

■ SOLUTIONS PORTFOLIO

# Solutions for Mobile Operators

Carrier-Grade Core 2G/3G/4G/5G, Roaming, Messaging, Value-Added Services, Data Charging and Management, and Private LTE/5G Networks.

☰ Core Network

📶 Evolved Packet Core

🌐 Roaming

💬 Messaging

📶 Intelligent Network & VAS

📊 Data & Policy

💰 Charging

🎧 Customer Care

**2009**

Founded

**400+**

Clients worldwide

**50+**

Systems & solutions

**70%**

Of our team in R&D

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# Company Profile

## Carrier-Grade Telecom Solutions since 2009

Founded in 2009 and headquartered in Amman, Jordan, Professional Telecommunication Incorporation (PROTEI) designs and delivers carrier-grade software for mobile and fixed network operators worldwide. Our portfolio spans the full service lifecycle — core network, roaming, messaging, value-added services, data management and customer care — backed by live deployments across the Middle East, Europe, Africa, Latin America, Central Asia and the CIS, and supported by regional offices in the UAE and Central Asia.

With development centres in Jordan, Europe and the CIS, and a multinational team of engineers and telecom specialists, most of them dedicated to R&D, PROTEI serves more than 400 clients with scalable, standards-compliant platforms that elevate subscriber experience, grow revenue and lower network operating costs.

2009

Founded

400+

Clients worldwide

50+

Systems & solutions

70%

Of our team in R&D

## Full Spectrum of Products

One integrated portfolio covering the needs of mobile and fixed operators, MVNOs and enterprises:

**Core Network Solutions**

**Mobile Solutions**  
 Messaging, Roaming, location-based services, IN & CAMEL solutions, VAS platforms

**Customer Care & Contact Center**  
 IVR, IP contact centers and Workforce Management (WFM)

**Next-Generation Networks (NGN) & IMS**

**Traffic Management & Policy Control**  
 DPI/PCEF, PCRF solutions

**Billing & CRM**  
 Online/Offline Charging Systems (OCS/OFCS)

**AI & Emerging Technologies**  
 AI Engine, IoT, Private LTE, Safe City Solutions

**Network Security**  
 Multi-Protocol Signaling Firewall & CEIR

### Engineered for Operators

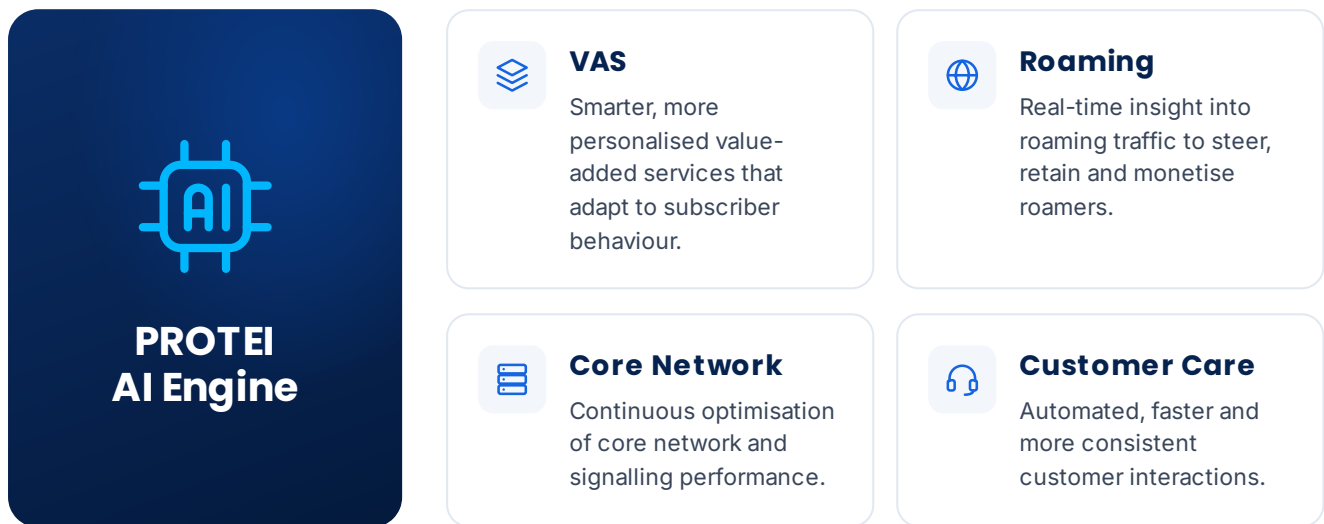
Every PROTEI platform is designed and built in-house under certified quality management (ISO 9001:2015 and ISO 14001:2015), then rigorously tested for stability, reliability and interoperability across our entire product range.

From pre-sales network design to post-launch support, our engineers work alongside your teams. PROTEI systems integrate seamlessly with one another and with third-party equipment, and every solution is tailored to your business model and scales as you grow.

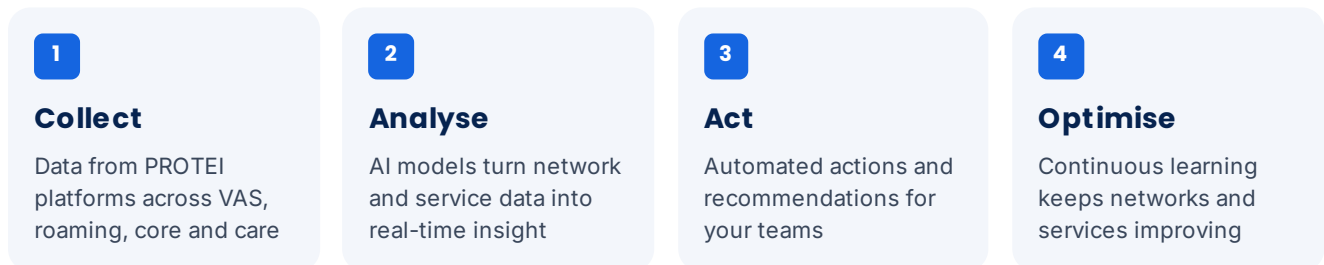
**17 years** of telecom engineering · **50+ systems** for GSM/UMTS and LTE · projects in **45 countries** · **full MVNOs** and **dozens of DPI deployments** in commercial operation.

# PROTEI AI Engine

Intelligence is becoming a core part of the telecom experience. The PROTEI AI Engine brings AI-driven automation and real-time intelligence into our portfolio, helping operators move from reactive operations to intelligent, adaptive and continuously optimised networks and services.



## How it works



## What operators gain

### Smarter automation

Move from reactive operations to automated, self-adjusting processes.

### Continuous optimisation

Network and service performance that keeps improving over time.

### Real-time intelligence

Operational visibility and insight at the moment decisions are made.

### Better decisions

Data-driven recommendations for engineering, commercial and care teams.

