STINGA
Monitoring Probe

Monitoring probes for
SS7oTDM, SS7oIP, ISDN PRA & SIP
network operators

MONITORED
NETWORKS

MASTER

PROBES

WAN/LAN
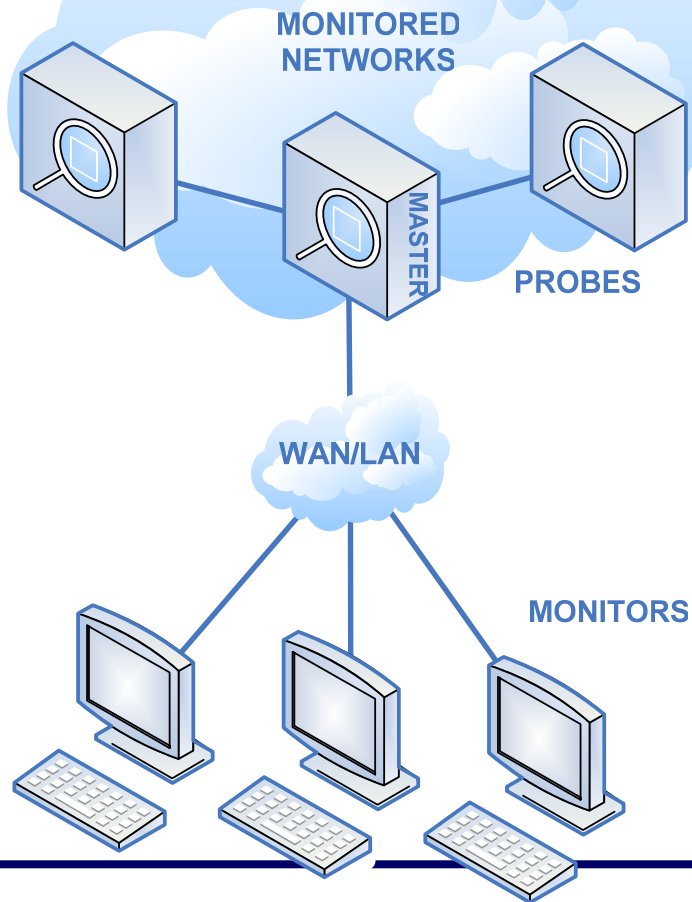
MONITORS

Gain customers and money by improving your networks.

Whether you're into mobile, voip, pstn, or isdn business,
get on top of your problems now!

U TEL
SYSTEMS

Your customers will notice

Odin TeleSystems Inc.
Open Telecom for Open Minds

IMPROVED BUSINESS WITH LOW COST SOLUTIONS

♦ Helps you to satisfy your customers by improving Quality of Services in your network

♦ Helps you to get the most out of your existing investments in your network

♦ Resolve your network problems before your customers even notice

♦ No 1st or 2nd line support anymore, you have 3rd line support directly by world class specialists

♦ Tailor made solutions in just a few days

♦ Training available by highly experienced and skilled protocol and signalling specialists

FAULTFINDING & TROUBLESHOOTING

♦ Resolve network issues

♦ Protocol decoding of all user parts and protocol layers makes it possible to track and search for protocol irregularities.

♦ Resolve customer issues

♦ Use CDRs collected 24/7 as evidence in case of disagreement with customers, authorities and operators.

♦ Identify bottlenecks in your network

KEY FEATURES

♦ **Centralized 24/7 monitoring and error tracking in SS7, ISDN & SIP networks**
♦ **Saves all traffic data to CDRs continuously**
♦ **Monitor converged networks**
♦ **Distributed link monitoring system**
♦ **Multi user**
♦ **Real-time protocol**

OVERVIEW

Components

The cost-efficient STINGA Monitoring Probe from Utel Systems comprises the following components related to SS7, ISDN & SIP monitoring:

♦ Hardware: Rack server or PC with E1/T1/J1 PCI interface card and/or NIC

♦ Operating system for probes: Linux (low cost/high stability)

♦ Monitors (SS7, SIP, ISDN PRA)

♦ CDR builders (SS7oTDM, SS7oIP, SIP, ISDN PRA)

♦ Correlators (SS7, SIP, ISDN PRA)

Modular system

♦ Expand your system as your business grows

♦ No need to throw away your earlier investments when your network expands or new protocols need to be monitored

