Magic Quadrant for Enterprise Wired and Wireless LAN Infrastructure

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Enterprise wired and wireless networks must support a diverse array of business use cases. I&O leaders must identify vendors that deliver suitable hardware along with automated and intelligent management tools that provide insight into network issues, end-user experience and application performance.

This Magic Quadrant is related to other research:

Critical Capabilities for Enterprise Wired and Wireless LAN Infrastructure

View All Magic Quadrants and Critical Capabilities

Additional Perspectives

- Midmarket Context: 'Magic Quadrant for Enterprise Wired and Wireless LAN Infrastructure'
  (13 December 2021)

Strategic Planning Assumptions

By the end of 2025, artificial intelligence (AI), machine learning (ML) and automation will cause 10% of enterprises to implement permanent reductions in their entry-level network technician workforce.

By 2024, 80% of enterprises that align network operations plans to business-led objectives will grow faster than their competitors that do not, up from 25% in 2020.

Market Definition/Description

This document was republished on 29 November 2021. The document you are viewing is the corrected version. For more information, see the Corrections page on gartner.com.

Gartner's view of the market is focused on transformational enterprise network technologies or approaches that deliver on the future technology needs of end users. It is not focused on the technology market as it exists today.

Gartner defines the enterprise wired and wireless LAN infrastructure market as that of vendors supplying wired and wireless networking hardware, and the related network software. Products in this market enable devices and end users to connect to the enterprise wired LAN or Wi-Fi network in support of the required organizational mission. Supported network devices are inclusive of end-user-operated devices such as laptops, smartphones and networked office equipment; and non-user-operated devices such as Internet of Things (IoT) devices.

This research is not inclusive of wired and wireless networking infrastructure devices the primary purpose of which is to support adjacent markets such as public venues, and industrial settings, or point-to-point WAN solutions.

The core capabilities of the enterprise wired and wireless local-area include the following technologies, hardware components and geographic market reach.

Hardware — The core capabilities of physical network elements include:

- Wi-Fi access points
- Ethernet network switches suitable for deployment at the network access, distribution and core network layers
- Wi-Fi controllers (physical, virtual or cloud-based)

Software — Network service applications that are cloud-, appliance- or virtual-appliance-based. The core capabilities include, but are not limited to:

- Network management
- Network monitoring
- Guest access portals
- Self-service device onboarding services
- Network security integration (e.g., IPS, IDS, 802.1X, DNS security, Anomaly detection, etc.)

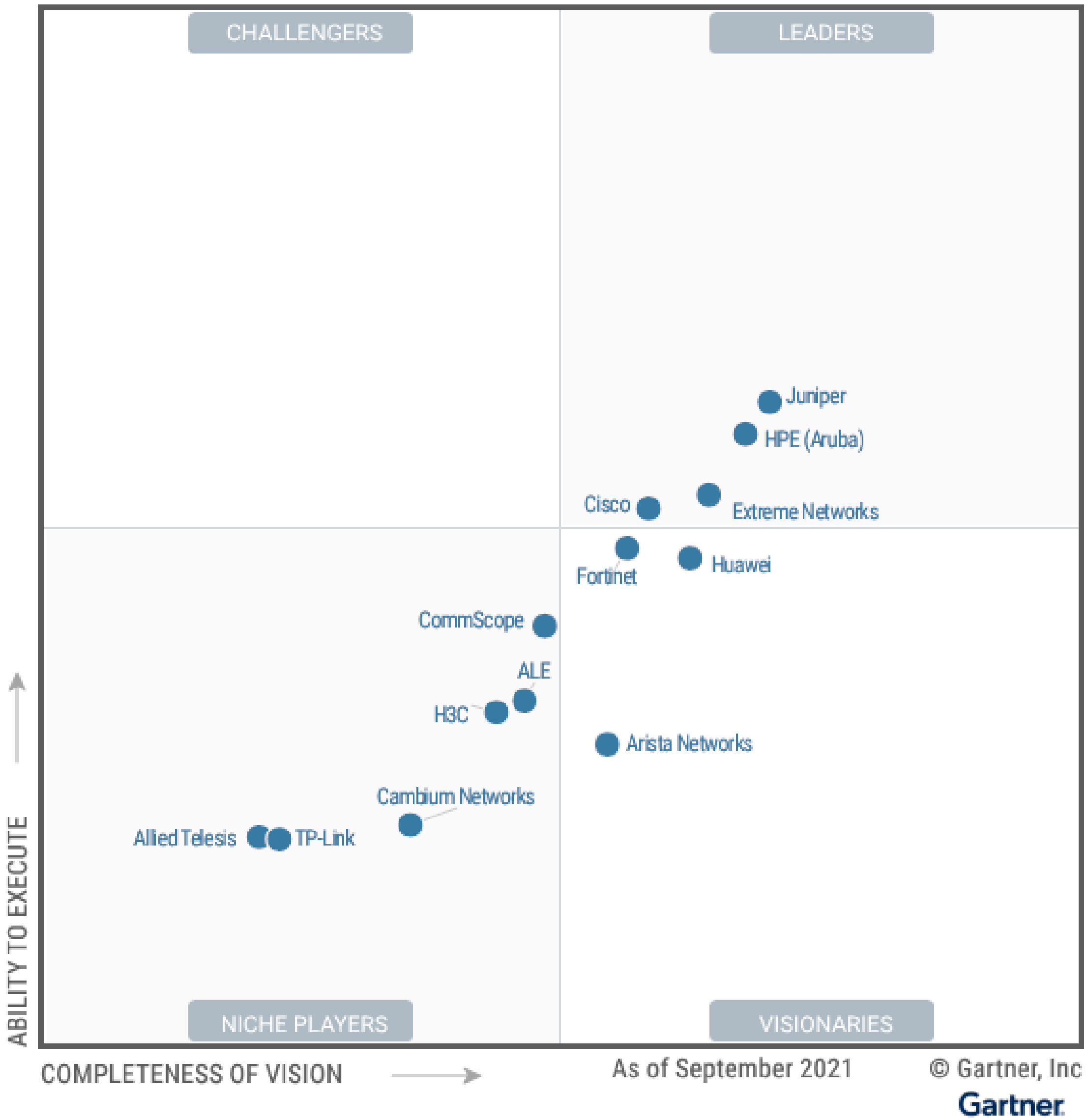
- Network policy enforcement/integration
- WLAN location services
- Application visibility and/or performance management
- AI- and ML-enabled network assurance tools
- Network automation tools
- Dedicated non-user device (IoT) management and security mitigation
- Natural language troubleshooting interface