**Integrated, not bolted on.** The AI Engine works with PROTEI's existing VAS, Roaming, Core Network and Customer Care platforms, so operators can add intelligence to the systems they already run — carrier-grade and future-ready.

# Core Network Solutions

IMS, converged subscriber data, Diameter signalling and network security, plus the proven 2G/3G elements every network relies on, all built to 3GPP standards.

IMS Core

HLR/HSS

DRA/DEA

Signaling Firewall

EIR

STP

GMSC

## ■ IMS Core

**Launch VoLTE and VoWiFi fast — and retire your legacy voice core with confidence.** PROTEI IMS Core is a complete, fully virtualised bundle that lets mobile operators bring HD voice to 4G and Wi-Fi, and helps fixed operators and CSPs move their voice services to an all-IP core. It brings together every IMS component defined by 3GPP — P-CSCF, S/I-CSCF, HSS, application servers, IP-SM-GW, USSI and MGW — so the full range of voice and messaging services runs on one cloud-ready platform. An optimised architecture and advanced codec support deliver crystal-clear calls, low latency and carrier-grade reliability, in full compliance with 3GPP TS 23.228, TS 23.218, TS 23.229, TS 24.229, TS 29.228, TS 29.229 and TS 29.949.

### Key features:

- Cloud-ready virtualised deployment on NFV infrastructure
- From 50 to 200,000 concurrently connected fixed and mobile subscribers per module
- Efficient scaling and traffic load balancing
- IMS elements can be enabled or disabled with zero service interruption
- Complete set of application servers for voice and messaging
- IMS ISC interfaces and iFC with third-party application support
- Standard 3GPP interfaces, procedures and reference points
- Support for non-IMS SIP devices and centralised IMS service delivery
- Flexible, pay-as-you-grow licensing

**Proxy-CSCF** is the secure front door of the IMS core: every signalling message to and from IMS/SIP devices passes through it. It handles device interworking, security and QoS in cooperation with the policy function, and its built-in SBC capabilities shield the network from threats, protect subscriber privacy and generate charging records. The P-CSCF routes registration and session requests to the right nodes, keeps the S-CSCF informed of the subscriber's access network, passes session information to the PCRF and maintains a secure connection with the client device.

**Interrogating-CSCF** routes SIP messages to the S-CSCF assigned to each subscriber and handles requests arriving from other networks. It queries the HSS to locate the serving S-CSCF, with addresses held in DNS as A or SRV records, and — as part of the IBCF — acts as the gateway to external networks via the BGCF.

**Serving-CSCF** is the brain of IMS session control. At registration it downloads the subscriber profile from the HSS and uses the iFC to decide which application server handles each service request. All signalling for registered subscribers passes through it, including breakout to the PSTN, and multiple S-CSCFs are typically deployed for high availability and load balancing.

**MGW (Media Gateway)** performs MRF and IMS-AGW/ALG functions, interworking at the signalling level and managing media resources across gateways. An optional BGCF module provides number-based routing from the S-CSCF. PROTEI MGW supports H.248, SIP, H.323, SS7 and PRI.

**Application Servers** execute call-processing logic and service scenarios over SIP. PROTEI IMS bundles include TAS and SCC-AS as standard, with **IP-SM-GW** and USSI commonly added so SMS and USSD work

natively in the IMS domain — the IP-SM-GW interworks with the legacy SMSC over MAP for seamless IMS-to-SMS delivery.

## ■ Home Location Register (HLR/HSS)

### **One subscriber brain for 2G, 3G, 4G, IMS and IoT.**

PROTEI HLR/HSS is a high-performance, converged subscriber data management platform built for operators of every size. Its scalable architecture and flexible, throughput-based licensing meet today's requirements and scale smoothly for tomorrow's — including IoT and Private LTE/5G deployments.

As the master subscriber database, PROTEI HLR/HSS holds everything the network needs to serve each subscriber — identity, account status, service profile, subscribed features, preferences and current location — with a single shared database behind multiple HLR/HSS front-ends. The integrated Authentication Centre (AuC) supports all major algorithms, including TUAK, Milenage and COMP128 v2/v3, and every data element and protocol is implemented in strict compliance with 3GPP standards.

The LTE-HSS profile extends the packet-switched profile with LTE subscription fields, supporting the PDN/EPS context alongside the GPRS/UMTS context so operators can provision either or both. S6a delivers seamless LTE integration, while Sh and Cx serve IMS subscribers — fully compliant with 3GPP TS 29.272, TS 29.273 and related specifications. A convenient provisioning interface ensures smooth integration with the operator's BSS and effortless day-to-day subscriber management.

## ■ DRA/DEA

**Tame Diameter complexity as your LTE, IMS and roaming traffic grows.** PROTEI Diameter Routing Agent (DRA) provides a single connection point for every Diameter entity in the network. By centralising routing, traffic management and load balancing, it lets LTE and IMS networks scale incrementally with demand while cutting the cost of connecting, provisioning and interworking Diameter equipment.

PROTEI DRA manages in-network and outbound roaming, mediates Diameter messages and strengthens signalling performance and security, while DEA functionality proxies traffic from external networks. Diameter dialect adaptation connects otherwise incompatible multi-vendor "Diameter islands", and the platform can be deployed as an IETF Diameter Agent or a 3GPP DRA.

Typical use cases include:

- Centralised Diameter routing in LTE networks
- LTE roaming and LTE-to-2G/3G roaming
- Centralised charging
- HSS address resolution and PCRF binding

The result: a leaner LTE core and a single, secure interconnect point to other networks.

## ■ Signaling Firewall

**Close the door on SS7 and Diameter attacks before they cost you revenue or reputation.** PROTEI Signaling Firewall detects and blocks irregular or malicious SS7 and Diameter traffic. Built in line with GSMA security guidelines FS.11, FS.07, IR.70, IR.71 and FS.19, it protects the network and its subscribers against fraud and prevents revenue leakage.

Multiple protection levels — monitoring and alerting, basic policing and advanced policing rules — stop network- and subscriber-targeted attacks such as spamming, flooding, fraud, location tracking, identity theft, denial of service and unlawful interception.

Routing and policies can be tuned individually for each SS7 or Diameter connection using a wide range of filtering criteria. A modular design, built from identical connection units, makes the platform easy to expand and upgrade, with interface throughput of up to 1,000 TPS.

## ■ Equipment Identity Register (EIR)

**Keep stolen and unauthorised devices off your network.** Hundreds of thousands of handsets are reported stolen every year. PROTEI EIR lets operators blacklist the IMEIs of stolen devices, blocking them from registering, and supports national device-registration programmes.

Automatic device detection identifies every handset change through standard MAP-CHECK-IMEI procedures: when a new IMEI appears against an MSISDN, PROTEI EIR detects it instantly, checks it against the blacklist and notifies external systems — opening the door to device-based marketing and customer care.

