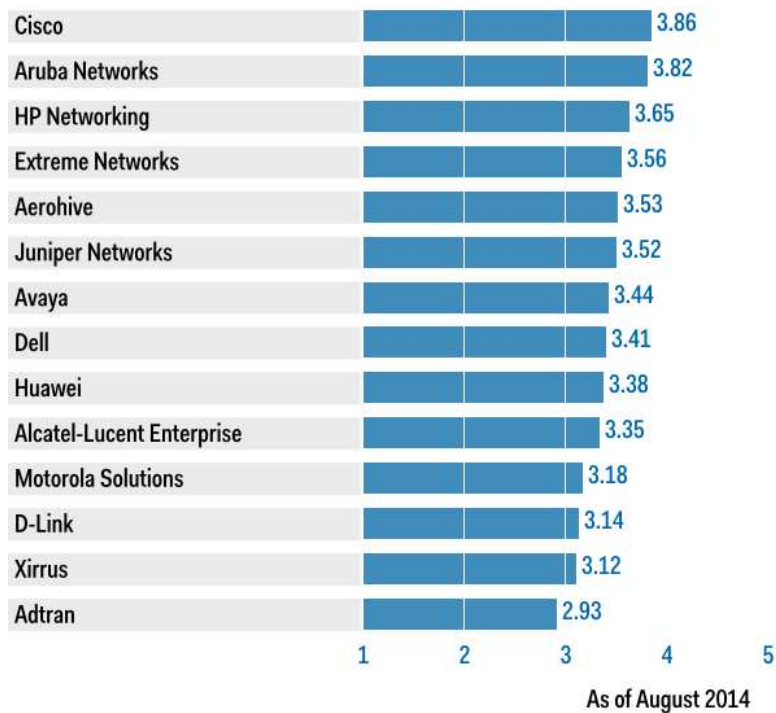


Analysis

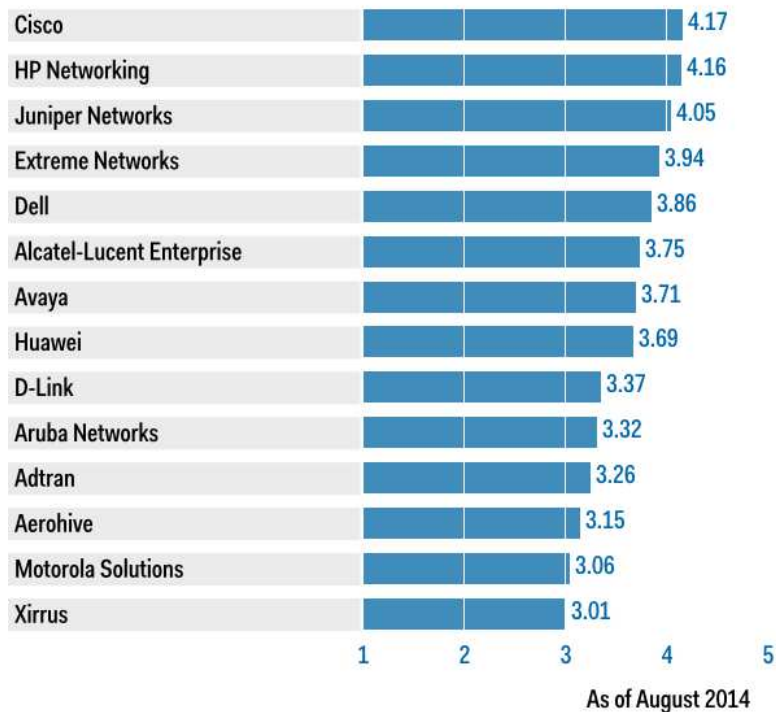
Critical Capabilities Use Case Graphics

Figure 1. Vendors' Product Scores for Enterprise Unified Wired and WLAN Access Use Case
Product or Service Scores for Enterprise Unified Wired and WLAN Access



Source: Gartner (August 2014)