Geographic Market Reach — Vendors providing and supporting enterprise wired and wireless LAN infrastructure in at least four of the five main geographies identified by Gartner:

- Asia/Pacific
- Latin America
- Middle East and Africa
- Europe
- North America

Magic Quadrant

Figure 1. Magic Quadrant for Enterprise Wired and Wireless LAN Infrastructure



Source: Gartner (November 2021)

Vendor Strengths and Cautions

ALE

Alcatel-Lucent Enterprise (ALE) is a Niche Player in this Magic Quadrant. ALE addresses the enterprise network market with its OmniSwitch wired switches and OmniAccess wireless access point products. The company delivers automated network management, provisioning and IT security enforcement policies through its OmniVista on-premises or cloud management platform, as well as workflow automation via its Rainbow workflow software as a service (SaaS). ALE's operations are mostly focused in EMEA. However, the company also has existing operations in Asia/Pacific, North America and LATAM. The company's clients are primarily in the healthcare, government and transportation markets. Gartner expects ALE to continue to invest in its Intelligent Fabric network management technology as well as increasing its sales and support footprint in the North American enterprise market.

Strengths

- **Vertical Market Expertise:** Clients with complex networking requirements in specialty markets that ALE targets may benefit from its industry-specific expertise versus competitors who may address the same verticals with less specialized teams.

- **Simplified Network Provisioning:** ALE's Intelligent Fabric technology simplifies network deployment, moves, adds, changes and network monitoring/management, enabling a more automated framework, including for IoT devices.

- **Broad Network Management Capabilities:** ALE's OmniVista on-premises network management solution provides rich analytics for monitoring application performance and supports IoT onboarding. OmniVista Cirrus provides network management as a SaaS offering, more broadly focused on simplifying network provisioning for SMBs.

Cautions

- **Lagging Behind in AIOps Functionality:** AI/ML capabilities are less feature-rich compared with some competitors, especially self-healing and network assistant capabilities.

- **Lack of Advanced Network Access Control Capabilities:** While ALE offers OmniVista for simplified NAC requirements, more complex NAC deployments rely upon Aruba Clearpass integration. This can increase deployment costs in certain scenarios and causes reliance on a third-party vendor.

- **Limited Market Viability:** ALE has one of the smallest market footprints of all vendors in this research. The company has pockets of strength in Europe, but there is very little market penetration outside of this area.

Allied Telesis

Allied Telesis is a Niche Player in this Magic Quadrant. It addresses the enterprise networking market with its x Series wired switches and TQ Series of access points. The company provides its Autonomous Management Framework (AMF) and Autonomous Wave Control (AWC) products for an integrated operational view of applications, clients and network devices across the network. Allied Telesis products cover both large enterprise and MSE spaces; however, more than 60% of Allied Telesis customers are located in Japan. Gartner expects the company to increase investments in the configuration, automation, and AI/ML functionality of Vista Manager EX, its network management platform.

Strengths

- **Cost-Effective:** Allied Telesis delivers one of the most cost-effective enterprise-grade networking solutions on the market.

- **Automation Tools:** VistaManager enables simplified policy enforcement, automated traffic shaping, application identification and prioritization.

- **Focus on Integrated Network Fabric:** Allied Telesis' network portfolio has the simplicity to be attractive to midsize enterprises (MSEs), but the features, functionality and performance options to scale up to large-enterprise network deployments.

Cautions

- **Limited Wi-Fi 6 Portfolio:** Allied Telesis lags behind the industry with only one Wi-Fi 6 (802.11ax) access point model. The rest of its AP portfolio is 802.11ac only.

- **Limited Advanced Network Management Technologies:** VistaManager includes no automatic problem resolution via AI/ML; therefore, it cannot offer problem correlation and remediation or intent-based assurance.

- **Mix of GUI and CLI Configuration Requirements:** Even while using the GUI interface, many configuration commands, such as basic routing protocol configurations, require reverting to the CLI, increasing complexity and the possibility for human error.

Arista Networks

Arista Networks is a Visionary in this Magic Quadrant. It delivers its 7000, 750 and 720XP Series spine-leaf switches in addition to its C-200 Series wireless access points. Its Cognitive Campus Network strategy leverages its CloudVision management applications for wired switches and WLAN components, which started primarily in the data center market. However, Arista continues to penetrate the large-enterprise network space. Its operations are geographically diverse, but its client base is located primarily in North America and tends to be in the finance, high technology and healthcare industries. Arista leverages similar cloud design principles and spine-leaf-based architectures in its campus offerings as in its data center products.

Strengths

- **Advanced AI/ML Capabilities:** Ava, Awake's autonomous security analyst, provides CloudVision with both context for client issues and the ability to proactively respond. Awake Security is the network detection and response (NDR) security division of Arista Networks.

- **Strengthened Commitment to Security:** In 2021, Arista integrated its Awake Security acquisition, which provides networkwide visibility, threat detection and containment to improve its ability to provide a more complete campus security portfolio.

- **New Automated Workflow Functionality:** In April 2021, Arista released its CloudVision Studios to provide the definition and mechanism to proactively address campus network issues with an automated workflow.

Cautions

- **Awake Security Is Expensive for Some Targeted Markets:** The $50,000 to $70,000 pricing for the Awake platform is priced disproportionately higher than similar solutions and will limit penetration into many market segments such as higher education and MSE.