PROTEI EIR runs on PROTEI GeoInsight, which captures subscriber location and device data from the core using vendor-specific feeds or standard MAP capabilities (MAP-NOTE-MM-EVENT, MAP-CHECK-IMEI, MAP-SUBSCRIBER-LOCATION-REPORT), powering services such as geo-targeted campaigns, border roaming control and loyalty programmes.

## ■ Signal Transfer Point (STP)

**The proven backbone of your signalling network.**

PROTEI STP is a high-performance platform for SS7 message routing, with highly flexible routing rules, special handling for specific message types and connections to multiple roaming providers. It is field-proven as the foundation for active steering, SMS Firewall and SS7 Firewall deployments.

PROTEI STP capabilities:

- Flexible routing on SCCP-level parameters and by TCAP operation code
- Dedicated translation types for outgoing traffic
- Flexible route redundancy
- SIGTRAN or E1/SS7 connectivity

## ■ Gateway Mobile Switching Center (GMSC)

**A cost-efficient voice switch purpose-built for MVNOs.** PROTEI GMSC handles voice calls for GSM/UMTS subscribers on a Class 4 softswitch, adding GMSC-specific modules such as HLR interrogation over MAP and a gsmSSF supporting CAP.

Broad signalling support ensures interoperability with MNO core networks from any vendor, with core connectivity over SIP, SIP-I, SIP-T or H.323 and PROTEI mGate media gateways for interworking with PSTN and PLMN networks. A powerful routing engine routes calls on multiple criteria such as SLA and per-direction load, while T-CSI, M-CSI and N-CSI triggering unlock the full potential of CAMEL services.

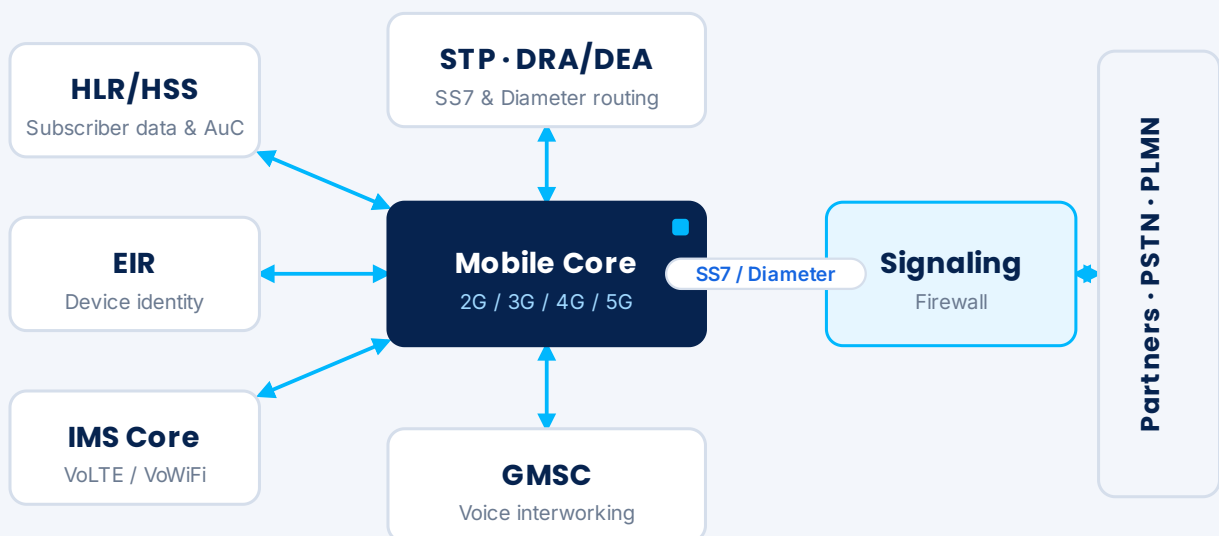


### ■ Built for the all-IP era

- 3GPP-compliant, from 2G to 5G
- Cloud-ready NFV deployment
- GSMA-aligned signalling security

**Carrier-Grade. Future-Ready.**

## ■ PROTEI core network portfolio



# Evolved Packet Core

A complete LTE packet core, MME, SGW and PDN-GW/GGSN, deployable separately or as a turn-key bundle, including Private LTE/5G.

PROTEI EPC

MME

SGW

PDN-GW/GGSN

## ■ PROTEI EPC

**A complete 4G packet core — for nationwide networks, MVNOs and Private LTE/5G alike.** PROTEI EPC gives operators everything they need to deliver fast, reliable and secure mobile broadband. Its all-IP, flat architecture delivers high throughput and low latency, lowers cost per bit and supports real-time, media-rich services with an outstanding quality of experience, while interworking with 2G/3G networks through an external SGSN.

The set comprises MME, SGW, PDN-GW/GGSN and, optionally, HLR/HSS and PCRF — deployable individually, in any combination or as a turn-key bundle. It covers access control, packet routing, mobility and security, radio resource and network management, from macro to pico cells. Each node supports from 100 to 1 million simultaneously attached subscribers, so PROTEI EPC fits any size or topology — from a campus Private LTE/5G network to a national operator.

## ■ MME

**The control-plane heart of the LTE network.** PROTEI MME manages signalling between devices and the core: bearer establishment, maintenance and release, authentication via the HSS and security between the UE and the network. It also handles mobility — tracking and handover — manages subscription profiles and service connectivity, verifies authorisation and enforces roaming restrictions.

Fully 3GPP-compliant, PROTEI MME supports default and dedicated bearers (up to 8 per subscriber), NAS ciphering and integrity protection, and all key procedures including attach/detach, PGW and SGW selection, and S1, inter-SGW and inter-MME handovers. Interfaces include S6a to the HSS, S1-MME, SGs and Sv.

## ■ SGW

**Seamless mobility for every data session.** PROTEI SGW routes and forwards user data and acts as the user-plane mobility anchor for handovers between eNodeBs and between LTE and other 3GPP technologies. It retains bearer information while devices are idle and manages UE contexts, including IP bearer parameters and routing information. Default and dedicated bearers, multiple sessions per subscriber, S5/S8 towards the PDN-GW and S1-U towards eNodeBs are all supported.

## ■ PDN GW/GGSN

**Your gateway between the mobile network and the Internet.** PROTEI PDN-GW/GGSN acts as the PDN Gateway in 4G/LTE and as the GGSN in 2G/3G, routing data between the packet core and external IP networks. It authenticates sessions via RADIUS and assigns IP addresses per APN.

Built to international standards, it integrates over SGi/Gi to packet networks, S5/S8 to LTE SGWs and Gn to SGSNs. Gx and Gy interfaces with a built-in PCEF enable real-time policy control and data charging, and capacity grows simply by adding modules as traffic increases.

