



Build 4G signaling network Secure legacy STP migration

Huawei SPS Solution



Introduction

With MBB era is coming, operators' business is changed. The business transition makes network infrastructure and signaling network changed. The diameter protocol, is widely used in the IMS and LTE architecture, Diameter plays a central role in mobility management, authentication, routing, policy and charging.

The DRA plays as the central nervous system, interconnects with Diameter-based elements and transfers messages among them. The applied DRA can eliminate the Diameter mesh, improve signaling efficiency and interoperability, and reduce network cost and complexity.

Challenges

DRA/DEAs will be the critical and central elements of next generation signaling network, mainly used for the centralized routing of LTE/IMS/PCC network and LTE roaming, so the reliability, convergence, easy IOT and rich experience in signaling network domain will be very important. But without a separate DRA, the network will incur some challenges:

- How to fast and economically realize deployment for fast time to market?
- How to manage rapidly increased and unpredictable future signaling traffic in PCC and LTE?
- How to cost-effectively manage two signaling networks of SS7 and Diameter in the future?

SPS Solution

Huawei signaling solution is named SPS, is a convergent signaling solution supporting DRA & DEA & STP convergence. Aims to help operators to construct a reliable, visible, predictable, and manageable next generation signaling network, and overcome legacy signaling network challenges.

Fast service rollout capability

- **Rich signaling experience and most comprehensive IOT experience**
20+ years experience, has finished a large number of IOTs with mainstream vendors
- **Flexible adaption capability**
Flexible & scalable routing and AVP manipulation
- **Powerful and professional delivery team**

High reliable and intelligent signaling traffic management

- **Reliable network**
Multi-level redundancy, self fault detection and recovery
- **Comprehensive security**
IP firewall, Diameter firewall, System overload control
- **Intelligent traffic control**
Service and User based traffic control

Convergent signaling network

- **Unified signaling network** for 2G/3G/4G (diameter & STP)
- **Unified monitoring** for Diameter and SS7
- **Unified routing database** for MNP, SLF, FNR...

Fast Service Rollout Capability

Finishing the equipment implementation fast, rolling out services quickly, in no more than maximum several months, is a key weapon for operators to attract customers and keep the market competitiveness. Signaling network is the basis for the development of the telecom communication network, to support future network and service development quickly and smoothly, in this fierce competitive and rapidly changing market, operators can't accept long development and test cycles. They need a professional vendor who already focuses on signaling long period, and an easy-to-use DRA solution which has flexible adaption capability, to help them realize fast service rollout.

Rich signaling experience and comprehensive IOT experience

Since 1994, releasing a TDM STP, Huawei has focused on signaling network for more than 20 years and has provided more than 2,000 sets of in-service equipment. Meanwhile Huawei has local support teams in more than 140 countries and regions.

With the number of devices provided by multiple vendors' increases, IOT activities consume amount of operator time and resources which leads to cost increased. Leveraging on the fully integration capabilities, Huawei SPS can shorten the service time to market.

	Vendor	NE	Place
Gx	Huawei	PCRF	CMCC(China)
	E///	PCRF	CMCC(China)
	Openet	PCRF	Safaricom(Kenya)
	Camiant	PCRF	Telefonica(Spain)

Gy	E///	PCRF	MTN(South Africa)...
	NSN	PCRF OCS	Malaysia, CMCC(China)...
	HP	OCS	China
	Comverse	OCS	Kyivstar(Ukraine)

	Vendor	NE	Place
S6a	E///	MME HSS	CMCC(China),AM(Mexico),etc
	NSN	HSS MME	CMCC(China),USCC(USA), Telenor(Denmark)
	ALU	HSS MME	CMCC(China)
	Bridgewater	USS	LEAP(USA)
	Cisco	MME	Clearwire
	NPC	MME	CMCC(China),...
DRA to DRA	Tekelec	DRA	CMCC(China)
	ALU	DRA	CMCC(China)
	ACME	DRA	...
	F5/Traffic	DRA	AIS (Thailand)

Figure1: SPS has done lots of IOT with mainstream vendors

Flexible adaption capability

In order to solve interworking issues arising by the difference of the implementation from multi-vendors, drawing on its history and expertise in signaling, Huawei SPS can provide flexible routing approaches (for example, routing based on host, realm, IP address, user number, ...) to match operators' different requirements, and can provide an easy-to-use service broker function (AVP manipulation) orchestrate and mediate the interaction between different diameter nodes, even non-Diameter nodes.