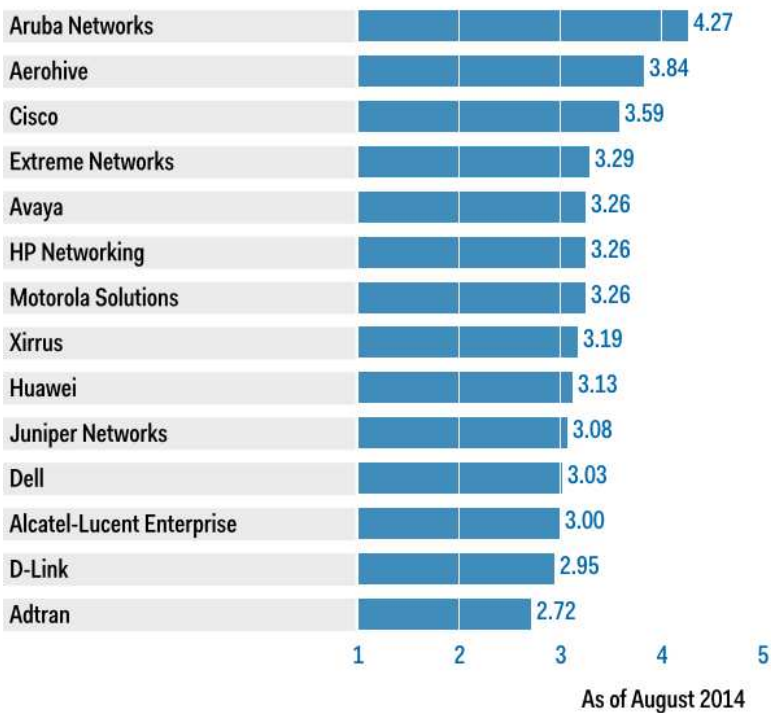
Figure 2. Vendors' Product Scores for Enterprise Wired-Only Access Use Case
Product or Service Scores for Enterprise Wired-Only Access



Source: Gartner (August 2014)

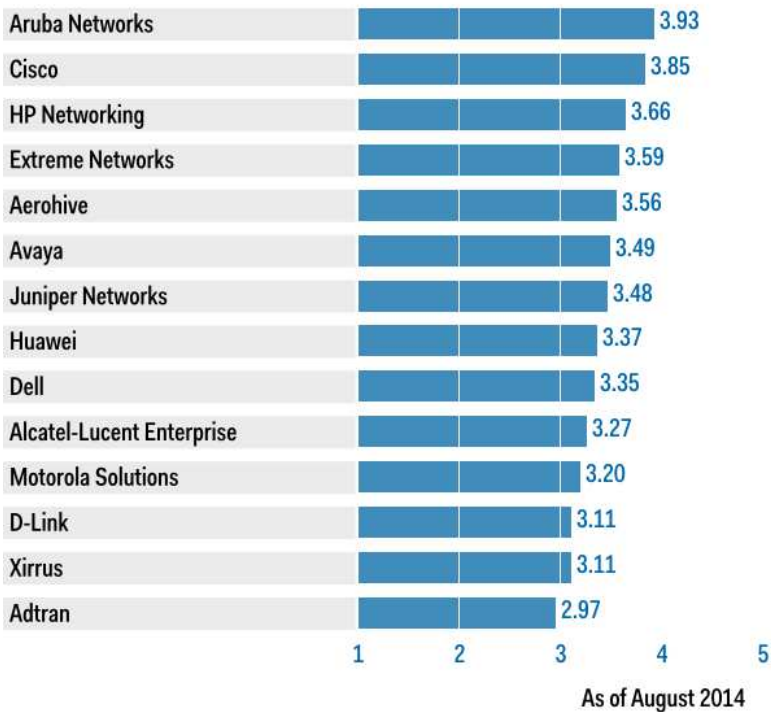
Figure 3. Vendors' Product Scores for Enterprise WLAN-Only Access Use Case

Product or Service Scores for Enterprise WLAN-Only Access



Source: Gartner (August 2014)