# Roaming Solutions

Steer, retain and monetise roaming traffic across 2G, 3G and LTE while giving travellers a better experience.

Steering of Roaming

Multi IMSI Roaming Gateway

GLR

Roaming Optimization Suite

Border Roaming Gateway

SMS Welcome & Tariff Advisor

Local Number for Visitors

Roaming Assistant

## ■ Steering of Roaming Platform

**Put your roaming agreements to work — on 2G, 3G and LTE.** PROTEI Steering of Roaming gives operators precise, flexible control over network selection, guiding outbound roamers to preferred partner networks to hit traffic commitments and protect roaming margins.

Registration control follows GSMA IR.73, the core guideline for steering services, strengthening the operator's position with roaming partners and securing the required quality of service. A Diameter front-end extends steering to LTE roaming traffic.

Steering decisions combine multiple criteria — partner priority, roaming KPIs (successful registrations, unique subscribers per network, error rates) and traffic distribution targets. The platform also manages outbound roamer profiles, for example updating CAMEL profiles or disabling fraud-prone supplementary services, and built-in Border Roaming Prevention keeps subscribers on the home network while still in-country.

Real-time statistics and reporting give technical and commercial teams KPI monitoring, fast troubleshooting and deep insight into roaming trends through an intuitive web interface.

## ■ Multi IMSI Roaming Gateway

**Instant global reach for MVNOs, challengers and IoT providers.** PROTEI Multi-IMSI Roaming Gateway extends the roaming footprint of MVNOs and smaller operators by leveraging the agreements and

subscriptions of established operators and roaming brokers — without negotiating hundreds of bilateral agreements.

The gateway supports both Dual-IMSI and dynamic Multi-IMSI roaming. Multi-IMSI dynamically loads an alternative subscription from the visited operator, giving roamers a local number and full local services — low-cost or free incoming calls, affordable outgoing calls and attractive data rates — while they remain reachable on their main number.

## ■ Gateway Location Register (GLR)

**Hold on to every inbound roamer.** PROTEI GLR captures each visitor's profile at first registration and serves subsequent VLR requests locally, sharply reducing interrogations towards the home network. This shields visitors from home-operator steering and interoperability issues that can push them to a competitor — while cutting signalling costs.

Key benefits:

- Stronger roamer retention during home-network interrogation, short outages or coverage gaps
- Lower signalling volumes towards the SCCP provider
- Reduced exposure to home operators' SoR systems
- Full compliance with ETSI TS 23.119 and GSMA rules — no extra signalling
- High efficiency in complex or segmented networks

Comprehensive statistics, CDRs and a web-based toolkit provide dedicated analytics for inbound roaming traffic.

## ■ Roaming Optimization Suite

**More inbound roaming revenue, lower costs for visitors.** The suite combines two subsystems. **Roaming Optimization** connects calls between two visitors in the same network locally, avoiding a costly voice loop through the home network — a better deal for roamers and more revenue for the visited operator.

The **Visitor Retention Subsystem** keeps visitors on the network during momentary issues such as coverage loss, using standard MAP Update/Cancel Location procedures. Both subsystems include full statistics, CDR generation and web-based roaming analytics.

## ■ Border Roaming Gateway

**No more accidental roaming bills near the border.** Coverage gaps, outages or congestion can push handsets onto a neighbouring country's network, leaving subscribers with unexpected roaming and international charges — and operators with complaints and lost revenue.

PROTEI Border Roaming Gateway (BRG) keeps subscribers on the home network while they are still in their home country or zone, reducing complaints, raising service quality and protecting revenue for both operators and their customers.

## ■ SMS Welcome and Roaming Tariff Advisor

**Make a great first impression the moment roamers land.** "Welcome SMS" and "Bon Voyage SMS" engage both visitors and your own subscribers travelling abroad with useful information on the visited network, the country and key service prices.

Dynamic content, language selection by home country, flexible delivery scenarios and network or subscriber blacklists are supported, with SMSC connectivity over SMPP v3.4. Roaming Tariff Advisor adds location-based tariff information, reducing bill shock and churn.

## ■ Local Number for Visitors

**A new inbound-roaming revenue stream.** Long-stay business visitors get a local number that receives incoming calls while their main number stays active — no separate local SIM required. Roamers avoid costly incoming roaming charges and are easier for local partners to reach, while operators earn new revenue and optimise traffic in their network.

## ■ Roaming Assistant

**Every roamer call connects.** PROTEI Roaming Assistant automatically corrects typical dialling errors made by roamers and gives them access to their home network's short-number services while abroad — raising call success rates and operator revenue. Both inbound (ISUP-based) and outbound (CAMEL-based) roamers are supported.



## ■ Roaming revenue, maximised

- GSMA IR.73 steering
- LTE-ready via Diameter
- Retain every inbound roamer

**Carrier-Grade. Future-Ready.**

# Messaging Solutions

Public warning, A2P protection and carrier-class SMS and USSD, secured against spam and fraud.

Cell Broadcast Center

SMS Firewall

SMS Center

Bulk SMS/MMS/USSD

SMPP-Proxy/Router

USSD Server

## ■ Cell Broadcast Center

**Reach every phone in an area within seconds — for public warning, safety and engagement.** PROTEI Cell Broadcast Center delivers geographically targeted, one-to-many messages directly to handsets using GSM and LTE Cell Broadcast technology, ready to power national public warning systems as well as technical and marketing broadcasts.

Messages reach every subscriber in a defined area — a set of Cell IDs, LACs, TACs and more — as configured per information channel, with no network congestion. An open JSON-based interface lets authorities and content providers manage campaigns, and standard 3GPP interfaces connect to the BSC (TS 48.049), RNC (TS 25.419) and eNodeB (TS 29.168). The architecture complies strictly with 3GPP TS 23.041 with ETSI TS 102 900 extensions, and integration with PROTEI Geolnsight, managed from one campaign module, maximises reach and flexibility.

## ■ SMS Firewall

**Protect subscribers and capture the A2P revenue that grey routes are taking.** PROTEI SMS Firewall shields the network against the main SMS spam and fraud threats, detecting and blocking:

- SMS spoofing and faking
- SMS flooding and spam
- Grey-route A2P traffic and other technical fraud

It covers both application-originated SMPP traffic and inbound or transit SS7 traffic. Filtering rules can be set per traffic type, MSISDN range, operator, Global Title range or SMPP sender, with SS7 parameter checks on traffic from abroad and limits on traffic intensity per MSISDN, SMSC or network element. Anti-spoofing and anti-faking follow GSMA IR.71, and advanced anti-

spam combines keyword filtering, heuristic content analysis and statistical detection of identical or similar messages, plus personal white and black lists.

## ■ SMS Center

**Carrier-class SMS that scales with your network.**

PROTEI SMSC combines proven reliability with innovative messaging features. SIGTRAN support simplifies rollout in modern networks, and broad protocol support covers GSM/UMTS and IS-41 deployments. First Delivery Attempt, flexible delivery scenarios, policy management, a powerful routing engine and straightforward licensing make it an ideal fit for operators.

