Magic Quadrant for 4G and 5G Private Mobile Network Services

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The emerging 4G and 5G private network services market includes vendors with varying capabilities in geographical reach, multivendor support, orchestration, and industry-vertical focus. This research helps CIOs evaluate providers for their global 4G and 5G private mobile network service needs.

Market Definition/Description

Gartner defines 4G and 5G private mobile network (PMN) services as private wireless network deployment, operation and management services for the exclusive use by a given organization, to provide dedicated connectivity for people and assets of an enterprise setting. 4G and 5G PMN services are delivered as an end-to-end service that covers design, architecting, deployment and management, based on the 3GPP standards, in a specific enterprise location, with dedicated or a mix of shared assets, such as spectrum or core network.

Enterprises deploy PMNs for wireless connectivity in enterprise locations such as factories, warehouses, ports, airports and mines to provide:

- Better reliability than other wireless options
- Greater independence on technology direction and decisions versus public network
- Data privacy which enables better surface attack management
- Isolation from public cellular networks, stronger authentication than Wi-Fi
- Consolidation of multiple existing connectivity technologies into one PMN
- Data collection and analysis, and additional decision services that are necessary for connected solutions and industrial applications
- Easier scalability for number of endpoints and use cases, and multiple sites
- Seamless handover and national roaming to public mobile network
- High-throughput use cases, such as computer vision

Mandatory Features

These capabilities must be supported by the vendors:

- **Network end-to-end sourcing:** Sourcing the full scope of network elements for the PMN. This includes elements such as radios, packet core and transport that are either vendor-owned or sourced from a third party, possibly from multiple providers. Vendors should be able to act as an agent on behalf of a customer with these third-party providers. These providers could be third-party equipment vendors, network operators, independent software vendors (ISVs), IoT device manufacturers and resellers.
- **Network design:** Includes all the activities necessary to plan, design and implement a solution for the enterprise setting. Vendors should be responsible for:
  - Creating project requirements and site surveys
  - Selecting for most suitable technology (e.g., LTE, 5G)
  - Creating the network architecture design
  - Performing radio and capacity planning to support the desired number of endpoints, users and applications
  - Designing security
  - Determining all costs
  - Identifying all required approvals, permits and regulatory approvals
- **Implementation and integration:** Includes installation, commissioning of individual network elements as well as integration testing between network elements and final testing of the end-to-end network. Includes several deployment options (for example, scalable PoC, dedicated on site, hybrid, hyperscaler partner, sliced network).
- **Service management and support**:
  - **Operations and maintenance:** Includes remote management as well as tiered levels of support for various faults levels, including Level 2 and Level 3 back-office support. Also relates to ongoing and project-based services (for example, service outages, network performance and coverage issues). This capability includes the systems and services needed to track and manage network usage patterns, related assets and service elements.
  - **Performance and availability:** Includes functionality to audit and log network service performance and availability, as well as assign qualitative and quantitative ratings, which relate to negotiated SLAs. Also provides actionable intelligence with analytics on service optimization.

- **Transparent governance models:** Service management provides a definition of transparent governance models with clear responsibilities between the vendor and the client, including escalation procedures. This capability should include service desk capabilities to address technical requests (Levels 1, 2 and 3), including security operation centers (SOCs) and network operation centers (NOCs). It also includes physical locations where the provider is able to offer on-site support, professional services and engineering services.

- **Service support:** Includes the ability to act as an agent on behalf of a customer with third-party providers. Aso relates to ongoing and project-based services (for example, service outages, network performance and coverage issues, warranty management, and management of network and device maintenance). This includes life cycle management upgrades (for example, from LTE to 5G) and migration (for example, from legacy connectivity technology to PMN).

- **SIM and subscription management:** This capability includes the systems and services that make connectivity information visible. It also covers over-the-air (OTA) SIM management capabilities to manage single SIM, multi-IMSI SIMs, eSIM (eUiCC) and iSIM ("soft" SIM or virtual eUiCC).

Common Features

Enterprise clients increasingly expect the following additional capabilities to be included as part of end-to-end PMN service vendors' scope, supported by vendors to varying degrees to add differentiation:

- **Connectivity management portal:** This capability includes the systems to administer and manage operational functions for device acquisition; provisioning and activation; ordering and provisioning capabilities; inventory management; change, incident and problem management; and network performance. Networks may include 5G network slicing. This capability may be offered under a single management interface, which is preferred, or implemented via different systems. These portals monitor real-time utilization and asset status, generating alerts that trigger automatic actions against SIM cards or other connectivity assets in real time (for example, changing SIM status). These portals can expose APIs that are integrated with third-party systems.

- **Device logistics and management:** This capability includes the systems and services that make connected endpoints and managed asset information visible. It also applies health diagnostics to measure connectivity and edge device performance and manages connection options. This capability also includes processing activities and management tasks that are performed at the edge, aggregating several edge devices and filtering the information that needs to be sent to the device management platforms. This capability also offers analytics and reporting related to the edge device and software parameters. This device management capability may be transversal or focused on specific industry use cases, such as automotive, global asset tracking or manufacturing.

- **Security management:** This capability includes the systems and services to administer and enforce policies relating to the identity and data access, data transmission and encryption, and the secure consumption of business services linked to PMN and PMN-connected assets. Included in this capability are private LTE/5G networks and the mechanisms that seamlessly support the transition from private networks to public cellular networks and integration with OT security policies and systems.

- **Spectrum acquisition and support:** Includes provision of spectrum assets for the PMN project if the supplier is already a licensed spectrum holder (typically this would be a CSP); or assistance in the application process for unlicensed/industrial spectrum as required by the enterprise client.

- **Edge computing services:** Edge computing deployment and operation, management and orchestration, as part of the PMN infrastructure. This edge can be part of the initial project or be a later addition.

- **Multivendor management:** Provides a purpose-built management and orchestration framework for multivendor environments (extent may vary).

- **PMN site connection:** Provides for the interconnection of PMN site(s) where applicable.

Magic Quadrant

Figure 1: Magic Quadrant for 4G and 5G Private Mobile Network Services

Gartner

Vendor Strengths and Cautions

Ambra Solutions

Ambra Solutions is a Niche Player in this Magic Quadrant. The privately held wireless telecom engineering and equipment manufacturer is headquartered in Canada. It offers design and engineering of network projects, particularly for private LTE/5G mission-critical environments, focusing mainly on the mining industry for voice and video communications, underground tracking of personnel and assets, and remote operations.

Ambra Solutions collaborates with several RAN and core providers, and industrial specialists. Ambra Solutions owns spectrum in Canada, has access to spectrum in other countries and manufactures products designed for harsh environments, including intelligent positioning systems.

Ambra Solutions reported 115 4G/5G PMN sites deployed at the end of May 2024, mostly in North America.

Strengths

- **Deep customization capabilities:** Ambra Solutions possesses deep wireless engineering capabilities to deploy highly tailored and complex industrial private 4G/5G service solutions.
- **Successful in mission-critical environments:** Ambra Solutions has a track record of successful deployments in industries with specific and often extreme requirements, including hazardous environments and high availability, particularly in the mining sector.
- **End-to-end services:** Its service portfolio spans from assistance with spectrum access, radio planning, site surveys and industrial devices monitoring, to network management, including its own custom and third-party monitoring systems from OEMs (mainly Ericsson, Nokia and Cisco). Ambra Solutions added a new NOC in Italy to its Canada NOC and provides follow-the-sun 24/7 support services.

Cautions

- **Limited geographic presence:** Most of Ambra Solutions' presence, and most of its sales support, is in the Americas, particularly North America, with limited presence in EMEA and Asia/Pacific. Approximately 80% of Ambra Solutions' current deployments are in North America, with the remaining projects distributed across six other regions.
- **Limited scope:** The company doesn't have a structured roadmap to productize the offering beyond testing new RAN and packet core vendors and adding new industries to the portfolio.This may constrain the scope of opportunities it can address, and its ability to expand.
- **Limited productized service portfolio:** Ambra Solutions primarily focuses on custom-made solutions tailored for complex, self-contained industrial deployments, such as government and large enterprises. This specialization may render its offerings less attractive to organizations seeking more straightforward, standardized deployments, such as those required for campus environments including Wi-Fi integration.

