

# SILAT



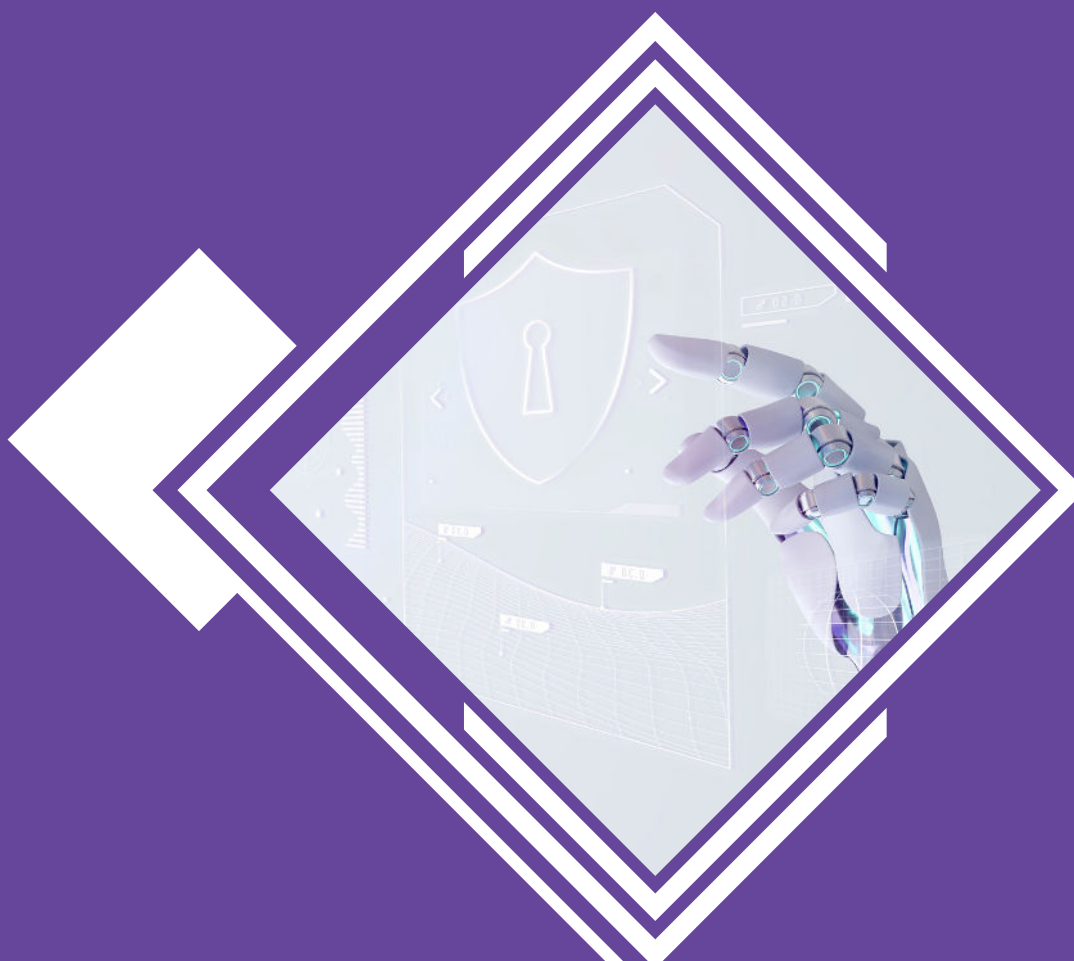
**SILAT**  
**Policy and Charging Enforcement**  
**Function(PCEF)**

# SILAT Company Profile

Systems and Information–Leading Advance Technology (Silat) is a premier technology provider and business consulting service dedicated to enhancing our clients' operational excellence and profitability. We pride ourselves on delivering reliable solutions through innovative and intelligent integration of cutting-edge technologies and business processes, all tailored to meet each client's unique needs. With over fifteen years of experience and a proven track record of hundreds of successful projects across various industry sectors, Silat's team excels in providing forward-thinking consulting and technology solutions. Our unwavering commitment to excellence and client satisfaction drives us to continually introduce the latest technologies, serving enterprise companies and telecom operators with unmatched dedication.