- **Global Reach Challenges:** Arista has limited channel and sales resources in the midmarket, particularly outside of North America and Europe, which inhibits its ability to reach and support smaller customers in those areas.

- **Limited Campus Network Experience:** Although Arista has significant data center experience, it is challenged with penetrating the campus market and is primarily dependent on incumbent Arista users to drive campus growth. This lessens Arista's campus experience, especially in multivendor LAN environments.

Cambium Networks

Cambium Networks is a Niche Player in this Magic Quadrant. The vendor primarily addresses the education, hospitality and MSE markets with its cnPilot and Xirrus lines of wireless access points, and its cnMatrix line of switches. Cambium Networks' operations are geographically diverse outside of China, and Gartner expects the company to continue to invest in feature-rich, cloud-based management and simplicity of deployment within its XMS-Cloud and cnMaestro offerings.

Strengths

- **Solid Foundation in Wireless:** Cambium offers a controllerless and distributed architecture that places application and policy control, locationing, analytics and firewall capability in the APs. Some models have up to five integrated radios for high-density coverage, and APs with multiple software-defined radios provide a migration path to changing Wi-Fi requirements.

- **Enterprise-Level Features:** Despite Cambium's focus on the MSE market, the cnMaestro management platform includes features such as policy-based network segmentation and zero-touch provisioning, which are attractive to the wider enterprise market.

- **Comprehensive IoT Onboarding:** Cambium's architecture supports IoT device fingerprinting via policy-based automation, and the APs with integrated firewall perform traffic filtering. EasyPass provides automated onboarding for IoT devices, as well as employees and guests.

Cautions

- **Limited AIOps Functionality:** Cambium's analytics engine is limited to less complex use cases compared with the more advanced AI functionality of other vendors.

- **Weak Wired Network Portfolio:** Cambium offers a limited selection of campus switches with 802.3bz multigigabit ports, true stacking capabilities, operational redundancy, high-capacity access, and switching capabilities at the core and distribution layers.

- **Limited Market Viability:** Cambium has one of the smallest market footprints of all vendors in this research. While company revenue grew in 2020, revenue from sales of wired and wireless LAN infrastructure accounted for less than 15% of overall company revenue.

Cisco

Cisco is a Leader in this Magic Quadrant. Its Catalyst and Meraki products address most large and MSE use cases. Its operations are geographically diverse, and its clients tend to be enterprises of any size in a wide variety of industry sectors. Cisco has invested heavily in DNA Center (DNA-C), which is an AI-/ML-enabled, on-premises, platform that provides network management for Catalyst wired and wireless hardware. Cisco also continues to invest in the Meraki Dashboard, which is the cloud-based management platform primarily for Meraki devices.

Strengths

- **Vast Wired and Wireless Portfolio:** The breadth and scope of Cisco's wired and wireless hardware and software product ecosystems enable it to address use cases across nearly all scenarios.

- **Strong Channel Ecosystem:** Cisco's global internal sales and partner channel enables it to address and support enterprise presales engineering and procurement requirements, irrespective of location.

- **DNA-Center Management Platform:** Cisco DNA-C enables an integrated network management platform for its Catalyst wired and wireless devices. The inclusion of AI and ML to support network assurance can deliver reduced time to problem resolution versus traditional CLI troubleshooting, and integrates deep visibility into the network, applications and user experiences.

Cautions

- **Software-Defined Access (SD-Access) Complexity:** Gartner clients report concerns with SD-Access, including deployment complexity and general architectural and "brownfield" network environment integration challenges.

- **Confusing and Overlapping Product Lines and Tools:** Catalyst is focused on large enterprises but also includes MSE-focused products. Meraki has many MSE-focused products but can also meet certain large-enterprise requirements. Additionally, Cisco has two separate management products: Cisco's DNA Center and Meraki Dashboard, neither of which is fully integrated across the Catalyst and Meraki product lines.

- **Mandatory Three-Year Catalyst DNA Subscription:** All purchases of Catalyst 9000 switches require a DNA license and subscription for the first three years. However, the ultimate value of DNA licensing remains unproven since the majority of Catalyst purchasers are not yet using DNA Center for either network management or SD-Access networking.

CommScope

CommScope is a Niche Player in this Magic Quadrant. It offers RUCKUS ICX switches and access points to address use cases for MSE ranging to large enterprises. CommScope delivers cloud-based wired and wireless network management capabilities through its RUCKUS SmartZone and RUCKUS Cloud products. Its operations and clients are global, with most clients in the U.S. government, hospitality, healthcare and education markets. Gartner expects CommScope to focus on increasing the capabilities of RUCKUS Cloud and RUCKUS Analytics, which will minimize product reliance on manual CLI-based configurations while expanding its automated and AI-/ML-based problem identification and resolution capabilities.

Strengths

- **Integrated Network Intelligence:** RUCKUS Analytics uses AI and ML to provide end-user-affecting anomaly detection and root cause analysis across the wired and wireless network infrastructure.
- **Ansible Automation Integration:** CommScope provides more than 50 prebuilt Ansible AWX playbooks that enable enterprisewide automation of time-consuming and repetitive tasks.
- **Strong Wired and Wireless Portfolio:** The RUCKUS product line includes multiple Wi-Fi 6 and 802.11ac access points as well as wired switches covering true access, distribution and core use cases with uplinks from 1 to 100 Gbps. Additionally, RUCKUS covers both large enterprise and MSE deployment scenarios across a single unified portfolio.

Cautions

- **Disjointed Problem Resolution in Management Platform:** RUCKUS Analytics does not offer an option for automatic issue resolution on the wired network. Furthermore, remediating identified issues cannot be accomplished directly through the RUCKUS Analytics interface.
- **Lack of Modular Switches:** With no modular chassis product, CommScope cannot adequately address high-density access or high-speed core/distribution use cases in which a common high-speed backplane and redundant management and power supplies are highly desirable.

