Magic Quadrant for the Wired and Wireless LAN Access Infrastructure

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Summary

We evaluate enterprise LAN vendors providing converged access layer connectivity. Vendors are increasingly able to provide and differentiate capabilities that integrate wired and wireless hardware components with network applications.

Market Definition/Description

This document was revised on 2 September 2015. The document you are viewing is the corrected version. For more information, see the Corrections (http://www.gartner.com/technology/about/policies/current_corrections.jsp) page on gartner.com.

This market consists of vendors that supply wired and wireless local-area network hardware and software components that provide device connectivity to the enterprise infrastructure access layer. These components typically include:

Hardware: Wireless access points, wired switches

Software: Network applications including:

Network management

Guest access

Onboarding

Authentication, authorization and accounting (AAA) security

Policy enforcement

Intrusion detection system (IDS)/wireless IDS (WIDS)

Location services

Network performance monitoring (NPM)

Application profiling and analytics

We cover the following types of access layer vendors in this market:

1. Those that provide their own wired and wireless infrastructure connectivity, network applications and professional services.

2. Those that mainly focus on a specific connectivity option such as wired switching or wireless connectivity, often offering one or more vertical markets or deployment solutions that address a unique set of market requirements.

3. Those that use a strategic partner to provide a hardware or software portion of the solution. It is important that these vendors provide differentiating functionality that shows why they collectively provide a better offer to enterprises, rather than being considered separately.

Enterprises continue to tell Gartner during inquiries they prefer to use a common set of security, policy enforcement and management across both their wired and wireless access networks. In a recent Gartner enterprise access layer client survey with 114 responses, 75% of clients prefer to employ a single vendor that handles the entire access layer solution. This unification of wired/WLAN access applications reduces both capital and operational expenses (see "Consolidating LAN and WLAN Tools Simplifies Operations While Saving Time and Money").

To address a variety of implementation scenarios, such as multiple, remote branch offices in addition to large campus environments, clients tell Gartner through inquiries that they want the flexibility to deploy these network applications: (1) on-premises within the enterprise, (2) in a private cloud or (3) in a public cloud to avoid architectural "lock-in" and to provide the ability to change as their needs change.

What Has Changed?

Over the past 12 months, access layer vendors continue to evolve their products, including hardware, software and applications needed to provide a complete solution. In 2014, vendors looked beyond the 1.3Gb capacity of 802.11ac Wave 1 and began planning to deploy 802.11ac Wave 2 radios with new capabilities such as multiuser multiple input/multiple output (MU-MIMO), and, theoretically, more than 6 Gbps of higher performance at 5GHz. However, despite vendor hype, we limited consideration of availability of these products in the enterprise marketplace until late 2015 or early 2016.

Higher-performance radio exposes an architectural issue that arises from the introduction of the new radio technology: Wave 2 access points (APs) and switches connecting to the enterprise infrastructure are typically limited to 1Gb, which creates significant oversubscription for higher speeds (see "Don't Let the New WLAN Standard Break the Bank or Your Wired Network"). Several LAN industry consortia [1] are addressing the need for upstream access point connectivity to the enterprise infrastructure beyond the current 1Gb connection, but currently there is no industry standard.

The need for additional bandwidth was originally attributed to the widespread adoption of bring your own device (BYOD) and videoconferencing and streaming, but now is being required by Internet of Things (IoT) sensors and beacons. When considering vendors, this trend has exposed several important enterprise requirements:

1. The quality of connectivity is paramount (that is, whether it is latency for voice applications or addressing the bursty communication requirements of IoT devices).

2. Security and network management are mandatory. New device usage scenarios that started with guest BYOD requests and have expanded to IoT sensors and controls have exposed weaknesses in both.

3. Access layer cloud management is emerging. Over the past year, vendors have been targeting this solution to organizations with a large number of geographically dispersed, remote or branch offices. This, combined with end users' desire for simplified and turnkey access layer solutions, has led to a 10% increase in cloud-managed access layer inquiries in the past 12 months.

During 2015, several vendors also made or completed acquisitions, including Zebra Technologies' acquisition of Motorola Solutions' Enterprise business and HP's acquisition Aruba Networks. Additionally, Aerohive Networks completed its IPO. We expect market consolidation to continue over the next 12 to18 months, including smaller acquisitions of technology-focused startups that continue to fuel LAN applications, like location-based services, wireless analytics, NPM and sensor solutions that enable independent monitoring of access layer connectivity.

As hardware prices continue to decline, we continue to see fewer client RFPs focus on the speeds and feeds of access layer connectivity (see "Forecast Analysis: Enterprise Network Equipment, Worldwide, 2Q15 Update"). Rather, when evaluating vendors, clients often cite network applications and unified access layer management as key topics of interest.

What's Required in the Enterprise Wired and Wireless Access Layer?

Enterprises are looking for complete solutions that address enterprise wired and wireless connectivity and access layer services that include but are not limited to:

Offer and support 24- and 48-port Power over Ethernet (PoE), chassis or stackable switches with a roadmap for 2.5Gb/5Gb wired connectivity on existing Category 5 enhanced (Cat5e)/Category 6 (Cat 6) cabling to closet switches.

Offer and support IEEE 802.11n and 802.11ac Wave 1, with a planned future offering that supports 802.11ac Wave 2.

The ability to deploy any or all access layer network applications within the enterprise on either vendor-provided or enterprise-selected hardware platforms, or in a private cloud or a public cloud.

Minimally support a captive portal for a guest access application with the ability to provide Web authentication credentials via SMS, email or printout to users for Windows, Mac, iOS and Android clients.

At a minimum, providing device authentication for Windows, Android and iOS devices via Wi-Fi Protected Access 2 (WPA2), as well as addressing Internet of Things device authentication issues.

Ability to detect wired and wireless intrusion.

Policy enforcement that provides credential-based access to applications and portions of the network, such as only the conference room. Policy enforcement will also integrate context-aware variables such as location and device profiling. This is particularly useful for both BYOD scenarios

and "headless" [2] IoT devices, where security is of paramount concern. It must also be able to place guest access clients on a separate virtual LAN (VLAN) with additional controls that limit bandwidth and available content.

Integrated network management for all wired and wireless LAN components, and is vendor-independent for configuration, provisioning and device profiling.

Onboarding services, including device authentication and user authorization services for BYOD programs that support many operating systems and device postures.

