

Magic Quadrant for LTE Network Infrastructure

Published: 25 July 2016 ID: G00277823

Analyst(s): Kosei Takiishi, Jessica Ekholm, Sylvain Fabre, Frank Marsala, Peter Liu

Summary

Long Term Evolution rollouts continue as more than 500 network-based CSPs have rolled out commercial 4G LTE service. Gartner compares the 10 vendors of end-to-end (radio access and core) infrastructure for LTE networks to help CSP CTOs find the right one for their needs.

Market Definition/Description

This Magic Quadrant evaluates vendors of "end-to-end" Long Term Evolution (LTE) infrastructure — the term Gartner uses to denote radio and core network of cellular infrastructure — for communications service providers (CSPs) wanting to deploy LTE technology, whether as an overlay or with partial integration with, and some reuse of, existing network equipment (see Note 1).

The market for LTE network infrastructure products for CSPs is maturing. Products considered in this Magic Quadrant include radio access infrastructure (eNodeBs and small cells) located in base station sites, and core network equipment, which is where switching and radio resource management are handled. The core network equipment for LTE, a 4G technology, includes new elements not found in 2G and 3G networks, such as the Mobility Management Entity, a packet data network gateway and a serving gateway. This report also considers the IP Multimedia Subsystem (IMS) infrastructure and network elements required for the provision of voice over LTE (VoLTE), which are located in the core network. Also considered from last year are the vendors' approaches for LTE network alternative use cases, such as machine-to-machine (M2M).

We forecast that the worldwide market for end-to-end LTE network infrastructure will grow from \$20.9 billion in 2016 to \$36.6 billion in 2020, to account for 70% of spending on mobile network infrastructure (see "Forecast: Communications Service Provider Operational Technology, Worldwide, 2013-2020, 1Q16 Update"). We expect LTE to remain the fastest-growing segment of the mobile network infrastructure market.

The worldwide market for end-to-end LTE network infrastructure includes 10 vendors that provide both radio access and core network elements for LTE (see Figure 1).

Magic Quadrant

Figure 1. Magic Quadrant for LTE Network Infrastructure

Research image courtesy of Gartner, Inc.

Source: Gartner (July 2016)

Vendor Strengths and Cautions

Cisco

Cisco is a dominant player in the Evolved Packet Core (EPC) segment of LTE, including policy control, and a supplier of centralized self-organizing networks (SONs). Cisco does not have macrocell/microcell products, but the partnership with Ericsson announced in November 2015 could make amends for that. Incremental revenue opportunities of \$1 billion or more are expected for each company by 2018, but in terms of the LTE radio access network, Cisco's returns would be small. Regarding LTE small cells, Cisco is leveraging its enterprise channels to market for reselling SpiderCloud Wireless radio products (with, for example, agreements with Vodafone).

STRENGTHS

Cisco is a leader in the EPC segment, and its Virtualized Packet Core also receives major CSPs' interest. It is a leader in Internet Protocol (IP) technology, which is an advantage as EPC is an all-IP network technology.

Of the vendors in this Magic Quadrant, Cisco has one of the highest scores for overall financial viability.

In 2016, Cisco announced to buy Jasper Technologies, which provides an Internet of Things (IoT) platform. This IoT service has a broad geographic reach, and its integration with existing IoT products can push forward Cisco's Internet of Everything (IoE)/IoT vision of collaborating with other ecosystem partners.

CAUTIONS

The perception among some CSPs is that Cisco still remains principally an IT player.

The vision of the partnership between Ericsson and Cisco to create the networks of the future is interesting, but so far, its progress resulting from the alliance is primarily limited to IP networks and solutions.

Cisco's IMS for VoLTE solution relies on partners, and some CSPs have indicated this can increase project management overhead.

Datang Telecom

Datang Telecom Technology & Industry Group manufactures radio and core network equipment with a focus on Time Division-Synchronous Code Division Multiple Access (TD-SCDMA) and Time Division-Long Term Evolution (TD-LTE) segments. It is best-known for its leading role in developing the Chinese TD-SCDMA 3G mobile telecommunications standard.

In the LTE segment, Datang mobile focuses on TD-LTE and the Chinese market. The company offers end-to-end solutions for TD-LTE networks, including core, access and test terminals. It is one of the TD-LTE suppliers selected by all three Chinese operators, and the company continues seeking out international TD-LTE opportunities, especially in emerging markets, such as Africa and Eastern Europe.

STRENGTHS

Datang is an early adopter and specialist in time division duplex (TDD)-related technologies (TD-SCDMA, TD-LTE and TD-LTE-Advanced) for which it holds a large set of patents.