Boldyn Networks

Boldyn Networks is a Niche Player in this Magic Quadrant. Headquartered in the U.K., Boldyn Networks is a neutral host provider with PMN operations focused mostly in Europe and North America.

Boldyn Networks offers turnkey, dedicated, end-to-end PMN solutions encompassing design, build, operation and management, collaborating with technology partners such as Nokia, Hewlett Packard Enterprise (HPE), STREAMWIDE, Human Mobile Devices (HMD) and Zebra Technologies. The company's top PMN verticals are mining, energy, transport hubs, manufacturing and venues.

Boldyn Networks' PMN solutions include advanced capabilities like 5G slicing, traffic separation, and flexible security and QoS management, including four-tiered private 5G-as-a-service solutions,

and it is working on adding more interactive features to its connectivity management portal.

Boldyn Networks reported 48 4G/5G PMN sites deployed at the end of May 2024.

Strengths

- **European expansion:** Boldyn Networks' acquisition of Edzcom, Cellnex's private networks business unit, has reinforced its capabilities to deliver and manage PMNs for European customers. This builds on Boldyn Networks' previous acquisitions, further strengthening its overall portfolio and expertise in the industry.
- **Networking engineering and delivery capabilities:** Boldyn Networks' core neutral host network (NHN) business, where the vendor has demonstrated strong delivery and engineering capabilities across various industry verticals, provides a natural expansion into the PMN business.
- **Specialist in challenging environments:** Boldyn Networks has experience delivering and managing PMN service offerings in harsh scenarios with large-scale PMNs in mission-critical environments, such as nuclear power plants, mining and heavy manufacturing. It also has a proven track record of supporting wireless services in neutral host network environments.

Cautions

- **Limited geographic diversity:** Most of Boldyn Networks' current PMN deployments are in Western Europe, with only a few in the U.S. Eighty percent of its sales force is based in Western Europe, with the remaining 20% in North America, and no deployments yet in other regions.
- **Low number of PMN deployments:** Boldyn Networks' overall number of PMN deployments is in the low range of all vendors in this Magic Quadrant.
- **Limited market awareness:** Boldyn Networks is among the vendors less frequently considered by enterprises in RFP processes, as evidenced by Gartner's interviews for this Magic Quadrant.

Deutsche Telekom Group

Deutsche Telekom Group is a Leader in this Magic Quadrant. Headquartered in Germany, its 5G Campus Networks service offers dedicated local networks for secure, high-performance connectivity in industrial Internet of Things (IoT), automation and smart manufacturing applications. Its 5G Advanced Network Solution (ANS) service, offered through T-Mobile for Business in the U.S., delivers network features across broader areas. Services span design, implementation, managed services and customer care.

Its operations are focused in Western and Eastern Europe as well as North America, and its customers tend to be midsize and large enterprises in manufacturing, government, healthcare, education and logistics.

Deutsche Telekom Group reported 92 4G/5G PMN sites deployed at the end of May 2024.

Strengths

- **Hybrid and campus networks:** Deutsche Telekom Group has demonstrated a strong focus on hybrid and campus solutions using public 5G networks in countries where it has local communications service provider (CSP) operations, including T-Mobile for Business in the U.S. This approach could be attractive for enterprises seeking more cost-effective deployments.

- **Curated regional portfolio:** Deutsche Telekom Group's European portfolio is homogeneous, featuring three products using its public 5G network that address enterprises looking for cost-effective solutions that are easy to implement, and one product with private spectrum for complex industrial environments. In the U.S, the portfolio includes three solutions for public, hybrid and dedicated.

- **Flexible pricing:** Deutsche Telekom Group offers flexible pricing models, including options for operating expenditure (opex), capital expenditure (capex) and customized pricing structures. This allows customers to choose a financial model that best suits their operational and budgetary requirements.

Cautions

- **Limited geographic diversity:** Most of Deutsche Telekom Group's current PMN deployments are in Europe, with only a few in the U.S. The number of regions the vendor currently supports for PMN deployments is in the lower range among vendors in this Magic Quadrant.

- **Limited globalization roadmap:** Deutsche Telekom Group has no detailed services, geographic roadmaps or portfolio updates.

- **Variable capabilities:** Enterprise clients with projects in different regions may find that differences in the vendor's local PMN service offering and capabilities, in particular across the U.S. and Europe, may make it more difficult to harmonize their enterprise PMN services in different countries.

Ericsson

Ericsson is a Challenger in this Magic Quadrant. It's a multinational networking and telecommunications company with headquarters in Sweden.

Its private PMN solutions can be integrated with NHN solutions and mission-critical networks, leveraging carrier and industry spectrum such as Citizens Broadband Radio Service (CBRS), alongside converged 4G/5G solutions. CBRS solutions in the U.S. are delivered through Ericsson's Cradlepoint and integrated with Cradlepoint's NetCloud Manager, hardware and other third-party capabilities. The vendor's operations are geographically diversified, with its enterprise customers in industry verticals such as manufacturing, public safety, energy, mining, and transport and logistic hubs.

The number of deployed sites reported by Ericsson is among the highest for the vendors included in this research.

In September 2024, Ericsson announced that its Enterprise 5G portfolio, which incorporates private 5G and neutral host solutions, and was established as part of a comprehensive enterprise wireless

strategy that includes Cradlepoint, is being unified under the Ericsson brand name as Ericsson Enterprise Wireless Solutions. This announcement has not been factored into the evaluation process of this Magic Quadrant.

Strengths

- **Large portfolio:** A robust set of infrastructure, software and services offerings, such as RAN, packet core, transport and managed operations capabilities, alongside a well-structured and forward-looking roadmap, suggests that Ericsson will continue advancing its capabilities across its offerings.
- **Geographical presence and industry-vertical expertise:** Ericsson stands out among vendors in this Magic Quadrant for its extensive geographic reach, facilitated by direct and indirect deployments, and industry-vertical expertise.
- **Market awareness:** Ericsson is a prominent choice for enterprises, as evidenced by Gartner's interviews for this Magic Quadrant. Enterprises frequently consider Ericsson during their RFP processes for PMNs, underscoring the vendor's strong market presence and reputation.

Cautions

- **Sells through channels:** Ericsson's sales strategy is predominantly indirect, leveraging CSPs, systems integrators (SIs), managed service providers (MSPs), value-added resellers (VARs) and technology partners that provide the service layer on top of Ericsson's RAN and packet core capabilities.Therefore, a good deal of customer satisfaction or dissatisfaction rests in the selection of an Ericsson partner.
- **Single-vendor preference:** Ericsson will preferentially position its own infrastructure, rather than pursue a multivendor portfolio strategy.
- **Limited support:** Ericsson only rarely provides Level 1 support to clients. In most deployments, customers receive Level 1 support from the partner responsible for the contract and service delivery.

Fujitsu

Fujitsu is a Niche Player in this Magic Quadrant. Headquartered in Japan, the vendor offers end-to-end tailored PMN solutions, including site surveys, network architecture, radio planning, installation, integration, and ongoing network operation and support. Its operations are focused mostly on Asia/Pacific, and its customers tend to be large enterprises in manufacturing, transport (airports and ports), retail, agriculture and utilities.

The vendor's private managed networks consist mainly of Fujitsu's and Ericsson's portfolios of infrastructure products. Fujitsu PMN services include global consultancy and lab as a service.

Fujitsu reported 46 4G/5G PMN sites deployed at the end of May 2024, mostly in Japan.

