Magic Quadrant for Data Center Network Infrastructure

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VIEW SUMMARY

The requirements for data center networking equipment have evolved rapidly, with emerging technologies increasingly focused on supporting more automation and simplified operations within a virtualized data center. This new Magic Quadrant focuses on how vendors are meeting the emerging requirements.

Market Definition/Description

Requirements for data center networking equipment have evolved rapidly during the past four years after a period of architectural stability that lasted at least 15 years. While speed, density and scale increased during that period, the underlying, oversubscribed three-tier hierarchical approach — using end-of-row switches, an aggregation layer and intelligent layer three-core switching — was largely unchanged. Also during this period, common chassis switches were used in the data center, core campus and workgroup closet. The data center network market has been transformed with new architectures, new technologies and vendors specifically targeting solutions to address the changing size and density of the data center, shifts in traffic patterns, and the increasing requirement to simplify network operations.

What's Changed?

First, the size and density of data centers are changing, with three macrolevel trends driving both expansion and contraction of data centers:

1. Server and data center consolidation. IT organizations continue to centralize compute resources and reduce the number of physical data centers resulting in fewer, but larger corporate data centers.
2. Increasing compute density using multicore, multisocket servers combined with virtualization are reducing the physical footprint required. Workloads that used to take multiple racks of servers are now being delivered within a portion of a single rack.
3. The migration of applications toward external cloud services also reduces the space requirements within the corporate data center.

Second, traffic patterns are shifting within modern data centers, from one where the north-south traffic (or that from the server through the core out to users) was the predominant traffic flow to one where east-west traffic (between applications) now predominates. This has been driven by distributed and tiered application architectures.

Third, the desire for more service-based IT offerings, driven by increasingly real-time business requirements, has put a spotlight on manual network operations procedures. Automated application provisioning allows applications to be rapidly deployed, but the "human middleware" of network operations can delay deployment for days or weeks.

What Is Required in New Data Center Network Solutions?

These trends all have major implications for data center networking solutions. The increasing density (regardless of whether a data center is expanding or contracting) drives the need for higher-speed interfaces. New server connections are now mainly 10 Gigabit Ethernet (GbE), with uplinks from top of rack (ToR) or blade switches quickly migrating to 40 GbE. The use of virtualization drives the first level of aggregation into the virtual switch, which drives higher utilization on these faster links, eliminating the need for physical aggregation switches. The higher density and virtual switch aggregation means that ToR and blade switches are a better fit, rather than the former end-of-row solution. Another related capability is the ability to scale down as well as up, which requires cost-effective, rightsized data center networks and alternative form factors.

Applications are now more distributed, not physically tied to specific server hardware or within a single rack, and are more elastic in their deployment as they utilize compute and storage resources in the data center. With no physical dependency for network connections, it is more difficult to specify network requirements, which is the leading driver toward integrating virtual input/output (I/O) and storage gateway capabilities into the ToR or blade switch.

The increasing requirement to efficiently deal with east-west traffic has resulted in new approaches, including higher-performance, low-latency switches, the emergence of one- or two-tier architectures, flexible fabric architectures using technologies such as Transparent Interconnection of Lots of Links (TRILL) and Shortest Path Bridging (SPB), and more intelligence and traffic forwarding at the server edge of the data center network (through the use of virtual chassis or chassis clustering solutions). All these approaches improve server-to-server performance and, in some cases, move the network toward providing a homogeneous set of capabilities for all connected compute resources. For data center networks, it is imperative to

EVALUATION CRITERIA DEFINITIONS

Ability to Execute

Product/Service: Core goods and services offered by the vendor that compete in/serve 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 (Business Unit, Financial, Strategy, Organization): 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 and Track 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 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

focus on functional requirements, as opposed to debating emerging standards. Key criteria to consider include:

Simply and seamlessly add bandwidth via links and nodes.

Instantiate services (Layer 2, Layer 3 and above) at any point within the network.

Have consistent and homogeneous capabilities across the fabric.

Implement the fabric in such a way as to simplify ongoing management and operations.

Support performance that can cost-effectively scale down as well as up.

