

Scalable P-CSCF

NeatPathNetworks

Neat Path Networks Scalable P-CSCF disrupts the voice core telco providers market bringing compliance with the latest standards, including the strictest security features, combined with the practical needs of complex VoLTE/VoNR deployments. With the 2G/3G sunset as a catalyst, renewal of existing networks, IoT providers, MVNOs and private network operators demand a forward looking voice solution that scales and adapts to current and upcoming deployment practices.

The P-CSCF is the first point of contact of the device in the VoLTE/VoNR voice core. It is of vital importance since it guarantees the security of the communication, it deals with the diversity of device signaling performing corrections and adaptations where necessary, it integrates with the core network for verifying location data, identities and requesting QoS and it handles special cases like the different types of emergency calls.

Benefits

Solid Performance

Completely built from scratch in Go, its user-space IPsec implementation, pair with a newly designed SIP stack, enables L3-L7 firewall scaling to massive capacity and adapting also to smaller networks demands, with minimal resource consumption.

Flexible Integrations

User-to-Network-Integration is the cornerstone of an IMS deployment; strict in regard to security but extremely flexible for correcting miss-interpretations of the standard on device side makes deployments easier. Optional network next-hop based on Kamailio enables adapting also towards other IMS and network functions.

Security compliance

Latest releases of 3GPP standards (18,19) have added more secure authentications and security procedures, supporting them all adds an outlook towards the future.

Cloud

A lean and stateless application that shines when deployed in the cloud. Whether in public or private cloud platforms deployment becomes automatic by using the most standard practices and tools.

The IP Multimedia Subsystem (IMS) provides the VoLTE/VoNR voice capabilities of the network. Within the several components of the IMS, the P-CSCF is the most important one because it performs tasks which are fundamental for the network operator:

- Implements security to the UE
- Corrects misalignments with the standards of the UE
- Performs QoS reservations for calls
- Supports special logic for emergency calling according to regulatory requirements
- May transcode if necessary when acting as a Session Border Controller (SBC)
- Implements Lawful Interception which is a regulatory requirement too

Neat Path Networks Scalable P-CSCF provides all these features keeping the scalability and manageability of the solution using common paradigms and standard tools both for very large and very small deployments.

For the most advanced customers who have embraced DevOps, simulation tools are provided, to be used in pipelines of continuous testing in their CI/CD architecture. These tools also test security and IPsec scenarios.

Security

Latest releases of the standard have added stronger encryption algorithms that will be available in devices in the coming years. The Scalable P-CSCF supports them all up to Release 19 and permits to prioritize them, including filtering out some of them depending on the device type.

UE protocol proofreading

SIP and IMS are complex, not all device protocol stacks do everything correctly; the scalable P-CSCF is flexible to allow misalignments with the standards of the devices and correct them in the signaling towards the network. This includes header value corrections, number normalization, location data, identity selection and verification, privacy and topology hiding etc.

QoS and core integration

Supports QoS reservations for calls and events from the core network also for registrations. Additionally, location data and identities verification in synergy with the packet core. Supported for the 4G and the 5G core.

Transcoding

Integrates with external standard specialized software that enables transcoding when it's necessary for breaking out into other networks or the emergency network.

Emergency Calling

Supporting the role of E-CSCF with all types of emergency calls and the latest standards in ng112 and eCall with flexible routing towards the next hop in the emergency network.

Lawful Interception

An innovative architecture that permits implementing the X1, X2 and X3 interfaces in a flexible cloud friendly manner which integrates with the most common tools.

Protocols IPv4, IPv6, IPSec ESP, SIP, RTP, SIP over TLS Diameter on SCTP and TCP, HTTP2, X1, X2, X3	Security Algorithms (Rel.19) - aes-gcm-us, aes-gcm, aes-cbc, des-ede3-cbc, enc-null - aes-gmac-us, aes-gmac, hmac-sha1-96, hmac-md5-96, int-null
3GPP interfaces Gm, Mw, Rx, N5	3GPP Specifications (Release 18) TS 24.229, TS 33.203, TS 29.214, TS 29.514
Deployment options AWS, Google Cloud, Azure OpenStack, VMWare, OpenShift, any Kubernetes any Linux	Other Specifications RFC3261, RFC8866, RFC6733, RFC4302, RFC4303, RFC2403, RFC2404, RFC2405, RFC3602, RFC4106, RFC4543, RFC3329 and more ETSI 103.221
Observability Prometheus & Grafana	Use Cases VoLTE, VoNR, Private Networks, IoT, MVNOs

Neat Path Networks Scalable Voice core

The Scalable P-CSCF is part of Neat Path Networks' Scalable Voice Core which is a complete implementation of the IP Multimedia Subsystem for VoLTE/VoNR available for operators. Scalability and security have been at the forefront of the design fitting from small private networks that need to provide voice services to large operators that are renewing their existing IMS.

Deployable in the public and private cloud with integration with standard cloud tools and following current best-practices in a fresh new implementation of an existing standard that provides exactly the features which are needed to provide the service without the bloating of non relevant features.

About Neat Path Networks GmbH

Neat Path Networks (NPN) delivers new software solutions for telecommunications based on the latest software development paradigms and tooling. The vision is to remove complexity bringing solutions to customers of all sizes and which often go beyond what is available in the market and with the actually required features that never appear in the standards.

Founded in Berlin in 2024, the NPN founding team builds on the experience of having created an Open Source IMS implementation in 2004 (which is the roots of the most popular Open Source IMS) and a closed-source implementation of the EPC which is used in production by various companies today.

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