PROTEI

PROTEI PrivateLTE / 5G Bundle

Solutions leaflet

Company Profile

PROTEI – Leading the Way in Telecom Solutions

Since its founding in 2009, Professional Telecommunications Incorporation (PROTEI) has been a pioneer in the telecommunications industry, delivering innovative solutions on a global scale. Headquartered in Amman, Jordan, PROTEI offers an extensive portfolio that includes Core Network, Roaming, Messaging, Value-Added Services (VAS), Data Charging, and Customer Care solutions.

With a strong presence in the Middle East, Africa, Latin America, Central Asia, and Europe, along with offices in Central Asia and the UAE, PROTEI provides world-class technical support to a diverse global clientele.

To address the evolving needs of over 400 clients worldwide, PROTEI operates development centers in Jordan, Europe, and Central Asia. Our team of 1,800 specialists, with 70% focused on research and development, ensures we deliver scalable, reliable, and adaptable platforms aimed at enhancing customer experience, increasing revenue, and reducing operational costs.

What Sets PROTEI Apart?

PROTEI distinguishes itself by designing and developing innovative solutions in-house, utilizing cutting-edge
technology while adhering to rigorous quality standards (ISO 9001:2001 and ISO 14001:2004).

Each product undergoes comprehensive testing to ensure stability, reliability, and seamless compatibility across our full range. This commitment guarantees our customers access to flexible, high-performance solutions that enhance efficiency and foster innovation.

Dedicated to excellence, PROTEI continually drives industry leadership in the telecom sector by delivering solutions that not only solve current challenges but also position clients for future success.

Private LTE/5G: Where and Why?

Nowadays, almost the only growing segment of mobile operators on saturated markets is the B2B segment. Enterprise customers being involved in digitalization projects (in the context of automation and optimization of production processes) have a strong need for a comprehensive modernization of their telecommunications infrastructure, including delivery of specific communication services and the necessity to connect of a large number of M2M / IOT devices.

Areas where such networks may be used are very diverse: Industry 4.0 (wireless robots, automation of manufacturing enterprises and logistics complexes, wireless automatic vehicles), monitoring and control of critical infrastructure (power supply, power plants, transport), a large number of services where LTE services and 5G can replace aging professional radio communications services, building communication networks at complex sites with a high density of consumers (airports, etc.).

Providing industrial consumers with modern communication services is not a trivial task. Industrial facilities are often located in remote locations and are not covered by the infrastructure of telecom operators. It is necessary to provide different policies when serving different categories of users. Security and reliable device authentication are critical. For the optimal solution of automation tasks, traffic processing should be as close to the point of its generation as it's possible. At the same time, different IoT "Verticals" require completely different traffic characteristics (bandwidth, delays).

That is why recently there has been an explosive growth of projects that have been named Private LTE / 5G or Campus Networks — when a mobile network "in miniature" is built and operated in the interests of Enterprises.

New digitalized enterprises are hurry in bandwidth and connectivity capabilities. Robotics and autonomous vehicles require low latency whereas a big number of meters and sensors will require efficient mass connectivity management and efficient resource allocation for such types of traffic consumers. Yet another argument for 5G is an uplink capacity that is essential for some kind of applications such as CCTV integrated with the computer vision solutions. In the first priority 5G SA advantages may be demanded in the manufacturing, telemedicine, autonomous vehicles and some other industry segments.

Why 5G SA is a Game-Changer for Private Networks

While Private LTE and 5G Non-Standalone (NSA) have paved the way, they are built upon a 4G core, which inherently limits their potential. 5G Standalone (SA) is the definitive leap forward, built from the ground up with a cloud-native 5G Core. This architecture delivers the full promise of 5G: ultra-low latency, massive device connectivity, and enhanced network reliability.

For the private network, this translates into tangible business advantages. 5G SA enables advanced network slicing, allowing you to create multiple virtual, isolated networks on a single physical infrastructure—one for mission-critical robot control with guaranteed latency, and another for high-throughput AI video analytics. Furthermore, the distributed User Plane Function (UPF) allows for local data breakout, ensuring sensitive operational data never leaves your premises, which is crucial for security and compliance.

The ecosystem is ready. With mature 3GPP standards, a wide array of compatible devices, and the pressing need for industrial digitalization, the time for 5G SA is now. Enterprises are seeking a competitive edge through automation, real-time data processing, and flexible operations. 5G SA is the only network technology that provides the deterministic performance and architectural flexibility required to build the agile, future-proof digital backbone for Industry 4.0.

