under Alcatel-Lucent may allow ALU-E to blossom since it can take direct control of its future without being beholden to the larger company.

The 'Application Fluent Network' (AFN) is described by ALU-E as the embodiment of a flexible network that meets the demands of rich media applications and virtualization within the enterprise. Recent announcements from many vendors reinforce the increasing awareness that the market is heading towards an application-aware environment, and here, ALU-E has a head start.

Within the OmniSwitch portfolio, the OmniSwitch OS10K provides the dense chassis switch application, acting as either aggregation or core device, and the OS6900 provides dense, wire-speed 10G top-of-rack connectivity. These, in addition to the OS6850E Gigabit switch offering, provide customers with a variety of high-performance access and interconnect solutions. Architecturally, ALU-E proposes a mesh and pod concept, whereby up to 240 access ports are woven together for a 1:1 performance ratio with sub 2-usec latency, and pods can be interconnected or linked up to an aggregation/core layer, enabling scale from hundreds to up to well over 10,000 access ports with just two core switches. At the core of the AFN concept, as applied to data center switching, is a predefined application behavior profile, which ALU-E dubs 'virtual network profile' (vNP). The vNP is in turn associated with an application and has appointed metrics, QoS configurations, access control policies, and other parameters that dictate network behavior to optimize the environment for a given traffic and security need, whether media, big data, or other.

In theory, this will result in far fewer manual configuration changes, and as data center environments continue to increase in complexity exponentially, many enterprise data center architects are seeking ways to simplify their administration tasks. This technology is also used to respond to changes in the application environment, automatically reconfiguring the network when the virtualization platform moves a virtual machine from one physical location to another within – or even between – data centers, automating what all too often is a manual process for the network administrators. This mesh is in turn managed with the OmniVista platform, enabling a single console to control the infrastructure, which also integrates with leading virtualization solutions (vCenter, Hyper-V, XenServer, and KVM), providing ease of use and network automation for VMs in motion.

■ Strengths and Weaknesses

Strengths

• ALU-E has approached the data center with technology and a message that addresses one of the greatest challenges IT faces in the data center, which is managing the application experience versus the devices and individual elements. This focus is the foundation for the architecture and key to ALU-E's entire offering from data center to campus.

• ALU-E's virtualization partnership with Citrix enables customers to deploy a tightly integrated ALU-E pod and mesh into an existing Citrix solution quickly, or to plan a new project around Citrix technology. This speeds time to deployment and offers customers a strong L2-L7 solution for desktop virtualization, a Citrix strength. As VDI continues to gain traction in the market, this solution's value will only increase and pay dividends for Citrix, ALU-E, and ultimately customers that deploy the joint offering.

• ALU-E's global reach and scale provides customers with reasonable channel and support accessibility, regardless of the country in which they are located. Though strongest in Europe, ALU-E has heavily invested in growing its channel and support network in the Americas and Asia. ALU-E is enhancing its data center channel with new training, on-site

Alcatel-Lucent Mesh *(Continued)*

mentoring, and integration workshops aimed at educating the channel of the company's products and capabilities.

• The pod and mesh architecture proposed by ALU-E is both simple to deploy and highly scalable. It is ALU-E's name for a leaf-spine architecture, and with the throughput and features provided on the OS6900 and OS10K in particular, it scales up to 14,400 access ports with just two core switches. For many data centers, this is a sufficient number of access ports to accommodate growth for the life of the data center. The 40GbE availability demonstrates ALU-E's commitment to delivering high-performance networks for modern data centers.

• Full interoperability with existing infrastructures enables deployment and transition to the mesh/pod architecture without requiring a wholesale replacement, thus preserving investment and easing customers into a full fabric architecture gracefully. ALU-E, Avaya, HP, and Spirent demonstrated shortest path bridging interoperability at Interop 2013, further cementing ALU-E's commitment to standards-based networking.