Datang is a state-owned company and has been positioned as a TDD technology pilot. The support from government in both policy and finance allows Datang to continuously invest in LTE-related research and development.

Datang still has a relatively big market share in the TD-SCDMA market, which it can leverage to sell its TD-LTE solutions with upgrading concepts. Its TD-LTE products have been selected by all three Chinese CSPs' TD-LTE networks, albeit in a minor role.

CAUTIONS

Datang lacks visibility in the global LTE infrastructure market and is involved only in TD-LTE, a minor variety of LTE infrastructure.

Datang lacks system integration and deployment experience in LTE, which is one of the key barriers to wider adoption by CSPs.

In addition to Datang's brand being little-known outside China, the company's focus on TDD technology in its home market does not help it increase its visibility abroad, as the bulk of LTE deployments use frequency division duplex (FDD).

Ericsson

Ericsson remains in a strong position globally in the LTE infrastructure market. The company's end-to-end LTE and multistandard offerings for core, radio access network (RAN), IMS/VoLTE and software-defined networking (SDN)/network function virtualization (NFV), and its installed base in wireless CSPs' networks, together with its professional services, put it in a strong position to win business from CSPs. Ericsson is aggressively cooperating with leading CSPs on the next-generation technology (5G) and seems to be in a strong position to establish a continuous relationship with them. Nevertheless, Ericsson faces continued challenges from competitors, and several CSPs perceive it as lacking flexibility, such as regarding features, pricing structure and support.

STRENGTHS

Ericsson has long had a strong focus on mobile networks, and it is one of the leaders in terms of numbers of LTE deals. Ericsson has many 2G, 3G and 4G accounts in all geographies, including the United States — a country in which some of its competitors are less strong or have yet to enter the LTE market. Incumbency in 2G and 3G accounts has proved invaluable for any vendor looking to supply LTE upgrades, and Ericsson's many long-standing relationships with CSPs are a solid advantage in terms of making it one of the "go to" vendors for LTE upgrades.

CSPs' feedback indicated that the hardware quality and software stability of Ericsson's products are excellent, and the company's customers were first to commercially launch 600 Mbps service using Category 11 devices (using FDD LTE) and have tested the world's first commercial deployments of three-carrier TDD-and-FDD carrier aggregation with 256 quadrature amplitude modulation (QAM).

Ericsson is active with ecosystem partners addressing multiple verticals, such as public safety, utilities and connected cars. Ericsson promotes cellular for IoT with NB-IoT and LTE Category M, and its M2M/IoT connectivity platform — the Device Connection Platform (DCP) — is very useful for CSPs to support IoT/M2M devices.

CAUTIONS

While Ericsson's overall financial position is good, the company's recent growth and profitability have been challenged by a difficult macro environment. The company has announced structural changes to address these concerns, which may include layoffs and further cost cuts in the near term. Such changes must be monitored given their potential for disruption.

Several CSPs have noted that Ericsson can lack flexibility — for example, with most CSPs having to align to Ericsson's features, roadmap and delivery priorities, rather than the other way around.

Ericsson and Cisco formed a global business and technology partnership in November 2015. Their vision to create the networks of the future is interesting, but since Ericsson is relatively self-sufficient in terms of products and services, so far its progress from the alliance is primarily limited to IP networks and solutions.

FiberHome

FiberHome Technologies is one of the leading telecommunications equipment providers with a focus on optical communications. It is best-known for supplying the first optical fiber deployment in China and its leading position in China's optical fibers and cables and optical access network market.

FiberHome has been producing cellular radio products since 1997 and has been shipping small cells since 2014. Other than transmission and access, FiberHome also has core network products but is relatively weak compared with other vendors. Its TD-LTE products were in the suppliers' list of all three CSPs in China. To date, it has been awarded a small portion of the China TD-LTE market share, and its activities have been limited in its home market, China.

STRENGTHS

FiberHome is a state-owned company, and its relationship with the government can help it to continue to gain some market share in China's TD-LTE, especially in its base — Hubei Province.

FiberHome's leading position in the Chinese optical fiber market and close relationships with domestic CSPs can be leveraged for further expansion of its local TD-LTE business.

CAUTIONS

FiberHome focuses on TD-LTE technology and plays a relatively minor role, even in the Chinese LTE market. It has a limited product portfolio and a lack of visibility in the global LTE market.

The revenue from TD-LTE is a very small portion of FiberHome's total revenue, which has limited its investment in LTE 5G-related product development, such as the IoT, multiple input/multiple output (MIMO) and SDN/NFV.