Strengths

- **Tailored solutions:** Fujitsu customizes PMN deployments to meet customers' unique needs using its lab-as-a-service capability, and its DX/SX services from 2022 under its new brand, Uvance.

- **Partner ecosystem:** Its strong partnership ecosystem includes vendors such as Ericsson on the network solutions, and Microsoft and Amazon Web Services (AWS) for edge solutions and cloud.

- **Broad support:** Fujitsu can provide on-site and professional services with local delivery teams in Western Europe, North America and mature Asia/Pacific. Customers can select device management and logistics, edge computing capabilities, and other SI capabilities from Fujitsu on a project basis.

Cautions

- **Limited presence:** Most of the PMN deployments done so far by Fujitsu are located in Japan, with just a few in Western Europe, although the vendor offers PMN in the U.S. (but none deployed yet). Customers in other parts of the world should be cautious about Fujitsu's ability to deliver and support services with the field services available in their geography.

- **Low number of PMN deployments:** Fujitsu's overall number of PMN deployments is in the low range of all participants in this Magic Quadrant.

- **Limited roadmap:** The vendor's PMN solution roadmap lacks detail. Clients considering Fujitsu for PMN deployments should ask the vendor about evolutions and new capabilities, and how they would be made available through the course of the PMN contract.

HPE

Hewlett Packard Enterprise (HPE) is a Challenger in this Magic Quadrant. The vendor is a U.S. multinational information technology and service provider that offers HPE Aruba Networking Private 5G (based on its Athonet acquisition) to enterprises, utilizing 4G, 5G and Wi-Fi over both licensed and shared spectrum (initially CBRS in the U.S.).

HPE combines its 4G/5G core and edge functions with either bundled RAN it resells or a third-party "bring your own" RAN, with plans to offer its own HPE RAN in 2025. HPE offers vertical-specific solutions for manufacturing, mining, oil and gas, transportation, education, tactical/defense, and public safety organizations.

For 2H2025, HPE is working on PMN solution integration with HPE Aruba Networking Central for Wi-Fi and SD-WAN, with a centrally managed solution available on HPE GreenLake, as well as a campus PMN solution.

At the end of May 2024, HPE reported 461 4G/5G PMN sites deployed in multiple regions, mostly Western Europe and North America, mainly delivered by its service partners.

Strengths

- **Comprehensive solution:** The Athonet acquisition adds capabilities in packet core and PMN, such as a private 5G dashboard for improved visibility and IT/operational technology (OT) APIs for integration. The solution can be deployed in the cloud, on-premises or as a hybrid.

- **Complementary campus capabilities:** HPE Aruba Networking Private 5G brings 4G and 5G packet core, while HPE Aruba Networking Wi-Fi supports current enterprise campus deployments that can complement PMNs.

- **Geographical diversity:** HPE has a good balance of countries for PMN services, with most of its deployments in North America and Western Europe, and the rest balanced across most of the other regions.

Cautions

- **Indirect sales:** HPE's strategy is predominantly indirect, and will increasingly leverage CSPs, SIs, MSPs, VARs and technology partners that provide the service layer, such as mobile user domain security and RF survey tools on top of HPE's packet core capabilities.

- **Lack of integrated RAN support:** HPE lacks integrated RAN support in the PMN management tool. The service portal functionality for private networking is shared with the HPE Telco segment, which makes it less user friendly for enterprises until HPE integrates RAN support into its private 5G management dashboard in 2025. HPE relies on partners for mobile user domain security and RF survey tools. Proprietary HPE small cells are currently in beta with integration planned for 1H2025.

- **Roadmap in progress:** The integration between HPE and Athonet remains a work in progress, with the private networking solution integration into HPE Central occurring in 2025. The current offering lacks cohesion among the solutions. HPE's plan for a full private 5G offering with its own RAN in 1H2025 will help.

Kyndryl

Kyndryl is a Niche Player in this Magic Quadrant. Kyndryl is a multinational IT infrastructure services provider headquartered in the U.S.

Kyndryl's PMN managed service offering is based on Nokia Digital Automation Cloud (DAC) capabilities, where Kyndryl adds its overlay service layer and additional capabilities such as the integrated Kyndryl Bridge platform for network operations and management. Kyndryl offers push to talk/video, application management and network coverage visualization capabilities. Its customers are in the chemical, oil and gas, manufacturing, energy utilities, and retail verticals.

Kyndryl plans to integrate additional vendors' solutions into its service offerings by March 2025.

Kyndryl reported 29 4G/5G PMN sites deployed at the end of May 2024 across four regions, mostly in North America.

Strengths

- **Additional service capabilities:** Kyndryl's PMN managed service adds a Kyndryl services layer for network digital twin, and RF surveys, combined with partner infrastructure, its own cloud, OT security, edge computing, and other capabilities for a complete solution.

- **Integrated management:** Integrated management service for HPE Aruba Campus Wireless and Kyndryl PMN will be of interest to organizations that may choose to unify the management of Wi-Fi and PMN under a single provider.

- **Project and service management methodology:** Kyndryl employs a curated governance model that includes professional services, program and service management. Kyndryl leverages its own ServiceNow tools, flexible enough to adapt to various client scenarios.

Cautions

- **Limited geographical reach:** Kyndryl lacks deployment scale across multiple geographies. Its deployments are mostly in the U.S., and it has released its hybrid PMN offering with limited regional availability.

- **Limited number of deployments:** Kyndryl has the second-lowest number of deployed sites for PMN services in this research.

- **Single-vendor dependency:** Kyndryl is dependent on Nokia as its sole PMN vendor for platform and feature capabilities, which may limit the adaptability of Kyndryl's PMN service solution for some enterprises.

Nokia

Nokia is a Challenger in this Magic Quadrant. It's a global telecommunications and IT company headquartered in Finland. It offers a preintegrated, modular PMN platform and services in industries including transportation, the public sector, energy and manufacturing, with its Enterprise Campus Edge focused on support for Industry 4.0 use cases.

Its PMN services span infrastructure, managed services and operations. Nokia Digital Automation Cloud (DAC) is a PMN-as-a-service offering supporting 4.9G/LTE and 5G as well as Wi-Fi. Nokia supports industrial applications, including customized solutions for mission-critical environments through its Nokia One Platform.

Current support for OT environments includes Nokia Network Digital Twin and MX Grid architecture, and over the next 18 months, the vendor plans to add industrial 5G features and more.

Nokia reported 760 4G/5G PMN sites deployed at the end of May 2024, across seven regions, mostly North America and Western Europe, mainly delivered by its service partners.

Strengths

- **Geographical diversity:** Nokia's PMN footprint is geographically diverse, deployed in the Americas, Western Europe, the Middle East, Africa, mature APAC and Antarctica; it can deploy private wireless in any country.

- **Market recognition:** Nokia is the vendor most frequently considered by enterprises in RFP processes, as evidenced by Gartner's interviews for this Magic Quadrant. Nokia is also the most frequently chosen infrastructure partner for PMN RAN and core, boasting a strong track record in PMN services, particularly in the manufacturing sector.

- **Integrated end-to-end PMN services expert:** Alongside Nokia's services offering, DAC is well-suited to large enterprise and government PMN service deployments that do not require extensive customization.

Cautions

- **Dependency on channel sales partners:** Over two-thirds of Nokia PMN solution sales are via indirect channel partners, rather than Nokia acting as prime contractor to the enterprise for delivering the end-to-end PMN solution to the end user.

- **No multivendor support:** Nokia does not support multivendor private network deployments in its management and orchestration tools, and only provides a single-vendor solution. This limits Nokia's ability to meet various clients' needs, such as small/midsize enterprises or best-of-breed solutions depending on the client requirements.

- **Narrow vertical focus:** While Nokia has solutions geared toward multiple verticals, Nokia does not deal with many verticals directly, choosing, for example, 100% via partners for non-OT segments. Clients in verticals outside manufacturing and OT industries should confirm support and experience with their requirements.