• The benefits of the vNP are scale and simplicity by assigning a profile that automatically understands the requirements of an application across security and access control, VLAN assignments, quality of service levels, priority of the application relative to other applications, latency, and jitter. Once configured, the vNP can be applied automatically due to shared awareness of the application through integration with the virtualization management console.

Weaknesses

• Alcatel-Lucent has agreed to sell 85% of its stake in the enterprise business to Chinese investment firm China Huaxin for a reported $362 million. While the sale might ultimately be good for ALU-E, the short-term effects will be uncertainty of the company's strategy as well as xenophobic security concerns in the west regarding Chinese-owned infrastructure companies.

• As with most modern, virtualization-enabling network architectures, ALU-E's solution depends on an edge-to-edge data center capable of vNP application and control. In ALU-E installed base accounts, this will not present as much of an issue, as the AFN solution works on many of the OS members; however, in mixed vendor environments, the value would be inhibited or severely limited (though a single pod still offers value, it is less than the whole of the mesh/pod proposal).

• ALU-E has invested significantly in its support and channel networks; however, the number of support partners still pales compared to some competition. These solutions are nearly certain to require some assistance at some point and having rapid access to competent support personnel is critical. After all, the data center is the most sensitive and important element within IT today.

• ALU-E still suffers from brand visibility and awareness in the enterprise beyond its core optical and carrier strengths. Though this is mostly a perception and awareness issue, it does result in a growth inhibitor for ALU-E.

■ Point and Counterpoint

Point: ALU-E's primary goal is to serve telecom vendors and enterprises with telephony and telephony-related applications. Historically, data switching has been a sideline for ALU-E and a simple follow-through sale rather than a serious product line.

Counterpoint: ALU-E carries a broad and diverse product line, with products for service providers as well as the enterprise. ALU-E has spent significant resources on the OmniSwitch line of Ethernet switches and remains committed to providing world-class products in that space with increased investments in sales, marketing, and its channels, helping it grow market share. The upcoming purchase by China Huaxin will help to give ALU-E the greater flexibility and funding needed to re-focus its presence in North America, as well as emerging new markets in Latin America and Africa.

Point: If ALU-E's products are so hot, why is it that they are not popular in the North American market? Is it that ALU-E is a French company and pays more attention to the needs of European and Asian customers?

Alcatel-Lucent Mesh *(Continued)*

Counterpoint: ALU-E has continued to make strides in penetrating and raising awareness in North America. ALU-E is a truly global company with many markets to serve and an important one is North America. In the last 12 months, ALU-E has won dozens of regionally and globally recognized brands and logos, all of which indicate that ALU-E can certainly win the technology side of the business based on merit and value. ALU-E continues to show positive growth in campus and data center networking in nearly all markets and segments. With significant resources invested in a revamped and focused channel program, ALU-E continues to sign on many new partners and thus sees increased funnel activity throughout the region.

Point: ALU-E does not have a software-defined networking strategy and cannot support the programmability requirements needed for private clouds or their dynamic nature.

Counterpoint: ALU-E's mesh and pod architecture is well suited to deliver robust networking supporting dynamic data centers, and the company announced an enterprise SDN strategy in November 2012. Using shortest path bridging, the mesh and pod architecture naturally creates isolated, efficient interconnectivity not only between hosts in the data center, but also out to the campus LAN as well. It also has proven interoperability with other networking vendors. AOS running on the OmniSwitch product line offers a full set of RESTful APIs and CLI scripting for programmability by external systems such as cloud platforms and hypervisor management systems and a committed program of delivering OpenFlow and OpenStack integration. Finally, AFN detects, classifies, and prioritizes applications automatically, reducing operational overhead.

◼ Buying/Selecting Criteria

Scalability: Very Strong

• With delivery of the 40G technology modules and 100G options slated for release, the mesh architecture is now enabling multiple pods to connect at extremely high data rates and provides the scale to address all but the 'hyper' class data center architectures, which are a unique breed.

• With 10GbE, 40GbE, and 100GbE options in the product family, ALU-E has taken care to provide investment protection and scale capacity for the platforms.