Finally, the move to simplifying network operations is also driving innovations, including single-tier data center switching solutions, autoconfiguring network fabrics and increasing integration of network operations with application provisioning tools. Automation in the data center has had a major impact on data center operations and expectations are that the network will become part of a more coordinated virtual architecture. More recently, we have seen rapidly increasing interest in exploiting the broad network virtualization capabilities and open interfaces delivered with software-defined networking (SDN) solutions. Moving away from 40-year-old network operations interfaces is arguably the biggest transformational benefit when looking to modernize a data center network architecture.

Return to Top

Magic Quadrant

Figure 1. Magic Quadrant for Data Center Network Infrastructure

Source: Gartner (February 2013)

Return to Top

Vendor Strengths and Cautions

Alcatel-Lucent

Alcatel-Lucent is a strong player in service provider networking, voice technologies, applications and services, and it continues to expand its data network portfolio and reach. The introduction of its enterprise data center switching mesh extends its Application Fluent Network strategy into the data center to address customer elasticity, performance and oversubscription requirements. Alcatel-Lucent has made a concerted effort to extend itself geographically. The vendor should be on the shortlist for midsize enterprise and large European infrastructure decisions, with consideration for other geographical areas as well.

Strengths

Alcatel-Lucent augmented its Application Fluent Network strategy by focusing on performance, scalability and elasticity, with the introduction of wire rate 10 GbE and 40 GbE, virtual chassis and data center bridging to the enterprise data center mesh architecture. The vendor's WAN and optical networking product offerings also give Alcatel-Lucent the tools to address data-center-to-data-center switching requirements.

By focusing on switching as a core competency, Alcatel-Lucent has developed an ecosystem to address the additional components needed for an end-to-end solution. This means it is not overextending its resources into computing, storage or server virtualization but adding

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.

value to its partnerships where it does not provide the core competency.

The Alcatel-Lucent architectural vision in the data center also extends to network applications, such as Virtual Network Profile (vNP), which not only supports virtualized workloads, but also expands to understand the needs of the application, including provisioning requirements, access control rights and expected quality of service.

Cautions

Compared with a number of other vendors in this Magic Quadrant, Alcatel-Lucent data center revenue is relatively small (although growing quickly) and recent corporate restructuring efforts raise the issue of which technologies the vendor will continue to invest in.

The vendor continues to have solid capabilities, but limited marketing communications have reduced the company's visibility. This means that it is not considered for all potential opportunities in its target markets and geographies.

While Alcatel-Lucent has expanded its resources and support to target geographies such as North America, enterprises should vet local support both for sales and technical services as part of the evaluation process.

Return to Top

Arista Networks

Arista Networks is the best example of a vendor targeting the emerging needs of high-performance data centers and illustrates strong evidence that the data center network market is a separate independent market. The vendor has focused on building highly efficient, easy-to-manage network technologies that have clearly improved the price/performance expectations in the data center. Its standards-based solutions and growing ecosystem allow Arista Networks to play a role in an increasing range of deployments, and it will be key for the vendor to continue to move from its strengths in the high-performance computing, high-end cloud and financial services markets into the mainstream market. Expansion into the Asia/Pacific region helps the vendor address the needs of global organizations. Arista Networks should be considered for data centers in which there is a need to optimize performance and latency.

Strengths

A dedicated focus on high-performance data center networking has allowed Arista Networks to deliver solutions for the key challenges of performance and latency.

The vendor has leveraged merchant silicon combined with strong engineering to drive new technologies and performance levels into the market.

Recent innovations, such as Arista Networks' VXLAN gateway, bring key functionality and a growing ecosystem into the SDN marketplace, and the vendor's low-latency 7124FX Application Switch brings unique custom application features to the market.

Cautions

While emerging as a key data center vendor, Arista Networks is still very targeted in its approach to the market and may not be ideally suited to all data center requirements.

While the vendor has a growing global sales and support presence in EMEA and the Asia/Pacific region, its business is largely concentrated in North America. Enterprises should ensure the appropriate levels of local support when looking at international deployments.

Return to Top

Avaya

Avaya continues to make investments in its data networking portfolio and the launch of Virtual Enterprise Network Architecture (VENA) in 2011 allowed the vendor to compete for next-generation data centers with a highly robust architecture. The fabric solutions in VENA address not only data center requirements, but also extend to the campus as well. Although we currently see a strong corporate commitment to data networking, the future success of Avaya is not dependent on data networking, which raises long-term concerns in light of the vendor's mixed results and waning influence in the data networking market. Enterprises looking to expand existing Avaya data center solutions or considering an end-to-end unified communications and collaboration (UCC) platform that includes the enterprise network should consider Avaya.