Analytic applications that look not only at the network but also the end-user data (to provide better insight to the performance and use of their access layer networks).

Network forensics tools to determine what is happening across the entire access layer in addition to security functionality.
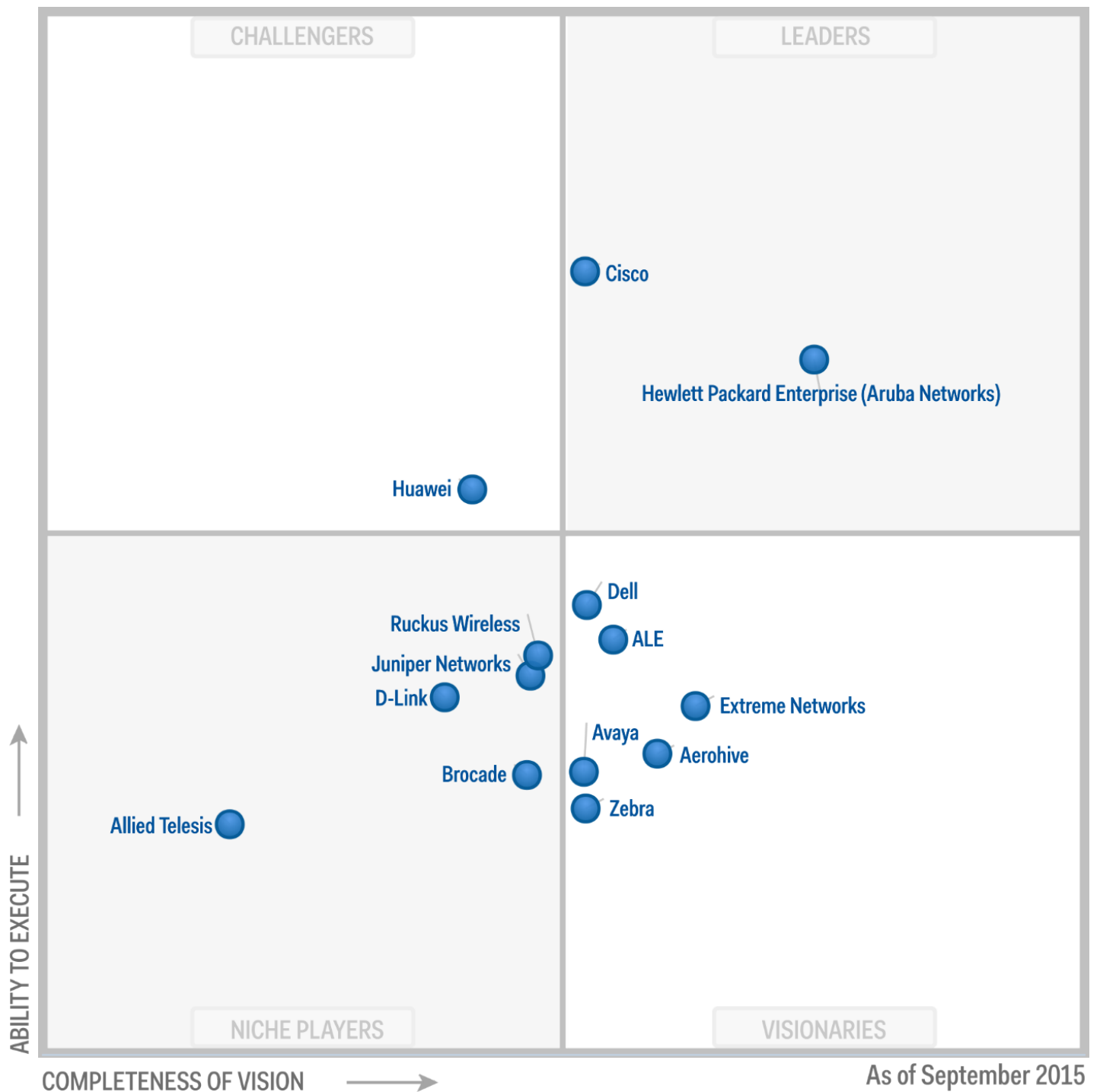
Support for voice and video applications by adding features to detect and resolve latency issues that result in reduced jitter, awareness and monitoring of voice and video quality, and fixed mobile convergence capabilities.

Location-based services, context-oriented services and asset management.

The ability to provide managed services when additional IT resources are needed.

Magic Quadrant

Figure 1. Magic Quadrant for the Wired and Wireless LAN Access Infrastructure

CHALLENGERS · LEADERS · NICHE PLAYERS · VISIONARIES

Cisco

Hewlett Packard Enterprise (Aruba Networks)

Huawei

Dell

ALE

Ruckus Wireless

Juniper Networks

D-Link

Extreme Networks

Avaya

Aerohive

Brocade

Zebra

Allied Telesis

ABILITY TO EXECUTE

COMPLETENESS OF VISION

As of September 2015

Source: Gartner (September 2015)

Vendor Strengths and Cautions

Aerohive

Aerohive focuses primarily on the WLAN component of access connectivity, and was the No. 7 WLAN vendor in 2014 when measured by revenue, growing at double market rates. The vendor sells 100% via the channel, primarily in North America and EMEA. Also, Dell began to resell the Aerohive WLAN solution in 2015. Aerohive provides a controllerless architecture with the full suite of access applications via its HiveManager software, which is available either on-premises or as a cloud-managed service. Clients in North America and EMEA should evaluate Aerohive for their WLAN infrastructure.

STRENGTHS

Based on enterprise deals that Gartner has reviewed, Aerohive is one of the most cost-effective solutions.

Aerohive has a strong installed base in distributed enterprise deployments, education and retail, and, consequently, it has a strong understanding of customer requirements in those environments.

Aerohive customers cite simplicity in deployment and ease of use of the cloud-managed offering as key benefits versus other competitors.

CAUTIONS

Aerohive has a limited wired switching portfolio that represents a very small percentage of its overall revenue.

Aerohive is one of the smaller players in the market, and it has limited visibility and penetration outside its core markets (distributed enterprise/education/retail) and geographies (North America/EMEA).

Aerohive's management component (HiveManager) currently only manages Aerohive equipment. Integration with external components can be achieved via API.