• With vNP, enterprise IT administrators possess the ability to save significantly on management cycles by enabling the network to optimize itself, autonomously, based on application auto-discovery and application profiling. As configuration deployment requires less labor cycles, fewer administration hours are spent maintaining the network and therefore the same number of headcount can manage the same network size.

Performance: Strong

• The OS6900 and OS10K both perform at line rate when populated. This simplifies deployment and architectural consideration and offers headroom to grow as the data center needs expand.

• The pod and mesh architecture is the result of an aggregate of 40G links both between OS6900s and the OS10K which results in both a 200G local pod mesh and an interconnect mesh that scales with the solution to over 10,000 ports.

Convergence: Very Strong

• ALU-E supports DCB and FCoE abilities on the OS6900. In addition, the OS10K also possesses support for these convergence standards and ALU-E has demonstrated shortest path bridging interoperability with other vendors, allowing customers to deploy a mixed environment if desired.

• ALU-E added native FC attachment to the OS6900 as promised, with a module offering 12 universal ports that can support 1 and 10G Ethernet as well as 2/4/8G Fibre Channel. In addition, the OS6900 supports NPIV FCoE to FC forwarding, FIP snooping, and FCoE – all underpinned with DCB support for lossless operation.

Alcatel-Lucent Mesh *(Continued)*

• With its flexible queue capability and control, storage applications that employ iSCSI or AoE can be assigned a vNP, which can provide high-priority service levels to the traffic running over any of the OS devices within the data center.

Management and Ease of Use: Very Strong

• 'Application fluency,' the concept of application awareness and network automation, is one that more vendors are embracing, if under different marketing names. In order to address the scale needs sought by carriers and public cloud providers, in addition to the largest enterprises, the only method to manage an environment with tens of thousands of access ports is through some software autonomy.

• ALU-E has introduced plug-n-play features which allow a network administrator to deploy the solution without requiring any configuration. This feature provides the capability to discover and configure LACP, SPB, and MVRP at first time boot-up or at runtime.

• The vNP technology employed by ALU-E provides scale and ease of use, though its greatest benefit may be in the ability to roll out a service level agreement (SLA) policy rapidly, with confidence that all devices are properly configured. In addition, the vNP capability reduces configuration errors by eliminating tedious QoS and policy administration, which at the level provided by ALU-E would have been done in both ACLs and within the QoS control.

• With integrations into all the major virtualization vendors, ALU-E has taken a pragmatic approach and can provide equitable capabilities for customers regardless of their standardized virtualization platform(s). ALU-E has augmented its VitalSuite platform with the new OmniVista 2500 Virtual Machine Manager (VMM). This provides the ability to obtain updates automatically from the virtualization platforms on virtual machine moves and allows the VMM to adjust the vNP in real time based on the real physical port of the virtual machine.

• The RESTful APIs, python library, and CLI scripting make ALU-E's OmniSwitch's fully programmable, supporting third-party control by external management and orchestration platforms. These features are well documented and well suited to dynamic, virtualized data centers. ALU-E has also introduced application fingerprinting, which allows the classification of applications based on REGEX signatures and provides the capability to discover and treat the applications at run time based on well-known signatures beyond traditional L2-L4 classification.

• With the vNP, what would have taken multiple administrators in the past to manage in a large deployment can be accomplished with just one. Additionally, new profiles can be developed and deployed in minutes or hours – versus days or weeks – providing a truly agile environment.

Total Cost of Ownership: Very Strong

• ALU-E has always priced its switching technology aggressively in the market and offered flexible feature licensing to enable customers to deploy the device today and utilize a feature or capability later as business needs dictate.

• Labor savings and OpEx implications with the vNP technology could prove to be significant over time. However, the impact of these savings may be reduced by the fact that few, if any, customers adjust their QoS after initial deployment, instead defining two or four queues and simply assigning applications based to one of these. The other operational benefit of vNP technology is the automatic network reconfiguration when a virtual machine is moved from one hypervisor to another, which is a common integration feature.