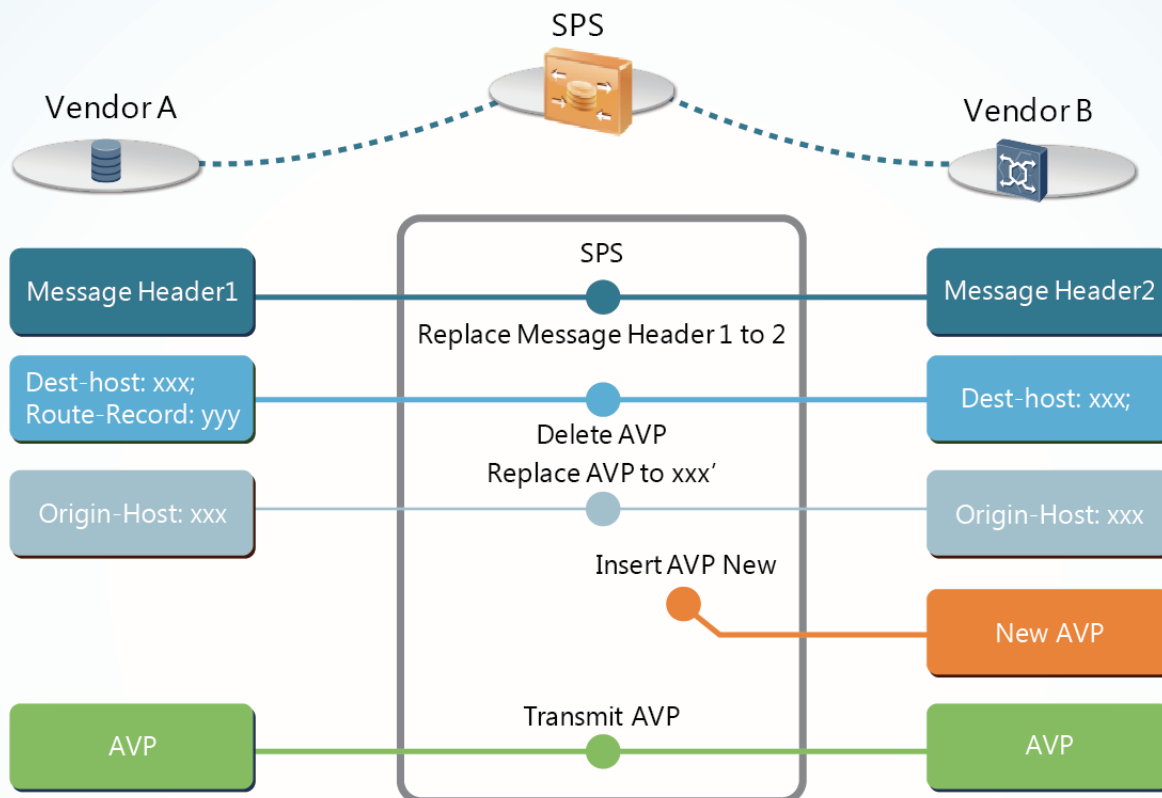


Figure2: SPS Service Broker provides the mediation and orchestration

Powerful and professional delivery team

Leveraging on Huawei's global service capabilities, for example, China, Romania and Mexico GTAC provide follow sun 7*24 technical support service, 9 language TACs covering ~150 countries, and more than 3400 professional engineers dedicated to customer support service, Huawei SPS can provide uninterrupted support for our customers.