NTT DATA

NTT DATA is a Visionary in this Magic Quadrant. Part of NTT Group, it is headquartered in Japan and provides IT solutions and international communications services.

The vendor provides professional and managed end-to-end 4G/5G private network services and includes two main packet core partners — Celona and Cisco, and several RAN partners such as Nokia. Its PMN operations are mainly focused in APAC, Europe and the U.S. (where it supports CBRS), and its customers are in the automotive, manufacturing, industrial, smart city, and transportation and logistics sectors. NTT DATA also offers device as a service (DaaS) through multiple partners.

In 2H2025, NTT DATA is expanding its offering in areas such as NHN in the U.S., OT security observability, network quality of experience analytics, edge AI, virtual programmable logic controller (vPLC) or time-sensitive networks.

NTT DATA reported 54 4G/5G PMN sites deployed over five regions at the end of May 2024, mostly mature Asia/Pacific, North America and Western Europe.

Strengths

- **Geographical diversity:** NTT DATA has extensive geographical diversity in its PMN deployments, with presence in North America, mature APAC, Western and Eastern Europe, and

Africa. This is backed by strong global end-to-end managed, support, and professional service capabilities, including local sales presence in most regions.

- **End-to-end industry vertical capabilities:** NTT DATA offers comprehensive capabilities complementary to its PMN offering, including global IoT connectivity, managed network and security services, edge computing and edge AI portfolios, enterprise IoT services, application development and system integration. It also offers a catalog of preintegrated industry-vertical solutions, such as connected workforce, machine vision and digital twins.

- **Multivendor portal:** NTT DATA's proprietary management portal, NTTView, aggregates Celona and Cisco portal capabilities through APIs and integrates Wi-Fi and other network services offered by NTT DATA. As part of its roadmap, NTT DATA is evolving this portal, currently showing a higher level of integration with Celona than with Cisco.

Cautions

- **Low number of PMN deployments:** NTT DATA's overall number of PMN deployments is in the lower quartile for participants in this Magic Quadrant, although it is geographically diverse.

- **Focus on private deployments:** NTT DATA Private 5G is focused on pure private developments tightly integrated with enterprise LAN, though the vendor also supports hybrid deployments in its PMN portfolio.

- **Access to an expanded portfolio beyond PMN is complex:** NTT DATA is undergoing an internal integration process as NTT Ltd. and NTT DATA are combining their IT services offerings, which span multiple legal entities providing various technologies and services. This ongoing integration adds organizational complexity in projects where several NTT teams are involved in end-to-end services that encompass a wide range of technologies and services beyond PMNs.

Orange Business

Orange Business is a Leader in this Magic Quadrant. It is the enterprise service unit of the Orange Group, headquartered in France. Its range of PMN deployment models encompasses consulting, design, build and run phases. It mainly leverages Nokia and Ericsson for RAN and core, and other providers based on customer requirements. Its operations are mainly focused on Western and Eastern Europe, with some additional deployments in North America and the Middle East. Its customers are in manufacturing, transport and logistics, oil and gas, public safety, and media and entertainment.

Orange's roadmap for the next eighteen months focuses on industrializing operating models for hybrid and virtual PMNs over 5G stand-alone (SA), and integrating cloud and edge computing into its PMN solutions.

Orange reported 115 4G/5G PMN sites deployed across three regions at the end of May 2024, mostly in Western Europe.

Strengths

- **Rollouts:** Orange Business has the largest number of 4G/5G PMN deployments across the Leaders of this Magic Quadrant.

- **Range of offerings:** Beyond its PMN stand-alone solution for industrial environments, Orange Business has demonstrated a strong focus on hybrid and campus solutions using public 5G networks in countries where it has local CSP operations with its own network, particularly in Europe. This approach could be attractive for enterprises seeking more cost-effective deployments without high capex commitments, as Orange Business' business model for these use cases is opex-only (as a service).

- **Consulting and professional services:** Particularly in Europe, Orange Business is able to deliver stronger direct consulting and professional service capabilities for PMNs with its own resources. This includes additional capabilities such as integration, security, cloud and edge computing. Outside Europe, Orange Business leverages local partners if required.

Cautions

- **Little support outside Europe:** The majority of Orange Business' active proofs of concept (POCs) and commercial PMN deployments (over 90%) are located in Western Europe. International customers should verify with Orange what field capabilities the provider can offer to support deployments in other regions.

- **No multivendor environments:** Despite working with technology partners such as Ericsson, Nokia, and others, Orange Business does not provide a purpose-built management and orchestration framework for supporting multivendor environments in PMN deployments.

- **No front-end digital portal:** Orange Business does not offer a front-end digital service portal for PMN customers for SIM cards or device management, apart from those provided by its technology partners. Additionally, it does not offer integration through its managed IoT connectivity portals with PMN systems.

Tech Mahindra

Tech Mahindra is a Niche Player in this Magic Quadrant. Headquartered in India, Tech Mahindra offers a suite of PMN solutions through a provider-agnostic, end-to-end approach. Its 5G4E portfolio includes consulting, planning, design, build, deployment and management of digital solutions, supported by multiaccess edge computing (MEC), private networks, system integration, security and SIM management, targeting large deployments.

The vendor provides lab-as-a-service environments, network operation centers and the innovative netOps.ai cloud platform to accelerate digital transformation and streamline private network deployment. Tech Mahindra's offerings include various 5G PMN applications tailored for different industries, supporting over 10 verticals and 150 use cases.

The vendor sells solutions directly and through partnerships, employing a consortium-based ecosystem approach, with numerous technology partners to deliver comprehensive, value-driven PMN solutions to both CSPs and enterprise customers.

Tech Mahindra reported 21 4G/5G PMN independently deployed sites across four regions at the end of May 2024.

Strengths

- **System integration and business models:** Tech Mahindra demonstrates significant expertise in SI. Tech Mahindra offers flexible business models including as-a-service (aaS) options.
- **ICT and services experience:** The company has strong software development capabilities and extensive enterprise ICT experience, which can be leveraged for diverse applications across various industries.
- **Multiple partnerships:** The Tech Mahindra 5G4E solution involves multiple partners including hyperscale cloud providers (HCP), along with its global labs and netOps.ai operations platform to support digital transformation.

Cautions

- **Limited number of deployments:** Tech Mahindra has the lowest number of independently deployed sites for PMN services in this research, relying mainly on CSPs to be prime contractors for the PMN service offering.
- **Service gaps:** Tech Mahindra lacks support for spectrum acquisition and ordering/provisioning capabilities, and only offers managed services in a low percentage of the deployments it is involved in. These service gaps, along with overreliance on CSPs for go-to-market for PMN services and limited infrastructure vendor options, may hinder its ability to offer comprehensive end-to-end solutions for clients with advanced networking needs.
- **CSP channel dependency:** Tech Mahindra relies heavily on third-party partners such as CSPs to be prime contractors for the PMN service offering. This dependency may limit its ability to act as prime contractor for PMN services and reduce its market reach.

Telefónica

Telefónica is a Leader in this Magic Quadrant. Telefónica is a global CSP headquartered in Spain. Telefónica PMN offerings leverage mainly Ericsson and Nokia as RAN and packet core partners for the U.S. and Western Europe, and to a lesser extent, Axyom.Core, HPE and Huawei. PMN services are delivered through Telefónica Tech, which acts as global integrator, and Telefónica local operating companies (OpCos). Telefónica offers dedicated PMNs in Western Europe, Latin America and the U.S., and hybrid PMNs in Spain, Germany and Brazil.

Telefónica's primary industry focus includes mining, manufacturing, public sector and defense, oil and gas, ports, healthcare, and education. Over the next 18 months, planned roadmap additions include portal integration, industry customization and infusing AI into its NOC.

Telefónica reported 83 4G/5G PMN sites deployed as of May 2024.