A fully featured SMPP interface with granular access policies serves external applications, and a horizontally scalable architecture lets capacity grow with traffic. Subscriber features such as forwarding, copy, auto-reply, personal black and white lists and detailed delivery reports enrich the user experience.

## ■ Bulk SMS/MMS/USSD

**Turn enterprise messaging into a growth engine.**

Banks, service and content providers and advertisers need to reach customers fast and reliably. PROTEI Bulk SMS/MMS/USSD is a high-capacity A2P platform that gives operators powerful tools to manage enterprise campaigns and to control and charge the bulk traffic generated by corporate clients.

Customers run their campaigns through convenient web and GUI interfaces, while online charging is supported over HTTP/XML, Diameter or proprietary protocols.

## ■ SMPP-Proxy/Router

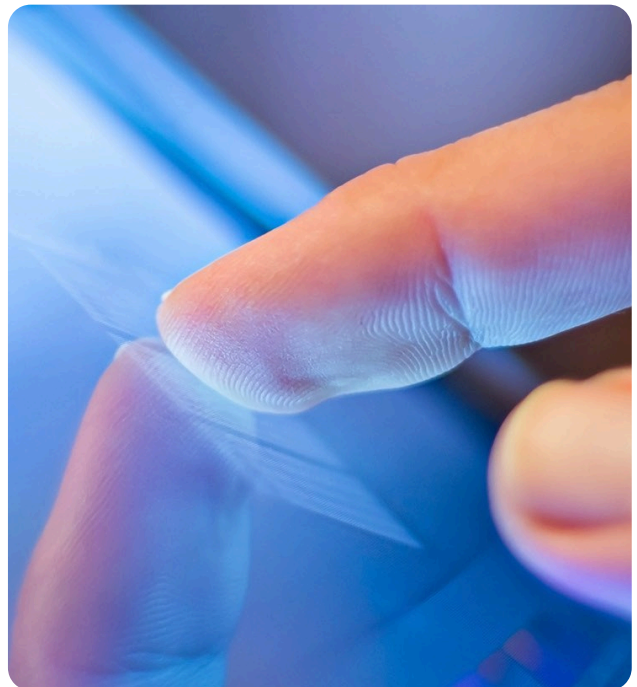
**One smart gateway between your messaging centres and the application world.** PROTEI SMPP Proxy/Router exchanges messages between SMS/USSD centres and external applications, serving operators and content aggregators alike. Flexible policy and bandwidth management route traffic by message type, sender and recipient, application IP address and more.

Typical scenarios include offloading application traffic from the SMSC — delivering directly and passing only undelivered messages to the SMSC — and interconnecting the SMSCs of several operators into a unified messaging space, so content providers reach multiple networks through a single access point.

## ■ USSD Server

**Instant, interactive self-service on every handset.** PROTEI USSD Server connects subscribers with external applications for balance enquiries, top-ups, mobile financial services and other care services — the fastest, most convenient channel on any phone. Messages are routed by service key, content and originating MSC, with per-application access policies and bandwidth management.

USSD Phase I and II enable interactive multi-level menus, SMPP v3.4 speeds integration with content providers, and open XML and ODBC interfaces connect external systems and databases. One service number can serve different applications per subscriber group, an online charging interface is included, and automatic load balancing across modules ensures high availability.



### ■ Messaging, protected

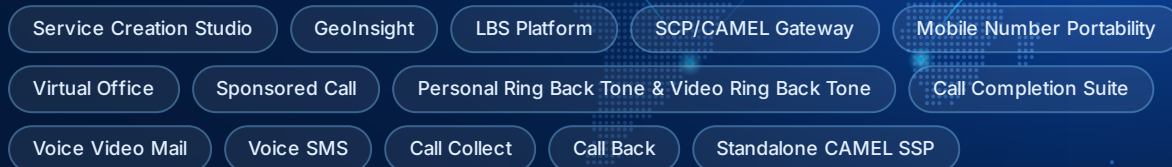
- 3GPP public warning ready
- GSMA IR.71 anti-spoofing
- Carrier-class SMSC and USSD

**Carrier-Grade. Future-Ready.**



# Intelligent Network & VAS

Location intelligence, programmable service control and value-added services that build loyalty and new revenue.



## ■ PROTEI Service Creation Studio

**Design, launch and evolve new services in days — without writing code.** PROTEI Service Creation Studio is a visual, low-code service creation environment that lets operator teams turn ideas into live value-added services as drag-and-drop flows, instead of lengthy development projects. Marketing and product teams can respond to market opportunities while they still matter, and engineering keeps full control of quality and network safety.

Ready-made building blocks cover call, SMS, USSD and data-session control, subscriber profile and balance checks, notifications and integration with external systems over open APIs. Services run on PROTEI's carrier-grade SCP/CAMEL, IVR and USSD platforms across 2G, 3G, 4G and IMS networks.

- Visual drag-and-drop editor for service logic and menus
- Library of reusable blocks and service templates
- Open API integration with billing, CRM and partner applications
- Faster time to market and lower cost of service creation

## ■ PROTEI GeoInsight

**Turn network location data into new revenue.** PROTEI GeoInsight is a carrier-class platform that collects, processes and delivers real-time subscriber location and registration data to external applications — a powerful engine for location-triggered messaging, geo-marketing and analytics.

GIS integration lets users draw a target area on a digital map, which is converted automatically into Cell IDs or Location Areas, and an HTTP/XML API makes integration fast and simple. Operators can offer businesses and advertisers geo-targeted campaigns refined with CRM data:

- ARPU-based segmentation for specific marketing programmes
- A business's own customer list, reaching clients as they enter its area
- Blacklists that respect subscribers who have opted out
- Powerful statistics for true multi-criteria targeting

## ■ Location Based Service Platform

**Location services that work on every handset.** The PROTEI LBS platform lets operators launch high-value services based on the subscriber's current location — parental control, fleet tracking, navigation with optimal routing and “find the nearest” search for cafés, cinemas, police stations and more.

Unlike many alternatives, PROTEI LBS works for every subscriber regardless of device, using Cell ID and Cell ID+ positioning with accuracy of up to 100 metres.

- A wide range of unique, high-value location services
- Convenient interface for content providers, with full SMPP support
- Standard interfaces, simple implementation and powerful reporting tools

## ■ SCP/CAMEL Gateway/proxy

**Launch new services in days, not months — across GSM, 3G and IMS.** PROTEI SCP/CAMEL Gateway controls calls, SMS and data sessions in real time through programmable service logic, enabling fast rollout of IN services for prepaid and postpaid subscribers in any CAMEL-enabled network. Service logic can be built by PROTEI, a partner or the operator's own team.