Centralized operation

♦ Reduced network maintenance cost

♦ Reduced error detection time

♦ Efficient use of expert personnel at central site

♦ Central maintenance and administration

Filtering support for real time monitoring

♦ Fast and easy filtering and grouping of data
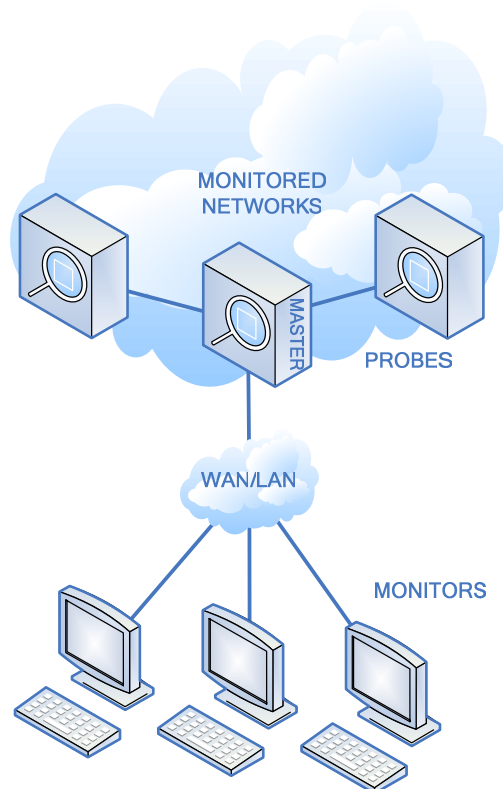
BUILD AS YOUR NEEDS GROW

Figure A shows a fairly basic system with only one STINGA SS7 Monitoring Probe with a STINGA SS7 CDR Builder. The software is installed on the master probe server. The client is a STINGA SS7 Monitor connected to the probe through WAN or LAN. The probe is connected to the SS7 network through an E1/T1/J1 interface.

THE MULTI PROBE MULTI USER SYSTEM

Figure B shows a multi probe system equipped with one STINGA SS7 Monitoring Probe and one STINGA SIP Monitoring Probe. The SS7 probe is connected to the SS7 network through an E1/T1/J1 interface and to the SIP network through a NIC (Network Interface Card). The STINGA SS7oTDM CDR Builder and the STINGA SIP CDR Builder passes the CDRs from the probes to the monitors through WAN or LAN. A STINGA SS7 Monitor and a STINGA NGN Monitor making this system a multi user system, presents both real time-data and historical data from the probes to the users.

THE COMPLETE SYSTEM

Figure C shows an advanced system equipped with six probes built into three probe servers situated at three different sites. The probe server to the left contains one STINGA SS7 Monitoring Probe connected to the SS7 network and one STINGA ISDN PRA Monitoring Probe connected to the ISDN network both through E1/T1/J1 interfaces. The STINGA CDR Builders for SS7oTDM and ISDN PRA passes the CDRs from the probes to the master probe server which in turn passes them further to the monitors through WAN or LAN. On the master probe server in the middle there is one STINGA SS7 Monitoring Probe connected to the SS7 network and one STINGA SIP Monitoring Probe connected to the SIP network both through NICs. The STINGA CDR Builders for SS7oIP and SIP passes the CDRs from the probes to the monitors through WAN or LAN. On the probe server to the right there is one STINGA ISDN PRA Monitoring Probe connected to the ISDN network through an E1/T1/J1 interface and one STINGA SIP Monitoring Probe connected to the SIP network through a NIC. The STINGA CDR Builders for ISDN PRA and SIP passes the CDRs from the probes to the master probe server which in turn passes them further to the monitors through WAN or LAN. A STINGA SS7 Monitor, a STINGA NGN Monitor and a STINGA ISDN PRA Monitor presents both real time-data and historical data from the probes to the users. STINGA Correlators for SS7, SIP and ISDN PRA installed on the master probe server provides a real-time call trace view for the users. In this way it is very easy to understand and see what is going on in converged networks.