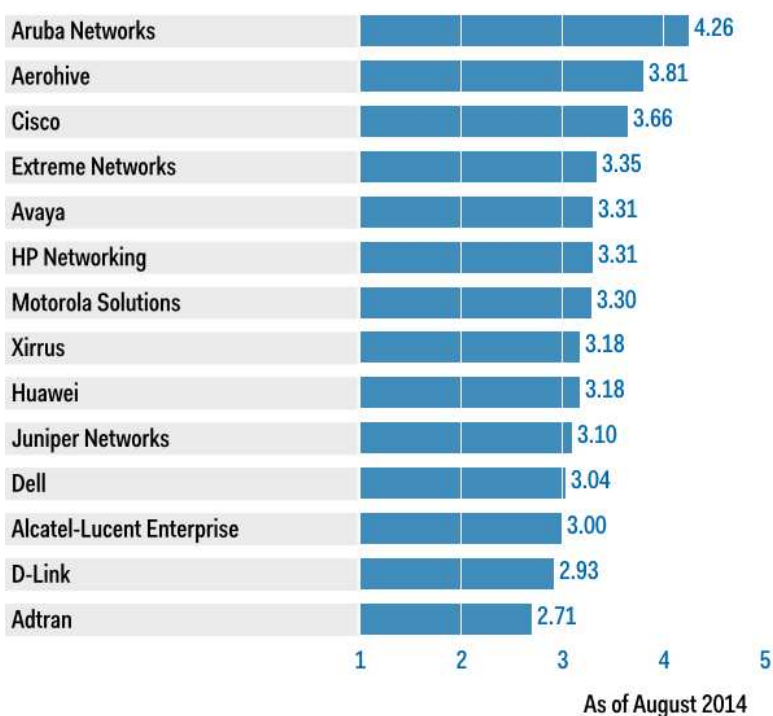
Figure 4. Vendors' Product Scores for Small or Remote Office Use Case
Product or Service Scores for Small or Remote Office



Source: Gartner (August 2014)

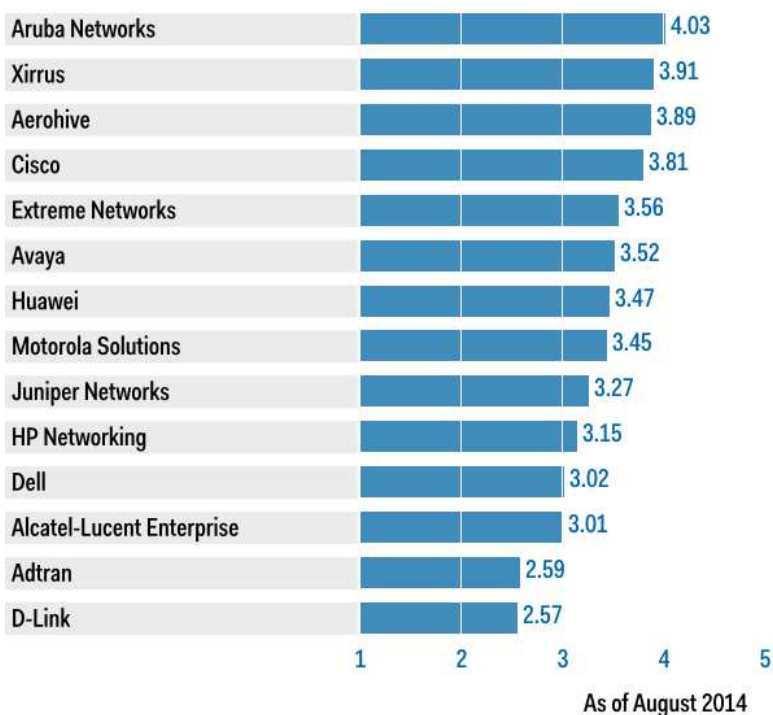
Figure 5. Vendors' Product Scores for Guest or Hot Spot Access Only Use Case

Product or Service Scores for Guest or Hot Spot Access Only



Source: Gartner (August 2014)

Figure 6. Vendors' Product Scores for High-Density Venue Use Case
Product or Service Scores for High-Density Venue



Source: Gartner (August 2014)

Vendors

Adtran

Adtran has a solid product portfolio that meets base user requirements, and it is sold via a broad reseller and service provider channel. The vendor has typically focused on midmarket organizations, including education and state and local governments, and it is attempting to expand into the broader enterprise market. Adtran provides an aggressively priced access layer solution, with its vWLAN wireless and NetVanta wired products. However, as of June 2014, Adtran is not shipping 802.11ac access points, which holds it back versus leading competitors. Organizations looking for a cost-effective wired/WLAN solution that meets basic networking requirements should consider Adtran.