Strengths

The vendor has a large installed base of data center network solutions, with a strong history of providing highly resilient data center network architectures.

Avaya has made investments in VENA and has worked to leverage its UCC sales organization and customer base to expand its footprint in North America.

VENA's architecture extends beyond the data center to the campus network, providing a seamless end-to-end enterprise solution.

Cautions

Declining market share has meant that Avaya's influence in data networking has waned and that Avaya does not get an opportunity to compete for many data center networking opportunities.

Increasingly limited financial resources, distribution and market support continue to put pressure on Avaya's abilities in this market.

Return to Top

Brocade

Brocade has depth of expertise across all data center networking technologies. The VDX 6700 family of switches and VDX 8770 chassis switches deploying the vendor's Virtual Cluster Switching (VCS) architecture provides a solid data center solution, including native integration of SAN

connectivity. Brocade has been growing at roughly market rates for the past year, but historically limited marketing means that its brand does not get the exposure that could assist in it being added to more shortlists. The vendor should be considered for the shortlists of all data center network infrastructures and large cloud providers.

Strengths

The VCS solution is a well-thought-out Ethernet fabric offering for virtualized data centers. The product family provides 1 GbE, 10 GbE and 40 GbE capabilities, with future 100 GbE support. Key VCS features include simplified and largely automated operations, such as self-configuring links and switches and fabric support for virtual machine (VM) mobility.

The "pay as you grow" model supported in the VDX family allows customers to pay for only the required capacity, either through port-based licensing or a monthly subscription, which provides additional differentiation and enhances Brocade's data center vision.

A scale-out architecture with entry-level pricing allows Brocade to appropriately rightsize data center solutions for a wide range of use cases.

Cautions

Coverage remains a challenge for Brocade, especially in the Asia/Pacific region, as it ramps up its direct sales force as the predominant approach for data center opportunities.

While the VCS fabric is a strong architectural solution, Brocade was initially slow in providing a broad range of VDX platforms, which limited its initial opportunities. The portfolio has been recently extended to include a range of chassis and fixed-format switches.

Clients need to ensure that Brocade is able to support new data center requirements and capabilities in their geographies, because Brocade's revenue is skewed toward the U.S. market, although it does have reference accounts in all regions.

Return to Top

Cisco

Cisco has the largest collection of data center networking products, ranging from large chassis core, aggregation, virtual switches, access port aggregators (Fabric Extender [FEX]) and custom low-latency solutions, combined with a range of network scalability features (such as FabricPath, Virtual PortChannel [vPC] and Overlay Transport Virtualization [OTV]). However, Cisco has not been able to knit this vast array of capabilities into a cohesive strategic portfolio, and, in many cases, leaves its customers confused about the appropriate solution required, especially when it involves a migration from an existing Cisco Catalyst solution. We are also concerned with Cisco's reliance on its FEX architecture as its preferred data center offering. While this does reduce management complexity, it comes at the expense of centralizing all traffic flows and reduces performance for the increasing amount of east-west traffic in modern data centers. Cisco should be considered for all data center network opportunities globally.

Strengths

The vendor has the widest selection of data center products and technologies that cover most, if not all, requirements in the data center.

Innovations such as Virtual Device Contexts (VDCs) and the use of the Nexus 5500 Series as core switches help reduce footprint and cost in midsize data centers.

Cisco has a huge installed base of largely loyal customers, as well as a strong channel that clearly helps the vendor migrate to its newer Nexus technologies and architectures.

Cautions

Although still the dominant player (with 71% revenue share and 58% port share), Cisco lost 8% revenue market share during 2011, with declining year-over-year revenue. While revenue growth appears to have returned in 2012, market share declines and input from client inquiries illustrate the increasing competitiveness in this market, and Cisco's challenges in delivering compelling, cost-effective solutions.

Software licensing costs can often result in additional costs that further challenge Cisco's ability to compete with alternative approaches.

Clients need to test their configurations and software revisions to address reported software reliability concerns in some complex environments with the Nexus 7000 and Nexus 1000V families. Organizations encountering problems in these areas should work closely with Cisco Technical Assistance Center (TAC) to ensure they have deployed and upgraded to appropriate software releases and configurations.