ALE

ALE, marketed under the brand Alcatel-Lucent Enterprise, became majority-owned by China Huaxin in October 2014, emphasizing that it was a debt-free, financially stable, independent business planning to grow both organically and through business acquisitions. The vendor's overall access switch revenue declined by 9.3% in 2014, and revenue for wireless LAN hardware is based on its OEM relationship with Aruba Networks. Early in 2015, ALE reaffirmed its intent to continue the relationship with Aruba, and mapped out continued plans for enhancements to the WLAN elements of its Enterprise Converged Network Solution, including a subscription-model, managed LAN and WLAN service. The vendor continues to derive nearly half of its total revenue from the EMEA region, although its share of overall revenue from the Asia/Pacific region grew by more than 25% in 2014. ALE's primary vertical market targets remain education, hospitality and healthcare. Enterprise customers, as well as global service providers and transportation, utilities, energy and other public-sector organizations, should consider this vendor for both wireless and wired access infrastructure.

STRENGTHS

ALE's application-fluent network strategy provides unified wired and wireless network access and control capabilities, with the OmniVista 2500 Network Management System (NMS) enabling management of both ALE and third-party LAN and WLAN components.

ALE's Intelligent Fabric technology in the core network enables autoconfiguration and autoreconfiguration with adds, moves and changes of applications and devices, and will be extended to the access layer in 2H15.

The vendor provides a telephony solution that can leverage its unified communications/voice over IP telephony products, and integrate with its own WLAN and wired LAN access products and its unified management platform.

CAUTIONS

By reaffirming its OEM relationship with Aruba, ALE relies on this partnership for continued enhancements in WLAN technology. It does not set the direction or shape its WLAN product offering.

ALE's ability to provide management services as SaaS or a public-cloud-based product remains to be proven, with its "pay per use" Network Subscription Service available via enhancements to the OmniVista 2500 Network Management System not scheduled for launch until 3Q15, and initially only in EMEA and Asia/Pacific.

ALE's strategic roadmap for growth under its new ownership was not detailed in great depth in 1H15. Thus, clients are limited in their ability to determine how well it aligns with their long-term access layer network requirements.

Allied Telesis

New to the Magic Quadrant this year, Allied Telesis provides campus switching and a wireless solution. At the end of 2014, it also acquired the Extricom, a small Israeli WLAN vendor, which it plans to integrate into its wireless product line. Allied Telesis sells direct to end users, but 75% of its sales are completed through the channel. While Allied Telesis is a global vendor, almost 50% of its revenue is from the Asia/Pacific region. Allied Telesis should be considered for wired and wireless opportunities in Asia/Pacific, EMEA and North America in healthcare and public service, where clients have basic connectivity requirements and are using third-party applications for guest access, onboarding or policy enforcement.

STRENGTHS

Allied Telesis is a cost-effective solution with basic functionality that focuses on the access layer total cost of ownership.

Allied Telesis hardware components are tightly coupled. All products operate via the same operating system (AlliedwarePlus), have Allied Telesis Management Framework (AMF) embedded to provide a level of network automation, and use AlliedView to provide provisioning and management.

Net.Monitor is an Allied Telesis-managed service offering that provides a suite of private cloud-based active monitoring, management and professional services to maximize availability and uptime.

CAUTIONS

While Allied Telesis has recently made a WLAN acquisition with Extricom, the vendor has a limited WLAN portfolio that represents a very small percentage its overall revenue.

Allied Telesis has network management, and a guest access solution that provides a captive portal with the ability to define roles. The vendor does not have more advanced applications that address client onboarding or access layer policy enforcement.

While Gartner sees Allied Telesis on the shortlist for wired or wireless inquiries regarding opportunities within the enterprise, clients should validate the ability of the vendor to meet their requirements as well as its local support capabilities.

Avaya

Avaya provides a comprehensive access layer network offering with multivendor network management, access control, and automated onboarding and network configuration. Avaya continues to enhance the capabilities of its Unified Access solution for management, policy enforcement, guest management, and security across single or multivendor wired and wireless access networks. The company's fabric architecture underlying Unified Access extends Avaya's automation features from the core network to the network edge. This enables automated network provisioning at headquarters and remote or branch offices for wireless APs, smartphones, IP desk phones and Internet of Things hardware, such as surveillance cameras and printers. Avaya's focus remains primarily on customers in North America and EMEA, which together account for about 87% of its revenue. Priority vertical markets include education, hospitality and healthcare, although Avaya's extensive unified communications presence supports a broad customer base. Enterprises in Avaya's target markets should include the vendor for consideration in any access layer RFP.

STRENGTHS

Avaya's marketing focus on cost control via automation that enables zero-touch provisioning of users, devices and services reflects an understanding of the financial pressures facing enterprise IT customers.

Avaya updated its 9100 Series wireless APs with software programmability enabling multiple radios to operate at 5GHz, while others run in dual-band 2.4GHz/5GHz mode, where useful, for maximizing available channels.

Avaya Identity Engines' centralized policy management portfolio now integrates with mobile device management (MDM) systems, so the vendor's Ignition Server for policy management can map for itself any attributes a business creates in its MDM solution. These include username; physical location; the wired authenticator a user is accessing the network through; time of day or week; device OS; and individual attributes, such as whether a device has been jailbroken.

CAUTIONS

Access layer equipment, software and applications account for only about 6% of Avaya's total annual revenue, and the segment grew at a slower rate than the overall enterprise network equipment market in 2014 — factors enterprises must consider in assessing the vendor for long-term strategic investments.

Avaya's planned cloud-based management capabilities for WLAN remained on its roadmap in 1H15, but are not yet commercially available, limiting its appeal to customers that prefer cloud to on-premises management platforms.

Avaya's managed services portfolio includes turnkey installation, deployment and management of a WLAN, but the service is not yet available to customers for the wired access network.

Brocade

Brocade addresses access layer requirements primarily from a wired switching perspective with a full portfolio of fixed form factor and modular access switches delivered via its HyperEdge Architecture. Brocade does not offer a WLAN solution, but maintains alliances with several partners including Aruba (now a division of HPE), Aerohive and Ruckus Wireless. Brocade's access layer

solutions are deployed in more than 5,000 customer environments, and its "distributed chassis" technology can reduce switching layers and simplify overall management of the infrastructure. Over the past 12 months, Brocade launched several new aggregation and edge switches, incorporated software-defined networking functionality into its switching portfolio, and integrated its switches with its partners' management and policy software. Brocade should be considered for all wired switching opportunities in midsize and large enterprises.