**SILAT offers a comprehensive portfolio of advanced telecommunications solutions designed to meet diverse industry needs:**

- Mobile Network Solutions: Core network services (CS, PS, EPC), messaging, roaming, location-based services, Intelligent Network (IN) platforms, and value-added services (VAS).
- Customer Engagement: IVR-based systems and IP call center solutions for efficient customer care.
- Next-Generation Networks: Scalable NGN/IMS systems for streamlined operations.
- Traffic & Policy Management: DPI and PCRF solutions for optimized traffic control.
- Billing & Charging Systems: Integrated OCS/OFCS and CRM tools for seamless billing.
- IoT & Private LTE: Secure solutions for IoT applications, private LTE networks, and smart cities.





## PCEF Key Features

### Detection of over 6000 protocols:

- VoIP and Media: SIP, RTP, RTSP, MPEG;
  - Torrents and P2P;
  - Messengers: WhatsApp, Telegram, Viber, Skype;
  - VPN's: openVPN, L2TP, PPPTP;
  - Encrypted protocols like SOCKSS, HTTPS, MTproto;
  - BRAS with CG-NAT and PCEF functions;
  - VAS for ISP: IoT Security and Parental controls;
  - Protection against DoS and DDoS attacks;
  - Installation on the available server platforms;
- Throughput over 100Gbps per RU;
- Connection In-line» and «Mirror»

### About Policy and charging enforcement function (PCEF)

PCEF is a hardware-software complex that controls the flow of network data, identifies protocols and applications, filters by URL, prevent intrusion attempts and spread malicious software by deep packet inspection data. PCEF performs important safety functions by checking incoming packets, analyzing the code and transmitted data after their disassembly and decompression, for compliance with applications and services. If a malicious URL or code snippet is detected, the system is able to completely block it. PCEF can also be used by service providers to provide subscribers different levels of access (type of use, data restriction, bandwidth), compliance with access rules, traffic prioritization, network load balancing and statistical information gathering. As more and more software products go beyond the workstation and corporate resources using cloud technologies, network performance becomes critical for high productivity. PCEF can recognize applications; which data pass them.

## BASIC WORK SCHEMES

The solution supports filtering by Server Name Indication (SNI), blocking of HTTPS traffic on Common Name certificates and blocking by «\*.domain.com» mask. For greater flexibility, it is possible to use own black and white lists.

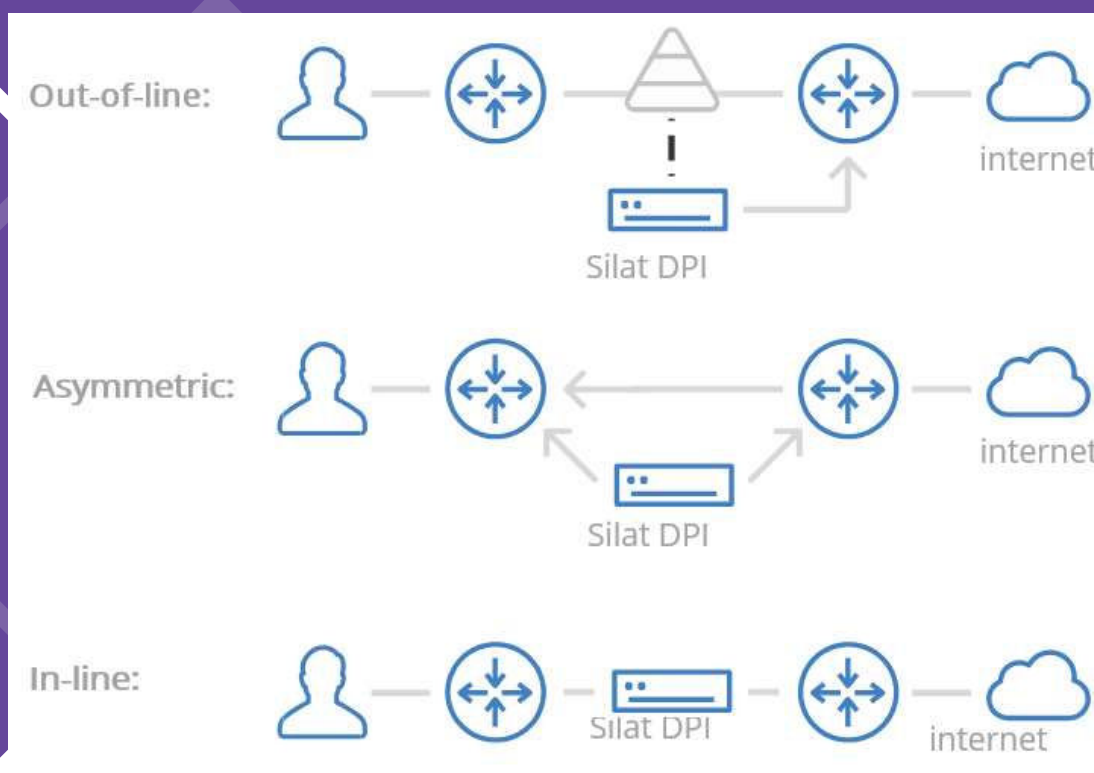
Silat PCEF has a full set of functions for working as L3 and L2 BRAS functionality and can also act as eGAT with support Hairpinning, Paired IP address pooling and Full Cone. Simple integrate by Radius protocol with most popular billing systems.