Aerohive

Aerohive focuses on WLAN and is growing faster than market rates but remains one of the smaller vendors in the access layer market. The vendor's HiveManager software provides unified wired/WLAN network service applications (guest access, onboarding, monitoring and so forth) and management that

can be either deployed on-premises or SaaS-based. Gartner typically observes Aerohive's proposals to be less expensive than that of leading competitors, largely due to its controllerless architecture. Organizations should consider Aerohive for all wireless deployments, including small or midsize business (SMB), enterprise, and high-density venues.

Alcatel-Lucent Enterprise

On 6 February 2014, Alcatel-Lucent announced its intent to sell an estimated 85% interest in its enterprise business to China Huaxin, which has indicated that it plans increased investments in the enterprise portfolio. The vendor continues to enhance its application-fluent network strategy, and it predominantly targets midsize and large enterprises with its Converged Campus Networks solution. The company uses Aruba's ClearPass access management technology to provide a consistent set of bring your own device (BYOD) services across both its own and third-party WLAN and wired LAN equipment. Consider Alcatel-Lucent Enterprise for wireless and wired access infrastructure in its target markets. Customers should vet local support and product road maps as more details of the Huaxin deal emerge.

Aruba Networks

Aruba focuses primarily on enterprise wireless and derives only 3% to 5% of revenue from wired switching. The vendor supports both pay-as-you-grow pricing and mixing/matching of components across product lines. Aruba's networking equipment can be provisioned via its SaaS-based management offering (Aruba Central) or traditional network management software (AirWave), while network service applications are delivered via Aruba's ClearPass software. Aruba's architecture, product portfolio and pricing make the vendor ideally suited for all wireless deployments, ranging from SMB to large-enterprise and high-density venues.

Avaya

Avaya has a strong product offering across wireless and wired access, with an emphasis on the education, healthcare, hospitality and local/state government verticals. However, while the vendor continues to invest in its access networking portfolio, we see a decline in its enterprise data/access layer sales relative to the market. Network service applications (such as onboarding and guest access) and network multivendor management are delivered via the vendor's Identify Engines software. Avaya's unified communications presence provides a large installed base, which is complementary to its wired/WLAN network products. Organizations in Avaya's target markets, including education, healthcare, hospitality and local/state government, or an existing Avaya unified communications deployment (regardless of the target market), should consider Avaya for wired/wireless use cases.

Cisco

Cisco has a broad product portfolio in the wired and wireless access market and is the leading vendor by a substantial margin, when measured by revenue. Cisco can meet all access networking requirements but has multiple access layer architectures that lack a consistent management interface between them. For larger enterprises, Cisco delivers wired/WLAN network service applications via its Identity Services Engine, with network management via Prime. For midmarket customers seeking SaaS-based management, Cisco Meraki is a strong solution. Cisco should be considered for all wired and wireless access layer opportunities, including SMB, midmarket, large-enterprise and high-density venues.

Dell

Dell focuses on midmarket and larger enterprises, including higher education and public institutions. The vendor recently overhauled its campus wired switching portfolio, releasing N-Series fixed form factor and C-Series modular switches. The company delivers wireless via an OEM relationship with Aruba (rebranded as W-Series access points), but it does not support Aruba's SaaS-based management. Based on customer feedback, Dell is typically less expensive than leading competitors and has a history of providing strong support. Organizations should consider Dell for all access layer opportunities, particularly in the midmarket.

D-Link

D-Link has a broad portfolio and focuses on the education and SMB markets, with a majority of its business derived outside the U.S. and Europe. D-Link's products are a good fit for the SMB, but they lack feature depth that larger enterprises typically require, versus leading competitors in the market. SMBs in D-link's core geographies looking for a cost-effective wired/WLAN solution that meets basic networking requirements should consider D-Link.

Extreme Networks

With the 2013 acquisition of Enterasys Networks, Extreme Networks now offers a full range of wired/wireless access networking capability, including wired switches, wireless access points, and management (NetSight) and network service applications. Extreme focuses on midsize to large enterprises, and its portfolio can meet a wide range of needs, from SMBs to service providers. Consider Extreme for "greenfield" and refresh access networking opportunities, including high-density venues.