Fujitsu

Fujitsu is a Japanese ICT vendor focused on the technology solution business that includes the IoT, cloud, big data and mobile. Fujitsu has a broad portfolio of IT services, but its mobile network infrastructure business is very focused on the Japanese market, and has only LTE commercial agreements with Japanese CSPs. It cooperates with Nokia on the development of Serving GW (S-GW) and Packet Data Network GW (P-GW) on the EPC provided to NTT Docomo.

STRENGTHS

Fujitsu offers the BroadOne LTE eNodeB base station family with a distributed architecture consisting of a remote radio head and a baseband unit and LTE femtocell for indoor/outdoor use and for enterprises. The BroadOne femtocell supports multifrequency bands, and selects automatically the operating frequency depending on actual network. Fujitsu's Femtocell GW can manage and operate data and control signals to reduce the high load on the core network.

A significant share of NTT Docomo's early investment in LTE in Japan went to Fujitsu, and KDDI also started to use its LTE femtocell that can support VoLTE. Thanks to the relationship with leading CSPs, Fujitsu can improve its product quality quickly.

Fujitsu provides not only mobile network infrastructure but also devices, including smartphones, tablets and feature phones. This can help to improve the quality of its mobile infrastructure product.

CAUTIONS

Fujitsu is very Japan-centric; its only two customers for LTE network infrastructure are in Japan. We have seen no evidence of traction or new contracts in international markets.

Fujitsu's LTE infrastructure product portfolio is not as comprehensive as that of the Leaders.

Huawei

Huawei holds a strong position globally in the LTE market, despite having its sales potential limited by political concerns in the United States, Australia and other countries. The company has a comprehensive portfolio, and its common radio access architecture has been widely accepted by CSPs. Huawei's MBB 2020 Strategy is composed of progressive enhancements of cellular technologies culminating in the future 5G standard. The strategy focuses on supporting more 4G subscribers, more video traffic and the IoT. The company has improved its professional and managed service capability with its SmartCare service solution.

STRENGTHS

Huawei has heavy R&D investment for both FDD and TDD technologies, and it is known to work hard to satisfy customers' demands. Huawei is involved in major TD-LTE network deployments in China, Japan and Europe. It has developed a TD-LTE-based trunking system for use in industries other than telecommunications, which could represent a business opportunity for CSPs.

Huawei has a comprehensive product portfolio not limited to LTE, which includes servers, storage, routers and switches. Optical transportation gives the company an advantage in addressing today's convergence and "cloudification" requirements.

Feedback from CSPs shows that Huawei's portfolio offers more scale and breadth than those in many more-specialized competitors, with a roadmap and feature support that are more aggressive than some competitors'.

CAUTIONS

Political resistance in the United States, Australia and other countries to granting Huawei unencumbered market access continues to prevent the company from gaining 4G network share in markets where CSPs would like to buy from it.

The vendor lock-in of competitors' existing Global System for Mobile Communications (GSM), Universal Mobile Telecommunications System (UMTS) and FDD LTE customers is still challenging, especially in advanced countries.

Huawei has grown organically in the telecommunications industry and is inclined to try to do everything by itself. On the other hand, it has become more active in the partnership and collaboration with various stakeholders during the past few years, but to be a leader in the IoT/5G era, Huawei still needs to improve its partnership strategy further and become more open.

NEC

NEC was one of the first vendors to articulate the need for smaller cells in LTE networks — long before this became a marketing trend. It has international aspirations for LTE networks and has won reference customers outside Japan. NEC is also an early adopter to support SDN/NFV on the CSP network infrastructure, and its virtualized Evolved Packet Core (vEPC) solution has been commercialized.

STRENGTHS

NEC has the capability not only as a mobile network equipment vendor to CSPs but also as a system integrator for M2M/IoT applications for users such as enterprises and the public sector. Their internal collaboration can create values such as value-added service (VAS) integration in the small-cell solution and mobile-edge computing (MEC) introduction.

NEC has a solid customer base in its home market in Japan. It supplied its technology — for example, LTE RAN and core network elements — to NTT Docomo. It has good support for advanced features, such as carrier aggregation, Cloud RAN and SDN/NFV.

NEC's microwave radio system "Pasolink" contributes to reliable, high-capacity backhaul for LTE, and it provides an advantage in supporting Cloud RAN architecture that is fundamental for LTE-Advanced (LTE-A) and 5G in the future.

CAUTIONS

NEC has made some progress toward achieving its ambitions for a global LTE presence, but its commercial deals are still limited because of insufficient marketing, brand invisibility, very Japan-centric product management and shortage of local support. CSPs should confirm its country-level support carefully.