An optional Service Creation Environment makes it easy to build and fine-tune services, and built-in CAMEL proxy functionality slots into existing IN networks — new services go live with zero disruption to those already running. Black and white lists, inbound usage counting, number translation and mobile VPN are typical examples.

## ■ Mobile Number Portability

**Regulatory-ready number portability, delivered with confidence.** MNP lets subscribers switch networks while keeping their number — a cornerstone of market liberalisation and a technical challenge almost everywhere. PROTEI-MNP implements portability in line with ETSI EN 301 715 and EN 301 716 (GSM 03.66), operating as the MNP-SRF with an embedded NPDB or an external database:

- IN-based call-related signalling (CAMEL approach, GSM 03.66 Annex A)
- Indirect routing for call-related, SMS and Any Time Interrogation scenarios
- Integration with national NPDBs via XML or ODBC

Operators choose the scenario that best fits their network, and the Comfortable Jump service can be added on the same platform.

## ■ Virtual Office

**Win the SME market with cloud PBX and FMC services.** PROTEI Virtual Office Server delivers PBX-like and fixed-mobile convergence services — Virtual Number, Virtual Call Center and Virtual Private Network — plus intelligent hunt groups for mobile teams.

Each incoming call is routed to the most suitable mobile agent according to hunting rules based on calling number, caller and agent location, time schedules and more, and business customers manage everything through a self-service web portal.

## ■ Sponsored Call

**Ad-funded calling that delights subscribers and opens a new advertising channel.** Subscribers who opt in to themed channels make free or discounted calls after a short audio or video message from an advertiser. In return they receive advertiser-paid minutes, a discounted per-minute rate or a daily, weekly or monthly allowance.

Subscribers join via SMS, USSD, IVR or a self-service portal; advertisers manage channels, creatives and statistics online; and operators can cap the number of adverts and rewards per subscriber.

## ■ Personal Ring Back Tone & Video Ring Back Tone

**One of the most loved VAS — now richer and easier to monetise.** PROTEI-RBT lets operators launch Ring Back Tone quickly on a flexible, scalable platform. Beyond tones by caller and time schedule, Music Box and management via IVR, USSD and web, it offers "Copy my friend's tone", "Gift a tone", Corporate RBT, channel-specific pricing, Hang-up SMS and Anti-RBT.

Promotions such as "second tone free" or "first month free" roll out in minutes, and Video RBT extends the experience to video calling, including from IMS and NGN networks.

## ■ Call Completion Suite

**Every missed call is a missed revenue opportunity.** PROTEI Call Completion Suite captures calls that would otherwise fail and turns them into completed, billable traffic. It can extend an existing voicemail system, run standalone or be delivered fully integrated with voicemail. Services include:

- Missed Call Notification ("Who Called") and Notify Me
- Call Completion and Video Call Completion
- Voice/Video SMS and Voice/Video Mail
- Comfortable Jump
- Call Collect (Pay4Me, Sponsored Call, called-party-pays calls)

Missed Call Notification tells subscribers who called while they were unreachable — and can tell callers when the subscriber is back — directly increasing completed calls and revenue.

## ■ Voice Video Mail

**Never miss a message — on any network, from any phone.** PROTEI Voice/Video Mail drives extra traffic and revenue, letting subscribers retrieve messages anytime, at home or roaming, from their mobile or any other phone.

- Personalised menus for different subscriber groups and language profiles
- Dynamic mailbox creation at the first call forward
- Configurable notifications and one-click call-back to the sender
- Video messages delivered as MMS or e-mail, with personal video greetings

Support for SS7, PRI and SIP enables efficient deployment across IMS and NGN networks.

## ■ Voice SMS

**“Talk and listen” messaging that works on every handset.** PROTEI Voice SMS is a carrier-class, store-and-forward voice messaging service that works across operators and networks, extracting more value from existing voice, SMS and billing investments. Per-message billing — just like SMS — needs only one new rating rule, inter-operator interconnection accelerates adoption, and no handset upgrade or learning curve is required.

## ■ Call Collect

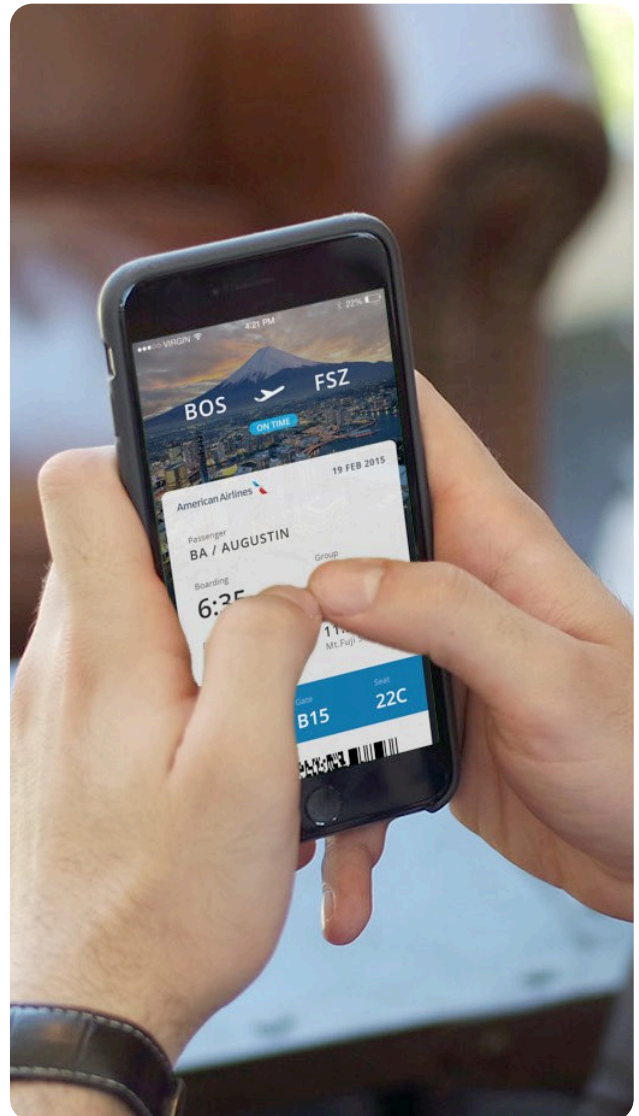
**Turn low-balance failures into revenue.** When a prepaid subscriber's balance is too low, PROTEI Call Collect lets them ask anyone on any network to call back or top up their account — or place a call charged to the called party. Counters and limits prevent misuse, prepaid/postpaid differentiation and forced location determination keep the service accurate, and white and black lists add convenience.

## ■ Call Back

**Affordable calling for roamers in non-CAMEL networks.** PROTEI Call Back Server lets subscribers request calls by SMS or USSD — or simply dial as usual with seamless CAMEL-based call-back. Flexible routing, location-aware policy management and open CAMEL, Diameter or XML interfaces integrate it with third-party prepaid platforms.