- **Dynamic Virtual Segmentation Not Yet Available:** CommScope lags behind other enterprise-class vendors due to lack of available VXLAN dynamic segmentation capabilities. While CommScope expects to deliver this architecture before the end of 2021, eventual adopters should use caution when attempting integration into production during the first six to 12 months after release.

Extreme Networks

Extreme Networks is a Leader in this Magic Quadrant. Its universal platform approach for wired switching is delivered to market via its 5420 and 5520 switches, and 300/400 Series wireless access points. Unified network management is provided via ExtremeCloud IQ, which is inclusive of AI-/ML-based issue identification and resolution. Extreme Networks' operations are geographically diversified, and its clients range from MSEs to large enterprises across various sectors. Extreme Networks will continue to invest in its CoPilot AI/ML and automation platform for simplified and centralized configuration, and network management capabilities across its product lines.

Strengths

- **Platform-Agnostic:** ExtremeCloud IQ can be deployed on-premises or in private cloud with all three of the largest public cloud providers, with no functionality changes and unlimited data retention.
- **Advancement of AI/ML Platform:** Extreme Networks' CoPilot platform offers explainable ML/AI recommendations that can be automatically acted on based on deviations from its own baseline environment.
- **Universal Licensing:** Extreme Networks offers poolable and portable licenses across its platforms and portfolio, which means that additional license expenses are not incurred when the same application is moved from one component to another.

Cautions

- **Global Reach Challenges:** Extreme Networks has global reach, but in-country presence in some areas of Asia or Latin America may vary depending on the vendor's go-to-market strategy.
- **Subpar Channel Training:** Customers and prospects report confusion with Extreme Networks' channel and product demonstrations, which may decrease their ability to deploy.

- **Migration Issues:** While Extreme Networks' universal APs and switches are being added to its portfolio, customers continue to be challenged with a limited migration strategy of features from acquired vendors until the integration is complete.

Fortinet

Fortinet is a Visionary in this Magic Quadrant. Fortinet provides tight integration between its FortiAP and FortiSwitch products with its FortiGate security appliance. This enables Fortinet to position network security and network fabric management as the core of its enterprise network market strategy. Its operations are geographically diversified, and its clients range from MSEs to large enterprises across various sectors. Fortinet has recently integrated AI, ML and automation into FortiManager Cloud to offer automated incident identification, network optimization, and remediation. Gartner expects Fortinet to continue to invest heavily in increasing these cloud-based capabilities.

Strengths

- **Pervasive Security Architecture:** Fortinet's go-to-market strategy emphasizes tight integration of pervasive security into all layers of its network architecture.
- **AIOps Capabilities:** FortiAIOps reduces time to identify and resolve operational issues across its security, wired and wireless portfolio through semiautomated network device issue identification and prompted issue remediation.
- **Integrated cloud management:** Fortinet has integrated most of its tools under a unified cloud-hosted interface that unifies network, security and application management functionality.

Cautions

- **Lack of Large Enterprise Experience:** Fortinet still has little exposure outside of security infrastructure in large-enterprise deployments.
- **No Modular Switches:** Fortinet does not offer a chassis-based switch, which is necessary for most high-density access layers and high-speed network core use cases.
- **Overlapping Products, Tools and Licenses:** As Fortinet continues to add more functionality to its network and security management portfolio, it adds another "Forti"-branded product under the FortiCloud umbrella. The result is an expansive and confusing mix of tools and licenses.

H3C

H3C is a Niche Player in this Magic Quadrant. H3C's S Series switches and WA Series wireless access points address network use cases that range from MSE through large enterprises. Its Application-Driven Campus (AD-Campus) cloud-native architecture provides unified wired/wireless management capabilities. H3C's operations and customers are mostly located in China; however, Gartner expects that the company will strategize an expansion into the EMEA market. Gartner also expects H3C to invest in its SeerAnalyzer and Cloudnet platforms.

Strengths

- **AI and ML Integration:** H3C's short-term roadmap is to apply fully integrated artificial intelligence and machine learning into SeerAnalyzer to better align with the requirements of its customer base.
- **Cloud-Native Network Management:** H3C's Cloudnet platform provides cloud-native solutions for enterprises looking to move their campus applications or unify multiple locations, such as branch offices, into the public cloud.
- **Enterprise Experience:** H3C has strong enterprise expertise and a solid portfolio of switches, access points, management and integrations that can address most usage scenarios.

Cautions

- **Limited Market Exposure:** Asia/Pacific still accounted for more than 60% of H3C's campus networking revenue in 2020. Enterprises considering H3C need to verify product and service availability in their geography.
- **Limited Brand Recognition:** H3C marketing is still limited, which has a negative effect on H3C's voice in the market and ability to drive market direction.
- **Lagging Capability and Functionality:** H3C was late to deliver several automated capabilities, including automatic problem resolution.

HPE (Aruba)

HPE (Aruba) is a Leader in this Magic Quadrant. It delivers a portfolio of LAN and WLAN products, including its Aruba CX line of switches, and 500 and 600 Series access points. HPE's Aruba product lines address most network use cases across both large-enterprise and MSE markets. Aruba ESP (Edge Services Platform) offers integrated network security and infrastructure management capabilities through Aruba Central, which is available both on-premises and via cloud, and is inclusive of the Aruba Central AIOPs and analytics technology. The vendor's operations are geographically diverse, and it services clients of all sizes in all major markets. HPE (Aruba) continues to evolve its network automation and AIOps capabilities and will also invest in increasing its enterprise network as a service (NaaS) offerings.

Strengths

- **Comprehensive and Unifying Campus Architecture**: Aruba ESP provides a unified automation and security platform that includes deep AI and ML integration.

- **Integrated Security Features:** The vendor has strong integrated network-security features, which provide policy-based access control and zero-trust capabilities, in addition to network, application and user performance analytics.