• One other hidden cost that may become quite significant as enterprises move to embrace more public cloud applications is the ability to mesh together services versus having a simple VPN or alternative connection. With that in mind; new or additional protocols may influence architectures and service choices to a degree (it is possible to encapsulate nearly everything, but each time one does so it affects performance). Shortest path bridging, one of the evolving alternatives to spanning tree (used to address the multi-link use limitation from which spanning tree suffers), provides good compatibility with many carrier systems and is a good option to implement on many existing systems which support the IS-IS protocol.

• The pod/mesh architecture significantly reduces the footprint (e.g., number of devices, etc.) to support the data center

Alcatel-Lucent Mesh *(Continued)*

networking requirements. TCO models show significant savings over competitor implementations – sometimes up to 70% or more.

• A benefit for carriers and public cloud providers is seamless integration with their existing OAM toolset.

■ Product Metrics

Alcatel-Lucent Mesh

Metrics	
Switch Models	OmniSwitch 10K: up to 64 40GigE ports or 256 ports 10GbE non-blocking, full IPv4, IPv6 support; future 100GigE modules. OmniSwitch 6900: SFP+-based models with 20 or 40 port models with one or two expansion bays (up to 32 or 64 ports wire-speed 10GbE SFP+ respectively) or 10GBaseT in 20- or 40-port models with one or two expansion bays (up to 28 or 56 10GBase-T ports respectively), full IPv4, IPv6 support, and a set of expansion modules available for all base models, including up to a three-port 40GigE module release, an eight-port 10Gbase-T module, up to a 12-port 10GbE SFP+ module, and up to 12-port universal module supporting 1/10GbE together with 2/4/8 Gbps native FC interface; OmniSwitch 6850E: 24 or 48-port 10/100/1000 models with up to 4x10GbE (SFP+) uplinks, full IPv4, and IPv6 support
Fabric Scale with 2 link layers	Pod: Six OS6900s all directly connected (concurrent) to each other resulting in 240 10GigE server ports and in addition six 40GigE links available for interconnecting pods to each other or for connecting to core switches. Multiple pods (240 ports) can be interconnected to form Alcatel-Lucent's mesh for a two-layer environment providing up to 14,400 server ports using two core switches at 1:1.8.
Storage Convergence	FCoE support in OS6900 family; Native FC support with N-port Interface Virtualization (NPIV) gateway functionality, FC-BB5 and FC-BB6 standards compliant, Enhanced Transmission Selection (802.1Qaz), Priority Flow Control (802.1Qbb), Quantized Congestion Notification (802.1Qau)
Failover Mechanisms	OS10K hardware: PSUs, fabric, fans, and management; OS10K software; OS6900 hardware: PSUs and fans
Active Multi-link technology (spanning tree solution)	MC-LAG, SPB, virtual chassis
Management	CLI/web-based management; OmniVista 2500 GUI for network & configuration management; OmniVista 2500 Virtual Machine Management; VitalSuite for multi-vendor performance and SLA monitoring; VitalQIP for IP address management and DNS Services; 5620 Service Aware Manager (SAM) for end-to-end management and monitoring for multi-site DC, cloud, etc. for deployments in conjunction with Alcatel-Lucent's IP service routers and optical networking equipment
Distribution location / Multi-site capabilities	Data center interconnection using Alcatel-Lucent's IP services routers and optical networking equipment; SPB-M interoperability
System / Software Resilience	
"Hot" System Patching	OS10K provides for hitless software upgrades when appropriately configured (2x management/fabric). OS6900 provides hitless software upgrades with staggered reboot when configured in a virtual chassis configuration.
Performance	
Box / Fabric Latency (if stated)	Pod: 240 1:1 10GbE ports, sub 2us latency any point to any point; Mesh: with two core switches 14,400 10GbE access ports, sub 5us aggregate latency any point to any point