

JDSU Signaling Analyzer Solution for Femtocell Monitoring



Key Features

- Interpret, correlate and analyze protocol messages on both sides of the femtocell gateway (Access Controller) that connects femtocells to mobile networks. The solution provides complete visibility across Iuh and Iu interfaces.
- Identify mobility problems as mobiles handover between the femtocell and macro network.
- Identify femtocells with performance issues that may overload the core network with excessive registration signaling.
- Evaluate femtocell performance in relation to third-party broadband connections.
- Examine problems that important customers have experienced in the past.
- Properly dimension network data links for deployment.

Applications

- Real-time diagnostics and troubleshooting capabilities
- Full historical analysis
- Feature and function testing
- Regression and interoperability testing
- Performance analysis

Whether you are developing, trialing or deploying femtocells, the JDSU proven Signaling Analyzer Real Time (SART) solution which extends the industry's most complete, end-to-end wireless analysis and troubleshooting solution to femtocells, enables users to quickly move from the lab through trials to successful deployment. The solution provides an unprecedented combination of detailed real-time diagnostics and troubleshooting capabilities with full historic analysis. These features coupled with our XMLAPI for automation provides a comprehensive suite of analysis tools to support the full range of test activities from feature/function testing to regression and interoperability testing and performance analysis.

Femtocells allow carriers to offload traffic from the outdoor macro network. This provides that network with more capacity and therefore higher performance for subscribers. It also allows operators to reach subscribers in previously uncovered rural areas. But there are many deployment and maintenance challenges.

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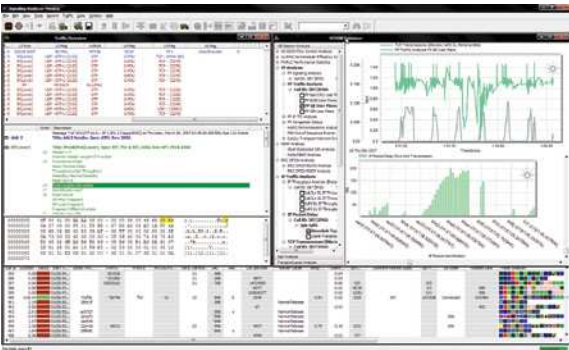
Overview of SART for Femtocell

Technology to quickly solve problems in today's complex mobile networks

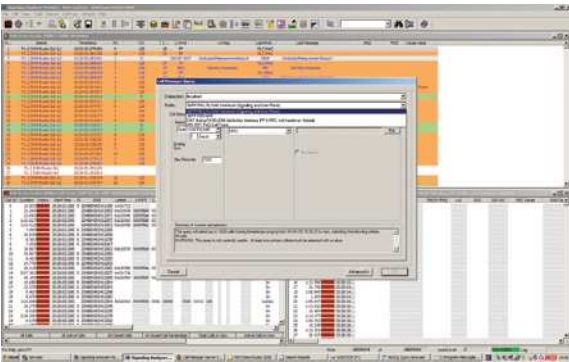
The Signaling Analyzer Real Time for Femtocell monitoring solution is comprised of the following basic components:



Distributed Network Analyzer (DNA) and Distributed Network Analyzer High Density (DNA-HD) for line rate link probing and data acquisition with real-time line rate hardware assisted analysis, reassembly and filtering features.



Signaling Analyzer Real Time (SART) provides a suite of measurement applications for real-time and offline troubleshooting and analysis. The call trace groups all messages in real-time for each procedure as they traverse across the Iuh and Iu interfaces. It quickly identifies calls that fail during registration, handover and call setups.



Call Manager provides detailed analysis of historical signaling data on both Iu and Iuh interfaces. It isolates and identifies calls originating from specific femtocells, access controllers and users.

Details of Solution Components

DNA-HD

The Distributed Network Analyzer High Density (DNA-HD) is a Gigabit Ethernet probe. It comes in two configurations: 8 ports and 16 ports. The two are functionally the same and available in a 1U rack mountable form factor.