NEC's LTE product portfolio is not as wide as those of the Leaders, making it harder to avoid commoditization.

Japanese radio frequency allocation for LTE is quite different from global trends, so NEC needs to refine its RAN offering to overcome vendor lock-in situations in its global business.

Nokia

Nokia is a leader in the LTE mobile network infrastructure market. It had transformed itself into a lean wireless network specialist but completed its acquisition of Alcatel-Lucent in January 2016. Nokia's presence in deployed LTE networks has enabled it to establish a business for its LTE-A solution and also contribute to testing advanced products, such as its AirScale, which is capable of supporting 5G. On the other hand, Nokia must continue to demonstrate that it can maintain its financial discipline and strong execution as it rationalizes and integrates the assets and operations of Alcatel-Lucent.

STRENGTHS

Nokia has a comprehensive, end-to-end LTE solution that includes radio, EPC, SON, voice core network, transport, network management, security products, public safety and professional services.

As a combined entity, the new Nokia now comes first among the leading vendors in terms of the number of LTE contracts signed.

Nokia has strong traction in countries including Brazil, Russia, India, China, Japan and South Korea for wireless network infrastructure, and it benefits from having good 3G and 4G presence and skills. The new Nokia now also benefits from a strong North American presence brought by Alcatel-Lucent's footprint.

CAUTIONS

Nokia is undertaking a complex integration with Alcatel-Lucent that includes eliminating portfolio overlap and reducing overlapping personnel. Although the current management team's track record in making such changes has been good, there is potential for disruption due to these changes, and therefore, they must be monitored.

Feedback from CSPs shows that Nokia's product portfolio and technology roadmap were slightly less aggressive compared with other Leaders.

CSP clients of the previous Alcatel-Lucent and Nokia need to care about existing products' continuity, including hardware maintenance and software updates and migration plans.

Samsung

Samsung is a South Korean network equipment vendor and is a relatively late comer to the business of Third Generation Partnership Project (3GPP)-based cellular technology. Samsung is also an early innovator of new cellular technologies, such as vEPC, small cell and Cloud RAN.

STRENGTHS

Samsung has established a position in large-scale LTE deployments in South Korea, North America and Japan. It also penetrated the Middle East in 2011 and European LTE markets in 2012, after establishing Samsung Networks Europe.

Samsung has participated in some very advanced commercial deployments of technology (including LTE-A and Cloud RAN solutions) with South Korean CSPs, which are the world's most advanced mobile network operators, and has also conducted some early 5G-related demonstrations. The company is focusing extensively on small-cell technologies and products supporting LTE in the unlicensed spectrum. Its aim is to make LTE-Unlicensed (LTE-U)-enabled small cells to be commercially available in 2016.

Samsung is one of the leading smartphone vendors, and the internal collaboration can help to improve its product quality and push forward its business.

CAUTIONS

Samsung's lack of presence in the 2G/3G network infrastructure market globally hampers its ability to expand its share of the LTE network infrastructure market, as CSPs tend to favor incumbent vendors for upgrades. It is observed that Samsung didn't announce many new LTE customer additions by 1Q16.

Despite some good international traction for its LTE base station business, Samsung's core network business has not yet extended in the global market.

Samsung is very aggressive in cooperating with CSPs around 5G testing, but its momentum is not as strong as three Leaders: Ericsson, Huawei and Nokia.

ZTE

ZTE is one of the key players in the LTE mobile infrastructure market. It places strong emphasis on China and other Asia/Pacific markets, and it has made some progress toward becoming a bigger international player, with some good reference cases, such as MTN. The experience that the company gained from LTE projects in China helps it break through into some key new markets, such as Southeast Asia, India and Europe. ZTE recently unveiled its Pre5G initiatives, which include both early commercialization of 5G key technologies and LTE-Advanced Pro and will build the bridge connecting 4G and 5G.

STRENGTHS

ZTE is a leading supplier in the Chinese 3G/4G market and a key player in the global mobile infrastructure market. This provides it with a steady stream of revenue and much network-building experience.

ZTE continues to demonstrate, test and interoperate advanced capabilities with CSPs — for example, massive MIMO and cloud radio — in order to gain mind share and market share. It has become increasingly visible in Asia (for example, in SoftBank's LTE network in Japan and Telkomsel's LTE in Indonesia), Europe, the Middle East, Africa and Latin America. It can also use its fixed-line products and relationships in these markets to help it access CSPs wanting LTE upgrades and to deepen its cooperation with them.

Feedback from CSPs includes praise for ZTE's flexibility and responsiveness specifically during the initial rollout phase. Its recently improved marketing communications could help it gain visibility.