Meanwhile, with well-proven process, Huawei SPS solution also can engage with customers to provide E2E integration services from network planning, network design, to network lifecycle management after the deployment.

High reliable and intelligent signaling traffic management

Signaling network as human's nervous system, its quality strongly related to the network quality, reliability is the most important point for signaling network, a single event/problem will create unimaginable or unexpected network outage.

To maintain a high reliable signaling network in the all-IP world, Huawei SPS solution provides multi-level redundancy mechanisms, overload function to ensure a rock-solid diameter network.

Reliable network

Huawei SPS solution can provide five-nine reliability and multi-level redundancy mechanisms (Link level, Route level and Network level). For link level redundancy, SPS can support to establish multiple links to the same peer in different processing boards and adopt SCTP multi-homing mechanism. For route level, SPS can support multiple routing load-sharing mechanisms and C link connection between two nodes of SPS which is similar like STPs. And when deploying a pair of SPSs can work as active-active mode to ensure network level redundancy.

Comprehensive security

The signaling network is changing, network infrastructure is shifting from TDM to All-IP, and the connection is shifting from trusted to untrusted. Operators are quickly find that they are facing real threats from untrusted IP connections. Huawei SPS solution not only embeds IP firewall, diameter firewall, but also can provide system overload control function to ensure the security of network and the privacy of subscribers.

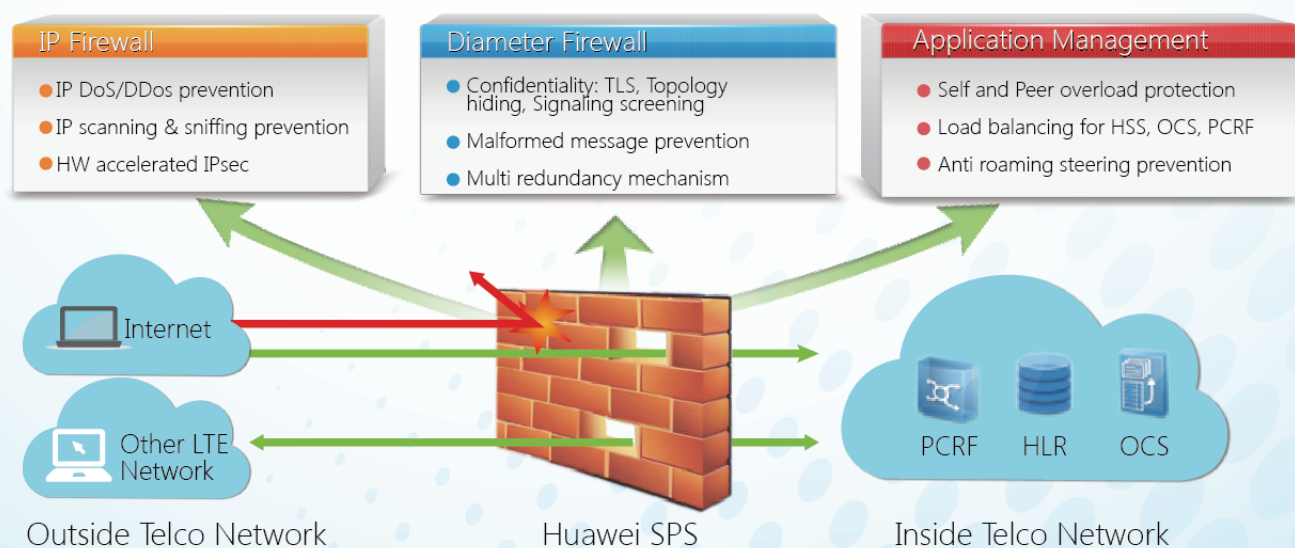


Figure3: Comprehensive security is your best "Gate Lock"

Intelligent traffic control

Diameter signaling traffic is expected to grow more than several times faster than mobile data traffic over the 2014-2018 period, driven by more and smarter devices, the changed user behaviors, and richer services. The rapidly increasing diameter traffic increases pressure to operators' network and operational cost.