Strengths

- **Broad multivendor portfolio:** Telefónica has dedicated PMNs in Western Europe, Latin America and the U.S., including Wi-Fi integration, own and AWS edge stacks, security, and cloud and edge orchestration and management, with different support levels and additional packet core

vendor integration (Huawei, HPE and Axyom). Telefonica also offers hybrid PMNs with dedicated packet core and RAN sharing and roaming to public networks in Spain, Germany and Brazil, integrated with its IoT KITE connectivity platform.

- **Industry 4.0 capabilities:** With the acquisition of Geprom in Spain, Telefonica enhanced its industrial end-to-end solution by adding consulting and engineering capabilities, expanding its PMN offerings with edge computing, security, AI/ML, blockchain, IT/OT integration, mobile robotics, and connected assets.

- **Strong Latin American presence:** Telefonica has more deployments in Latin America than any other vendor in this Magic Quadrant.

Cautions

- **Geographical diversity:** Most of Telefónica's current PMN deployments are in Western Europe and Latin America, with a small sales force in the U.S. and no presence in other regions. Enterprises should verify with Telefónica its capabilities in other regions, as the number of countries it supports for PMN deployments is among the lowest in this Magic Quadrant.

- **Lack of integrated portal:** Telefónica does not provide a customer-facing portal that integrates the different technology vendors it offers. The only customer-facing system is the incident management system. For administering limited PMN developments, enterprises must use technology partners' portals directly or rely on Telefónica's managed services. The only integration Telefónica has implemented is for its internal NOC.

- **Limited industrial applications:** Telefónica's out-of-the-box preintegrated industrial portfolio for integrated industry edge solutions, including SIs or an ISV ecosystem leveraging PMNs, is limited and lacks scale. Its current approach relies on custom-made solutions, though it is expanding into computer vision and mobile robotics platforms. Availability of these solutions may vary geographically.

Verizon

Verizon is a Leader in this Magic Quadrant. Headquartered in the U.S., Verizon offers its Private Wireless Network solution, marketed as a secure-by-design network that can leverage Verizon's licensed 4G and 5G spectrum, CBRS spectrum in the U.S., and industrial spectrum internationally. The portfolio includes multivendor configurations (Celona, Ericsson and Nokia) depending on enterprise size, customer use case, deployment complexity, and RAN and packet core combinations.

Verizon has sold solutions in industries that include manufacturing, mining, oil and gas, ports, healthcare, distribution and logistics, education, and entertainment. Geographical expansion includes additional markets in Europe, Latin America and Canada over the next 18 months.

As of the end of May 2024, the number of 4G/5G PMN sites deployed that Verizon reported was in the median range for providers in this report.

Strengths

- **Well-curated portfolio:** Verizon covers enterprise segments by leveraging various RAN and packet core technology vendors. It addresses midsize to global enterprises as well as the public sector, leveraging all major OEMs in the U.S., while deployments outside the U.S. leverage Ericsson and Nokia.

- **End-to-end solutions:** Verizon integrates its PMN offering with managed IoT connectivity, fixed wireless access, security, edge computing, and sensor insights, including low-range connectivity technologies and video analytics solutions, by integrating an expanding partner ecosystem for applications such as asset tracking, condition-based monitoring, quality detection, and worker safety.

- **Management and orchestration:** The unified platform On Site Network Dashboard (OSND), for managing and orchestrating the entire PMN environment, is fully integrated with Nokia and Ericsson and will be integrated with Celona by the end of 2024. Verizon has also incorporated features to integrate the network dashboard with its ThingSpace IoT connectivity management platform and private edge compute solutions.

Cautions

- **Lack of geographical diversity:** Most of Verizon's current PMN deployments are in the U.S., with a few in Western Europe. Over 90% of its sales force is based in the U.S., with the remaining 8% primarily in Western Europe, and a small presence in Asia/Pacific (covering Australia and Japan). With no presence yet in other regions, the number of countries it supports for PMN deployments is among the lowest in this Magic Quadrant.

- **Homogeneous capabilities outside the US:** Enterprises should assess Verizon's offering outside the U.S., which does not include Celona. While Verizon leverages its U.S. expertise in RF design for international customers, it collaborates with partners for delivery and deployment, and does not offer access to CSP public networks.

- **Wi-Fi integration/campus not standard:** Though Verizon supports integration with Wi-Fi networks on a case-by-case basis, including in Europe, this capability is not yet a standard part of its offering. However, it is working on integrating additional Wi-Fi capabilities within the network dashboard platform.

Vodafone

Vodafone is a Leader in this Magic Quadrant. Headquartered in the U.K., it offers dedicated, hybrid and campus PMN options, including design, build, operation and managed services with a variety of vendors, mainly HPE (its packet core vendor for its dedicated solution), Ericsson, Huawei and Nokia. Its operations are geographically diversified and its customers tend to be large enterprises in verticals such as manufacturing, energy and utilities, ports, sport venues, and universities and research institutions.

The company's 12-month roadmap includes Open RAN, network slicing, AI for performance, predictive maintenance, and evolving private 5G together with edge computing.

Vodafone reported 103 4G/5G PMN sites deployed at the end of May 2024, mostly in Western Europe.

Strengths

- **Rollouts:** Among the CSPs and SIs in this report, Vodafone boasts one of the largest numbers of active 4G/5G PMN deals. Additionally, it has the widest distribution of deployed sites across multiple countries, particularly in Europe.
- **Management and orchestration:** Vodafone offers a unified platform, the management plane console (MPC), for managing and orchestrating the entire PMN environment. This platform is fully integrated with Nokia and HPE packet core, as well as Ericsson, Nokia, and Huawei radios. Integration of MPC with Open RAN and Ericsson packet core is on the roadmap, although no clear date has been provided.
- **Recognized vendor:** Apart from network equipment specialists, Vodafone has the highest market awareness. Of the suppliers in this Magic Quadrant, Vodafone is the one most frequently invited by enterprises to submit RFIs for PMN services.

Cautions

- **Third-party service:** Vodafone's own sales and service staff for PMN services is mostly located in Western Europe, and the vendor serves other markets through third parties. Customers outside Western Europe should verify with Vodafone how deployments in their market will be served in terms of professional and managed services.
- **Spectrum allocation:** Vodafone allocates spectrum for PMN deployments on a case-by-case basis to avoid capacity issues and interference with public networks. For enterprise customers, this may limit the potential advantages of partnering with a mobile network operator for PMN deployments.
- **IoT integration:** Enterprises should assess Vodafone's ability to integrate public IoT networks with its PMN, especially now that Vodafone has spun off its IoT connectivity business into a separate legal entity. This separation may result in a different level of integration compared to what Vodafone previously demonstrated in the IoT business. MPC is not currently integrated with Vodafone's Global Data Service Platform (GDSP) managed IoT connectivity platform, though it's part of Vodafone's roadmap.

Inclusion and Exclusion Criteria

All of the following criteria was met by 15 March 2024 (the cut-off date) in order for providers to be included in this Magic Quadrant assessment:

- At least 20 direct, deployed commercial contracts or 20 direct, deployed commercial sites (excluding POCs) for 4G and 5G private mobile network services managed by the vendor, where it is the prime contractor with the enterprise (end user)
- At least 25% of commercial contracts (excluding POCs) for 4G and 5G private mobile

Network services managed by the vendor, where it is the prime contractor with the enterprise (end user). In case the vendor has less than 25% direct contracts, it must have at least 50 direct contracts (excluding POCs).