- **Wireless Analytics:** HPE (Aruba) has been a leader in its ability to deploy network infrastructure that gathers wireless telemetry data that is used for analytics and resolving customer issues.

Cautions

- **Limited Ability to Reach Some Market Opportunities:** Aruba's sales organization has limited ability to apply Aruba's full network technology portfolio when addressing some complex enterprise opportunities.

- **Incomplete NaaS Offering:** HPE (Aruba)'s consumption-based NaaS offering, GreenLake for Aruba, is still incomplete and confusing to some customers.

- **Differing Cloud and On-Premises Offerings:** Aruba Central and Aruba Central On-Premises have feature differences. Therefore, customers must ensure that the required functionality is available in their preferred deployment model.

Huawei

Huawei is a Visionary in this Magic Quadrant and addresses most MSE and large enterprise network use cases with its CloudEngine S Series switches in addition to its AirEngine wireless APs. Huawei delivers a unified AI-/ML-enabled cloud management platform via its CloudCampus 3.0 solution, which was released in March 2021 and is an upgrade to its iMaster NCE-Campus. While Huawei's operations are globally diverse, the company has virtually no penetration in North America and only limited penetration in some countries such as the United Kingdom and Australia due to ongoing geopolitical issues.

Strengths

- **Innovative Product Strategy:** Huawei's product development and marketing message of "Autonomous Driving Networks for Campuses" is consistent with the overall market's innovation, based on self-healing capabilities striving for advanced automation.
- **Wireless-First Strategy:** Huawei's marketing has added more focus to wireless-first, driven by experience assurance and backed by a comprehensive vision and roadmap based on automated resolution and reporting.
- **Network Automation Capabilities:** iMaster NCE-Campus supports digital twin technology as a management model, allowing mapping physical networks to a digital twin model, which can simulate, test and verify network planning.

Cautions

- **Geopolitical Situation:** The ongoing geopolitical situation currently limits Huawei's exposure in some regions and countries, such as North America, the U.K., and Australia.
- **Management Strategy for MSEs:** On-premises deployments of CloudCampus/iMaster NCE-Campus can be complex and/or costly for MSEs.
- **Nonstandardized IoT Elements:** Huawei's most advanced features in iMaster NCE-Campus require endpoints to use the company's HiLink IoT Protocol. This entails integration with its IoT module or the use of Huawei's open API and SDK, limiting its relevance to organizations standardizing on other endpoint platforms.

Juniper

Juniper is a Leader in this Magic Quadrant. It offers EX Series switches, QFX Series switches and Juniper Mist access points, which address most use cases across large-enterprise and MSE markets. Juniper is focused on integrating the Mist AIOps across its WLAN and wired switching portfolio. Mist AIOps offers management and visibility into the state of the network, application performance, end-user experience metrics and real-time measurement of various targeted SLA compliance metrics. Juniper's operations and clients are globally diverse, and the company continues to invest heavily in integrated AI and ML operations at the core of its campus networking portfolio.

Strengths

- **AI, ML and Automation as a Differentiator:** Juniper invests heavily in the differentiation of its network portfolio through the integration of Juniper Mist Wired Assurance cloud-based AI, ML and automation across its wireless networking, EX and select QFX switch portfolio.

- **Streamlined Network Portfolio:** Juniper doesn't attempt to segment the management, configuration or vertical alignment of its wired and WLAN portfolio into designated MSE or large-enterprise products. This limits product confusion and gives end users more flexibility to apply products that they feel best address their technical requirements.

- **Natural Language AIOps:** Network administrators can troubleshoot common network issues by using natural language queries through Marvis, a virtual network assistant offering that is part of the Juniper Mist Cloud.

Cautions

- **Cloud-Only Management:** The Juniper Mist network management platform is primarily a cloud-based solution. Those looking for a fully on-premises solution are relegated to the Junos Space Network Management Platform, which is functionally lagging versus the Juniper Mist platform.

- **Culture in Transition:** Mist's technology-forward culture continues to be integrated into the larger Juniper culture. Such integrations can be disruptive to both internal business units and to the end user. Both Juniper and its customers must monitor and manage this transition carefully.

- **Mist Technology Integration:** Juniper's pace of developing and releasing updated features at least twice per month can increase the pace of customer updates. Many companies may find it difficult to keep track of stable versions of code, new features, functionality and bugs.

TP-Link

TP-Link is a Niche Player in this Magic Quadrant. Its Omada WLAN and T Series wired network products are focused on MSE and prosumer use cases. While the company's market reach is global, its clients are primarily in education, hospitality and retail sectors. Gartner believes that TP-Link will continue to invest in the ease-of-configuration and operations requirements of MSE customers by continuing to develop its GUI web-based configuration and cloud management capabilities.

Strengths

- **Scalable and Cost-Effective Network Management Solution:** The Omada cloud network management solution is bundled with its access network hardware at no charge, providing unified monitoring for an unlimited number of TP-Link APs, campus switch and security gateway products.

- **Flexible Management Architecture:** In addition to the Omada cloud-based controller, TP-Link has a free, VM-based version of Omada (that manages up to 1,500 network devices) and a hardware WLAN controller that can be remotely configured with a mobile app. Omada cloud can act as an intermediate agent to the on-premises WLAN controller, allowing administrators access from anywhere.

- **Aggressive Pricing:** TP-Link's ASPs for switches and WLAN APs are among the most aggressive in the industry. This aligns with the needs of MSEs or, more broadly, with those of organizations with basic connectivity needs looking for a cost-effective solution.

Cautions

- **Lack of Strategic Focus on Innovation:** TP-Link provides simple functionality to optimize network performance and to identify network anomalies, but AI-/ML-driven analytics and automation capabilities are lagging compared with other vendors profiled in this research.

- **No Indoor Location Services:** TP-Link has not yet integrated Bluetooth Low Energy (BLE) support in its WLAN APs and has no indoor location services offering.

- **Limited Product Differentiation:** Omada provides some differentiation, but TP-Link's software capabilities are limited, and there is barely any innovation with hardware access layer products today in the market, given its maturity.