SYSTEM OPERATION

The STINGA Monitoring Probe meets the requirements for a centralized monitor solution. It includes server software enabling the probe to act as a master probe. The master probe is able to manage a number of probes situated at different sites in the monitored networks. Probes can easily be stacked where a large number of E1/T1/J1 interfaces need to be monitored. This is an excellent basis for building a complete system as your needs grow.
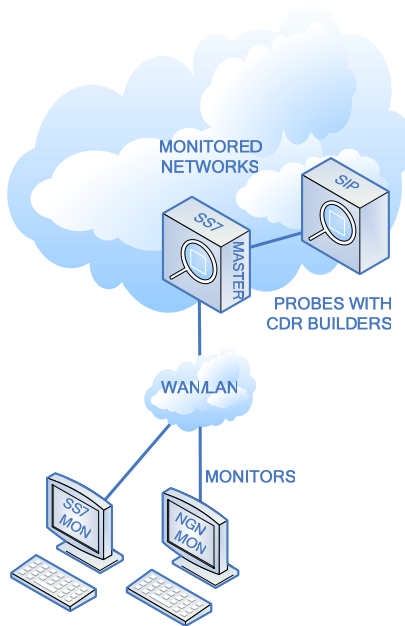
Configuration data (e.g. filter setup) is sent from the clients to the probes via the master probe. Data from the probes to the monitors are sent via the master probe. All CDR files are stored on the master probe and can be downloaded to the monitors. The CDRs are on an open format (ASCII), and libraries are available for manipulation of the CDR data.
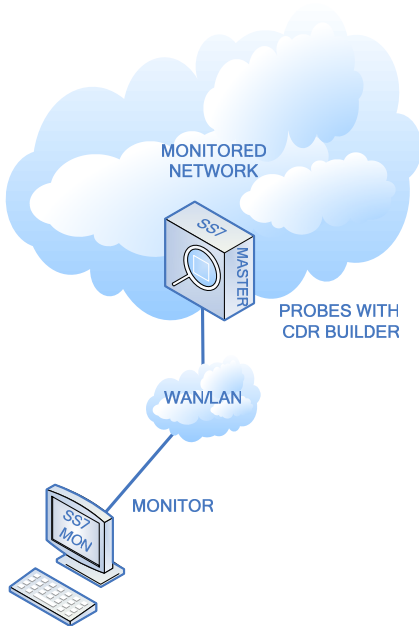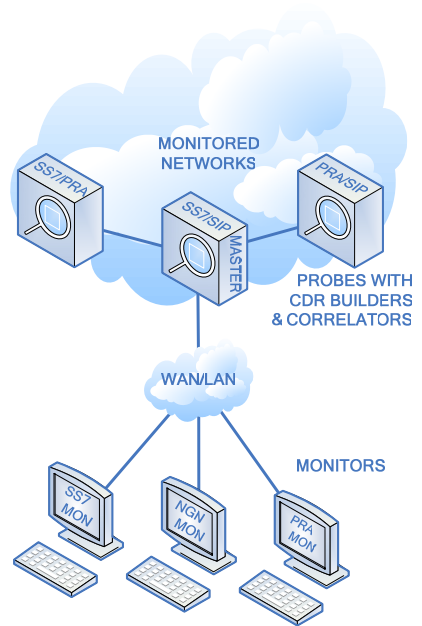

Fig. A — Basic system

Fig. B — Multi user Multi probe system

Fig. C — Complete system

Who is STINGA Monitoring Probe for?

The typical network operator offering SS7, ISDN or SIP services or any combinations of these will need efficient tools for monitoring the network and the interconnects.

Error tracking

The users have remote access to every probe for analysing the SS7, ISDN & SIP traffic through LAN/WAN.

It is possible to do real-time monitoring of a specified timeslot on a specified E1/T1/J1 interface and using filters to get the traffic from one particular customer using LAN/WAN.