- Commercial contracts in two or more regions where the vendor is the prime contractor, (excluding POCs) for 4G and 5G private mobile network services provided by the vendor. Regions are defined as follows:
  - North America
  - Latin America
  - Western Europe
  - Eastern Europe
  - Eurasia
  - Greater China
  - Emerging Asia/Pacific
  - Mature Asia/Pacific
  - Middle East and North Africa
  - Sub-Saharan Africa
  - Other

- At least two or more commercial contracts won where the vendor is the prime contractor, (excluding POCs) for 4G and 5G private mobile network services managed by the vendor in the last 12 months

- Provide the following capabilities defined in this Magic Quadrant as prime contractor or through a third party:
  - Network end-to-end sourcing
  - Network design
  - Implementation and integration
  - Service management and support

Honorable Mentions

Celona is a specialist PMN network equipment vendor headquartered in the U.S. Its end-to-end Celona 5G LAN solution includes radios, core, edge, and management and orchestration functionality, as well as neutral host options. In addition, Celona offers RF design, network deployment and operations support. The solution can be deployed either as self-managed network infrastructure as a service, or as a managed service sold and delivered almost entirely through partnerships with resellers, CSPs (e.g., Verizon in the U.S. and stc in the Middle East) and global systems integrators (such NTT DATA, HCLTech and Tech Mahindra).

Over 80% of Celona's current footprint is in the U.S. Celona's PMN infrastructure is relevant to include in PMN service projects.

The vendor's business model is to sell through partners and CSPs, and so did not meet the PMN services Magic Quadrant criteria of having at least 20 direct, deployed commercial contracts or 20 direct, deployed commercial sites (excluding POCs) and at least 25% direct contracts.

DXC Technology is a U.S. multinational IT services and consulting company headquartered in the U.S. DXC offers DXC Signal Private LTE and 5G, a custom, private LTE solution that integrates Nokia networking capabilities with DXC's professional and managed services. Its PMN operations are mainly focused in the U.S. and Europe, and its PMN service customers tend to be large enterprises in industrial environments such as manufacturing, power and utilities, oil and gas, and logistics.

Its spectrum strategy is focused on the industrial spectrum, mainly CBRS in the U.S. DXC provides a complete PMN service solution that is relevant for enterprises, mostly in the U.S. The vendor did not meet the Magic Quadrant criteria of having at least 20 direct, deployed commercial contracts or 20 direct, deployed commercial sites (excluding POCs).

ZTE is an ICT technology solution provider headquartered in China. It offers a comprehensive private 4G/5G portfolio spanning RAN, core, transport, design, build, system integration, operation and maintenance services. Most of its delivery is through CSPs. ZTE's operations are primarily based in China, with key customers in manufacturing, transportation, mining, steel and power utilities.

ZTE's PMN infrastructure and service solution is particularly relevant for enterprises based in China, either directly or through CSP partners.

The vendor did not meet the Magic Quadrant criterion of having deployed PMN services as prime contractor in at least two regions.

Evaluation Criteria

Ability to Execute

Gartner evaluates vendors on the quality of their multiregion, end-to-end PMN services offering that enables enterprises to improve their operational performance and efficiency, and to positively impact revenue, retention and reputation within Gartner's view of the market. Ability to Execute is judged by seven main criteria:

Product or Service: Core goods and services that compete in and or serve the defined market. This includes current product and service capabilities, quality, feature sets, skills, and more. This can be offered natively or through OEM agreements/partnerships as defined in the Market Definition.

The emphasis is on comprehensive and advanced offerings, strong interoperability and interworking across all elements of the offer, whether offered as first party or via partners; robust security offerings; and flexible support for diverse usage as well as deployment scenarios, including in cloud environments.

We evaluated the vendors based on the following:

- The offering as of 15 March 2024, in terms of capabilities covered in this Magic Quadrant, specific offerings per segment, preintegrated functions with ecosystem partners, productized versus project-based offering for each segment, and geographical availability of each of the offerings (global/regional/local):
  - Dedicated/stand-alone
  - Hybrid PMN
  - PMN with core network slicing
  - Campus and level of integration with WLAN solutions
  - PMN for industrial sites, including OT security capabilities and compliance
  - Multisite, including management capabilities, to provide a centralized life cycle management experience for all included sites
  - PMN offerings for small and midsize businesses
- Radio planning and site survey capabilities
- Modularity of the offer
- Public network integration (private/public handover features)
- Service management options (self-service, co-managed, fully managed service)
- API capabilities
- Integrated capabilities with other related, prepackaged technologies and services such as IoT, MEC, managed mobility, cloud, security and industry-edge application

Overall Viability: Viability includes an assessment of the organization's overall financial health, as well as the financial and practical success of the business unit. It also includes our assessment of

the organization's likelihood to continue to offer and invest in the solution, as well as the solution's position in the current portfolio.

Sales Execution/Pricing: The organization's capabilities in all presales activities and the structure that supports them. This includes:

- Quantifying overall PMN deployments across segments, industry verticals, geographies and technologies
- The balance of direct versus indirect sales (with a focus on analyzing direct sales)
- Negotiation, presales support and the overall effectiveness of the sales channel
- Vendor's price competitiveness and account management experience

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.

Marketing Execution: The clarity, quality, creativity and efficacy of programs designed to deliver the organization's message in order to influence the market, promote the brand, increase awareness of products and establish a positive identification in the minds of customers. This mind share can be driven by a combination of publicity, promotional activity, thought leadership, social media, referrals and sales activities.

Customer Experience: Products and services and/or programs that enable customers to achieve anticipated results with the products evaluated. Specifically, this includes quality supplier/buyer interactions, technical support or account support. This also may include ancillary tools, customer support programs, availability of user groups, service-level agreements, and more.

Operations: The ability of the organization to meet goals and commitments. Factors include the quality of the organizational structure, skills, experiences and programs. It also includes roles like project and service managers, help desk support structure, systems and other vehicles that enable the organization to operate effectively and efficiently. We also evaluate SLAs and credits offered by the vendors and NOC and SOC organizations.

Table 1: Ability to Execute Evaluation Criteria

Evaluation Criteria ↓	*Weighting* ↓
Product or Service	High
Overall Viability	Medium

Evaluation Criteria ↓	Weighting ↓
Sales Execution/Pricing	High
Market Responsiveness/Record	Medium
Marketing Execution	Low
Customer Experience	High
Operations	High

Source: Gartner (January 2025)

Completeness of Vision

Gartner evaluates service providers on their ability to articulate logical statements convincingly about the market's current and future direction, innovations, customer needs, and competitive forces, and on how well these correspond to Gartner's position. Ultimately, we rate providers on their understanding of how they can exploit market forces to create opportunities for their organizations. Completeness of Vision is judged by seven main criteria:

Market Understanding:

- Ability to understand customer needs and translate them into products and services. Vendors that show a clear vision of their market — listen, understand customer demands, and can shape or enhance market changes with their added vision.
- The ability to see the PMN in the wider context of enterprises' overall transformation is of particular importance, provided this insight is reflected directly by the vendor, or service provider, in the solution roadmap and design.
- The ability to understand and address the evolving sourcing and contracting requirements of the segments the vendor serves, including the evolving competitive and partner landscapes.

The vendor was evaluated based on the following:

- Global reach acting as a prime contractor

- Ecosystem play, particularly across Wi-Fi vendors, edge computing/MEC, segments and industries
- Differentiation based on market understanding
- Multiple facilities deployment strategy for a single client

Marketing Strategy:

- Clear, differentiated messaging consistently communicated internally, and externalized through social media, advertising, customer programs, events and positioning statements
- Alignment of the vendor's private mobile network solution core marketing strategy with its current market position and its overall 5G private mobile network solution portfolio strategy, including a market segment focus.
- Structure of the marketing function and the role PMN marketing plays in the sales process
- Projected and ongoing investments in the Marketing function related to PMNs

Sales Strategy:

A sound strategy for selling PMN solutions that uses the appropriate channels, including direct and indirect sales, marketing, serviceS and communication. This includes partners that extend the scope and depth of market reach, expertise, technologies, and services, as well as each vendor's customer base.

We evaluated the vendors' pricing strategy and distribution channels for different scenarios.