Vendors Added and Dropped

We review and adjust our inclusion criteria for Magic Quadrants as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant may change over time. A vendor's appearance in a Magic Quadrant 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

No vendors were added to this Magic Quadrant.

Dropped

The following vendors were dropped:

- **D-Link:** Gartner was unable to validate inclusion criteria for this year's Magic Quadrant.
- **Dell:** Gartner was unable to validate inclusion criteria for this year's Magic Quadrant.
- **Rohde & Schwarz (LANCOM Systems):** Rohde and Schwarz did not meet the revenue criterion for this year's Magic Quadrant.
- **Ruijie Networks:** Ruijie Networks did not meet the revenue criterion for this year's Magic Quadrant.
- **Ubiquiti Networks:** Gartner was unable to validate inclusion criteria for this year's Magic Quadrant.

Inclusion and Exclusion Criteria

Gartner clients utilize the Magic Quadrant and Critical Capabilities research to identify and then analyze the most relevant network vendors' business strategy and vision, and products in a market. Gartner uses by default an upper limit of 15 vendors to support the identification of the most relevant providers in a market. On some specific occasions, the upper limit may be extended by Methodologies where the intended research value to our clients might otherwise be diminished. The inclusion criteria represent the specific attributes that analysts believe are necessary for inclusion in this research.

To qualify for inclusion, vendors need to:

- Demonstrate relevance to Gartner clients in the enterprise access layer market by manufacturing switching and WLAN hardware to address enterprise access layer networking requirements outlined in the Market Definition/Description section.
- Demonstrate relevance to Gartner clients in the enterprise access layer market by providing two or more network service applications as outlined in the Market Definition/Description section.
- Manufacture and deliver enterprise networking products covering at least the network access layer (e.g., core, distribution and access, network layers) for general availability as of 15 April 2021. All components must be publicly available for purchase, exist in inventory and be available for shipping and included on the vendor's publicly published price list. Products shipping after this date will only have an influence on the Completeness of Vision axis.
- Have at least 100 enterprise customers that have deployed products at the network access layer in enterprise production environments as of 30 April 2021.
- Demonstrate production enterprise customer adoption with a minimum of five reference customers having deployed the vendor's products at the enterprise access layer network, inclusive of more than 200 Wi-Fi access points.
- Provide production enterprise reference customers for at least four of the five geographic regions.
- Have no more than 55% of revenue generated in any one country in a single region.

Note that analysts may need to update the inclusion criteria as they progress through the research process. You will be explicitly notified of the change(s) should they need to happen.

Evaluation Criteria

Ability to Execute

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	High
Customer Experience	Medium
Operations	Medium

Source: Gartner (November 2021)

Completeness of Vision

Table 2: Completeness of Vision Evaluation Criteria

Evaluation Criteria ↓	*Weighting* ↓
Market Understanding	High
Marketing Strategy	High
Sales Strategy	Low
Offering (Product) Strategy	High
Business Model	Low
Vertical/Industry Strategy	Medium
Innovation	High
Geographic Strategy	Medium

Source: Gartner (November 2021)

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 maintain strong relationships with their channels and customers, and have no obvious gaps in their portfolios.

Challengers

A vendor in the Challengers quadrant demonstrates sustained execution in the marketplace. It will have clear and long-term viability in the market, but it 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 or to serve a broad, global customer base.

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. A Visionary will have innovated in one or more of the key areas of access layer technologies within the enterprise (for example, security, management or operational efficiency). The ability to apply differentiating functionality across the entire access layer will affect its position.

Niche Players

A vendor in the Niche Players quadrant demonstrates a near-complete product offering. However, it may not be able to control development or provide differentiating functionality because it relies on a strategic partner to offer part of the solution, whether it is a hardware component or a network application. Niche Players may also lack strong go-to-market capabilities that would enhance 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

Gartner’s perspective of the enterprise wired and wireless Ethernet infrastructure marketplace emphasizes the continued and accelerating shift from merely providing foundational network connectivity to technologies that also include application performance, end-user experience and the overall support of business requirements across the entire network fabric. This market view is based on the preceding 12-month time period ending April 2021.

Gartner's research indicates that investments by companies in enterprise Ethernet networking technology caused the market to grow by 17.9% year over year for the period ending 2Q21 (see Market Share: Enterprise Network Equipment by Market Segment, Worldwide, 2Q21). Additionally, end-user investments in enterprise wireless LAN technologies caused the market to grow at 21.6% during the same period. Gartner forecasts that global campus network revenue will grow at approximately 3% compound annual growth rate (CAGR) through 2025, while wireless LAN access points will grow at approximately 7% CAGR. The biggest pressure on enterprise networking growth continues to be the global COVID-19 pandemic, supply chain disruptions due to microchip shortages and labor shortages. Additionally, emergent network technologies such as Wi-Fi 6E and policy-based networking, which is inclusive of dynamic segmentation technologies, will further delay planned purchases and network projects.

Gartner has observed significant shifts in spending from campus networking projects to projects necessary to support the networking requirements of remote workers. To this end, it is expected that up to 80% of all employees will maintain hybrid work capabilities after the COVID-19 pandemic (see Forecast Analysis: Remote and Hybrid Workers, Worldwide). This trend will require enterprises to deploy a leaner, yet technically capable, campus network to support traditional and remote paradigms. They will need to deliver secure and consistent access to bandwidth-intensive applications such as video conferencing across on-campus, remote and cloud-based network infrastructures.

