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Private 5G Networks Market Forecasts to 2032 – Global Analysis By Component (Hardware, Software, and Services), Deployment Model (Standalone (SA) Private 5G Networks, Non-Standalone (NSA) Private 5G Networks, and Hybrid Private Networks), Frequency Band, Spectrum, End User, and By Geography

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Abstracts

According to Stratistics MRC, the Global Private 5G Networks Market is accounted for $4.6 billion in 2025 and is expected to reach $89.7 billion by 2032 growing at a CAGR of 52.6% during the forecast period. Private 5G networks deliver dedicated cellular infrastructure for enterprise campuses and industrial sites, offering deterministic latency, high reliability, and controlled security for automation, robotics, AR/VR, and real-time analytics. Adoption is propelled by Industry 4.0 initiatives, access to local spectrum, and operator or neutral-host managed offerings. Growth accelerates as vendors package turnkey solutions with edge compute and orchestration.

According to the 5G Americas industry consortium, enterprises have deployed over 1,000 commercial private 5G networks globally as of 2023 for secure, low-latency business communications.

Market Dynamics:

Driver:

Expansion of IoT and edge computing applications

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The expansion of IoT and edge computing applications has become a decisive driver for private 5G, because enterprises increasingly require deterministic, low-latency connectivity for automation, robotics, and real-time analytics. Private 5G enables predictable throughput and stricter service guarantees than Wi-Fi or public cellular, making it suitable for Industry 4.0 use cases in manufacturing, logistics, smart ports, and campuses. Additionally, local edge compute reduces backhaul and supports immediate decisioning, while vendors and systems integrators craft tailored solutions that combine radios, cores, and on-premise processing to meet vertical-grade SLAs and operational demands.

Restraint:

Limited spectrum availability and regulatory challenges

Limited spectrum availability and regulatory complexity constrain private 5G rollouts, particularly where licensed mid-band holdings are scarce or expensive. In many countries enterprises must negotiate with incumbent operators or rely on unlicensed/shared bands that can have performance trade-offs, and divergent national rules complicate cross-border scaling. Lengthy licensing, site-approval procedures, and uncertainties over local spectrum frameworks also raise project timelines and capital requirements, discouraging smaller buyers.

Opportunity:

Development of network slicing and edge computing services

The development of network slicing combined with edge computing presents a significant commercial opportunity for private 5G suppliers and service providers. Slicing enables virtualised, SLA-backed partitions of a single physical network to run diverse workloads critical control, high-bandwidth vision systems, or best-effort connectivity simultaneously with guaranteed performance. When paired with localised edge compute and orchestration, slicing supports differentiated managed services, subscription models, and vertical-specific analytics. Additionally, partnerships between telecom operators, cloud providers, and systems integrators can yield turnkey offerings that accelerate enterprise adoption, especially in sectors prioritising data sovereignty and operational predictability.

Threat:

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Cybersecurity vulnerabilities in critical infrastructure

Cybersecurity vulnerabilities in critical infrastructure are a material threat to private 5G adoption, because private networks increasingly bridge IT and OT environments. As factories, utilities, and ports connect sensory and control systems to private radio and edge domains, the attack surface grows and the potential impact of breaches escalates to production disruption, safety incidents, and proprietary data loss. Supply-chain weaknesses, firmware vulnerabilities, and inconsistent security hygiene across vendors magnify risk.

Covid-19 Impact:

The COVID-19 pandemic accelerated interest in private 5G as organisations sought resilient, controllable connectivity to sustain remote operations and automation. Lockdowns exposed the limits of legacy networks for supporting distributed supply chains and remote monitoring, prompting renewed emphasis on on-premise connectivity and edge processing. Although some projects were delayed by budget constraints or deployment interruptions, the crisis reinforced strategic investments in private networks as part of broader digital transformation and continuity planning, thereby strengthening medium-term demand for secure, low-latency campus networks and associated services.

The hardware segment is expected to be the largest during the forecast period

The hardware segment is expected to account for the largest market share during the forecast period because on-site radios, antennas, and edge appliances remain prerequisites for controlled coverage and performance. Organisations prioritise robust, high-capacity equipment to support dense IoT and automation workloads, while systems integrators often combine hardware with engineering services planning, commissioning, and lifecycle support raising total contract value. Furthermore, hardware refresh cycles, densification needs, and the move toward hybrid on-prem/cloud topologies ensure prolonged vendor engagement and sustained hardware revenue as networks expand across industrial and enterprise campuses.