Key Use Cases Enabled by Private 5G SA:

- Smart Factories & Automated Guided Vehicles (AGVs): Achieve seamless, reliable wireless communication for moving assets and coordinated machinery with millisecond-level latency.
- Precision Augmented & Virtual Reality (AR/VR): Power real-time remote expert guidance, immersive training, and digital twins with high bandwidth and minimal lag.
- Massive Industrial IoT (IIoT): Connect thousands of sensors seamlessly for predictive maintenance, asset tracking, and environmental monitoring across a vast campus.
- Ports & Mining Operations: Enable autonomous haulage and remote-controlled machinery with robust, wide-area coverage and enhanced safety.

PROTEI Private LTE/5G

PROTEI is closely following all the trends and doing the best to be ready to answer market demands. Our product line is fully equipped to propose turnkey bundle for Private LTE/5G creation. The solution provides compatibility with eNodeB and gNodeB of various vendors, which makes possible to organize the construction of Private LTE/5G networks taking into account all industry specifics of regulation, as well as taking into account the peculiarities of the object.

Turnkey Private network bundle offered by PROTEI, provides the ability to deploy the Private LTE/5G Option 3 NSA as well as Private 5G SA network core in the optimal way, with the ability to scale from hundreds to tens of thousands of devices and subscribers. PROTEI Private LTE/5G solutions will help customers to create a unique cellular infrastructure that guaranteed coverage, high security level and ensures essential capacity.

Key Benefits:

- Full range of core and connectivity management solutions
- Compliance with 3GPP Rel.16,17 standards
- Easy adaptation to any customer requirements
- COTS hardware and Telco/Private Cloud compatibility
- 5G NSA & SA support
- A wide range of basic and additional services
- Modular architecture

PROTEI Private LTE/5G suitable for delivery a wide range of services to enterprise customers: voice (VoLTE/VoNR), messaging, data services including broadband, such as CCTV over LTE, Group Communications and Mission Critical Voice (MCPTT), vehicle tracking, device management and many others.

PROTEI Private LTE/5G may include:

- Basic set of platforms:
  Private LTE/5G NSA core (SGW, MME, HSS, PGW);
  Private 5G SA core (UDM/UDR, SMF, UPF, AMF, NRF)
- Policy and traffic management: PCRF/PCF, DPI.
- Voice services: MCPTT, IMS.
- Connectivity Management.

PROTEI Private LTE/5G NSA components

HLR/HSS/AUC

PROTEI HLR/HSS/AUC is a cost-effective, high performance and scalable solution being a central database containing details of each user subscription (SIM-card) for terminals or devices that may be authorized and registered in the network. It contains data such as account information, subscription status, barrings, services, data profile, current location, etc. Integrated Authentication Centre (AuC) supports all main authentication algorithms such as Milenage, COMP 128 v2/v3 and TUAK as well as new ones suitable for 5G.

Subscriber's data, supported protocols and interfaces are implemented in strict accordance with 3GPP standards (29.002, 23.008, 29.272, 29.273, ect). The system supports convenient provisioning interface to enable smooth system integration with and performing appropriate management operations.

HLR/HSS implements both SAE-HSS (supporting Nb-IOT among others) and IMS-HSS functionality and used for such services as IMS and MCPTT as well.

MME

PROTEI MME is the key control-node in LTE performing mobility management, subscription profile fetching from HSS, managing bearers and performing authentication functions for all devices being registered in 4G network. It is implemented in full accordance with appropriate 3GPP standards and supports all necessary features such as default and dedicated bearer establishment, ciphering and integrity protection of NAS messages, all kind of applicable signaling procedures, S1, inter-SGW and inter-MME handovers and so on. In addition, MME supports Nb-IOT interface towards SCEF.