HP Networking

HP is the No. 2 wired switching vendor in terms of both revenue and port shipments, and its FlexCampus and FlexBranch architectures provide a comprehensive unified wired and wireless solution. The vendor provides integrated network and BYOD management, enabling device onboarding, provisioning, monitoring, policy enforcement and security. HP is developing a location-aware application to provide deterministic real-time location of wireless devices and assets on the network. Gartner typically observes HP's access layer solutions to be aggressively priced versus leading competitors. Large enterprises and SMBs globally should consider HP for access layer networking opportunities.

Huawei

Huawei's Enterprise Business Group (EBG) wired/WLAN access products can meet the needs of all enterprise use cases identified in this research. Huawei's solution has made good strides to offer a complete end-to-end campus networking solution. As with many vendors in the market, Huawei is able to meet the fundamental needs of the enterprise, but it struggles with differentiation. The vendor has a strong presence in Russia and the Asia/Pacific region, including Japan and India, as well as in China, where 72% of its access layer revenue was generated. Huawei's EBG targets healthcare, education, financial services and the public sector/government. Huawei should be considered for enterprise access layer opportunities where it has a geographical presence.

Juniper Networks

Juniper has a broad solution that can meet the needs of large "carpeted" enterprises. The company has

had more traction with its wired EX switching portfolio versus its WLAN business, and it is the No. 3 switching vendor by market share. In the wireless space, Juniper recently announced an agreement with Aruba on joint product development and go-to-market collaboration, where the vendors' channels will have the opportunity to offer joint Juniper-Aruba solutions. Gartner considers this a positive move that signifies a strategic shift within Juniper away from its own portfolio and toward Aruba's WLAN products. Juniper should be considered for all wired campus networking opportunities.

Motorola Solutions

Motorola Solutions is a global leader in WLAN for in-store retail, transportation, logistics and government verticals, but less than 5% of its access layer revenue is attributed to wired switching. In April 2014, Motorola Solutions announced that it had entered into an agreement through which Zebra Technologies will acquire its enterprise business, and Gartner anticipates continued investment in the retail, transportation, manufacturing and healthcare vertical markets after the acquisition. Motorola's service offerings provide an end-to-end solution and SLAs desired by applications in the retail, manufacturing and logistics verticals. The vendor should be considered for all WLAN use cases involving in-store retail and in other verticals that have data collection, security (including guest access), location and analytics requirements.

Xirrus

Xirrus focuses on wireless access with its portfolio, which includes access points, arrays and management services. Its modular array product line integrates up to 16 radios and controller capability, which enables the vendor to better support enterprise environments. While its access points support lower-density environments, the vendor's larger arrays provide differentiation in highly dense user environments, such as auditoriums and entertainment venues, as well as in large indoor and outdoor facilities. Xirrus' network service applications, such as guest access and network management, address market requirements, and the vendor has invested in analytics and deep packet inspection capabilities to differentiate its solutions. Xirrus sells through direct and indirect channels in education, healthcare, retail and hospitality, primarily in North America and EMEA, as well as having a presence in Asia/Pacific. Xirrus should be considered for WLAN deployments in its core markets and for all high-density WLAN deployments.

Context

The access layer market consists of vendors that supply networking hardware and software components that provide connectivity to the infrastructure access layer. Both wired and WLAN networks are seeing an increase in traffic, which Gartner estimates will grow at a 28% compound annual growth rate through 2017.³ Over the last 12 months, the market has continued to evolve, and we have seen the following major trends:

The 802.11ac wireless standard has been ratified, and vendors have introduced 802.11ac Wave 1 products in the enterprise (see "Enterprises Should Optimize the Timing of 802.11ac Adoption").

Several vendors introduced hardware and software to improve application performance (for example, to adjust the network for jitter-sensitive applications).

Vendors made hardware and software innovations to improve management and provisioning of wired campus infrastructure.

Vendors have started to add software-defined networking capabilities into their access networking portfolio (see "Ending the Confusion about Software-Defined Networking: A Taxonomy").

Thus, organizations must balance adequately sizing their access networking solution versus overbuilding it and consequently overspending. For planning purposes, organizations can plan for refresh cycles of four to seven years for WLAN and seven to 10 for wired edge (see "Know When It's Time to Replace Enterprise Network Equipment"). Since WLAN refresh cycles are substantially shorter than those for wired, synchronization of wired/WLAN refresh cycles will be economically feasible approximately half the time.