In order to help operators better face the sharp increased and unpredictable signaling traffic, Huawei SPS solution can provide a unique intelligent signaling traffic control, to help operators to precisely forecast, and precise control to resist the huge signaling traffic flood, then achieve better business operations.

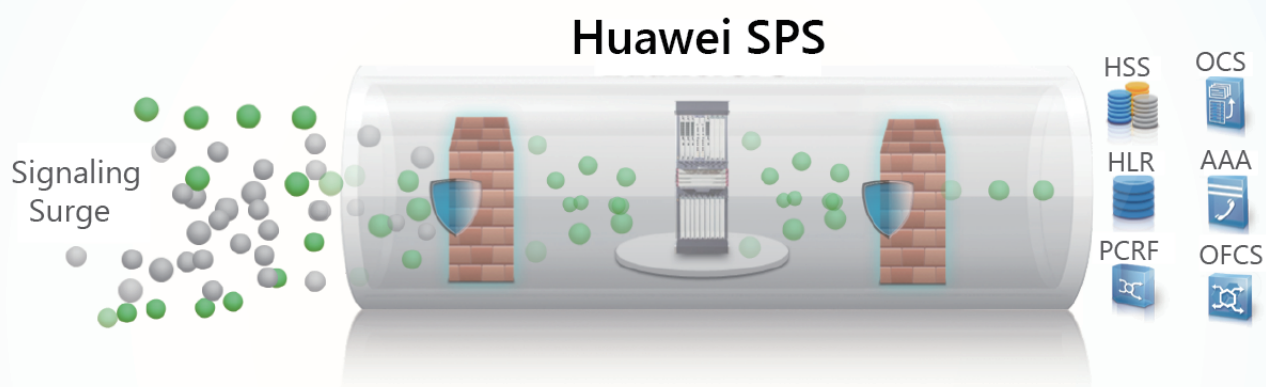


Figure4: Traffic control guarantee self and neighbors robust

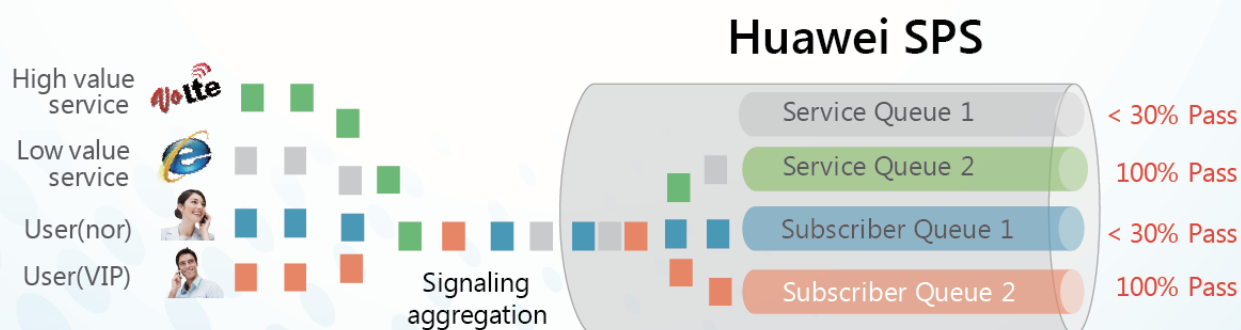


Figure5: Intelligent traffic control guarantee more better business operation

Convergent signaling network

Nowadays, operators are facing two challenges:

- Traditional signaling network equipment faces lifecycle expiration and has no evolution solutions. In most of operators' network, their STP has run for more than 8 years, as human being, has entered into aged, the potential risk is increasing. With the investment changed of some traditional signaling vendors, operators are difficult to find a substitution.
- Maintaining and managing both the SS7 and Diameter networks mean higher cost for carriers.