SGW

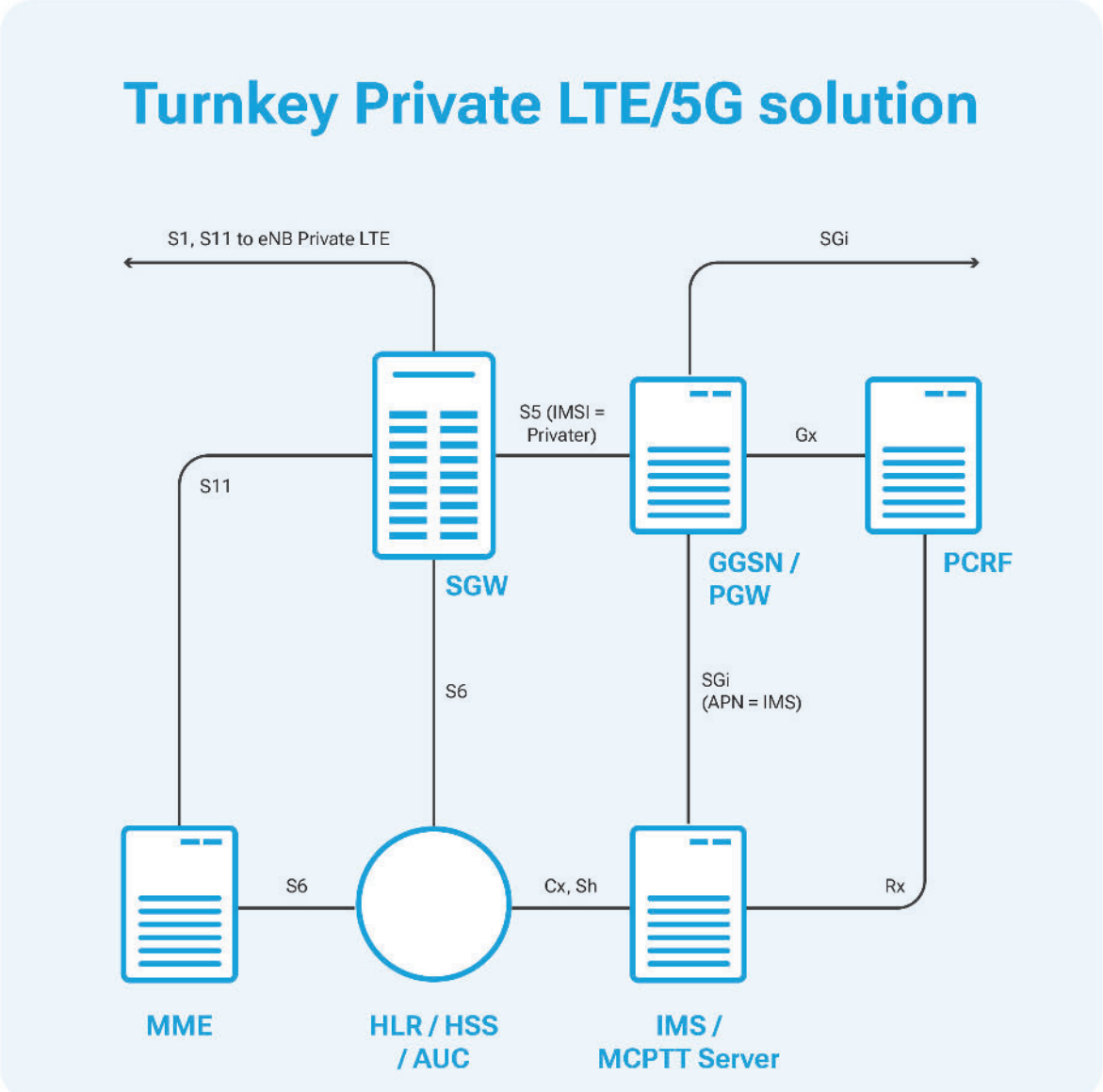
PROTEI SGW routes and forwards user data packets, while also acting as the mobility anchor for the user plane during inter-eNodeB handovers and as the anchor for mobility between LTE and other 3GPP technologies. It retains information about the bearers when the UE (User Equipment) is in idle mode. SGW manages and stores UE contexts, e.g. parameters of the IP bearer service, network internal routing information.

PROTEI SGW supports default and dedicated bearers, multiple sessions/multiple bearers per subscriber, S5 and S8 interfaces for PDN GW interaction and S1-U for interaction with eNodeBs.

PGW

PROTEI PGW acts as a Packet Data Network Gateway (PGW) in 4G/LTE network architecture. It is responsible for data routing between GPRS Core network via GTP protocol and external IP-networks.