Application example: Billing verification

Operator A has a STINGA SS7 Monitoring probe and a STINGA SS7 Monitor as shown in **figure D**. On the probe server a STINGA SS7oTDM CDR Builder is installed as illustrated in the figure D. In this example there is a disagreement between operator A and the national TDM network provider when it comes to billing of a certain customer at a given point of time. Operator A fetches the actual CDR file and is able to see the SS7 signalling sent and received from the national provider on the monitor. Thus, operator A is able to prove his case against the national provider. Alternatively, operator A unveils a fault in his own network.
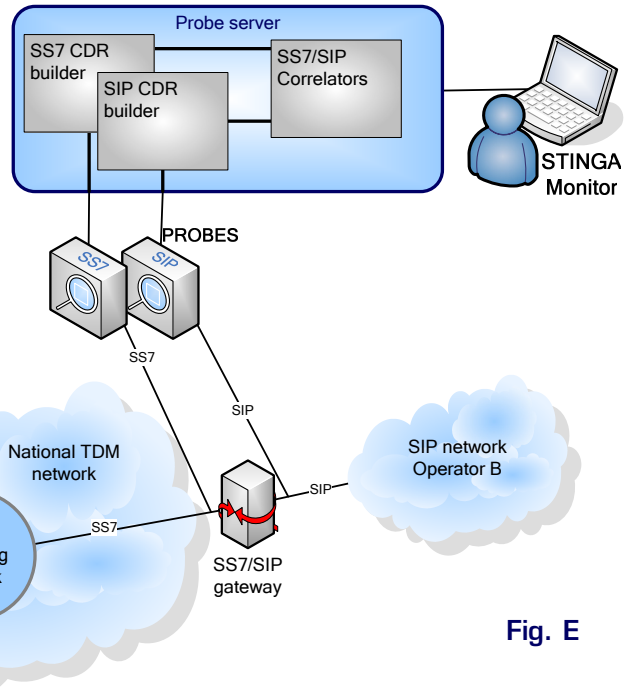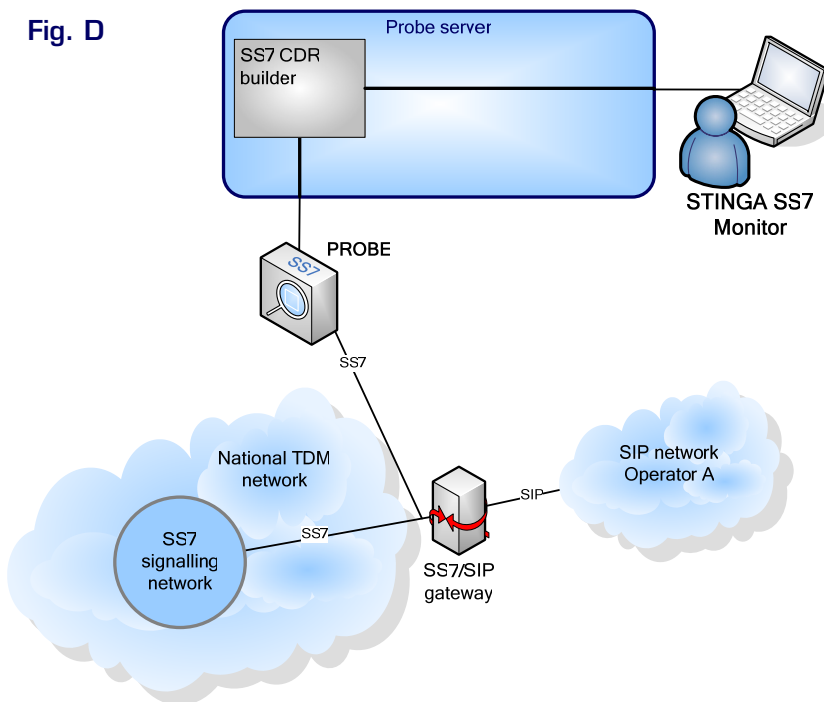

Fig. E

Application example: Customer not connected

Operator B has a STINGA SS7 Monitoring probe and a STINGA SIP Monitoring probe both installed on the same probe server as shown in **figure E**. Also STINGA SS7oTDM CDR Builder, a STINGA SIP CDR Builder and a STINGA SS7/SIP Correlator are installed on the probe server. A customer complaints to operator B because he is not able to make an outgoing call to his friend who is connected to the national TDM network. Customer service for operator B has a STINGA SS7 Monitor and a STINGA SIP Monitor installed on their site as illustrated in the figure above. Operator B tell their customer to make a call to his friend. On their monitors they are able to see what's happening in a real-time call trace view. The call appears on the monitor as expected in form of an INVITE message and a corresponding SS7 IAM (Initial Address Message) message. However, the answer to the message is REL (Release) with cause value 'Unallocated number'. Operator B contacts the national TDM network provider and tell them to solve the problem. The national network provider defines the missing number in the numbering plan. The problem is resolved, and their customer is satisfied with the excellent service. Alternatively, operator B unveils a fault in his own SS7/SIP gateway.