Cisco has still not adequately addressed upper-layer services within the Nexus portfolio, and has also been slow in delivering technologies such as 40 GbE for ToR switches in its mainstream Nexus 5500 family.

Return to Top

Dell

Dell's acquisition of Force10 Networks has extended the depth of Dell's expertise across all data center networking technologies through its internal server capabilities, leveraging its switching acquisition and utilizing storage relationships that can be deployed as a "data center in a chassis" or built as a fabric. Dell quickly integrated Force10 switching into its PowerEdge M-series blade server chassis and has clearly invested in building its networking presence. Dell should be considered for the shortlists of enterprise data centers, especially if PowerEdge servers are being considered or custom implementations are needed for private cloud opportunities.

Strengths

The Dell Force10 offering has a broad portfolio and strong road map for clients that are looking for consistent performance, and energy-efficient and price competitive components with the ability to be deployed in private or public cloud solutions.

Large enterprises and cloud infrastructure providers can expect a strong direct model with

Dell; its Data Center Solutions group targets high-end customers and offers custom design and manufacturing capabilities as an end-to-end data center solutions provider.

Dell has a strong focus on network automation, and that allow enterprises to simplify and integrate network operations into broader data center management processes.

Customer support remains a strength with Dell references.

Cautions

Dell needs to continue to broaden its portfolio to deliver a more complete convergence of data and storage networking (especially for ToR switches), and to better articulate and further develop a more comprehensive SDN strategy.

Dell needs to extend its marketing and awareness of the new Active System architecture, and to better leverage its strengths in servers and storage, to take advantage of its increasing capabilities in this market.

As a smaller and relatively new player in data center networks, Dell lacks an enterprise network installed base that is often leveraged by market leaders.

Return to Top

Enterasys Networks

Enterasys Networks has introduced OneFabric, an architecture that spans from the data center to the edge of the network, with management and policy enforcement across the entire network infrastructure. The vendor has a strong technical solution and an industry-leading lifetime warranty. While it continues to invest in marketing, Enterasys Networks remains a smaller vendor in the market and clearly needs to articulate its differentiation to expand its presence in the enterprise. Enterasys should be considered for enterprise data centers in North America, Latin America and Western Europe.

Strengths

The data center to network edge management offered by Data Center Manager (DCM) and the policy enforcement capabilities of OneFabric Control Center allow a single pane of glass for midsize enterprises for server and storage virtualization.

The S-Series chassis switch and 7100-Series ToR, combined with virtual switch bonding (VSB), provide scalability that can be leveraged for enterprises that will grow from 100 to more than 2,000 servers.

Enterasys' vision includes APIs integrated into DCM, and its CoreFlow2 technology in its data center switches allows for future SDN expansion and the ability to leverage application-level visibility.

Cautions

The vendor continues to have a small market footprint, with 1% to 2% market share, and it is somewhat geographically limited to North America, Latin America and Western Europe coverage.

While Enterasys continues to invest in marketing and has added more than 100 partners, Gartner does not see it represented outside of its core markets.

Return to Top

Extreme Networks

Extreme Networks' Open Fabric Data Center solution uses its BlackDiamond X8 and Summit switches for its data center architecture, and leverages ExtremeXOS software and industry standards for management and application integration. The BlackDiamond and Summit product lines focus on high-performance, low-latency and scalable switching solutions, which are solid components of the vendor's data center architecture, but Extreme Networks is still one of the smaller vendors in the market. The vendor should be considered in North America and Japan, or in target markets such as higher education.

Strengths

The ability for the Extreme BlackDiamond platform to deliver 1 GbE/10 GbE/40 GbE functionality and a road map to support 100 GbE in the data center have the vendor poised to address enterprises in the most demanding environments.

In conjunction with ExtremeXOS, the Ridgeline element manager and XNV provide orchestration as well as provisioning of virtualization capabilities across the fabric, which allow for policy enforcement differentiation in the data center.

Extreme Networks offers dynamic power management with its fabric switches through its Universal Port Manager, which optimizes power usage.

Cautions

In 2012, Extreme Networks continued to struggle to demonstrate a presence in the data center and was not seen on shortlists outside of its limited target market. It is geographically limited to North America and Japan.

The vendor has solid data center capabilities, but limited marketing communications, thus limiting company visibility and differentiated messaging. This severely limits its opportunities and its ability to expand both product offerings and investments in new target markets.