PROTEI PGW is developed in full accordance with international standards and allows easy integration into a network via Gi/SGi, S5, Gx interfaces to allow signaling and data path for establishing and maintaining subscriber PDP contexts and for providing charging for data services if needed. In case of data traffic increasing over one PGW capacity additional modules are installed to provide greater total throughput of the entire system that makes PROTEI PGW flexibly scalable.



PROTEI Private 5G SA components

UDM/UDR/AUSF

PROTEI UDM/UDR/AUSF (Unified Data Management/Repository/Authentication Server) is the central secure hub for subscriber profiles, authentication, and authorization, ensuring only authorized devices access your network. It supports all authentication algorithms as per 3GPP Rel 17 and also functions and features needed for data and VoNR services. Subscriber's data, supported protocols and interfaces are implemented in strict accordance with 3GPP standards (33.501, 29.501 etc). The system supports convenient provisioning interface to enable smooth system integration with and performing appropriate management operations.

AMF

PROTEI AMF (Access and Mobility Management Function): The primary contact point for all devices (UEs), handling connection, mobility, and registration procedures. It seamlessly routes session-related messages to the appropriate SMF, as defined in 3GPP TS 23.501, ensuring reliable device access across your campus.

SMF

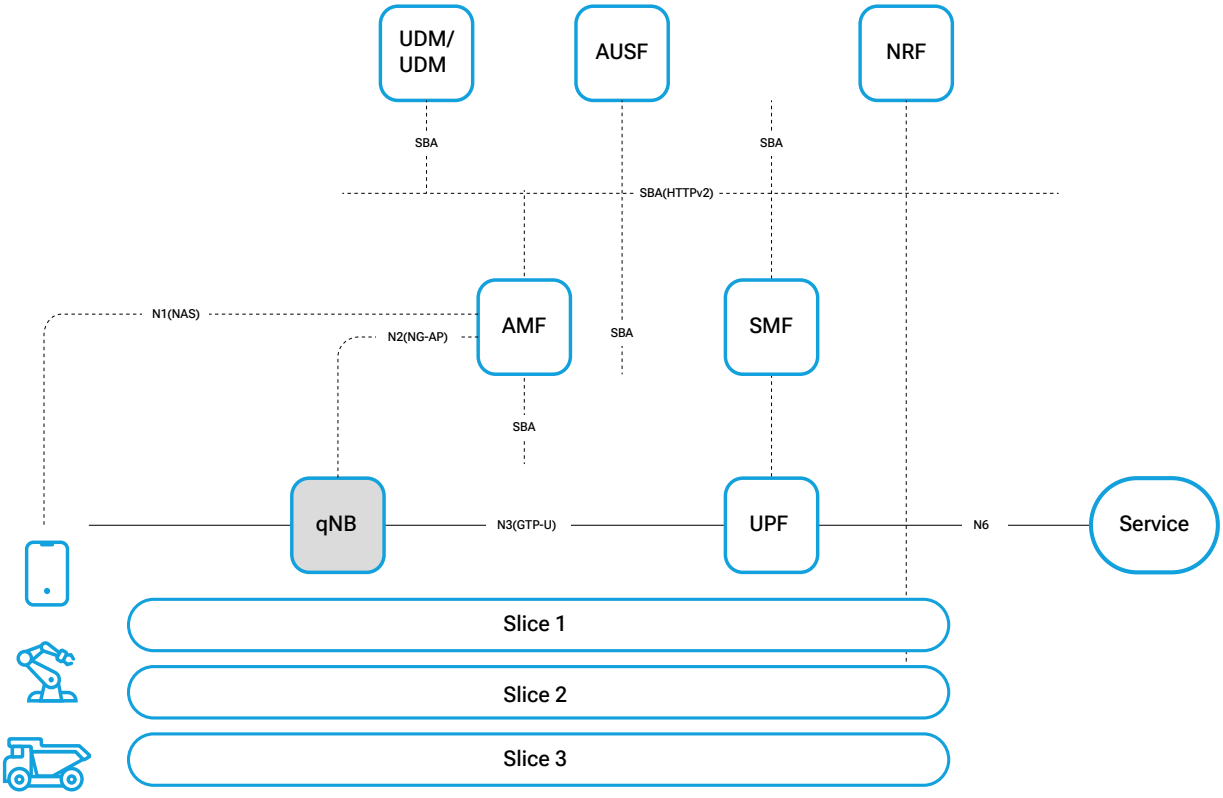
PROTEI SMF (Session Management Function): The "control brain" for data sessions (PDU Sessions). It is responsible for IP address allocation & policy enforcement, and dynamically selects and controls the UPF to create the optimal data path for each application, per the session management procedures in 3GPP TS 23.502.