BRAS with PCEF allows using prioritization in subscriber tariff plan. Silat PCEF have some level of prioritization: by protocols/applications and by directions (AS number). It is available for subscriber, Vlan or pair physical ports and common channel. The system allows to pass messages to the subscriber while working on the Internet or redirect to the start page. PCEF gives ISP channel to communicate with customers. Marketing programs allow to delivery news, promo or information about network failures.

The system has built-in protection against DoS and DDoS attacks, realizes fight against TeP SYN Flood, fragmented UDP Flood and supports the Turing test. Dynamic bandwidth management with protocol priorities is supported. Silat PCEF provides up to 15% savings on the uplink channels and fast delivery of audio and video content through the caching system. Thus, caching of Windows and iTunes updates is fully available. And it is also possible to control the torrents by hash value, which significantly reduces the torrent traffic on the uplink channels.

### Different Silat PCEF connectivity schemes are supported:

- «In-line» PCEF connects between the Edge Router and the Termination Device (BRAS). Fault tolerance is provided by using the bypass function in Silicom cards.
- Asymmetric connection PBR function is used to implement web traffic filtering relying on policy-based routing.
- «Out-of-line» A scheme of traffic mirroring is performed through SPAN ports or optical splitters.
- The system supports integration with billing and RADIUS server.





## BRAS

This solution allows broadband operator to control subscribers access to the Internet and apply the policies of tariff plans and additional tariff options. Silat PCEF directly interacts with RADIUS server to obtain information about the authorized user, compares IP addresses with the tariff plan and additional services that are defined on the billing server.

- Authorization of IPoE and PPPoE sessions on RADIUS;
- Identification of users by IP, Q-in-Q label, MAC address;
- Assignment and modifying policies (tariff plan and additional services) through VSA (Vendor Specific Attribute) in the process of authorization on RADIUS and through CoA (Change of Authorization);
- Redirecting users to Captive Portal (blocking);
- Working at L3 and L2 levels;
- Performance of Silat PCEF system can reach 160 Gbit and process simultaneously up to 128 M user sessions.

## CG-NAT

Network Address Translation function allows the telecom operator to share one public IPv4 address with multiple subscribers, extend usage of the restricted IPv4 address space, and simplify passing to IPv6 addressing. Since PCEF platform is designed for huge loads with deep traffic analysis, it can easily realize network address translation function (Carrier-Grade NAT), in addition to which the customer receives a full set of standard PCEF tools

- Effectively uses the limited IPv4 address space;
- Complies with industry standards specified in RFC 6888, RFC 4787;
- Provides transparent operation of peer-to-peer protocols (torrents, games);
- Allows to limit the number of TCP and UDP ports for the subscriber (DDoS protection);
- Supports functions of Hairpinning, Paired IP address pooling and Full Cone.