STRENGTHS

Brocade's stacking and distributed chassis capabilities simplify network operations via reducing the number of management touchpoints.

Brocade's campus switches are appealing to organizations looking for long switching life cycles, as its new ICX switches provide a high degree of performance, scalability, feature capability and investment protection.

Brocade has and will continue to integrate its wired switches with WLAN partners so that policy and management of access infrastructure can be achieved from a single console.

CAUTIONS

Without its own WLAN portfolio, Brocade is reliant on multiple technology partners and these relationships may not be long-standing. Similarly, the vendor may not be able to respond as quickly to customer requirements for unified access, when compared to competitors that maintain their own WLAN products.

Despite a deep and well-thought-out switching architecture, Brocade is not a top 10 player when measured by 2014 port shipments.

Based on Gartner inquiries, some Brocade end-to-end solutions have not been as aggressively priced compared to other players in the market. However, Brocade's ICX campus switch portfolio is priced competitively.

Cisco

Cisco is the No. 1 vendor in both access wired switching and WLAN when measured by 2014 revenue, and it appears on nearly all client shortlists. The vendor has two primary access layer solutions including Cisco Catalyst/Aironet and Cisco Meraki Cloud Managed. Cisco's Catalyst/Aironet solution provides on-premises functionality including a deep wired switching portfolio via its Catalyst line of fixed-format and modular switches, controller-based Aironet access points, Identity Services Engine (ISE) for policy-based access, and Prime for management functionality. The Merkai solution offers a separate cloud-managed access point and switching product line. Cisco continues to invest aggressively in its access layer, and, over the past year, released new hardware and software across its entire Meraki and Catalyst/Aironet portfolio, including new switches and access points. In concert with client RFP inquiries, we have observed over the past year that Cisco is increasingly leading with the Meraki portfolio for new opportunities and upgrades to existing installations versus its On-Premises solutions. Thus, the Meraki portfolio is growing much faster than traditional Cisco WLAN. Clients should consider Cisco globally for all enterprise access layer opportunities.

STRENGTHS

Gartner clients provide very positive feedback regarding Cisco's cloud-managed Meraki solution, in terms of ease of use and price.

Cisco was early to market in shipping its proprietary multigigabit 2.5 and 5 Gbps-capable wired Catalyst Ethernet switches, which can protect existing Enhanced Category 5 (Cat5e) cabling investments.

Cisco Connected Mobile Experiences (CMX) works with Meraki and Catalyst/Aironet offerings, and provides location services and analytics.

CAUTIONS

Cisco has two access layer connectivity product lines that are developed by separate development teams, with inconsistent user interfaces and different functionality for security, guest, network management and policy enforcement.

Cisco's cloud-managed (Meraki) WLAN access points cannot be migrated to Aironet WLAN deployments, unlike competitors' solutions. This limits customers' flexibility to scale and change their deployments without incurring additional costs.

Since the Cisco and Meraki architectures are different, enterprises need to be aware of which solution is being deployed and its local support.

Dell

Dell is a global solution vendor that provides a completely unified access layer portfolio and continues to grow its wired switching revenue faster than the overall market. In 2Q15, the vendor entered into a partnership with Aerohive to resell its WLAN into small or midsize enterprise deployments. Going forward, Dell will focus sales of its WLAN hardware from OEM Aruba (which Dell's switching competitor HPE acquired in 2Q15) on deployments for large customers, generally those with 5,000 or more employees. Businesses should consider Dell for all access layer opportunities, especially those for small or midsize businesses (SMBs) or midmarket enterprises.

STRENGTHS

Dell updated its campus switching portfolio with X-Series Web-managed switches aimed at SMBs with 1,000 or fewer employees. The SMB-focused portfolio also added an N-Series fixed form factor switch intended for smaller businesses, and it will integrate Aerohive's HiveManager access solution to manage both wired switches and wireless APs.

Dell's strategy to market unified access solutions "purpose-built" for SMBs targets a segment that is not the focus of the larger global access layer vendors.

In addition to its switches and wireless equipment, Dell's managed network services support wired and wireless hardware from a number of major vendors, including Cisco, Brocade, Juniper, Aruba and Check Point.

CAUTIONS

Since Dell does not build the parts of the solution and has engaged strategic partners for a complete solution, the client may go directly to the partner until Dell develops differentiated value with the combined product offer created with its partners.

Dell's decision to use Aerohive's HiveManager for SMB customers instead of its previously announced Networking Central Cloud SaaS-based management solution could present a confusing proposition to prospective users.

Gartner finds through inquiries that Dell continues to focus on the North America and EMEA markets. Customers outside these geographies should confirm Dell can provide sufficient ongoing local support.

D-Link

D-Link is a competitive provider of wired and wireless solutions for the unified access layer. The company's primary revenue generator remains its wired switch portfolio, which accounted for 71% of the business, primarily in markets outside of North America. D-Link focuses its messaging on ease of management, scalability and affordability, with education, retail and hospitality for both large enterprises and SMBs as primary targets. Clients should engage D-Link to provide wired and wireless networking capabilities for SMBs, including branch or remote office deployments.

STRENGTHS

D-Link offers a broad hardware portfolio of wired and WLAN components, including wireless stand-alone software-managed APs, targeted at uses such as medical device carts, where the AP can aggregate signals from multiple pieces of equipment for transmission to the network.

D-Link remains a low-price leader for both wired switch and wireless network hardware, with Gartner seeing list prices for some of its unified access hardware that are, in some cases, lower than the discounted prices from other vendors for equipment with equivalent functionality.

The vendor's Smart Switch portfolio includes the Auto Surveillance VLAN utility enabling remote discovery, setup and video transmission of IP surveillance cameras through a single wired switch, cutting costs versus maintaining dedicated video surveillance network hardware.

CAUTIONS

Although the D-View 7 on-premises platform supports monitoring and management of equipment from other vendors using standard industry Management Information Bases (MIBs), D-Link's new Central WiFiManager software controller (enabling management of up to 500 remote APs) covers only the vendor's hardware.

D-Link's differentiation as a provider of its own end-to-end complementary wired and wireless solutions is being eroded as rivals merge or form new strategic partnerships that more closely integrate their wired and wireless access layer capabilities.

D-Link's SaaS-based CloudCommand management solution, provided by partner PowerCloud Systems, as of 1H15 still did not cover wired switches or D-Link's growing array of 802.11ac access points, limiting its appeal to the targeted SMB market.