UPF

PROTEI UPF (User Plane Function): The high-performance data gateway that is critical for low-latency applications. It serves as the anchor point for all user traffic, performing packet routing, and the vital local breakout that keeps sensitive data on-site. Its programmability, detailed in 3GPP TS 23.501, is key to enabling traffic steering for network slicing.

NRF

PROTEI NRF (NF Repository Function): The service directory that enables a truly cloud-native and scalable architecture. It allows every Network Function (NF) to register its services and discover other available NFs, facilitating automated load balancing and resilient, self-healing networks, a core principle of the Service-Based Architecture (SBA) in 3GPP TS 23.501.



Additional systems

Policy Controller (PCRF)

PROTEI Policy Controller is an intellectual node regulating policy and charging parameters of mobile subscribers. Equipped with a flexible and easy-to-manage policy decision engine PCRF/PCF supports policy and charging rules and provides dynamic distribution of limited network resources. PROTEI PCRF/PCF performs policy and charging control based on dynamic per-service modification of available bandwidth and money debiting rules during ongoing Internet session depending on the type of service, subscriber profile parameters, date/time and commands from external systems. Gx, N7 & N15 are supported for interaction with EPC whereas Rx is used for interaction with MCPTT and IMS.

DPI Platform

PROTEI DPI platform unlock a variety of the service-aware data traffic management tools. It is capable of detection of obfuscated protocols using statistical analysis techniques and allows flexible creation of new services and protocols using regularly updated signature base. The platform supports bit rate control with regard to service priority, supports ToS/DSCP traffic prioritization. PROTEI DPI supports Gx for policing as well as Gy (Diameter) for real-time charging. DPI performs subscriber identification using RADIUS and Diameter (Gx).

IMS/MCPTT (Mission Critical Push-to-Talk)

PROTEI MCPTT provides enhanced 3GPP and non-3GPP services to professional radio subscribers based on 4G/5G networks, including Private LTE/5G. It can be deployed to any network environment and can be tightly integrated with a private network without interrupting its functioning. PROTEI MCPTT operates with any devices and IP-terminals supporting MCPTT standards.

PROTEI MCPTT provides group and individual calls in half-duplex mode, emergency group and/or broadcast calls, group call prioritization based on subscriber data and rules. It supports individual calls monitoring in full duplex mode using VoLTE technology and functionality of joining subscribers to already established group and/or broadcast call. The platform performs group calls functionality based on MCPTT standard (3GPP TS 22.179) and MCPTT architecture (3GPP TS 23.179).

All key benefits of MCPTT technology are fully implemented in PROTEI solution. It guarantees allocation of channels for subscriber calls with the highest priority (critical calls, LWR), prompt radio resource allocation and traffic prioritization, voice and video communication, group management and functioning through a dedicated or embedded IMS core.

PROTEI IMS provide out-of-the-box 3GPP compliant subsystem for P2P VoLTE services delivery in Private LTE networks.

M2M Connectivity Management platform

PROTEI M2M is a connectivity management platform supporting rich functionality specially tailored to serve M2M devices and answer demands of varied IoT projects.

It supports such functions as device control, location check (including determining permitted location areas), device management, IMEI control, traffic consumption control. System supports variety of triggering and notification capabilities; notifications may be triggered upon detection of reaching pre-defined consumption thresholds, unexpected location change, changing IMEI for the particular SIM-card and so on. Criteria may be flexibly defined for different group of SIM cards and/or group of devices. Full-featured API for integration with external application platforms is supported.

PROTEI Company Profile

PROTEI is an international telecommunication systems vendor operating in 40 countries having a proven track record of over 20 years in the telecommunication market.

Using the latest convergent technologies implemented in our products the most innovative services can be delivered with maximum efficiency. PROTEI product line covers all needs of mobile operators and corporate clients. Responding to the requirements of the telecom market, PROTEI also offers comprehensive solutions for building MVNO and Private LTE/5G networks.

Our products are highly customizable and can be altered according to any requirements. PROTEI serves more than 300 renowned customers to cater 250 million subscribers worldwide.

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