## QoE


Silat PCEF QoE - this is a software product created for collecting statistics and assessing the quality of service perception (Quality of Experience - QoE).

The resulting statistics is superimposed on specific metrics to determine user experience and take actions aimed at improving the quality of communication services.





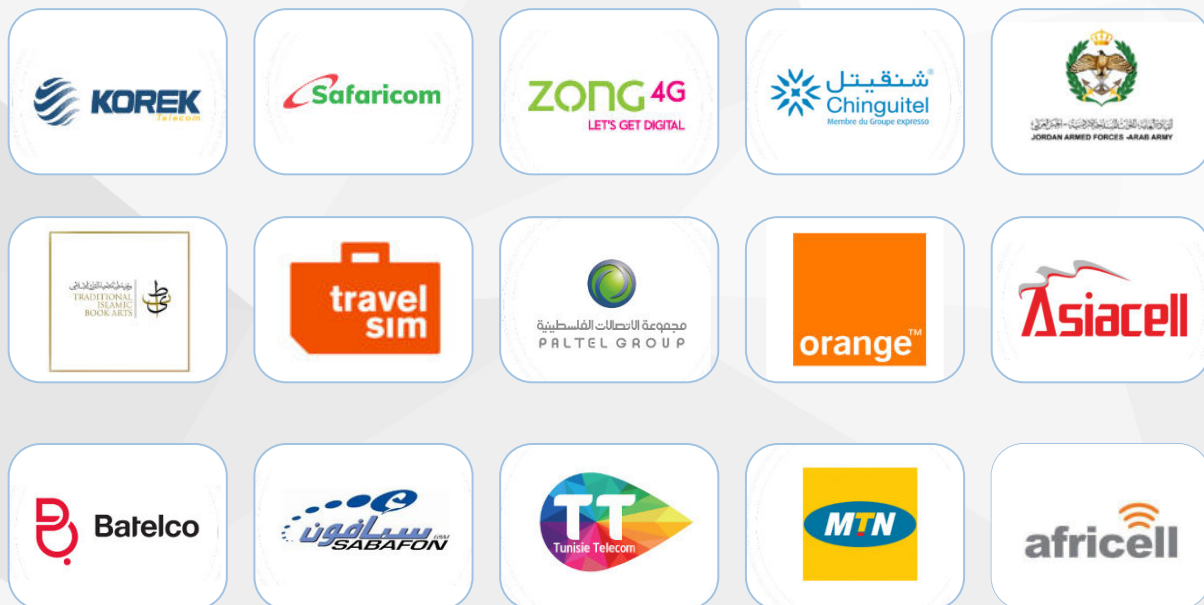
## TECHNICAL CHARACTERISTICS OF SPECTRE PCEF PLATFORM

| Name measurement           |  |              |              |              |  |               |
|----------------------------|---|--------------|--------------|--------------|---|---------------|
|                            | Silat DPI 6   | Silat DPI 10 | Silat DPI 20 | Silat DPI 40 | Silat DPI 80  | Silat DPI 160 |
| Performance Gbit           | 6   | 10           | 20           | 40           | 80  | 160           |
| Ports Pcs.xGbit            | 6x1/2x10  | 2x10         | 2x10         | 4x10         | 8x10  | 4x40/2x100    |
| Intefaces -                | RJ-45/SFP+  | SFP+         | SFP+         | SFP+         | SFP+  | FP+/100       |
| Dimension RU               | 1   | 1            | 1            | 1            | 2   | 3             |
| Subscribers -              | 400K  | 1M           | 2M           | 4M           | 8M  | 16M           |
| Maximum number of sessions | 4M  | 8M           | 16M          | 32M          | 64M   | 128M          |
| New sessions sessions/sec  | 100K  | 250K         | 250K         | 350K         | 400K  | 400K          |

## Our Customers



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# SILAT

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