Product/Service Class Definition

Wired and wireless access networking consists of a wide range of features and functions. In this research, we examine six critical networking capabilities that enterprises should consider when looking to develop broad unified access layer migration road maps and when choosing strategic suppliers. We evaluate vendors on the following capabilities.

Critical Capabilities Definition

Wired Access

This accounts for the vendor's wired switching solution, which includes hardware (port extensions, fixed form factor or modular switches, Power Over Ethernet, supported interfaces, and so forth) and integrated software.

Key components of this capability include performance, availability, scalability, interoperability, cost and the overall portfolio architecture.

WLAN Access

This accounts for the vendor's wireless access solution in traditional carpeted enterprise environments, which includes hardware (access points, antennas, wall jacks and controllers) and integrated software.

Key components of this capability include performance, availability, scalability, interoperability, cost and the overall portfolio architecture.

High-Density WLAN Access

This accounts for the vendor's wireless access solution in areas with a very high density of users and/or devices, such as stadiums, concert halls and conferences venues.

These venues often have user densities that are at least an order of magnitude higher than traditional carpeted office space, with spiky and unpredictable traffic patterns from a heterogeneous mix of client devices.

This capability includes hardware (access points, antennas and controllers) and integrated software. Key

components of this capability include capacity, performance, availability, scalability, interoperability and cost.

Management and Administration

This refers to the fault, configuration and performance management/administration capability of the vendor's hardware/software products, as well as support for third-party networking products.

This can include capabilities embedded into individual network elements, vendor-provided network management system software/hardware (such as a management console graphical user interface), and/or integration with third-party management tools (such as network performance management and network configuration and change management) via standardized protocols or APIs.

Onboarding and Policy Enforcement

This capability is particularly useful in BYOD scenarios and refers to onboarding services, including device authentication and user authorization services that support many operating systems and device postures.

Policy enforcement provides access to applications and parts of the network based on credentials, as well as context-aware variables, such as device profiling.

Additional Network Services

This capability includes a broad set of network service applications, including analytics, forensics, advanced application support and location-based services.

Performance of latency-sensitive applications, such as voice and video, can be improved via features that increase application awareness, reduce jitter, and increase monitoring of voice and video quality. Analytic applications look not only at the network, but also at the end-user data. Network forensics tools determine what is happening across the entire access layer in addition to security functionality.

Use Cases

This research identifies the most common set of use cases in which organizations invest in and deploy access networking solutions (see Table 1). These use cases vary significantly, and as a result, the access networking market is driven by a wide range of user needs and environments.

Enterprise Unified Wired and WLAN Access

This is a physical facility that typically supports more than 500 users, requiring wired/WLAN access in a carpeted office space environment.

The majority of users are typically badged employees, but contractors and guests also require connectivity. Employees typically have assigned workspaces and utilize desk phones. Employees are issued corporate-owned devices, but BYOD is also typically supported for mobile devices (such as smartphones and tablets). This buyer is typically highly technically competent and/or is comfortable making granular changes to wired/WLAN infrastructure components. This use case is typically initiated by a campus refresh for greenfield opportunities. This is the most common use case for newly constructed office space.

Enterprise Wired-Only Access

This is a physical facility that typically supports more than 500 users, requiring only wired connectivity.

This use case is often observed as a refresh initiative and/or when incremental wired switching capacity is needed. Typically, there is an incumbent wireless solution in place, with no requirement to replace it. Users are typically badged employees, but contractors and guests also require connectivity. Employees typically have assigned workspaces and utilize desk phones. Employees are issued corporate-owned devices, and there is limited support for BYOD on the wired infrastructure. This buyer is typically highly technically competent and/or is comfortable making granular changes to wired infrastructure components.

Enterprise WLAN-Only Access

This is a physical facility that typically supports more than 500 users, requiring only wireless connectivity within carpeted office space.