Return to Top

HP

HP continues to enhance its data center networking capabilities, especially focusing on network management and automation. It leads the established networking vendors with its strong investments in and delivery of SDN and OpenFlow solutions, and its Virtual Application Networks solution can streamline network configuration from the data center to the desktop. HP's data

center network revenue jumped 60% during 2011 (to $750 million), gaining nearly 4% of revenue market share, and we observed continued momentum during 2012. HP should be considered for the shortlists for all data center networking requirements, especially for organizations looking to simplify network operations and take advantage of SDN as part of their data center network evolution.

Strengths

- The vendor offers a broad set of data center network technologies, running from server access to highly scalable core chassis solutions.
- HP Networking has demonstrated leadership and a major commitment to integrating SDN and OpenFlow into its portfolio and delivering commercial-ready SDN solutions.
- HP Intelligent Management Center (IMC) allows HP Networking technology to be easily integrated into an incumbent networking solution through the use of strong multivendor management capabilities. The addition of Virtual Application Networks solutions further reduces the operational burden within the data center and campus network.

Cautions

- The vendor has been slow in introducing a next-generation fabric technology (based on TRILL) to its solution, which we expect will be combined with its Intelligent Resilient Framework (IRF) technology to deliver a highly scalable data center fabric.
- HP Networking has not aggressively taken advantage of both the technology and footprint provided by Virtual Connect, missing out on many opportunities to expand its data center network opportunities.
- Some HP channels can be relatively weak in representing the vendor's network solution. Organizations that are considering HP should ensure that their channels have appropriate levels of HP Networking experience.

Return to Top

Huawei

Huawei made a major investment in enterprise data networking technologies starting in 2011, and has ramped up a broad portfolio to address data center infrastructure requirements, as well as providing scalable security platforms in the data center. While corporately global in scale and reach, the vendor's data center products are primarily delivered in China, the Asia/Pacific region and other emerging markets, with a plan to increase its coverage and target markets over time. The Huawei platforms provide a high degree of scale and density, with very strong performance metrics. The vendor should be considered when there is a need for a high degree of scalability and port density, especially in Asia and developing markets.

Strengths

- Huawei has aggressively ramped up its enterprise capabilities, including specific data center products under its CloudEngine brand, which have extremely high densities for both 10 GbE and 40 GbE in the core.
- The vendor has invested in network automation and virtualization support through its nCenter management platform.

Cautions

- Currently, there is no FCoE-FC gateway capability, although Huawei has plans to provide an FC forwarding solution that aggregates FC traffic before forwarding it to the FC network.
- While Huawei is a large, global telecom supplier, its data center products are relatively new and deployments are heavily concentrated in China and some emerging markets. With increased security warnings and concerns from the U.S., Australia and other countries, enterprises need to ensure appropriate local engineering support and demographic coverage for these products.
- The focus, to date, has largely been on delivery of highly scalable infrastructure, with little tangible evidence of investments in strong ecosystem partners.
- The direct data center service and support capability in Huawei is relatively immature and still needs time to evolve. Its partners' services and support ecosystems and market coverage are incomplete and at the newly built phase in many countries.

Return to Top

IBM

IBM has focused its internal efforts in the data center networking market largely at the server access layer, although fabric technologies are allowing enterprises to build increasingly large data center networks with fixed form factor devices. The acquisition of Blade Network Technologies in 2010 provided IBM with a strong entry into a portion of the market, and it has clearly ramped up its efforts to integrate networking technology into its data center offerings. IBM's recent PureSystems announcements of an integrated data center solution further highlight the importance of networking. The vendor has not yet articulated a complete data center network vision, while maintaining an outwardly confusing mix of internal technologies. As IBM's data center networking strategy becomes clearer, the vendor has the opportunity to influence networking opportunities more directly.

Strengths

- IBM has the ability to provide strong data center networking integration and support for multivendor environments on a global scale.
- IBM was one of the first vendors to support 40 GbE uplink connectivity from its server access switches.
- The vendor is making strong investments in SDN and OpenFlow, from providing OpenFlow support in its switches to working with NEC on an SDN controller and working on open APIs to provide further control of the network marketed under its Distributed Overlay Virtual

Ethernet (DOVE) brand.

Cautions

IBM does not yet have a full portfolio of in-house-developed data center network solutions, which limits its ability to deliver solutions using its own technology.