Fig. D

Application example: No connection, international traffic

Network operator C has a number of probes strategically placed in their network as shown in **figure F**. On a regular basis they check all their CDR files. Then they get suspicious because there are too many abnormal release messages from probe A. This is a probe that is connected to the link that carries operator C's international signalling traffic. A closer investigation into the CDRs reveals that this happens for all calls to a certain country. The IAM messages are always returned with REL messages containing cause value 'address incomplete'. Operator C contacts their international network carrier and show them the CDRs. The international network carrier checks the routing tables and correct the fault. Operator C detected the problem in an early stage resulting in high customer satisfaction.
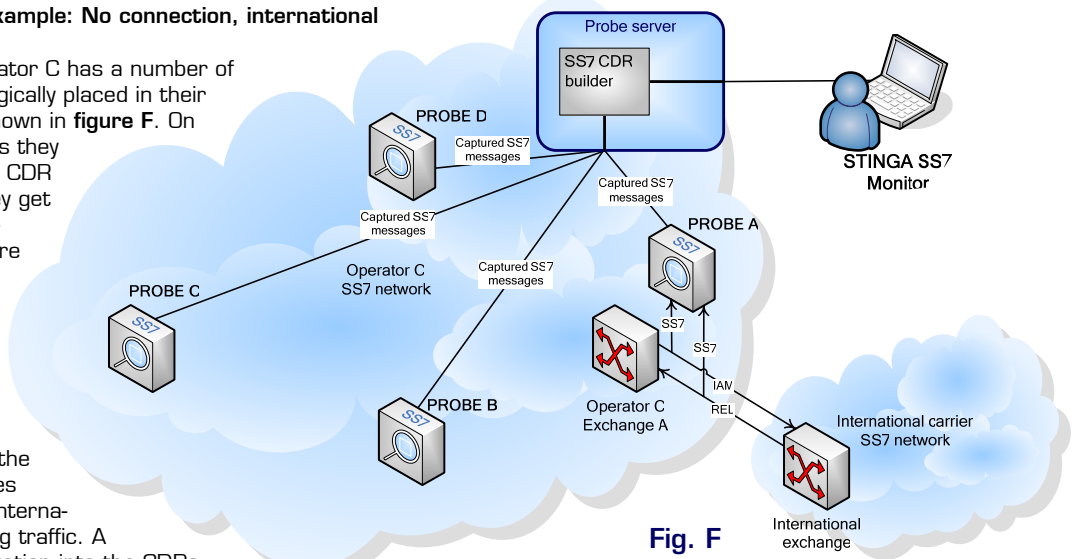
Application example: One probe reveals problems anywhere in the SS7 network

Operator D has connected his SIP network to the national TDM network through a single SS7 interconnect point situated in London as

shown in **figure G**. A probe has been connected to the interconnect point to monitor all the SIP calls routed to the national TDM network. The calls are routed through the operator's media gateways situated in several cities in England. In this way operator D can see if there is a problem with the media gateway in Leeds even if the SS7 signalling has to pass several exchanges on it's way. With one single probe, operator D is able to track down problems everywhere in the SS7 network based on the OPC (Originating Point Codes) included in the SS7 signals monitored.
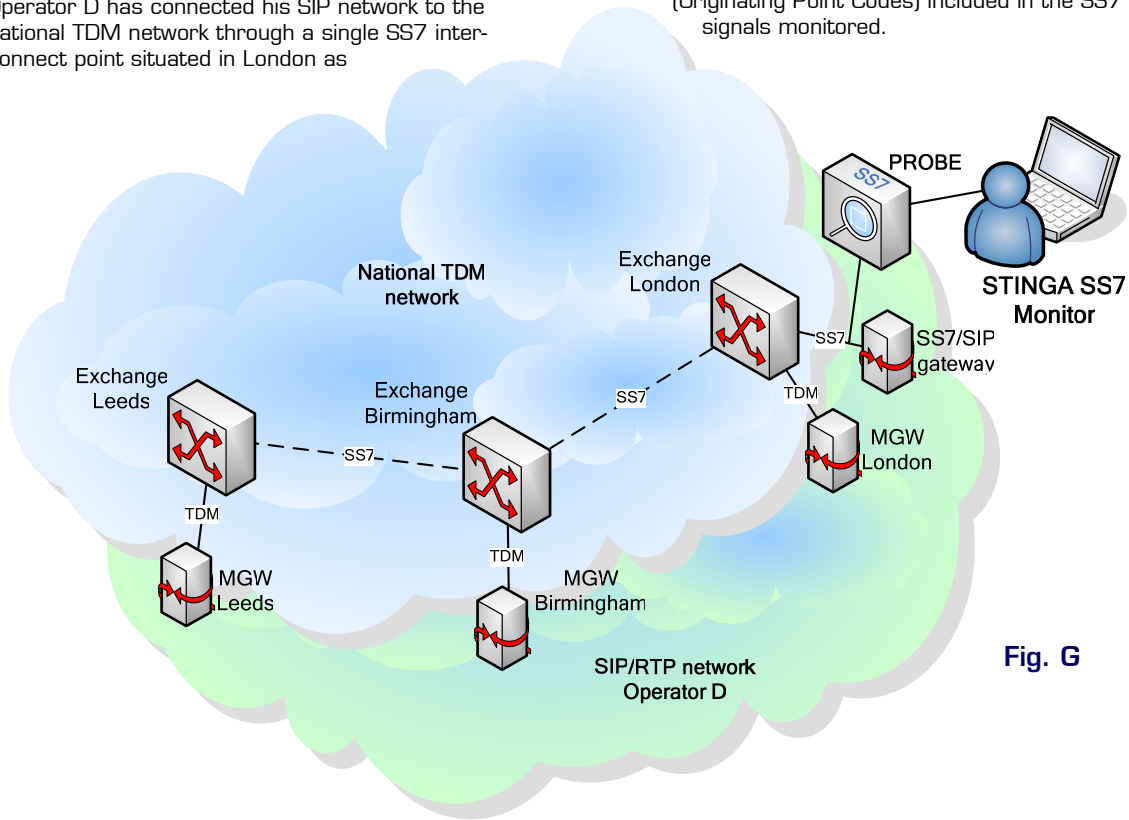