CAUTIONS

Although ZTE is branching out from China as it gains more contracts and a wider footprint in international markets, it still needs to boost its presence and mind share in more countries. ZTE could benefit from hiring more local support engineers with local network knowledge and language skills as it becomes more international.

ZTE still experiences difficulty competing against stronger players for Tier 1 CSP accounts in Western Europe, in addition to political resistance in some countries. The election of the new board of directors and leadership members in April 2016 also resulted from some security challenges. In the future, it needs to focus on compliance much more and improve its global business.

ZTE is aggressively seeking to have a 5G partnership with CSPs, but its momentum is not as strong as the other three Leaders: Ericsson, Huawei and Nokia.

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

FiberHome Technologies

Dropped

Alcatel-Lucent, after the acquisition by Nokia

Inclusion and Exclusion Criteria

Vendors in this Magic Quadrant supply end-to-end LTE network infrastructure equipment to network-based CSPs. End-to-end equipment includes radio access and core network elements.

Products considered in this Magic Quadrant include radio access infrastructure (eNodeBs and small cells), located in base station sites, and core network equipment, which is where switching and radio resource management are handled. The core network equipment for LTE, a 4G technology, includes new elements not found in 2G and 3G networks, such as the Evolved Packet Core (EPC), which includes the Mobility Management Entity, a packet data network gateway and a signaling gateway. This report also considers the IP Multimedia Subsystem (IMS) infrastructure and network elements required for the provision of voice over LTE (VoLTE), which are located in the core network. This year, we also consider the vendors' approaches for LTE network alternative use cases, such as M2M.

Several vendors have made progress in their security, as well as NFV offerings around LTE, and while these capabilities will get more attention over time from CSPs, they have not yet appeared as a critical, deciding factor in LTE infrastructure procurement and vendor management decisions.

All of the vendors featured have reference customers for LTE technology with CSPs. Many are also covered elsewhere in Gartner's mobile network infrastructure research.

Evaluation Criteria

Ability to Execute

Gartner evaluates technology vendors on the quality and efficacy of the processes, systems, methods and procedures that enable their performance to be competitive, efficient and effective, and to benefit revenue, retention and reputation. Ultimately, we judge vendors on their ability to capitalize on their vision and their success in doing so.

The vendors' positions on the Ability to Execute axis were determined by evaluating them against the following criteria:

Product/Service. Goods and services offered by the vendor that compete in the defined market (radio and core network elements for LTE carrier infrastructure, as well as 4G small cells and IMS support). This includes current product and service capabilities, quality, feature sets and skills, whether offered natively or through OEM agreements or partnerships, as defined in the Market Definition/Description section and detailed in subcriteria. Both radio (macro and small cells) and core network equipment (EPC and IMS) are included. Professional services offerings, including system integration skills specifically relating to LTE, are also considered. In addition, potential advantages gained in the LTE market through capabilities in important neighboring segments are taken into account.

Overall Viability (Business Unit, Financial, Strategy and Organization). This criterion includes an assessment of the overall organization's financial health, which underpins the financial and practical success of the relevant LTE business unit, and the likelihood of that business unit continuing to invest in the product, offer the product and advance the state of the art within the organization's portfolio.

Market Responsiveness and Track Record. The vendor's ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customers' needs evolve and market dynamics change. This criterion also considers the vendor's history of responsiveness, as well as market traction demonstrated through LTE contract wins. In addition, it covers the vendor's ability to adapt and scale activities to work with its own partners as well as crucial third parties (such as regulators, municipalities and civil works contractors) — in other words, to "cast a wide net" while still being able to execute and scale quickly when opportunities turn into actual LTE contracts.

Marketing Execution. The clarity, quality, creativity and efficacy of programs designed to deliver the vendor's message in order to influence the market, promote the vendor's brand and business, increase awareness of its products, and establish a positive identification with its products, brand and organization in the minds of buyers. This mind share can be driven by a combination of publicity, promotion, thought leadership, word of mouth and sales activities. Also considered is the vendor's

ability to market solutions in different regulatory contexts and to adapt to different CSPs' LTE business models.

Customer Experience. Relationships, products, services and programs that enable the vendor's clients to succeed with the products evaluated. Specifically, this includes the ways in which customers receive technical support or account support. It can also include ancillary tools, customer support programs (and the quality thereof), the availability of user groups, and SLAs.