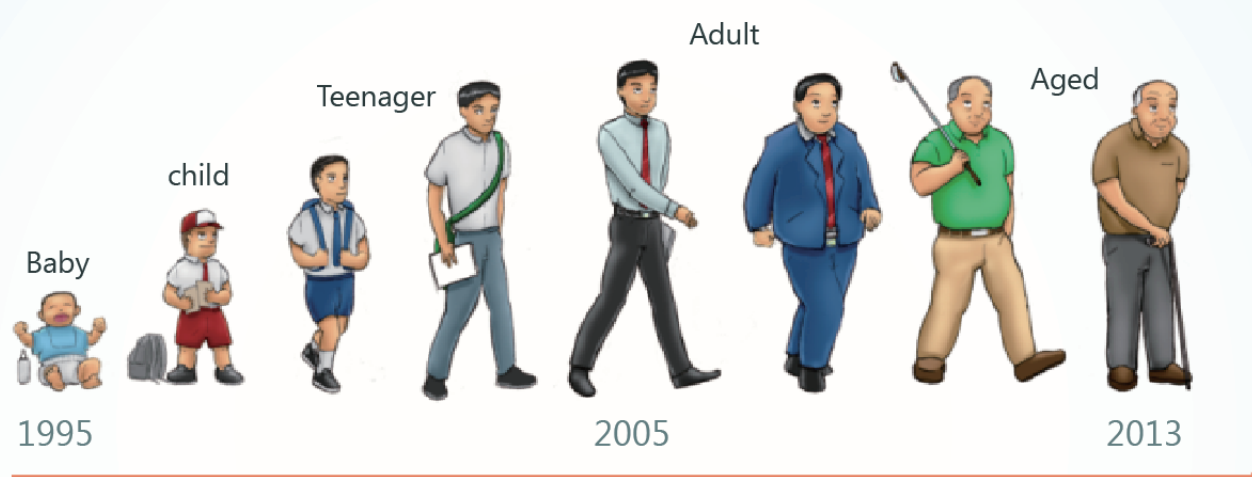


Figure6: AS human being, traditional STP entered into aged

Huawei SPS solution aims to create a highly reliable, efficient and intelligent signaling network, to meet operators' long-term business development. Huawei SPS solution is comprised of two components, the SPS and SANEX (Signaling Analysis System). SPS can provide a real complete convergence of TDM-STP, IP-STP, MNP, DRA, DEA, even SSR in near future, to allow PSTN/2G/3G/LTE network to access. SANEX can assist operators to achieve better operation based on signaling network, and also makes signaling network visible, predictable manageable. Huawei SPS solution can support to evolve to NFV based architecture lie on Huawei's FusionEngine off-the-shelf (COTS) hardware and standard third-party hardware. The SPS solution reduces the CAPEX and OPEX and ensures future smooth evolution.