Probe server
SS7 CDR builder
Captured SS7 messages
PROBE D
Captured SS7 messages
STINGA SS7 Monitor
Operator C SS7 network
PROBE C
Captured SS7 messages
PROBE A
PROBE B
Operator C Exchange A
IAM
REL
International carrier SS7 network
International exchange

Fig. F

National TDM network
Exchange London
PROBE
Exchange Leeds
Exchange Birmingham
SS7
SS7
STINGA SS7 Monitor
SS7
SS7/SIP gateway
TDM
TDM
MGW London
TDM
MGW Leeds
MGW Birmingham
SIP/RTP network Operator D

Fig. G

TECHNICAL SPECIFICATIONS

Hardware & Software Requirements

- One or more Linux servers (e.g. rack servers) with E1/T1/J1 interfaces (PCI cards) and/or Network Interface Cards (NIC) providing a standard Ethernet interface.
- Up to eight E1/T1/J1 interfaces (32 timeslots each) per PCI card
- One or more STINGA Monitoring Probes
- One or more STINGA CDR Builders running on the probe server
- One or more Windows based client software applications (e.g. STINGA SS7 Monitor) that is installed on each operator's PC.

Administrative communication requirements

- IP network

STINGA Monitoring Probe server

- The Linux based STINGA Monitoring Probe server handles the multi user/multi probe environment. It can act as a probe as well with the STINGA Monitoring Probe software installed.

Protocols Supported

- Ethernet:
  - IP
  - SIGTRAN (SCTP, M3UA, M2UA, SUA)
- Real time monitoring: See specifications for the clients (STINGA Monitors SS7, PRA and NGN)
- CDRs:
  - SS7oTDM (ITU, ANSI)
  - SS7oIP (ITU, ANSI)
  - ISDN PRA (ITU, Euro-ISDN, National ISDN-2)
  - SIP
  - Other protocols and national protocol variants are implemented on customer requests.

Distributed STINGA Monitoring Probe components

Probes

- STINGA SS7 Monitoring Probe
- STINGA SIP Monitoring Probe
- STINGA ISDN PRA Monitoring Probe

CDR Builders

- STINGA SS7oTDM CDR Builder
- STINGA SS7oIP CDR Builder
- STINGA SIP CDR Builder
- STINGA ISDN PRA CDR Builder

Correlators

- STINGA SS7 Correlator
- STINGA SIP Correlator
- STINGA ISDN PRA Correlator
- STINGA SS7/PRA Correlator
- STINGA SS7/SIP Correlator

Client applications

- STINGA SS7 Monitor
- STINGA ISDN PRA Monitor
- STINGA NGN Monitor

Related Products

- UQOS INSIGHT - Link Monitoring System (LMS) covering SS7 and ISDN PRA. Provides automatic generated reports such as billing reports, various QoS reports etc.

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