Table 1. Ability to Execute Evaluation Criteria

Evaluation Criteria

Weighting

Product/Service

High

Overall Viability

Medium

Sales Execution/Pricing

No Rating

Market Responsiveness/Track Record

High

Marketing Execution

Medium

Customer Experience

Medium

Operations

No Rating

Source: Gartner (July 2016)

Completeness of Vision

Gartner also evaluates technology vendors on their ability to articulate logical statements about the market's current and future direction, innovation, customer needs, and competitive forces, and on how well these statements correspond to Gartner's position. Ultimately, vendors are rated on their understanding of how market forces can be exploited to create opportunities for CSPs.

We determined the vendors' positions on the Completeness of Vision axis by evaluating them against the following criteria:

Market Understanding. The vendor's ability to understand buyers' needs and to translate them 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 them with their added vision. The ability to see LTE in the wider context of CSPs' overall network transformation strategies is particularly important, though this insight must be reflected directly in the vendor's product roadmap.

Marketing Strategy. We look for a clear, differentiated set of messages, consistently communicated throughout the organization and externalized through a website, advertising, customer programs and positioning statements. We also assess the alignment of the vendor's LTE marketing strategy and its overall LTE portfolio strategy, including regional focus.

Offering (Product) Strategy. A vendor's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature set as they map to current and future requirements. This includes differentiated approaches to the different LTE segments, including traditional carriers, municipalities and utilities.

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

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

Sustained evidence of technological expertise and adoption of latest advanced features

Ability to commit to an individual CSP's network rollout, where economically feasible

New product development milestones and compliance with the roadmap of milestones

Migration path for existing wireless network infrastructure technologies, including upgrade evolution to LTE, LTE-Advanced, LTE-Advanced Pro and 5G

Support for ecosystem partners via interfaces and interoperability

Demonstration of appropriate budget for R&D planning

Geographic Strategy. The vendor's strategy to direct resources, skills and offerings to meet the specific needs of its home markets — typically outside its native geography — either directly or through partners, channels and subsidiaries, as appropriate for those geographies and markets.

Table 2. Completeness of Vision Evaluation Criteria

Evaluation Criteria

Weighting

Market Understanding

High

Marketing Strategy

Medium

Sales Strategy

No Rating

Offering (Product) Strategy

Medium

Business Model

No Rating

Vertical Strategy

High

Innovation

High

Geographic Strategy

Medium

Source: Gartner (July 2016)

Quadrant Descriptions

Leaders

Leaders typically have a significant number of commercial references for the LTE network equipment market. They also have momentum in this area, as exemplified by new contract wins. They have a broad portfolio and, even where they need partners, they are the preferred prime vendors for CSPs. They appear in nearly all CSP procurements and trials of LTE infrastructure as de facto suppliers, and their presence in the Leaders quadrant tends to be fairly stable. These are high-viability technology providers. They are well-positioned with their current product portfolios and likely to continue to deliver leading products. Leaders do not necessarily offer the best solution for every customer requirement, however, and their products may not be "best of breed" in every area. Overall, Leaders provide solutions that offer relatively low risk and can achieve and sustain deployments of high quality.

Challengers

Challengers have strong market execution capabilities and good solutions, but overall their products lack the breadth and depth of those of Leaders. Their solutions do not indicate a clear vision for how the market is evolving and are not as innovative or advanced as those of Leaders.

Visionaries

Visionaries demonstrate a clear understanding of the market and provide key innovative elements that are illustrative of the market's future. They lack the ability to influence a large part of the market, or have not yet fully expanded their sales and support capabilities to achieve global reach, or do not yet have the funding and scale to execute with the capabilities of Leaders. A characteristic of Visionaries is that their positions in the Magic Quadrant may potentially move over time into other quadrants, where they could attain a more stable state. They could, for example, achieve this stability by gaining strength and scale or wider market adoption (presence in multiple geographical markets and recognition), in which case they could enter the Leaders quadrant, or by judiciously specializing in a smaller segment and ceasing activities in others as part of a strategic transformation, in which case they could enter the Niche Players quadrant.

Niche Players

Niche Players tend to offer products that focus on a particular segment of the market (for example, a given country, such as Japan) or a subset of functionality (such as TD-LTE). They also tend to be more specialized with regard to regional coverage and/or technology. This can be an advantage, because CSPs aligned with the focus of Niche Players can find these vendors' offerings very suitable. In some cases, Niche Players have made specific decisions about where and where not to compete, so being a Niche Player does not preclude having a well-defined strategy. They could also prove attractive partners for some of the larger vendors in this market, thanks to their market specialisms or technological strengths.

Context

When shortlisting vendors, CSPs should take into account the many commitments they need to make when deploying LTE infrastructure in terms of capital investment in eNodeBs for radio access, core network elements and backhaul, as well as time, project duration and the impact on network complexity when LTE is added as an overlay. LTE deployments are such complex projects that replacing an underperforming vendor after implementation has begun can be impractical, even if liquidated damages and penalties are included in the terms of the contract.