The reliance of diverse suites of technologies to support digital business has placed significant emphasis on understanding application performance, user experience and security postures across the entire network fabric. To this end, a comprehensive suite of cloud-based and on-premises management tools is now a compulsory part of enterprise network vendor portfolios. These tools give the enterprise networking team deep visibility up to Layer 7, which is where applications, business-relevant data and end users exist. These tools enable a unified view of relevant data derived from various points of the interconnected infrastructure, which supports reduced time for troubleshooting. To facilitate greater operational agility, network infrastructure availability and reduced costs, it is common for vendors to integrate AIOps to further reduce the time to identify and resolve issues. These intelligent features also enable quicker and shorter device, end-user and application provisioning across the network. Integration of these tools becomes critical as the ever-expanding footprint of the enterprise network requires supporting access to data from anywhere, on any device, at any time.

Gartner

Disruptive technologies that focus on application performance and end-user experience drive the majority of innovation in the overall enterprise networking market. But core connectivity technologies are also driving network refresh projects. The most visible of the connection-oriented technologies is Wi-Fi 6 (802.11ax), which is soon to be accompanied by Wi-Fi 6E, which operates in the 6GHz spectrum. However, the majority of contemporary end-user devices such as laptops, tablets and smartphones are still limited to 802.11ac, with 802.11ax end-user devices only becoming widely available within the last 12 months.

Therefore, while enterprise end users may deploy Wi-Fi 6 or eventually Wi-Fi 6E access points as a future-proofing strategy, the technology will have minimal impact across the enterprise for at least 36 months. As a result, it is Gartner's position that enterprises that have recently deployed 802.11ac access points have little reason to upgrade to Wi-Fi 6E at this time. This position is further reinforced for enterprises that no longer need to support the increased client density and bandwidth capabilities of Wi-Fi 6E in their branches and campus locations due to increased numbers of hybrid workers.

What Has Changed?

Microchip Shortages

Microchip shortages are having an uneven but increasing impact on network hardware lead times across all enterprise network market segments. Recent Gartner inquiries on networking hardware purchases have indicated that lead times vary widely from 30 days to more than 180 days for orders placed in October 2021. I&O leaders in charge of networking must factor in the costly effect of extended delivery times on network projects. Organizations are mitigating these long lead times by anticipating disruptions and ordering critical network equipment sooner than required or temporarily pushing noncritical projects out over the short term and midterm.

Labor Shortages

Global labor shortages (see Supply Chain Brief: U.S. Review of Supply Chains Magnifies Massive Talent Shortage) are also exacerbating supply chain disruptions due to the microchip shortages while also reducing organizational capabilities for supporting existing networks or deploying new network equipment. The knowledge worker segment has been among the most volatile, while also presenting one of the highest levels of open positions. I&O leaders in charge of networks can mitigate this trend by deploying enterprise networks that are simpler to deploy, maintain and manage. Enterprises are adopting on-premises or cloud-based management platforms to reduce reliance on complex configurations and manual command line interfaces, thus supporting higher levels of enterprise networking capabilities with less reliance on specialized or expert-level certifications. Similarly, AI and ML tools reduce the number of low-level trouble tickets, while automation tools reduce the No. 1 cause of network outages — configuration errors — while also reducing the time to deploy new network equipment.

COVID-19 Pandemic

The global COVID-19 delta variant has either slowed or reversed enterprise plans to repatriate workforces back to the traditional office environment. To support workforce disaggregation, network vendors have solutions that directly support enterprise-grade connectivity for remote users. Such solutions not only extend the enterprise network fabric to any location with an internet connection, but also support the ability to deliver remote security and end-user application experience management.

Organizations recognize that the pandemic presents only a temporary operational state, so they are scaling their enterprise network projects appropriately to support the eventual return to the office of up to two-thirds of the workforce. As such, WLAN and wired LAN products are still required to support the permanent reliance on high-bandwidth, real-time applications such as HD videoconferencing and off-premises cloud-based SaaS applications. Additionally, enterprises are refreshing older WLANs (e.g., 802.11n) to Wi-Fi 6 access points as a future-proofing measure. However, enterprises that have recently deployed 802.11ac access points have little reason to immediately upgrade to Wi-Fi 6.

This point is reinforced with a projected 48% of the workforce continuing (see Remote Work After COVID-19) to work remotely, thus reducing the total density of wireless clients that must be supported in traditional offices. Furthermore, operational uncertainty driven by a prolonged COVID-19 pandemic is forcing some enterprises to postpone large, centralized capital network projects in lieu of workforce fluidity. This enables more flexibility to invest in technologies that can readily address unforeseen mid- and long-term organizational requirements

Focus on Business Outcomes

The primary business outcome of enterprise networking is no longer simply delivering connectivity. Business outcomes are now measured in the enterprise network's ability to successfully and securely support applications, diverse end-user experiences, and quickly changing operational requirements. The traditional delivery of these services has been focused on carpeted and branch offices, but it is now necessary to provide these services to remote locations of various sizes and functionality, as well as across diverse methods of WAN connectivity.

Market Overview

The Enterprise Wired and Wireless LAN Infrastructure market is now composed of vendors not only delivering wired and wireless Ethernet networking hardware, but also tightly integrating network management software that resides both on-premises or in the cloud. This combination of network hardware and powerful software is integral for addressing organizational mission agility, pervasive security and the increased levels of performance required by end users across all categories of connected applications and devices.

These integrated software tools speed time to completing enterprise network deployments, reduce time to identify and resolve network and application issues, and deliver pervasive automation tools which reduce network administrator workloads.

Additionally, core integration of AI and ML are integral to correlating the flood of generated data, thereby presenting key data points necessary to optimize the network in support of digital business requirements. This technology is also becoming a valuable source of business relevant data that is useful to I&O and overall business leadership.

The enterprise networking market includes vendors with the following capabilities:

- The vendor develops and manufactures its own enterprise-grade wired and wireless infrastructure components, network applications, and services.
- The vendor develops and manufactures its own comprehensive portfolio of wired and/or wireless components, but also uses a strategic partner to fill gaps in its portfolio, supporting its ability to deliver an end-to-end, enterprise-grade network solution.