Extreme Networks

Extreme Networks is a global vendor that has a broad portfolio of wired and wireless products that can meet a wide range of needs from enterprises, SMBs and managed service providers. It has a strong presence in North America and EMEA, where over 80% of its total revenue is delivered. Within these regions the revenue is delivered directly (12%) and through the indirect channel (88%). Extreme

continues to invest in enterprises with heterogeneous stacking for switching, and with semiautonomous access points that operate in controller and controllerless modes that allow for reduced costs in smaller environments. Clients should consider Extreme for "greenfield" access layer networking opportunities, as well as when refreshing existing installations in North and South America and EMEA.

STRENGTHS

Extreme's NetSight is a single console that provides multivendor, centralized management — including management of the full wired and wireless portfolio — that can be deployed on-premises or virtually in a public or private cloud environment.

The ability to report mean opinion scores (MOSs) for voice applications means Extreme is one of the few vendors that can fully optimize the access layer for any enterprise considering an "all-wireless office" decision.

Extreme's Purview analytics engine software provides insight into who is on the network, what applications they are accessing, where they are located and what device they are on.

CAUTIONS

Extreme has increased marketing efforts with its "simple, fast and smart" message over the past 12 months. While there has been an increase in client inquiries, it has low brand awareness among Gartner clients (versus leading competitors), and, consequently, does not show up as often on client shortlists outside of its target markets.

While the vendor continues to expand its channel organization, enterprises should work with resellers to ensure that Extreme can provide the level of support in their specific geographies or markets.

Based on deals that Gartner reviews, Extreme's solutions are not as aggressively priced compared to other players in the market.

Hewlett Packard Enterprise (Aruba Networks)

In 2015, Hewlett Packard Enterprise (HPE) acquired Aruba Networks. The combination of HPE's wired switching line with Aruba's WLAN and mobility products creates a strong access solution. When measured by 2014 revenue, this deal combines the No. 2 campus switching vendor with the No. 2 WLAN vendor. However, as with any large acquisition, execution within the first 12 months is critical to success, and HPE (Aruba Networks) is faced with the daunting task of integrating and rationalizing multiple hardware, software and management product lines, and merging corporate cultures. We anticipate that the new division will continue to leverage the HPE internal switching line, but will promote Aruba Network's WLAN portfolio and ClearPass to be the flagship WLAN and policy management software, while Aruba's AirWave and HPE's Intelligent Management Center (IMC) management applications will be merged. Clients globally should consider HPE (Aruba Networks) for all wired/WLAN access layer opportunities.

STRENGTHS

Gartner clients report a high degree of satisfaction with Aruba's ClearPass, which provides guest access, device profiling, posture assessment, onboarding and more.

Aruba's FlexCampus switching provides a broad range of fixed-form and modular switches, and is aggressively priced with a lifetime warranty in deals that Gartner has reviewed.

Aruba's management and service applications (ClearPass, IMC, Meridian and AirWave) support non-HP devices, which simplifies orchestration within multivendor environments.

CAUTIONS

HPE has yet to reveal a committed roadmap that includes postintegration efforts for the combined Aruba Networks/HPE access layer portfolio. Organizations must review the updated roadmap to ensure it aligns with their requirements.

Due to the acquisition, we anticipate continued changes in Aruba's existing partner relationships. Organizations acquiring Aruba Networks solutions via OEM partners (Dell, ALE, Brocade or Juniper), should consider sourcing from HPE (Aruba Networks) directly.

Customers that have recently purchased Aruba Networks' wired switches or legacy HPE wireless access points should request detailed support and migration plans.

Huawei

Huawei's Enterprise Business Group (EBG) is a global solution provider that has a strong presence in China, where 68% of its access layer revenue was deployed; but it is continuing to build its presence in EMEA and Asia/Pacific. Huawei has a maturing reseller channel where 97% of its revenue is delivered, and EBG targets education, financial, energy, transportation and the public sector/government verticals.

Huawei's Agile Network Solutions offers the vendor's vision of end-to-end campus networking, and continues to extend the functionality and capabilities to meet new and expanding enterprise requirements. We traditionally see Huawei EBG with a larger presence in the data center or core of large enterprises rather than the access layer. Clients should consider Huawei for enterprise access layer opportunities where it has a geographical presence, especially China.

STRENGTHS

Huawei's eSight management and network applications support non-Huawei devices, including from HP and Cisco, which simplifies orchestration within multivendor environments.

Huawei has a strong foundation in switching, which provides a broad range of fixed form and modular switches, as well as a wireless offering. Huawei expanded its network application support beyond guest access and onboarding, and now provides location-aware capabilities and analytics. eSight supports fine-grained SLA management based on Huawei's Packet Conversion Algorithm for Internet (iPCA) and can analyze network traffic.

Huawei provides a cloud-based centralized management solution that deploys its eSight management application in a multitenant cloud environment.

CAUTIONS

Huawei continues to grow wired and wireless revenue with technically capable solutions; however, even with 6,000 partners, limited marketing communications outside of China impede enterprise awareness in its target markets.

Clients looking to implement voice solutions need to work with Huawei to understand what tools are available beyond normal quality of service (QoS) statics to assure performance.

Only 28% of Huawei's revenue is derived from outside of Asia/Pacific. Organizations should request references for implementation and service of applicable Huawei solutions from outside of Asia/Pacific.

Juniper Networks

Juniper Networks provides access networking via its EX Series wired switching portfolio, but it has ceased development of its WLAN portfolio beyond 802.11n. For new WLAN needs, Juniper leverages a partner framework that currently includes Aruba and Ruckus. In 2014, Juniper was the No. 4 wired switching vendor when measured by revenue, and it offers a deep and well-thought-out campus switching architecture. Over the past 12 months, Juniper has enhanced its EX9200 core switching platform with new hardware modules and released the new EX4600 high-density campus switch, which can also serve as a core in smaller environments. Juniper should be considered for wired switching opportunities in midsize and large enterprises.

STRENGTHS

Juniper has a superior reputation for high-quality products and technical support among customers in its core verticals of financial services and the technology sector, which is reiterated in research surveys.

Juniper aggressively prices its campus switches in competitive scenarios.

Juniper's portfolio is standards-based and includes several options for automation, including stacking, OpenFlow and Python scripting.