There are multiple LTE vendors for CSPs to choose from, but they vary greatly in the scale and scope of their offerings. It is, therefore, vital that CSPs look for equipment providers that have a clear and differentiated network value proposition and strategy, and that emphasize their differentiation, functionality and features. They should also expect quality software.

CSPs also need to know that their vendor will maintain an adequate roadmap and enable them to sustain a high-performance network. Vendors therefore need to show evidence of resources, expertise and capital for investment in LTE technology in the longer term. With regard to vendors

seeking business outside their home market, CSPs should look for evidence that these vendors have effective strategies to direct resources to meet the specific needs of their intended international markets.

To gauge how well vendors meet the above requirements, Gartner scores them using a series of criteria that we developed to capture their capabilities when it comes to addressing CSPs' wants and needs for end-to-end LTE infrastructure, as described above. These criteria are summed up in our framework as vendors' Ability to Execute and Completeness of Vision.

Several vendors in the lower half of the Magic Quadrant (Cisco, Fujitsu, NEC and Samsung) are much broader and larger technology conglomerates than those in the top half. The Leaders in the top half therefore naturally have more commitment to this segment, as they expect to generate a significant proportion of their overall revenue from it. This has strategic implications for vendor selection because, for CSPs, LTE is bound to require a long-sales-cycle, long-cost-recovery model, as well as an upgrade path to 5G networks.

Market Overview

As of 2 June 2016, 503 LTE networks in 167 countries have been commercially launched, according to GSA. Most of them deployed LTE using the FDD mode only, but almost 50 CSPs deployed LTE using the TDD mode only, and almost 20 operators deployed using both LTE FDD and TDD modes.

End-user uptake of LTE will depend on several factors, such as the availability of affordable LTE service plans and LTE-enabled devices. The availability and price of LTE-enabled devices will play a key role in LTE uptake. We forecast that by the end of 2016, LTE devices will reach a \$75 price point, which will give the LTE market a boost in terms of reaching end-user segments that have so far shied away from LTE services due to the high price of LTE devices. We predict that, by the end of 2020, sales of FDD LTE and TD-LTE mobile phones to end users will reach 1,683,846,000, which is 81.8% of all sales to end users (see "Forecast: Mobile Phones, Worldwide, 2013-2020, 1Q16 Update").

In terms of service pricing, an increasingly competitive market will create downward pressure on service prices, and we predict that during this year, the price difference between a 3G and an LTE service will be less than 3%. A growing number of CSPs will not be charging a premium for LTE access. Revenue potential lies in being able to offer a superior network experience and thus increase brand recognition and retention and prevent churn. Additionally, we expect an LTE user to use more data than a 3G user; thus, there are upsell opportunities for CSPs.

The growth in LTE users is helping boost mobile data traffic, as the enhanced network experience has encouraged more users to use data-hungry apps such as streaming video. In our latest consumer mobile app survey, we asked, "How long at a time do you typically stream video using your provider's cellular network?" We found that 29% streamed 30 minutes or more, and that the average streaming time per session was 19.1 minutes. In addition, we found that 85% of the U.S. respondents used YouTube regularly and 68% watched Netflix regularly on their mobile phones.

Thus the increased availability of LTE networks, with the launch of new service plans offering more bandwidth at a lesser price, as well as the improved integration of video into mobile apps by 2018, will contribute to the tripling of consumption of mobile video by early adopters from 15 minutes per day.

In terms of usage per LTE connection, we expect that a 4G smartphone user will use 5.3GB of data per month in 2018 and in comparison, a 3G smartphone user will use 1.4GB of data per month (see "Forecast: Mobile Data Traffic, Worldwide, 2011-2018" for further information). Thus, by 2018, a 4G smartphone user will use 3.7 times more data per month than a 3G smartphone user. In total, despite only 17% of all mobile connections utilizing 4G networks, we estimate that 46% of all mobile traffic will be generated by 4G connections by 2018.

This Magic Quadrant examines vendors of end-to-end (radio and core) LTE network infrastructure, but Gartner also monitors several vendors that do not yet meet the minimum criteria for inclusion because they do not offer end-to-end LTE network equipment, instead focusing on only the radio network or the core network. For example, Potevio, New Postcom Equipment and Mitsubishi Electric offer only radio products; Brocade announced its first virtualized Evolved Packet Core (vEPC) offering in 2016.