The market defined above is inclusive of vendors providing and supporting enterprise wired and wireless LAN infrastructure globally in at least four of the five main geographies identified by Gartner:

- Asia/Pacific
- Latin America
- Middle East and North Africa
- Europe
- North America

How Buyers Shape Their Buying Decisions

Incumbency

Organizations tend to stay with their current enterprise network vendor if it offers a technology portfolio that is “good enough” to fit its needs and functions within reasonable expectations. Since the network market is relatively conservative and risk-averse, incumbent relationships often survive even when technology alignment is suboptimal due to high vendor switching costs.

Traditional Network Technology Capabilities

Enterprise networking has been shaped by more than 30 years of primarily delivering connectivity and resiliency at Layer 2 and Layer 3 of the OSI network model. As a result, buyers expect robust traditional Layer 2 switching features, appropriate power over Ethernet to support VoIP and AP hardware, quality of service (QoS), and sufficient uplink speeds to support various traffic requirements. At the wired access layer of the network, customers expect the necessary Wi-Fi power, performance and throughput to support the necessary client connection densities and bandwidth requirements. Finally, the network core and distribution layers must deliver the redundancy and high-speed routing and switching capacity to support dramatically increased north-south traffic, much of which is destined for the cloud and other off-network destinations.

Perpetual and Subscription Licensing

Network hardware continues to be relatively commoditized, and true differentiation across vendors is reliant on the capabilities of network software features and functionality. However, as network vendors adopt the stance of software vendors, there are diminishing options for traditional perpetual licensing. Vendors realize new revenue streams by shifting to subscription-based licensing, but the shift is often confusing and continues to be a source of frustration for I&O leaders. Subscription licensing may make sense for some organizations. However, a preponderance of Gartner clients continues to express a preference for having a choice of licensing options instead of being forced into licensing that is often inclusive of features that are not required.

AI, ML, Automation and Management Suites

Enterprise network vendors now offer tools utilizing various degrees of artificial intelligence, machine learning and automation to reduce network administration and operational workloads. These tools are unified for management and security at all layers of the network. However, adoption of these essential toolsets is slow. Initially, there were concerns about the maturity of the tools. As tools mature and there is less concern about the capabilities to operate in the production network environment, vendors still struggle to clearly articulate the value proposition of these tools and solutions to the enterprise.

Currently, there are varying degrees of self-driving capabilities enabled by machine learning. Artificial intelligence will drive more business-relevant network outcomes as routine issues are quickly and automatically resolved. Additionally, configurations are more tightly aligned to the original strategic or tactical business intent. Therefore, vendors that successfully deliver products with meaningful automation of network functions enable network teams to meet SLAs for increased overall application performance and user satisfaction. Going forward, organizations must invest in solutions that will increase the capabilities of the enterprise network to support all levels of the business. However, enterprises must thoroughly test and verify that a vendor’s stated capabilities meet or exceed AI, ML and automation hype.

How Providers Package, Market and Deliver

Buyers generally source their wired/wireless LAN infrastructure through an authorized vendor channel partner, with relatively few purchases occurring directly from the network vendor. Hardware expenditures are usually a one-time cost, which is inclusive of a firmware end-user licensing agreement. These initial costs include updates to resolve certain firmware bugs that adversely affect the use of the hardware, or security vulnerabilities that would expose the end user to significant damage if left unpatched. Otherwise, future operating system updates, feature upgrades or security patches are a function of a firmware maintenance contract that is purchased separately, either at the time of purchase or at a future date. Vendors charge for hardware and software licenses either as a perpetual license or as a subscription license but, as mentioned previously, the market is trending away from perpetual licensing.

Network management platforms have become ubiquitous, so access usually requires separate management licensing with various functionality assigned to higher levels. However, some vendors offer enterprise networking solutions that are 100% reliant on the management platform for all functionalities. In such cases, the network management platform is included and various security and/or feature license levels are offered.

Evidence

This research was informed by more than 1,500 client interactions in enterprise wired and wireless networking technologies 2020-2021, data from vendor briefings, vendor surveys, vendor demos, Peer Insights, practitioner interviews and previously published Gartner research.

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.

Document Revision History

Magic Quadrant for Wired and Wireless LAN Access Infrastructure - 4 November 2020

Magic Quadrant for Wired and Wireless LAN Access Infrastructure - 24 September 2019

Magic Quadrant for the Wired and Wireless LAN Access Infrastructure - 11 July 2018

Magic Quadrant for the Wired and Wireless LAN Access Infrastructure - 17 October 2017

Magic Quadrant for the Wired and Wireless LAN Access Infrastructure - 30 August 2016

Magic Quadrant for the Wired and Wireless LAN Access Infrastructure - 1 September 2015

Magic Quadrant for the Wired and Wireless LAN Access Infrastructure - 26 June 2014

Magic Quadrant for the Wired and Wireless LAN Access Infrastructure - 3 September 2013

Magic Quadrant for the Wired and Wireless LAN Access Infrastructure - 13 June 2012

Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

How Markets and Vendors Are Evaluated in Gartner Magic Quadrants

The 6 Principles of Successful Network Segmentation Strategies

2020 Strategic Roadmap for Enterprise Networking

Optimize Costs by Extending the Life Cycle of Campus and Branch Office Networking Equipment

Segmentation or Isolation: Implementing Best Practices for Connecting 'All' Devices

Best Practices for Implementing Wireless Network Guest Access

Navigating Emerging Network-as-a-Service Promises and Challenges

Three Ways to Improve Network Automation

How Do I Get IoT Under Control?

Next-Gen Campus Connectivity Must Start by Defining the End-User Experience

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	High
Customer Experience	Medium
Operations	Medium

Source: Gartner (November 2021)

Table 2: Completeness of Vision Evaluation Criteria

Evaluation Criteria ↓	*Weighting* ↓
Market Understanding	High
Marketing Strategy	High
Sales Strategy	Low
Offering (Product) Strategy	High
Business Model	Low
Vertical/Industry Strategy	Medium
Innovation	High
Geographic Strategy	Medium

Source: Gartner (November 2021)