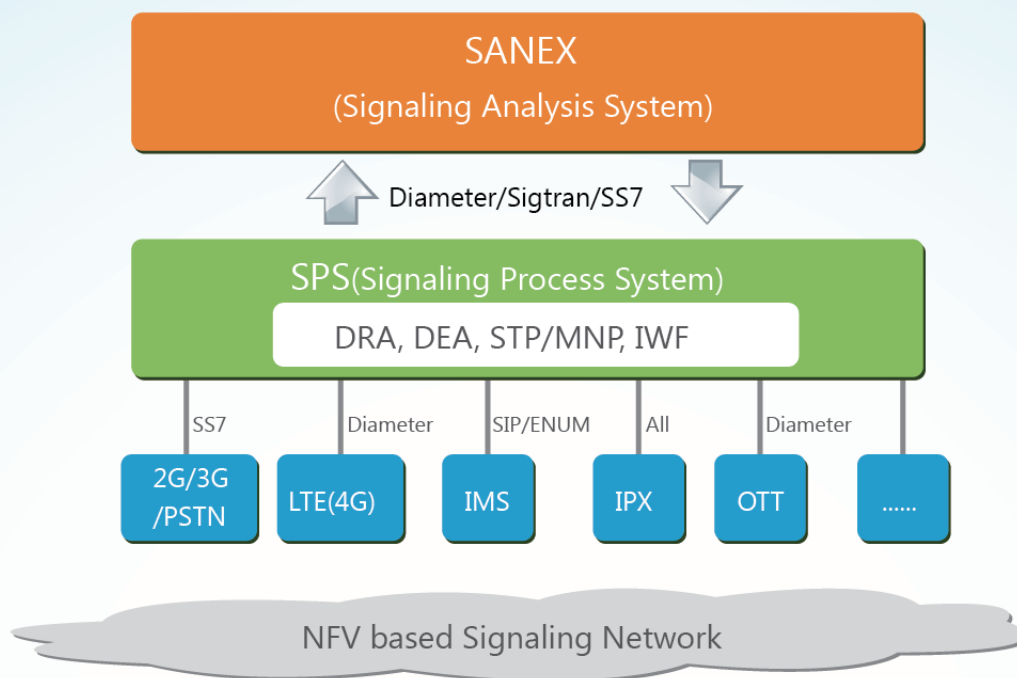


Figure7: A complete “Visible, Predictable and Manageable” convergent signaling solution

Now diameter signaling is at the initial stage, the traffic is far below than SS7 traffic. But with more and more 2G/3G users migrate to LTE/VoLTE network, with smart devices popularity, and diverse services appearance, the situation will be reverse. Diameter signaling will increase rapidly, especially for policy & charging signaling, according to Huawei's analysis, the traffic of policy & charging will be approximately 80 times than roaming/mobility traffic. SS7 traffic will decline year by year. Diameter will replace SS7 to dominate signaling traffic.

In the future, when SS7 signaling wanes and Diameter waxes, SPS enables dynamic sharing of hardware resources, to protect the investment.

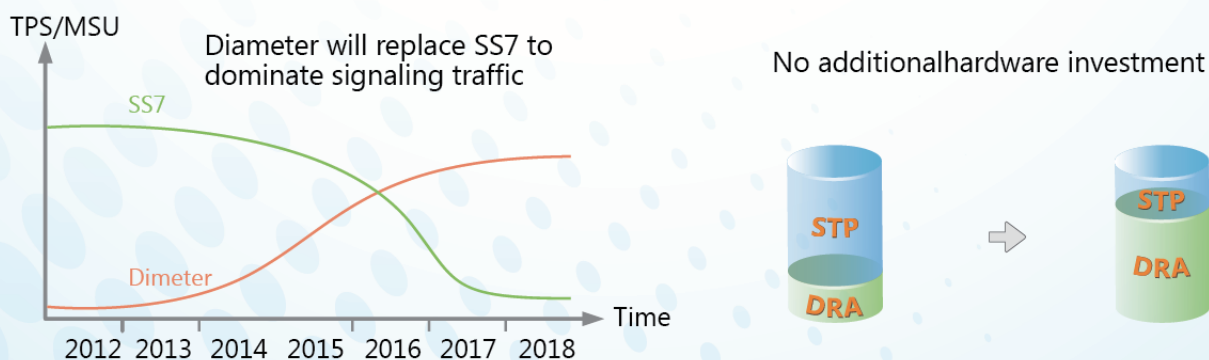


Figure8: Huawei SPS guarantees smooth signaling transformation



Huawei SPS Solution

Build 4G signaling network, Secure legacy STP migration

- The carrier grade platform ensures zero faults in signaling networks for 20 years.
- Intelligent flow control can easily overcome signaling storm.
- The "multi-layered security shield" efficiently protects the network against potential security threats.
- The convergent signaling network reduces the CAPEX and OPEX greatly.

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