Gartner clients are confused by IBM's array of technologies, partnerships and investments for data center networking technologies, which make it difficult for customers to get a clear picture of IBM's solutions.

Return to Top

Juniper Networks

Juniper Networks continues to increase its presence in the data center market with its QFabric and Virtual Chassis fabric switching technologies. The vendor's strategy to evolve a simplified, flat data center architecture aligns well with server virtualization, cloud computing and network fabric requirements. Juniper Networks should be considered for all data center requirements, but especially when building "greenfield" data centers.

Strengths

The QFabric solution is innovative and will significantly reduce operational costs in the data center. Junos Space provides the orchestration and automation capabilities that drive network discovery and synchronization between the physical and virtual networks.

Historically known for its software quality through Junos, the vendor has a streamlined portfolio of data center products that provide total cost of ownership (TCO) benefits by reducing the number of overall layers of traditional architectures.

Juniper Networks continued with an aggressive pricing approach to the market in competitive situations. This approach, combined with very good service and support, keeps the vendor well-positioned in the market.

Cautions

Until mid-2012, Juniper Networks was slow to deliver QFabric and its capabilities in a form factor that was consumable for the majority of the market. Although form factor issues have been addressed, enterprises should ensure that the solution meets their requirements from the test stage through to scalable deployment.

The vendor continues to have a strong brand in the carrier infrastructure market; however, as a smaller player, compared with competitors in the data center market, it lacks an enterprise network installed base, which is often leveraged by market leaders. Although Juniper Networks should be on the shortlist for any data center opportunity, we see it most often competing for greenfield data centers or when the network is being redesigned.

Channels and account coverage continue to limit the vendor's reach. Major partners, such as IBM and Dell, have ramped up their own solutions, and, while we still observe joint activity in the IBM channel, Juniper Networks will have to rely more on its traditional channels, with an enterprise heritage that has been security- and routing-based. Enterprises should closely evaluate partner support ability for data center solutions.

Return to Top

Vendors Added or 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 appearing 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. This may be a reflection of a change in the market and, therefore, changed evaluation criteria, or a change of focus by a vendor.

Return to Top

Added

This is a new Magic Quadrant; therefore, all vendors included are new in the initial version.

Return to Top

Dropped

This is a new Magic Quadrant; therefore, no vendors were dropped.

Return to Top

Inclusion and Exclusion Criteria

Vendors in this Magic Quadrant must demonstrate a clear understanding of emerging enterprise data center requirements and must have evolved their portfolios to deliver on many of the emerging networking requirements outlined in the Market Definition/Description section. The vendor must have publicly available, shipping products as of 1 August 2012, and must be able to demonstrate production enterprise data center customers and sustained revenue capabilities within the data center environment.

Return to Top

Evaluation Criteria

Ability to Execute

The following provides some insight into the criteria Gartner uses when evaluating a vendor's

Ability to Execute. At a high level, our analysis of Ability to Execute attempts to capture how well a vendor is performing across the primary functional units of the business — product, sales/channels, marketing, service/support and financial:

Product/Service: Evaluates vendors by looking at their overall portfolios, including the ability to deliver core switching, ToR switches, virtual switches and blade switches. We look at product migration strategies, virtual switching, and the ability to address virtualization, latency and scalability issues for both north-south and east-west traffic. More emphasis is placed on capabilities that would apply in an open, multivendor application scenario, including SDN, because many of these areas cross the boundaries of the IT architecture, making proprietary protocols a problem.

Overall Viability (Business Unit, Financial, Strategy, Organization): Looks at a vendor's investments in the data center network switching market, its financial investments and capabilities, and its long-term viability.

Sales Execution/Pricing: Evaluates presales and go-to-market activities, and includes an analysis of the resulting pricing and solution for the enterprise. On presales activity, the evaluation focuses on the vendor and its channel's ability to deliver comprehensive data center network solutions. The second aspect of this criterion includes our evaluation of the cost-effectiveness of the solutions for capital purchase and long-term maintenance, and the ability to recognize and position the most appropriate solution in specific sales situations.

Market Execution: Focuses on how the vendor is perceived in the market, and how well its marketing programs are recognized. For data center network infrastructure, the evaluation focuses on how well the vendor is able to influence the market around key messages and attributes related to the four key areas in the market. An additional indicator for this criterion is how often Gartner clients consider a vendor as a possible supplier in a shortlist evaluation. The change in momentum in this indicator is particularly important.