The number of large vendors in the end-to-end LTE network infrastructure market could continue to decline, as happened in the 2G/3G market even before the latest economic downturn. Further consolidation remains possible, because there are still many vendors in the mobile network infrastructure market, some of which face financial problems or lack the scale and reach needed to remain relevant. CSPs should, therefore, generally continue to consider a diverse set of stable vendors to minimize the risk of disruption from acquisitions in, or departures from, this market, while containing supplier management overheads — although some CSPs have chosen to use a single vendor for their entire mobile network. As network complexity increases with multiband, multilayer (2G, 3G, 4G and Wi-Fi, and soon 5G) and heterogeneous networks with macro and small cells, and now carrier aggregation, it becomes increasingly attractive to use a single vendor just to ensure quality of service and accountability.

In the latest large acquisition in this segment, Nokia gained control of Alcatel-Lucent through a successful public exchange offer in January 2016. Ericsson and Cisco announced a global business and technology partnership to create the networks of the future in November 2015. Vendor alliances and consolidations aim to increase economies of scale and operational efficiency and improve financial standing; however, technology evolution could happen increasingly fast, with new disruptive technologies, such as SDN/NFV, which could allow alternative vendors, such as HP and Intel to come into the LTE infrastructure market.

The race to win business in the LTE infrastructure market is far from over, and vendors are achieving different degrees of traction when it comes to securing commercial contracts with CSPs. CSPs evaluating vendors for selection should consider whether they have a history of high-quality delivery. They should also favor vendors with a strong track record that effectively promotes their LTE network equipment brand and provides clear differentiation beyond standards. CSPs should partner with vendors that show vision and understand their wants and needs. They should choose a vendor not just for its "boxes," but also for long-term service and support, and ultimately also as a partner to help them with their business models for LTE and succeeding technologies.

Most CSPs plan to integrate small cells into their LTE architecture. The more mature LTE networks are already using small cells in their networks, and the number of small cells is increasing rapidly. Small cells are used in a variety of situations: to increase capacity at busy outdoor locations, to provide coverage and capacity at large indoor locations, to provide services within large, medium and small enterprises, to provide femtocell coverage within households and branch offices, and to provide coverage to rural communities and remote locations. Different situations require a different mix of equipment attributes from LTE equipment vendors, and a specific deployment scenario might favor a given vendor over others; but feedback from CSPs is that even with the Leaders, different markets and deployment scenarios dictate using more than one vendor's 4G RAN.

Evidence

Questionnaires sent to and completed by vendors provided Gartner with an up-to-date view of their activities and achievements in relation to LTE.

We held direct discussions with technical personnel from CSPs that have deployed LTE infrastructure from one or more of the vendors profiled.

We also conducted surveys investigating all available and relevant commercial contracts for LTE involving the vendors concerned.

Local Gartner analysts provided country- and region-specific views, as appropriate.

We also requested that vendors provide supplementary information to use in our research.

Our analysis also reflects earlier briefings and credible sources, including publicly available information.

Note 1

Long Term Evolution

"LTE" was initially intended as an acronym to identify the new radio access network introduced in Release 8 of the 3GPP's standards. Its application has since been extended to the entire technology, including core network elements. In this Magic Quadrant, LTE includes not only LTE of 3GPP Release 8 but also LTE-Advanced of 3GPP Release 10 and LTE-Advanced Pro of 3GPP Release 13.

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.

© 2016 Gartner, Inc. and/or its affiliates. All rights reserved. Gartner is a registered trademark of Gartner, Inc. or its affiliates. This publication may not be reproduced or distributed in any form without Gartner's prior written permission. If you are authorized to access this publication, your use of it is subject to the Usage Guidelines for Gartner Services posted on gartner.com. The information contained in this publication has been obtained from sources believed to be reliable. Gartner disclaims all warranties as to the accuracy, completeness or adequacy of such information and shall have no liability for errors, omissions or inadequacies in such information. This publication consists of the opinions of Gartner's research organization and should not be construed as statements of fact. The opinions expressed herein are subject to change without notice. Gartner provides information technology research and advisory services to a wide range of technology consumers, manufacturers and sellers, and may have client relationships with, and derive revenues from, companies discussed herein. Although Gartner research may include a discussion of related legal issues, Gartner does not provide legal advice or services and its research should not be construed or used as such. Gartner is a public company, and its shareholders may include firms and funds that have financial interests in entities covered in Gartner research. Gartner's Board of Directors may include senior managers of these firms or funds. Gartner research is produced independently by its research organization without input or influence from these firms, funds or their managers. For further information on the independence and integrity of Gartner research, see "Guiding Principles on Independence and Objectivity."