This use case is often observed as a refresh initiative and/or when incremental WLAN capacity is needed. BYOD initiatives within an organization can also drive investments into this use case. Typically, there is an incumbent wired switching solution in place, with no requirement to replace it. Users are typically badged employees, but contractors and guests also require connectivity. Employees typically have assigned workspaces and utilize desk phones. Employees are issued corporate-owned devices, and BYOD is supported on the WLAN. This buyer is typically highly technically competent and/or is comfortable making granular changes to WLAN infrastructure components.

Small or Remote Office

This is a physical facility that typically contains 10 to 50 users, requiring wired and wireless access in a carpeted office space environment.

This use case applies to remote branch offices affiliated with midmarket and larger enterprises, as well as SMB environments. The majority of users are badged employees, but contractors and guests also require connectivity. Employees typically have assigned workspaces and utilize desk phones. Employees are issued corporate-owned devices, but BYOD is also typically supported for mobile devices (such as smartphones and tablets). There is usually no on-site technical support in these locations.

Guest or Hot Spot Access Only

This is typically a physical facility that provides "hot spot" services, including "free Wi-Fi" for nearby guests and/or patrons.

This is common in retail venues such as coffee shops, and it usually supports one to 50 users via WLAN only. The vast majority of users are true guests. This use case includes greenfield and refresh opportunities and typically entails: (1) adding guest capabilities to an existing corporate WLAN; and/or (2) building out separate guest-only infrastructure. Organizations typically are looking to provide

targeted customer engagement to users connecting to the WLAN (through, for example, advertisements and coupons). This buyer is typically highly technically competent and/or is comfortable making granular changes to WLAN infrastructure components, but there is usually no on-site technical support in remote locations.

High-Density Venue

This is typically a facility with a large number (1,000 to more than 100,000) of concentrated users and/or devices, such as a stadium, concert venue or conference facility.

Nearly all users are true guests, and WLAN is the primary connectivity method. A limited amount of wired access components are occasionally needed to provide connectivity for WLAN. This use case is observed for greenfield and refresh opportunities. This buyer is typically highly technically competent and/or is comfortable making granular changes to WLAN infrastructure components.

Inclusion Criteria

This document is meant to be used in conjunction with Gartner's "Magic Quadrant for the Wired and Wireless LAN Access Infrastructure." Thus, the same inclusion criteria will be utilized (see below). As the market evolves, Gartner may re-evaluate the inclusion criteria separately between the Critical Capabilities and the Magic Quadrant as there are compelling wired-only and WLAN-only vendors in the space, such as Brocade, Meru Networks and Ruckus Wireless.

Vendors must be able to demonstrate a clear understanding of enterprise access layer networking requirements. They must have a minimum of \$100 million in 2013 revenue in enterprise-class product revenue for wired and wireless access layer hardware and software solutions, of which a minimum of \$40 million is derived from enterprise wireless LAN solutions. All hardware and software components must be available on the vendor's published price list. A minimum of 80% of access layer product revenue must be generated from vendor-manufactured or OEM components. Product revenue must be from enterprise office environments, which may include in-store retail, healthcare, and grade school, high school and university education. Product revenue may not include convention centers, hotels or cellular offloading for outdoor environments or public venues, including stadiums and train or bus stations. Vendors must provide factual details on how they meet these criteria.

Vendor solutions must be able to address the following criteria:

Vendor must minimally sell and support a 24- or 48-port Power Over Ethernet, chassis or stackable switch

Vendor must minimally sell and support 802.11n and have a road map for 802.11ac.

Vendor must support a guest access application, with the ability to minimally support:

Ability to provide Web authentication credentials via SMS, email or printout for Windows, iOS and Android clients

More than one captive portal

Vendor must be able to minimally support the following security functionality:

Device authentication for Windows, Android and iOS devices via 802.1X, as well as an authentication method for supporting devices that cannot support a supplicant

Ability to detect wired or wireless intrusion

Vendor must be able to minimally support the following policy enforcement functionality:

Ability to create access policies that minimally include device and user for wired and wireless connectivity

Ability to traffic shape/rate limit and content filter trusted clients, as well as for guest access connected clients; the solution may be internally developed or a strategic alliance

Vendor must be able to minimally support network management:

Must be able to minimally discover and manage wired and wireless access layer infrastructure, including supported switches and access points