CAUTIONS

Juniper's long-term commitment to support mainstream and midmarket enterprise campus network environments is a concern due to confused messaging and a shift from its own WLAN product family to a partner-focused wireless strategy based on its Open Convergence Framework.

Participation in Juniper's Open Convergence Framework can be short-lived if the partner moves in a different direction. While this approach allows Juniper customers to take advantage of technology shifts provided by new partners, it also introduces migration issues and potential long-term support concerns for some solutions.

The level of integration between Juniper and its Open Convergence Framework partners may impact customers' ability to implement a unified access layer with a single policy, security and management interface. Organizations need to ensure that any proposed solution meets their business requirements.

Ruckus Wireless

Ruckus Wireless is a global vendor that has renewed its focus on the enterprise network, resulting in 22% year-over-year growth in its enterprise business. The vendor sells over 96% via the channel, with strong revenue across all geographies. Ruckus was one of the first vendors to announce and ship 802.11ac Wave 2 access points. Also, Ruckus announced a relationship with Juniper to expand its ability to provide an end-to-end wired and wireless solution. Ruckus provides a controller-based

architecture that can be deployed virtually with the full suite of SmartFlex applications, and which can be delivered either on-premises or as a cloud-managed service. Clients should consider Ruckus for WLAN opportunities in all geographies in hospitality, government, education, retail and manufacturing markets.

STRENGTHS

Ruckus continues to invest in flexible deployment options. Its virtualized enterprise architecture allows on-premises deployment capability, as well as public/private cloud services.

Ruckus has expanded its network application support beyond guest access and onboarding, and now provides location-aware capabilities (Smart Positioning Technology [SPoT]) and analytics (SmartCell Insight [SCI]), as well as in the radio-communication-specific with ChannelFly, SmartCast and SmartSec to optimize the wireless experience.

Ruckus is expanding its footprint in managed services through its public cloud offering, which will be managed by Ruckus but offered through its partner channel.

CAUTIONS

Ruckus is WLAN-focused and does not have a wired switching portfolio. While it has formed a partnership with Juniper, competing vendors may be used for switching to provide a complete access layer solution.

Ruckus has deeper penetration in its core verticals (education/hospitality/manufacturing); however, Gartner does not often see it on the shortlist for enterprises deployments.

The vendor's management component (FlexMaster) currently only manages Ruckus equipment, unlike many top competitors. Integration with external components can be achieved via API.

Zebra

Zebra Technologies is a global leader in WLAN within the in-store retail, hospitality, transportation, logistics and manufacturing verticals. Zebra has integrated the WLAN portfolio of the former Motorola Solutions. In its target vertical markets, it emphasizes solutions such as its T5 System power over VDSL platform, which enables hotels to deploy 802.11n/ac backhaul from guest rooms over their existing telephone wiring, and its MPact location services platform, which supports both Wi-Fi and Bluetooth low-energy beacons. Zebra should be on the shortlist for any wireless LAN opportunities in in-store retail, manufacturing and other verticals that have data collection or location requirements.

STRENGTHS

WiNG 5 Enterprise platform is a highly scalable WLAN offering, with its NSight analytics that provides predictive management.

Clients implementing IoT solutions into their operations should consider Zebra's Zatar solution, a cloud-based application-enablement platform that allows enterprises to create applications.

SMB clients should consider Zebra's WiNG Express, which enables one wireless AP to serve as a virtual controller for up to 25 other APs, thereby reducing costs for small deployments compared with controller-based WLAN architectures.

CAUTIONS

Zebra Technologies is visible in its core verticals; however, Gartner does not often see Zebra on the shortlist for enterprises deployments.

Zebra's WLAN OEM relationships with Extreme Networks and Brocade were terminated, reflecting strategic corporate changes at those partners and resulting in slower-than-market overall growth during 2014 for Zebra.

With 67% of Zebra's revenue generated in North America, enterprises in other regions need to ensure that their selected channel partners can make competitive proposals and effectively design, implement and support access network solutions based on Zebra products.

Vendors Added and Dropped

We review and adjust our inclusion criteria for Magic Quadrants and MarketScopes as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant or MarketScope may change over time. A vendor's appearance in a Magic Quadrant or MarketScope one year and not the next does not necessarily indicate that we have changed our opinion of that vendor. It may be a reflection of a change in the market and, therefore, changed evaluation criteria, or of a change of focus by that vendor.

Added

The following vendors were added to this year's Magic Quadrant:

Allied Telesis

Brocade

Ruckus

Zebra (acquired Motorola Solutions)

Dropped

The following vendors were part of last year's report, but did not meet the inclusion criteria:

Xirrus is a broad-range provider of unified access solutions that can be deployed with cloud-based or on-premises management options. Xirrus sells through global direct and indirect channels in education, healthcare, retail and hospitality. The vendor has a strong presence in public venue connectivity such as stadiums and highly dense user environments.

Adtran has a strong presence in the service provider market and sells its enterprise offering through distribution partners. Adtran has a complete end-to-end access layer solution represented by its vWLAN and NetVanta products in its Internetworking portfolio, but has limited revenue in the enterprise.

HP Networking and Aruba Networks entries have been combined due the acquisition of Aruba Networks by HPE.

Other Vendors

There are several additional vendors that garner interest from Gartner clients and/or that could impact this market over time. These vendors do not currently meet our inclusion criteria, but can address enterprise access layer connectivity in certain usage scenarios. In some cases, these vendors sell to customers outside the traditional IT organization. Specific players we track include:

Netgear

Ubiquiti Networks

ZTE

Inclusion and Exclusion Criteria

The inclusion criteria in the 2015 Magic Quadrant have changed from the previous versions of this report. As we continue to evaluate the market, instead of separating out wired campus switches and enterprise wireless revenue as distinct criteria, they are combined and equally weighted, as the revenue is reported to Gartner by vendors.

The inclusion criteria that have been used to determine which vendors will be covered in this research include:

Vendors in the Magic Quadrant must be able to demonstrate a clear understanding of enterprise access layer networking requirements.

Vendors must be one of the top 17 vendors during 2014 of combined revenue derived from enterprise WLAN, which includes equipment and applications, and campus Ethernet switching as reported in Gartner's "Market Share: Enterprise Network Equipment by Market Segment, Worldwide, 1Q15."

All hardware and software components must be available on the vendor's published price list. All access layer product revenue must be generated from vendor-manufactured or OEM components.