## ■ Standalone CAMEL SSP

**Serve CAMEL roamers even where your switches can't.** PROTEI Standalone SSP brings CAMEL roaming to networks without native support, giving inbound roamers access to their home operator's SCP services — including prepaid voice and SMS — in line with CAMEL Phase 2 and 3.



## ■ New services in days

- Low-code Service Creation Studio
- GeoInsight location intelligence
- Works on every handset

**Carrier-Grade. Future-Ready.**

# Data Traffic & Policy Management

Deep packet inspection, real-time policy control, Wi-Fi offload and bill-shock prevention to manage and monetise data.

DPI Platform

Policy Controller (PCRF)

WiFi Offload

Bill Shock Prevention

## ■ DPI Platform

**See, shape and monetise every byte on your network.**

PROTEI DPI gives operators complete control of data traffic, enabling application-aware tariffs, bandwidth management, zero-rating and premium service tiers that turn data growth into revenue.

A built-in signature constructor detects flows from newly emerging Internet applications, statistical analysis identifies even obfuscated protocols, and a regularly updated signature library speeds the launch of new services. Priority-based bit-rate control and

ToS/DSCP prioritisation protect the experience of what matters most, while URL-based policies use external categorisation databases as well as local black and white lists.

Real-time per-service charging over Gy and periodic quotas are supported, with subscriber identification via RADIUS, Gx or XML and tariffs applied per subscriber or on command from a 3GPP PCRF. Horizontally scalable and fully redundant — no single point of failure — PROTEI DPI is available as software only or as an integrated solution using PROTEI-developed 40 Gbps boards.





PROTEI DPI analytics: per-application traffic statistics

## ■ Policy Controller (PCRF)

### Real-time policy for smarter, fairer mobile broadband.

PROTEI Policy Controller manages policy and charging parameters for 3G and LTE subscribers, with a flexible decision engine that allocates broadband resources dynamically — adjusting bandwidth and charging per service, in real time, during a live session.

Decisions draw on service type, subscriber profile, usage history, time of day and commands from external systems such as self-care portals. Beyond bearer control, it manages content-filtering rules for parental control and corporate services. Supported interfaces:

- Gx towards the PDN-GW, GGSN or DPI to push policy and charging rules
- Sp (Diameter or XML) to retrieve subscriber profiles
- Rx for applications that adjust session parameters, with XML also supported
- Gxc towards the S-GW and S9 towards the V-PCRF in roaming scenarios

## ■ WiFi Offload

### Add Wi-Fi capacity to your mobile network —

**seamlessly.** Data demand is surging, and Wi-Fi is the most cost-effective complement to licensed 4G/LTE spectrum. PROTEI WIX is a market-proven offload solution that integrates Wi-Fi into the mobile core, so subscribers can receive calls and SMS on their own number over Wi-Fi.

Operators can offer bandwidth-efficient FMC services — Wi-Fi in the office, 4G outside, one MSISDN and one bill — and Wi-Fi roaming through WLAN aggregators. Data and voice are charged in real time against the subscriber's main account, for prepaid and postpaid via CAMEL and Diameter.

## ■ Bill Shock Prevention Platform

### Happy roamers, fewer disputes, protected margins.

Bill shock frustrates customers and costs operators unrecoverable revenue and wholesale charges. PROTEI Data Usage Control and Bill Shock Prevention notifies roaming subscribers in real time of their data consumption and costs.

Subscribers and operators set spending and usage thresholds; the system sends SMS alerts as limits approach and suspends the service once reached — encouraging confident data use abroad while preventing fraud and misuse of flat-rate roaming plans.



# Charging

Real-time online charging and billing for operators, MVNOs and MVNEs.

OCS for MVNO/MVNE

## ■ OCS Platform for MVNO/MVNE

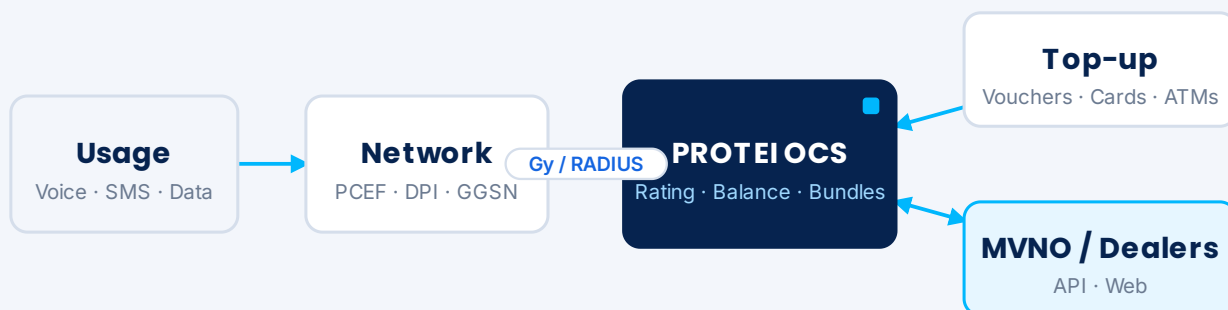
**Real-time charging that lets you launch new offers — and new MVNOs — fast.** PROTEI OCS is a complete, automated accounting, charging and billing solution covering subscriber registration and management, real-time service charging and much more. Its powerful rating engine makes it ideal for MVNEs, with one platform shared across multiple MVNOs.

It charges every type of telecom service in real time, manages subscriptions and supports an unlimited number of tariff plans, with time-, event-, volume- and

service-based charging, pay-as-you-go and bundles. Real-time data charging via Diameter (Gy) or RADIUS connects to PCEF/DPI, gateways and Wi-Fi service gateways.

Inventory and dealer management, convenient APIs and web portals for dealers and MVNOs, and integration with voucher management and IVR complete the picture. Accounts can be topped up by voucher, airtime transfer or card payment through gateways, kiosks and ATMs, while open APIs to finance, CRM and care systems and powerful reporting give a full view of usage and subscriber activity.

## ■ Real-time charging with PROTEI OCS



# Customer Care

Omnichannel contact centre, voice self-service and voucher management for efficient, modern customer care.

Call Center

Voice Portal (IVR)

Voucher Management System

## ■ Call Center

**An omnichannel contact centre built on VoIP and web.**

PROTEI Call Center lets customers reach you by phone, web call-back, e-mail or VoIP, and supports geographically distributed teams for help desk, information, booking and customer care services.

Unlimited agent groups and service numbers run any number of services on one platform. Routing by dialled or calling number, time and queue status, plus skill-based distribution, tune every contact centre to its customers, with built-in call recording, monitoring and powerful supervisor tools.