The vendors were assessed on the following:

- Homogeneous and global sales strategy across the entire service portfolio with focus on the direct channel. Indirect sales channels were evaluated as an add-on, but are not the focus of this Magic Quadrant.
- Structure of the sales function organization, and projected and ongoing investments in terms of governance and end-to-end sales process relating to global, regional and local sales efforts.
- Homogeneity of the partner ecosystem strategy across segments, technologies and industries.
- Projected and ongoing investments in the channel partner strategy.
- Pricing strategy.
- Vendors moving into a solution-oriented approach for each industry, where PMNs are one component of the solution together with IoT, MEC, managed mobility, cloud, security, industry-edge applications or other technologies and services.

Offering (Product) Strategy:

An approach to product development and delivery that emphasizes market differentiation, functionality, methodology, and features as they map to current and future requirements.

This encompasses innovation, level of conformance/adherence to 3GPP standards or initiatives, differentiation, and considerations such as solution performance, architecture, scalability, and portfolio comprehensiveness.

Vendors were assessed based on the following:

- Scope of the offering, and planned or ongoing investments in the following segments in terms of capabilities covered in this Magic Quadrant and specific offerings per segment, preintegrated functions with ecosystem partners, productized versus project-based offering for each segment, and geographical availability of each of the offerings (global/regional/local):
  - Dedicated/stand-alone
  - Hybrid PMN
  - PMN with core network slicing
  - Campus and level of integration with WLAN solutions
  - PMN for industrial sites including OT security capabilities and compliance
  - Multisite, including management capabilities to provide a centralized life cycle management experience for all included sites
  - PMN offering for small and midsize businesses
- PMN-related acquisitions or strategic partnerships to add capabilities to the PMN offering
- Radio planning and site survey capabilities
- Modularity of the offer
- Flexibility to offer an open partner ecosystem for core PMN elements (radio, core network, monitoring and life cycle management, edge/cloud computing infrastructure stack, SIM management)
- Public network integration (private/public handover features)
- Service management options (self-service, co-managed, fully managed service)
- API capabilities
- Bundling capabilities with other related prepackaged technologies and services such as IoT, MEC, managed mobility, cloud, security, industry-edge application

Business Model:

- The design, logic and execution of the vendor's business proposition to achieve continued success
- The value proposition, revenue models, customer segmentation, distribution channels, etc.
- Appropriate use of build/buy/partner options to maximize profitability
- Management of customization costs
- Use of automation to improve cost-efficiency

The vendors were assessed based on the following:

- Scope of the spectrum offered: regulated and industrial spectrum (CBRS type)
- Proof of concept models
- Flexibility offering capex and opex models
- Flexibility to bring your own partners

Vertical/Industry Strategy:

- The strategy to direct resources (sales, solution, development) and skills to meet the specific needs of individual market segments, including verticals
- Organizing sales and marketing in support of vertical-specific target markets showing evidence of knowledge of how to deploy specific go-to-market strategies across industries
- Developing vertical-specific propositions, with evidence of solution adoption within each industry, including number of deployments, use cases deployed and geographical scope
- Ongoing or planned investments for the development of additional vertical sectors to target

Innovation:

Direct, related, complementary, and synergistic layouts of resources, expertise or capital for investment, consolidation, defensive or preemptive purposes.

This encompasses ongoing demonstration of technological expertise and leadership, allocation of adequate R&D budget, involvement in and contribution to the evolution of the private mobile network solutions sector, and facilitation of ecosystem partner support, as well as fostering co-innovation through collaborative initiatives with partners, customers, industry forums, and other stakeholders. This also includes innovating in commercial models and practices.

Geographic Strategy:

The provider'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.

This includes evidence of deployments across different regions at scale and planned or ongoing investments to increase geographical scope.

Table 2: Completeness of Vision Evaluation Criteria

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

Source: Gartner (January 2025)

Quadrant Descriptions

Leaders

Leaders primarily sell and deliver PMN services directly, investing in a PMN services future that includes a continuum of value from infrastructure to services, orchestration and management platforms, and related analytics. They perform skillfully and often exceed expectations. Leaders

have a clear vision of the market's direction and develop competencies to maintain their leadership. Leaders engage customers and provide value across several geographies. They shape the market, rather than follow it, and they often set the benchmark for market growth. Leaders have the size and scale (for example, operations, sales and marketing, formal bid, and product management) to pursue panregional and multinational opportunities for PMN service across a number of industry verticals. They have established a robust and diverse ecosystem of technology alliances and service delivery partnerships spanning PMN, services for network, IT, OT and IoT to meet broad market requirements.

Leaders typically have a significant number of commercial references for the PMN services 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 enterprises' preferred primary vendors. They appear frequently in enterprise PMN service procurement and trials. These are high-viability technology providers. They are well-positioned with their current service portfolios and are likely to continue delivering leading services. Leaders do not necessarily offer the best solution for every customer requirement, nor do they necessarily address all geographies, 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 high-quality PMN service deployments.

Challengers

Challengers execute well today, have a strong PMN offering with reliable service delivery capabilities, and maintain a sizable installed base. Most of the PMN solutions deployments they participate in are through their indirect channels. Their offerings may be more specialized and focused on a specific domain, such as network infrastructure, and a few target industries. They tend to rely more heavily on channel partners and resellers. They also favor a single-vendor approach, based on their own first-party infrastructure offerings.

Challengers in the market for global end-to-end PMN services have less emphasis on outlining and communicating their strategy for the future outside of their core focus on single-vendor PMN infrastructure and services. They also have less emphasis on how they invest in innovative service offerings that include other vendors as part of curated portfolios, as well as how they invest in further geographic expansion for PMN services over diverse industry verticals. Their ability or future commitment to providing global, multivendor, end-to-end PMN solutions as a prime contractor versus relying on channel partners may vary. This can be seen in the breadth of offering, service delivery operations, geographical coverage, or the investments for resources and value that build toward acting as a prime contractor for global, multivendor, end-to-end PMN solutions for multiple verticals. Challengers are strong providers for enterprises whose needs align with the provider's offering.

Visionaries

Visionaries demonstrate a clear understanding of the market and provide key innovative elements that exemplify the market's future direction. They focus on providing a broader value proposition to meet future market needs. They effectively upsell and cross-sell within their installed base through trust and the extension of recognizable, iterative value. However, they may lack the ability

to influence a large part of the market, may not have fully expanded their sales and support capabilities to achieve global reach, could be newer to this market than others, or do not have the funding and scale to execute the capabilities of Leaders.

Visionaries expand their capabilities through acquisitions, internal development and, increasingly, robust partnering. Visionaries need to improve their ability to meet customer demand at scale, in more geographies. Where investment resources do not exist, Visionaries must work to expand through service delivery partnerships and technology alliances (for example, resell and industrial partner agreements) such that they can act as prime contractor for PMN services that are broader in scope and available in additional geographies. Additionally, Visionaries must work to expand their market focus through catalog expansion, sales force and services headcount growth in key geographies, and/or industry-specific expansion to further penetrate the market for global PMN end-to-end services.

Niche Players

Niche Players tend to offer services that focus on a particular segment of the market (for example, a given country) or a subset of functionality (such as PMN infrastructure) or a few industries or sub-industry. Their technology and products also tend to be more specialized. This specialization can be an advantage, because enterprises whose needs are 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 can also be attractive partners for some of the larger vendors in this market, thanks to their market specializations or technological strengths, either as supplier or reseller.

Niche Players focus successfully on a constricted channel to market, PMN technologies, a particular service, a particular set of industry verticals, a limited number of regional markets or a combination of all of these strategies. The narrower focus of Niche Players may affect their ability to outperform or innovate. A provider can be successful in a single capability focused on a single market industry or segment, or a single geography, reselling a single infrastructure vendor, or selling through partners only. However, Niche Players may have difficulty expanding into alternative geographies or upselling broader value to their installed base. Niche Players can still be very much viable providers of PMN services. However, enterprise users must be aware that some limitations may apply in the scope of a global, end-to-end PMN service offering with these providers.