Product revenue must be installed in enterprise office environments, which may also include in-store retail, healthcare and education environments. Product revenue may not include convention centers, hotels or cellular offloading for outdoor environments. It will not include public venues, such as stadiums or municipal installation or transportation hubs such as train or bus stations.

Vendors must provide factual details on how they meet these criteria.

Evaluation Criteria

Ability to Execute

We continue to adjust the weightings and criteria for this Magic Quadrant as buyers' requirements and market forces shift what is important for vendors to provide.

Gartner evaluates technology providers on the quality and efficacy of the processes, systems, methods and procedures that enable IT provider performance to be competitive, efficient and effective, and to have a positive effect on revenue, retention and reputation. Technology providers are ultimately judged on their ability and success in capitalizing on their vision.

Product or Service: We evaluate access layer infrastructure products and services consisting of switches, access points and related components, such as external antenna and outdoor enclosures needed for the end-to-end solutions in various vertical markets. We also look at network services, such as management, monitoring, guest access, policy enforcement and security applications. We consider product and architectural migration strategies from legacy implementations, whether from an incumbent vendor or a new solution provider. We also look at maintenance and deployment service capabilities.

Overall Viability: This includes an assessment of the vendor's overall financial health, and the financial and practical success of the business. We also evaluate whether the vendor continues to invest in the access-layer-related business, including technology and product development, as well as solution delivery to the market, including sales channels, marketing communication and service delivery.

Sales Execution/Pricing: This involves the vendor's capabilities in presales activities and the structure that supports them. This criterion includes deal management, pricing and negotiation, presales support (including communication of differentiating functionality), and the overall effectiveness of the sales channel, both direct and indirect.

Marketing Responsiveness and Track Record: This includes the quality and effectiveness of the vendor's marketing messages in communicating to the market the advantages and differentiating capabilities of its product lines, company and supporting partners/services. This evaluation also includes the history of the vendor's marketing messages and its ability to react to changes in market requirements in its target markets.

Marketing Execution: This criterion focuses on how the vendor is perceived in the market, and how well its marketing programs are recognized. For access layer infrastructure, the evaluation focused on how well the vendor was able to influence the market around key messages and attributes. An additional indicator for this criterion is how often Gartner clients consider a vendor as a possible supplier in a shortlist evaluation.

Customer Experience: We assess how customers and partners view the vendor. This evaluation includes significant input from Gartner clients in the form of inquiries, face-to-face meetings and written responses about the vendors. A key component in this category is the vendor's ability to provide strong presales and postsales support, especially aligned with vertical requirements.

Table 1. Ability to Execute Evaluation Criteria

Evaluation Criteria	Weighting
Product or Service	High
Overall Viability	Medium
Sales Execution/Pricing	Medium

Market Responsiveness/Record	Medium
Marketing Execution	Medium
Customer Experience	High
Operations	Not Rated

Source: Gartner (September 2015)

Completeness of Vision

Gartner evaluates technology providers on their ability to convincingly articulate logical statements about current and future market directions, innovation, customer needs, and competitive forces. Vendors are ultimately rated on their understanding of how to exploit market forces to create opportunities for themselves.

Marketing Understanding: This criterion includes an assessment of whether the vendor's marketing strategy articulates a clear, understandable message that answers the market requirements for technologies and services. We also look at whether the vendor's message and supporting products lead the access layer market requirements or merely fulfill them.

Market Strategy: We evaluate the ability of the vendor to look into the future and drive/influence the direction of the market through product roadmaps and offerings. We also look at messaging and marketing campaigns and their ability to communicate differentiating functionality and value proposition. Are the issues that are being communicated and addressed meeting the trends in the market and the needs of end users? Are vendors focusing on building their core competencies or are they investing in random technologies?

Offering (Product) Strategy: For this criterion, we look at whether the current and future planned product line meets the needs of buyers now, and how it will do so in the future. We evaluate whether the vendor is simply building products that the buyer is asking for, or if it is anticipating the issues that buyers will face and allocating resources to address them.

Vertical/Industry Strategy: We evaluate whether the vendor's strategy, direct resources, skills and offerings meet the needs of market segments, including vertical industries. In this market, can the vendor differentiate itself with solutions that are specifically developed for the unique requirements of many verticals, such as healthcare, logistics, manufacturing, retail, hospitality, etc.?

Innovation: This criterion assesses what the vendor has done to address the future requirements of access layer infrastructure, including the need for tighter integration with wired networking products, voice, video and application support? Has the vendor successfully differentiated the current and future product lines, to better address customer requirements, both now and two to five years out?

Geographic Strategy: This criterion is an evaluation of whether the vendor meets the needs of global enterprises for products and support.

Table 2. Completeness of Vision Evaluation Criteria

Evaluation Criteria	Weighting
Market Understanding	Medium
Marketing Strategy	Medium
Sales Strategy	Not Rated
Offering (Product) Strategy	High
Business Model	Not Rated
Vertical/Industry Strategy	Medium
Innovation	High
Geographic Strategy	Low

Quadrant Descriptions

Leaders

A vendor in the Leaders quadrant will have demonstrated an ability to fulfill a broad variety of customer requirements through the breadth of its access layer product family. Leaders will have the ability to shape the market and provide complete and differentiating access layer applications, as well as global service and support. Leaders should have demonstrated the ability to shape the market, maintain strong relationships with their channels and customers, and have no obvious gaps in their portfolios.

Challengers

A vendor in the Challengers quadrant will have demonstrated sustained execution in the marketplace, and will have clear and long-term viability in the market, but may not have a complete access layer product portfolio for either products or network applications. Additionally, Challengers may not have shown the ability to shape and transform the market with differentiating functionality.

Visionaries

A vendor in the Visionaries quadrant demonstrates an ability to increase features in its offering to provide a unique and differentiated approach to the market. Visionaries will have innovated in one or more of the key areas of access layer technologies within the enterprise (for example, convergence,

security, management or operational efficiency). The ability to apply differentiating functionality across the entire access layer will affect their position.

Niche Players

A vendor in the Niche Players quadrant demonstrates a near-complete product offering, but may not be able to control development or provide differentiating functionality because part of the solution is being offered through a strategic partnership, whether it is a hardware component or a network application. Niche Players may also lack strong go-to-market capabilities that limit their regional or global reach or service capabilities in their product offerings. Niche Players often have deep vertical knowledge and will be an appropriate choice for users in the specific vertical markets where they have specialized offerings and knowledge.