## ■ Voice Portal (IVR)

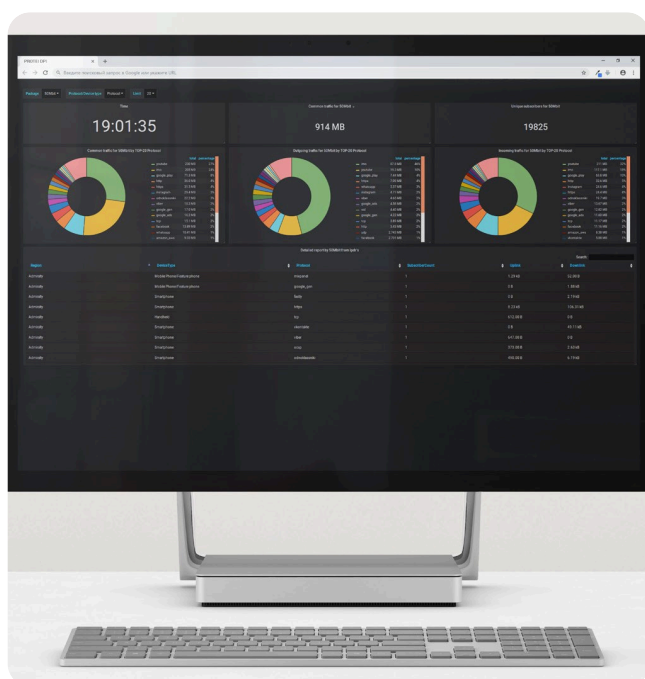
**Self-service that cuts care costs and delights subscribers.** PROTEI IVR is a carrier-class voice platform for customer care, information and

entertainment services, with a modular, SIP-enabled architecture for smooth IMS and NGN integration and SS7/EDSS-1 connectivity to TDM networks.

It covers balance enquiry, payments, service activation, tariff changes, low-balance alerts and more, querying billing and other systems in real time. Administrators design menus in a visual service creation environment, launch outbound notification campaigns, and add ASR and TTS engines for advanced voice services.

## ■ Voucher Management System

**Full control of the prepaid voucher lifecycle.** Generate PINs with the built-in generator or an external system, track expiry, dealer transfer and activation dates, and manage reseller activity end to end. Web-based administration with role-based access fits existing business processes, and vouchers can be activated via IVR, USSD, SMS or a contact centre agent.



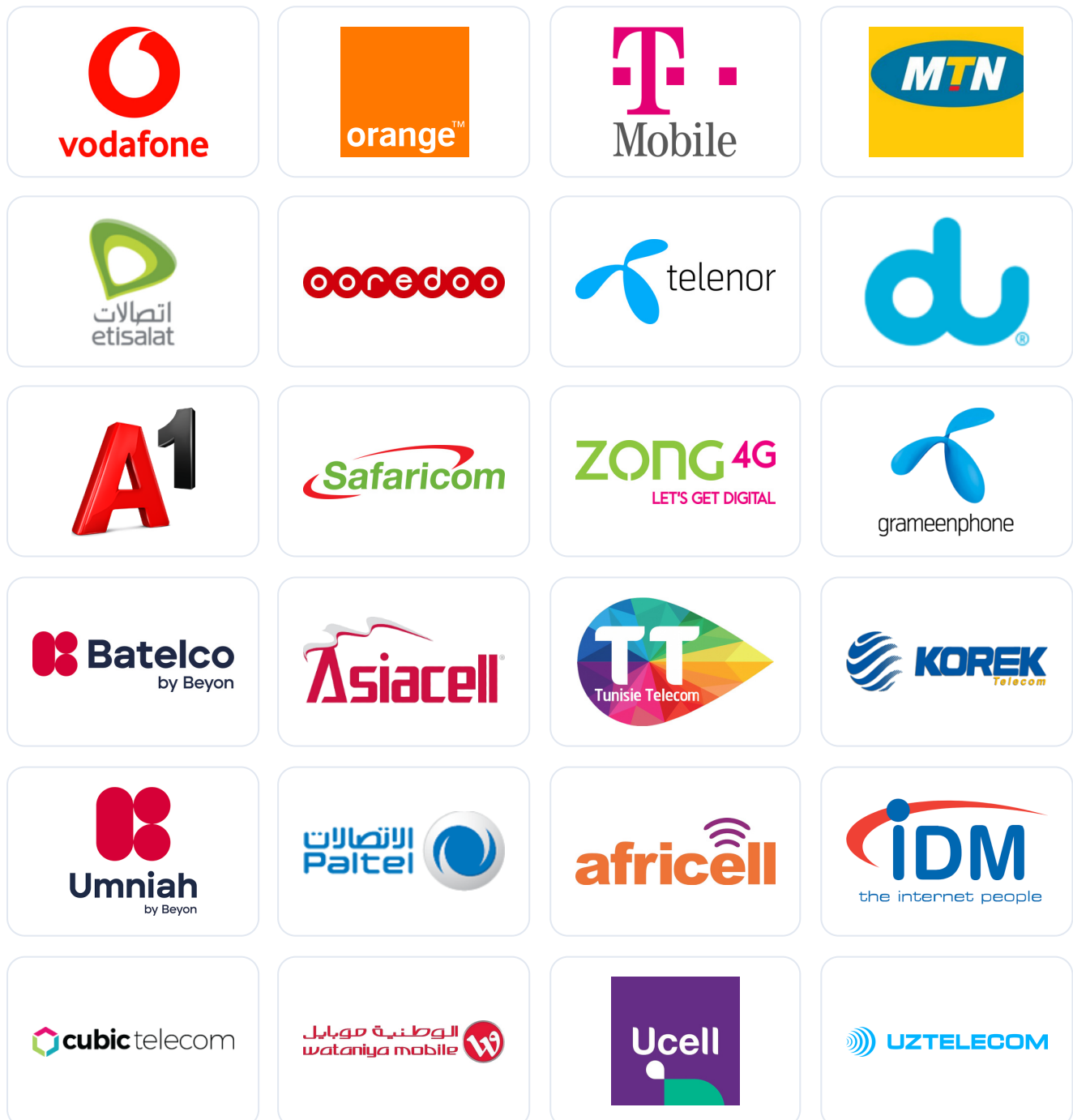
## ■ Care that scales

- Omnichannel contact centre
- IVR self-service with ASR/TTS
- Full voucher lifecycle control
- Real-time supervision and reporting

**Carrier-Grade. Future-Ready.**

# Our Customers

Over 400 clients worldwide, from global operator groups to national operators, MVNOs and enterprises, rely on PROTEI platforms. A selection of our key references:





**Carrier-Grade. Future-Ready.**

# Turn your network into your next growth engine.

From core and roaming to messaging, data and AI, our engineers design, deploy and support carrier-grade solutions that help operators, MVNOs and private networks grow revenue, cut costs and delight every subscriber. Let's talk.



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