The mid-band (1-6 GHz) segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the mid-band (1-6 GHz) segment is predicted to witness the highest growth rate. Mid-band spectrum (roughly 1–6 GHz) offers the best compromise

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between coverage and capacity for many private 5G use cases, which fuels faster adoption and higher growth rates. Mid-band signals penetrate buildings and cover campus extents with fewer cells, while providing much higher throughput than low-band alternatives making it well suited for indoor industrial automation, video analytics, and mobile robotics. As regulators provide clearer mechanisms for local mid-band access or shared licensing and as equipment for these frequencies becomes more mainstream, the mid-band segment is positioned for rapid CAGR expansion.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share due to mature spectrum policies, substantial enterprise digital-transformation budgets, and a well-developed ecosystem of operators, cloud providers, and integrators. The United States and Canada host numerous pilots and commercial deployments across manufacturing, logistics, education, and ports, supported by progressive frameworks for local spectrum access and operator partnerships. High availability of capital, active vendor investment, and early adoption by large enterprises and public sector organisations accelerate deployments, sustaining North America’s dominant position in terms of market size and commercial activity.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR as rapid industrialisation, large manufacturing bases, and vigorous government initiatives drive demand for private connectivity. Markets such as China, India, Japan, South Korea, and Australia are investing in spectrum, trials, and incentives for industry 4.0 deployments, while domestic vendors and startups supply localised, cost-effective solutions. Rising smartphone penetration, logistics modernisation, and significant addressable market scale create fertile conditions for accelerated private 5G adoption, yielding higher regional CAGR.

Key players in the market

Some of the key players in Private 5G Networks Market include Telefonaktiebolaget LM Ericsson, Nokia Corporation, Samsung Electronics Co., Ltd., Huawei Technologies Co., Ltd., ZTE Corporation, Deutsche Telekom Group, AT&T Inc., Juniper Networks, Inc., Verizon Communications Inc., Cisco Systems, Inc., Vodafone Group Plc, BT Group plc, Mavenir Inc., NEC Corporation, Altiostar Networks, Inc., Radisys Corporation, Kyndryl Holdings, Inc., Sterlite Technologies Limited, Blinq Network, and Firecell.

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Key Developments:

In May 2025,Nokia has been identified by research firm Omdia as the ‘champion’ of the private 5G network vendor sector, following an evaluation that “reflects the vendors’ maturity, market commitment, and ability to deliver full-stack solutions tailored to enterprise needs across vertical sectors.”The Finnish vendor, which has long been snapping up private 5G network deals in the enterprise market – it ended March 2025 with 890 private mobile network customers – achieved “advanced” status in four of the six criteria assessed by the Omdia team. Chinese vendor ZTE was identified as a “trailblazer” (it achieved advanced status in two criteria), while Ericsson was identified as the third market leader (also with two advanced status awards).

In March 2025, Ericsson has recently published an updated version of its white paper '5G Spectrum for Local Industrial Networks', offering timely insights into how dedicated spectrum is shaping Private 5G adoption across industries. The most notable update is Appendix A1, which presents a global snapshot of regulatory activity around spectrum set aside for industrial use, as of March 2025.

In February 2025, Samsung Electronics announced that the company has successfully completed the industry’s first end-to-end Reduced Capability (RedCap) trial over a private 5G network with Hyundai Motor Company (Hyundai Motor), a global leader in smart mobility solutions. This trial highlights the potential of next-generation industrial private 5G connectivity, and will be showcased at the Samsung booth during the Mobile World Congress (MWC) 2025.

Components Covered:

- Hardware
- Software
- Services

Deployment Models Covered:

- Standalone (SA) Private 5G Networks

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Non-Standalone (NSA) Private 5G Networks

Hybrid Private Networks

Frequency Bands Covered:

Low-Band (Sub-1 GHz)

Mid-Band (1-6 GHz)

High-Band (mmWave)

Spectrums Covered:

Licensed Spectrum

Unlicensed/Shared Spectrum

End Users Covered:

Energy & Utilities

Transportation & Logistics

Healthcare & Life Sciences

Government & Public Safety

Manufacturing & Automotive

Retail & Entertainment

Aerospace & Defense

Other End Users

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Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK
  - Italy
  - France
  - Spain
  - Rest of Europe
- Asia Pacific
  - Japan
  - China
  - India
  - Australia
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  - Rest of Asia Pacific

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Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
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- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
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- Competitive Benchmarking
  - Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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