Context

In the access layer, our inquiries with clients show that enterprises are making the decision to go with wireless as the first option for client connectivity for mobile devices for data requirements. Many are considering wireless for the first connection for all devices by addressing the security and performance issues with network printers, and are considering softphones or voice over wireless LAN (VoWLAN) desk phones as rightsizing the number and type of switch ports at the edge of the network continues to change. While the amount of bandwidth needed for each user has not changed, the number of wireless connections, prioritization of the application and the sheer number of high-transaction dense areas are requiring vendors to educate their channel resellers to address not only wireless issues, but also the potential for aggregation issues for upstream connectivity from the wiring closet switch.

As reliance upon and use of wireless connectivity continue to expand in the enterprise, clients should focus on voice and videoconferencing performance, including a vendor's ability to address latency challenges and report either rating factor (R-factor) or MOS for users. New functionality such as location awareness and application performance, multivendor capabilities and device/network analytics are providing for functionality and justification for wireless, as well as a better view of the entire access layer. The decision to move provisioning, management or security to the cloud is based on the enterprise use case, typically depending on the available bandwidth and performance of broadband connectivity to the site, or the propensity to have other enterprise applications in the cloud.

Market Overview

In 2014, a survey of access layer clients showed that 75% wanted to purchase their end-to-end access layer solution from a single vendor. In this report, we changed the inclusion criteria to be entirely based on the total revenue of both wired and wireless LAN components instead of separating them out and providing distinct criteria. Additionally, we identified that revenue and product solutions needed to focus on enterprise environments. We have eliminated confusion associated with public venue solutions by separating those requirements.

In 2015, we saw vendors announce 802.11ac Wave 2 radio solutions. We found that all solutions were announced with limited functionality of Wave 2 capabilities including approximately 1.7 Gbps of the more than 6 Gbps radio capacity promised by the standard, and typically only supporting a 1

Gbps wired connection to upstream switches. No vendor provided a migration to IEEE 802.3bz for any Wave 2 access points, which, when ratified, will allow for 2.5 Gbps/5 Gbps over Cat 5e/Cat 6 cable.

We evaluated vendors on their ability to provide the entire end-to-end solution, because it is difficult to be an IT administrator when vendors focus on one specific technology or the other. Over half of our evaluation was of the vendors' network applications to provide onboarding, security, guest access, policy enforcement, network management and other access layer benefits. These applications reduce enterprise complexity and costs to provision, manage, authenticate and even locate end users across one or multiple enterprise facilities. Vendors continue to provide innovation around network services that are not only wired and wireless, but also support multiple vendors.

In our research, we found that enterprises also want the choice of architecture deployment options, whether on-premises, private cloud or public cloud deployment capabilities. Additionally, controller-based or controllerless WLAN is a vendor implementation option, not an enterprise requirement, and enterprises with defined usage scenarios should look for pricing based on market-equivalent functionality that meets their usage needs.

Moving forward, flexible pricing and packaging will also be important as small and midmarket enterprises expect the same functionality as larger enterprises, and vendors attempt to close the gap that historically seemed to exist in functionality and ease of use. Additional services that provide improvements in managed services, indoor location, analytics and application visibility are just the beginning for new application capabilities as vendors search for new areas of differentiation.

Evidence

[1] In 2014, the NBASE-T Alliance (http://www.nbaset.org/) and MGBASE-T Alliance (http://www.mgbasetalliance.org/) were formed to enable multi-Gigabit Ethernet speeds (2.5GbE and 5GbE) on existing copper Ethernet cabling.

[2] In this context, the term "headless" indicates there is not human intervention and a screen or keyboard may not be included.

Evaluation Criteria Definitions

Ability to Execute

Product/Service: Core goods and services offered by the vendor for the defined market. This includes current product/service capabilities, quality, feature sets, skills and so on, whether offered natively or through OEM agreements/partnerships as defined in the market definition and detailed in the subcriteria.

Overall Viability: Viability includes an assessment of the overall organization's financial health, the financial and practical success of the business unit, and the likelihood that the individual business unit will continue investing in the product, will continue offering the product and will advance the state of the art within the organization's portfolio of products.

Sales Execution/Pricing: The vendor's capabilities in all presales activities and the structure that supports them. This includes deal management, pricing and negotiation, presales support, and the overall effectiveness of the sales channel.

Market Responsiveness/Record: Ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customer needs evolve and market dynamics change. This criterion also considers the vendor's history of responsiveness.

Marketing Execution: The clarity, quality, creativity and efficacy of programs designed to deliver the organization's message to influence the market, promote the brand and business, increase awareness of the products, and establish a positive identification with the product/brand and organization in the minds of buyers. This "mind share" can be driven by a combination of publicity, promotional initiatives, thought leadership, word of mouth and sales activities.

Customer Experience: Relationships, products and services/programs that enable clients to be successful with the products evaluated. Specifically, this includes the ways customers receive technical support or account support. This can also include ancillary tools, customer support programs (and the quality thereof), availability of user groups, service-level agreements and so on.

Operations: The ability of the organization to meet its goals and commitments. Factors include the quality of the organizational structure, including skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently on an ongoing basis.

Completeness of Vision

Market Understanding: Ability of the vendor to understand buyers' wants and needs and to translate those into products and services. Vendors that show the highest degree of vision listen to and understand buyers' wants and needs, and can shape or enhance those with their added vision.

Marketing Strategy: A clear, differentiated set of messages consistently communicated throughout the organization and externalized through the website, advertising, customer programs and positioning statements.

Sales Strategy: The strategy for selling products that uses the appropriate network of direct and indirect sales, marketing, service, and communication affiliates that extend the scope and depth of market reach, skills, expertise, technologies, services and the customer base.

Offering (Product) Strategy: The vendor's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature sets as they map to current and future requirements.

Business Model: The soundness and logic of the vendor's underlying business proposition.

Vertical/Industry Strategy: The vendor's strategy to direct resources, skills and offerings to meet the specific needs of individual market segments, including vertical markets.

Innovation: Direct, related, complementary and synergistic layouts of resources, expertise or capital for investment, consolidation, defensive or pre-emptive purposes.

Geographic Strategy: The vendor's strategy to direct resources, skills and offerings to meet the specific needs of geographies outside the "home" or native geography, either directly or through partners, channels and subsidiaries as appropriate for that geography and market.

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