Table 1. Weighting for Critical Capabilities in Use Cases

Critical Capabilities	Enterprise Unified Wired and WLAN Access	Enterprise Wired-Only Access	Enterprise WLAN-Only Access	Small or Remote Office	Guest or Hot Spot Access Only	High-Density Venue
Wired Access	35%	75%	0%	27%	0%	1%
WLAN Access	35%	0%	55%	33%	55%	0%
High-Density WLAN Access	0%	0%	0%	0%	0%	75%
Management and Administration	12%	15%	15%	25%	20%	6%
Onboarding and Policy Enforcement	10%	8%	20%	10%	10%	6%
Additional Network Services	8%	2%	10%	5%	15%	12%
Total	100%	100%	100%	100%	100%	100%
						As of August 2014

Source: Gartner (August 2014)

This methodology requires analysts to identify the critical capabilities for a class of products/services. Each capability is then weighed in terms of its relative importance for specific product/service use cases.

Critical Capabilities Rating

Each of the products/services has been evaluated on the critical capabilities on a scale of 1 to 5; a score of 1 = Poor (most or all defined requirements are not achieved), while 5 = Outstanding (significantly exceeds requirements).

Table 2. Product/Service Rating on Critical Capabilities

Product or Service Ratings	Adtran	Aerohive	Alcatel-Lucent Enterprise	Aruba Networks	Avaya	Cisco	Dell	D-Link	Extreme Networks
Wired Access	3.3	3.0	4.0	3.0	3.7	4.3	4.1	3.5	4.0
WLAN Access	2.5	4.0	3.0	4.3	3.0	3.5	3.0	3.0	3.0
High-Density WLAN Access	2.5	4.0	3.0	4.0	3.5	3.8	3.0	2.5	3.5
Management and Administration	3.3	3.5	3.0	4.3	4.0	4.0	3.2	3.0	4.0
Onboarding and Policy Enforcement	3.0	3.8	3.0	4.3	3.3	3.3	3.0	3.0	3.3
Additional Network Services	2.5	3.5	3.0	4.0	3.5	4.0	3.0	2.5	3.8

Source: Gartner (August 2014)

Table 3 shows the product/service scores for each use case. The scores, which are generated by multiplying the use case weightings by the product/service ratings, summarize how well the critical capabilities are met for each use case.

Table 3. Product Score in Use Cases

Use Cases	Adtran	Aerohive	Alcatel-Lucent Enterprise	Aruba Networks	Avaya	Cisco	Dell	D-Link	Extreme Networks
Enterprise Unified Wired and WLAN Access	2.93	3.53	3.35	3.82	3.44	3.86	3.41	3.14	3.56
Enterprise Wired-Only Access	3.26	3.15	3.75	3.32	3.71	4.17	3.86	3.37	3.94
Enterprise WLAN-Only Access	2.72	3.84	3.00	4.27	3.26	3.59	3.03	2.95	3.29
Small or Remote Office	2.97	3.56	3.27	3.93	3.49	3.85	3.35	3.11	3.59
Guest or Hot Spot Access Only	2.71	3.81	3.00	4.26	3.31	3.66	3.04	2.93	3.35
High-Density Venue	2.59	3.89	3.01	4.03	3.52	3.81	3.02	2.57	3.56

Source: Gartner (August 2014)

To determine an overall score for each product/service in the use cases, multiply the ratings in Table 2 by the weightings shown in Table 1.

Gartner disclaims all warranties as to the accuracy, completeness or adequacy of such information and shall have no liability for errors, omissions or inadequacies in such information. This publication consists of the opinions of Gartner's research organization and should not be construed as statements of fact. The opinions expressed herein are subject to change without notice. Although Gartner research may include a discussion of related legal issues, Gartner does not provide legal advice or services and its research should not be construed or used as such. Gartner is a public company, and its shareholders may include firms and funds that have financial interests in entities covered in Gartner research. Gartner's Board of Directors may include senior managers of these firms or funds. Gartner research is produced independently by its research organization without input or influence from these firms, funds or their managers. For further information on the independence and integrity of Gartner research, see "[Guiding Principles on Independence and Objectivity](#)."

[About Gartner](#) | [Careers](#) | [Newsroom](#) | [Policies](#) | [Site Index](#) | [IT Glossary](#) | [Contact Gartner](#)