Customer Experience: Looks at all aspects of the customer interaction, with a heavier weighting on postsales service and support activities.

Market Responsiveness and Track Record and **Operations:** These criteria were not ranked.

Table 1. Ability to Execute Evaluation Criteria

Evaluation Criteria	Weighting
Product/Service	High
Overall Viability (Business Unit, Financial, Strategy, Organization)	Standard
Sales Execution/Pricing	Standard
Market Responsiveness and Track Record	No Rating
Marketing Execution	Standard
Customer Experience	Standard
Operations	No Rating

Source: Gartner (February 2013)

Completeness of Vision

Evaluations for Completeness of Vision attempt to determine how well the vendor understands and is preparing for future market conditions, as well as how it is shaping the future market:

Market Understanding: Assesses the vendor's ability to look into the future and drive new ideas into product road maps and offerings. In this market, leadership in driving the data center network to support three key market transitions (data center size and density, changing traffic patterns, and the need for a more rapid operational response to meet business requirements) with the product offering, as well as how and where SDN will be implemented, are good examples of what we are looking for.

Marketing Strategy: Evaluates the ability of the vendor to influence the market through its messaging and marketing campaigns. Vendors that incorporate and drive the three key data center network market transitions demonstrate an ability to use their marketing strategies to their advantage.

Offering (Product) Strategy: Evaluates how the vendor invests in R&D to continue to innovate in the three key market transitions and to ensure that future products continue to evolve.

Innovation: Measures the vendor's ability to drive data center switching requirements in the three key areas, and how the vendor invests in new transformational technologies to move its business and the market forward.

Geographic Strategy: Measures how a vendor approaches global opportunities and takes advantage of a global marketplace.

Sales Strategy, **Business Model** and **Vertical/Industry Strategy:** These criteria were not ranked.

Table 2. Completeness of Vision Evaluation Criteria

Evaluation Criteria	Weighting
Market Understanding	High
Marketing Strategy	Standard
Sales Strategy	No Rating
Offering (Product) Strategy	Standard

Business Model	No Rating
Vertical/Industry Strategy	No Rating
Innovation	High
Geographic Strategy	Standard

Source: Gartner (February 2013)

Quadrant Descriptions

Leaders

A Leader has demonstrated a sustained ability to meet the changing needs for mainstream data center architectures. A Leader also has the ability to shape the market and maintain strong relationships with its channels and customers, while offering solutions for the data center infrastructure market.

Return to Top

Challengers

A Challenger has demonstrated sustained execution in the marketplace, and has clear, long-term viability in the market, but has not shown the ability to shape and transform the market.

Return to Top

Visionaries

A Visionary has demonstrated an ability to increase the features in its offering, to provide a unique and differentiated approach to the market. A Visionary has innovated in one or more of the key areas of data center infrastructure, such as management (including virtualization), security (including policy enforcement), SDN and operational efficiency, as well as cost reductions.

Return to Top

Niche Players

A Niche Player has a complete or near-complete product offering, but does not have strong go-to-market capabilities, such as channel or has geographical limitations. A Niche Player has a viable product offering, and, in some cases, will be an appropriate choice, depending on the usage scenario.

Return to Top

Context

This new Magic Quadrant focuses on data center networking infrastructure to solve the emerging requirements for a scalable, high-performance and simply controlled network infrastructure that integrates the network into a more cohesive data center architecture. The data center networking market, as described in this research, is still emerging as architectures and vendor differentiation continue to be developed.

Because the market is rapidly changing and requirements are significantly different than in the past, organizations should ensure that they understand their data center network requirements, and should carefully evaluate alternate approaches and vendor solutions to arrive at the most appropriate future architecture.

Return to Top

Market Overview

This new Magic Quadrant addresses the emerging requirements and focused technologies we are seeing in the market today. Technologies include data center core networking solutions, ToR and blade switches, and virtual switching. As enterprises started to look at their business requirements, we saw a segmentation of the infrastructure and a shift in the buying practices, from making a homogeneous decision for all LAN switching requirements to one where requirements were disaggregated into three largely independent decisions (LAN access, campus core and data center networking). The campus edge, which includes wired and wireless access infrastructure, is now covered in the "Magic Quadrant for the Wired and Wireless LAN Access Infrastructure." The data center Ethernet network is covered in this Magic Quadrant.

Return to Top