Context

Multinational enterprises requiring end-to-end PMN services across different countries and regions face a number of challenges:

There is a lack of homogeneous end-to-end PMN service provision service across countries.

While PMN sites deployments are still in relatively low numbers with plenty of headroom globally, basic PMN connectivity is no longer sufficient.

Elements such as IoT connectivity platforms and integration with other connectivity solutions, as well as enterprise IT/OT, APIs, a vendor's partner ecosystem, multiple architecture and infrastructure options, geographic reach and diversity, or managed service depth provide elements that enterprises need to assess in order to identify providers that can effectively handle regional or global deals.

At the same time, businesses are becoming more mature in the way they wish to interoperate PMN services, IT and OT in order to derive more value. Historically, many early PMN service solutions were planned, deployed and maintained within functional silos within business units, such as production, or R&D/engineering. Today the trend is for PMN service procurement responsibility and ownership to move to the CIO function, as well as a marked increase in larger, multisite and multicountry PMN services deals, where enterprise buyers are looking for partners that can support rollouts at scale. CIOs and CISOs are becoming decision makers (in contrast to the operational business owners and R&D functions) within these larger, multisite, multicountry PMN service deals. CIOs may be leading a cross-functional team with the right technology specialists, but are decision makers for PMN service procurement. CIOs must continue to insert themselves in the process of selecting PMN service solutions and vendors to determine whether suppliers can also provide broader value beyond connectivity.

This Magic Quadrant assesses the Ability to Execute and Completeness of Vision of 12 PMN service providers. CIOs building PMN services can use this information and analysis to help them identify potential providers of PMN services that can support their business objectives. They can also use this information to assess the provider for future capabilities as the enterprises work toward broader PMN service solutions.

This research focuses on providers' ability to deliver comprehensive, end-to-end PMN services, as the lead provider, in several geographies, with minimum dependencies on partners to deliver the total solution to enterprise clients.

Use this Magic Quadrant as a reference, but explore the market further beyond these providers. The Magic Quadrant is not Gartner's sole tool for creating a vendor shortlist. CIOs should also consider other Gartner reports (see the Recommended by the Author section) and Gartner analyst discussions.

Gartner advises enterprises to base their choice of external vendor on the following:

- An evaluation of multiple (at least two) 4G and 5G private mobile network services vendors, as providers' scope still tend to be varied, and to provide more options during the RFQ and bidding process.
- Specify PMN service requirements in detail, so that providers' capabilities to fulfill them can be verified.
- Decide how much of the project to take on, or whether a full end-to-end PMN service is preferred.

- If a complete managed solution is the goal, evaluate the target service providers' ability to support service in all required geographies, deliver and install a solution in an efficient time frame, offer monitoring with strong response and repair time SLAs, and offer a range of technology vendor options.
- The vendor's willingness to work together with other stakeholders (sometimes including its competitors) to achieve the enterprise overall PMN service aims.
- A business value assessment against the enterprise's most important goals.

Market Overview

The market for network equipment and services for 4G and 5G PMN for the top five industries will reach $45.3 billion by 2033, up from $2.2 billion in 2023 (see **Market Trend: Top 5 PMN Industries Offer Revenue Gains for TSPs**). A varied set of providers are pursuing this opportunity, including communications service providers (CSPs), network equipment providers (NEPs), systems integrators (SIs) and hyperscalers. Comprehensive PMN service offerings, the ability to provide value in specific industrial scenarios and replicable PMN blueprints are key to capturing part of this opportunity.

PMN Services Provision Is Moving Beyond Infrastructure

While the market for PMN services was originally started by network equipment providers, there is now a more pronounced role by providers focusing on offering PMN services end-to-end.

The providers covered here are assessed on their ability to provide a complete service offering for PMN globally. Some providers are actually moving away from this service space by increasing their indirect channels. Gradually, some providers may fully go indirect, potentially leading to providers moving out of this market entirely.

Multiple types of potential technology and service providers (TSPs) are able to offer end-to-end services for 4G/5G PMN, including CSPs, NEPs and SIs.

Go-to-Market and Portfolio Strategy

To accelerate adoption and reduce complexity, enterprise clients expect PMN service suppliers to deliver a holistic end-to-end solution. This includes infrastructure, multiple deployment choices, design services, installation, professional and managed services, spectrum, devices, industry-specific applications and, eventually, other ancillary capabilities.

Enterprises seek tailored solutions from their primary PMN service provider that match their size and budget, with clear, comparable pricing and dimensioning that are simple to understand and allow evaluations across several potential PMN suppliers.

As a result, siloed PMN connectivity offers evolve into a scalable end-to-end service solution. This integrates various services and deliverables into a comprehensive service, and reduces procurement and vendor management overhead for the enterprise.

Providers are gradually organizing their offerings around a few packages focusing on the PMN service client's footprint size and location, and aligning different partner vendors' solutions to each offering based on their ability to support larger or smaller implementations, use cases, and prices. This approach appears to be more adaptable, potentially reducing the amount of custom project work for each new PMN service contract, and providing a more manageable and scalable approach.

PMN Service Topologies Are Evolving

Today, industrial PMN tends to be prevalent. When coverage is the main driver, typical scenarios involve indoor/outdoor settings where cellular augments or replaces Wi-Fi due to Wi-Fi limitations and complexity for pure coverage in small-to-midsize facilities (education, smart buildings, etc.). Other uses are in large facilities (indoor/outdoor) where cellular outperforms other wireless technologies in quality, coverage and/or simplicity, notably in ports, mining, and oil and gas.

Over time, campus networks may become more common as tighter integration between PMN and Wi-Fi develops.

Slicing May Eventually Favor CSPs

Network slicing enables network-based CSPs to create multiple isolated end-to-end logical networks on top of a common shared physical network infrastructure. Each slice can be customized to provide a specific service quality profile based on the requirements for distinct applications, driving revenue opportunities. While this scenario is ideally suited to CSPs, which possess public 5G networks where core slicing can occur, Gartner estimates it will take at least a year for CSPs to develop the underlying technology tools, and to design and price PMN services that leverage network slicing.

PMN Is a Bridge to Managed IoT Connectivity and Edge Computing

CIOs can benefit from synergies of PMN service providers when expanding their digital transformation into the edge and IoT, which opens up a new and complex environment for enterprises. The evolution of private 5G service, including unlicensed or lightly licensed spectrum networks for industrial use, has opened up new alternatives to enterprises wanting to take more control of their IoT network infrastructure.

Most enterprises are looking at PMNs because the existing LAN and public cellular options don't deliver the coverage, performance or security they need. However, the overall complexity associated with deploying and running PMNs requires skills that enterprises typically lack. In this environment, CIOs can reuse their existing managed PMN service providers to get synergies. This is typically the case when CIOs are managing international or multisite deployments and can include these initiatives as an extension of their managed IoT connectivity strategies.

This could promote further edge adoption, for example, as many PMN service deployments are initially rolled out with limited or no edge capabilities — they're not proactively deploying edge industry-vertical ecosystems.

This is the first version of the Magic Quadrant for 4G and 5G Private Network Services. It replaces the **Market Guide for 4G and 5G Private Network Services**.

Evidence

A survey based on PMN services references was conducted as part of data gathering to help Gartner build on existing knowledge of the selected vendors in this market for the Magic Quadrant for 4G and 5G Private Mobile Network Services. As part of the process, all 14 selected vendors were asked to submit a minimum of ten references that had not been provided previously and represented PMN implementations. A total of 61 references completed the survey from 18 July 2024 through 1 August 2024. Vendor reference data is different from primary research and is not a representative knowledge base of the PMN market. The 61 references do not represent customers in the overall PMN market in an exhaustive manner. Rather, they represent select customers that the participating vendors chose to share with Gartner and that elected to participate as reference checks.

Note 1: Device as a Service

DaaS encompasses the full life cycle for a device: readiness and design, ordering and procurement, automated provisioning, asset management, support and maintenance, and life cycle management through to disposal.

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.