The DNA-HD is used to collect data from the Iuh interface. In the case of IP-based UTRAN deployments, the same probe can also be used to acquire data from the IuCS and IuPS interfaces. Key features of the DNA-HD include:

- Monitors 8 or 16 ports of 10/100/1000 using SFPs (copper and fiber)
- Hardware data capture and filtering at full line rate for each port
- Hardware IP reassembly at full line rate for each port
- Real-time streaming to disk of 600 Mbps
- Both AC and DC power options available
- 1U height, 19 inch rack mount



DNA

The Distributed Network Analyzer (DNA) supports multiple interfaces via its swappable Line Interface Module (LIM). For traditional ATM-based UTRAN networks the 4 port full-duplex ATM OC-3/STM-1 LIM is used to monitor the IuCS and IuPS interfaces. Key features of the DNA include:

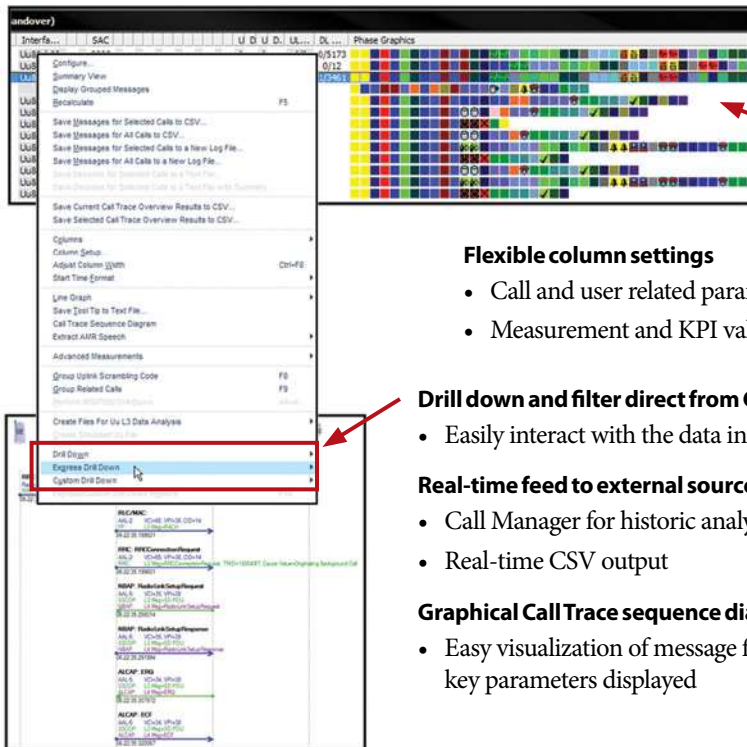
- Monitors 4 OC-3/STM-1 ports at line rate supporting both ATM and channelized links
- Hardware performs line rate capture and hardware filtering
- Reassembly of ATM network traffic in real-time
- Real-time streaming to disk of 400 Mbps
- Both AC and DC options available
- 2U height, 19 inch rack mount



**Signaling Analyzer
Real Time**

SART is an easy-to-use yet powerful network and service troubleshooting tool. It provides detailed information on one or multiple subscriber sessions and enables the user to perform detailed analysis of signaling procedures. Troubleshooting has historically been a 'niche' area occupied by only a handful of highly skilled network experts. The user interface simplifies troubleshooting tasks enabling less skilled users as well as experts to more effectively diagnose problems, often with just three clicks of the mouse. Start by enabling the call trace engine. The phase graphics display events in various icons and color codes. This allows you to make an immediate decision on which call to focus on. Clicking on the line item brings you straight into the message for analysis. Key features of the DNA include:

- Comprehensive decoding with full view of all protocol data
- Robust Call Trace engine correlates procedures across multiple interfaces
 - Export Call Trace Extended data records
- Real-time graphical statistics reporting
- Drill down and drill up troubleshooting
 - Seamlessly move between messages, calls and measurements
- Protocol auto detection and configuration in real-time and post-process
- Powerful hardware ATM/IP transport network troubleshooting capability
- Automated testing utilizing XML API for remote configuration and control
- User-definable filters
 - Probe, Port, Link, Name, Protocol, Parameter, Time, Event and Text-Based Filters
 - Create complex filters



View Call Status at a glance

- Summary view showing current number of active calls

Quickly identify key events during call

- Phase Graphics provides unique visibility to signaling failures during call session

Flexible column settings

- Call and user related parameters
- Measurement and KPI values

Drill down and filter direct from Call Trace

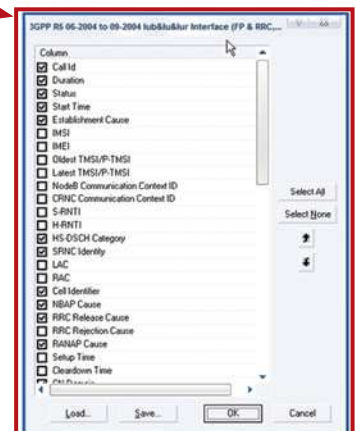
- Easily interact with the data in three clicks

Real-time feed to external sources

- Call Manager for historic analysis
- Real-time CSV output

Graphical Call Trace sequence diagrams

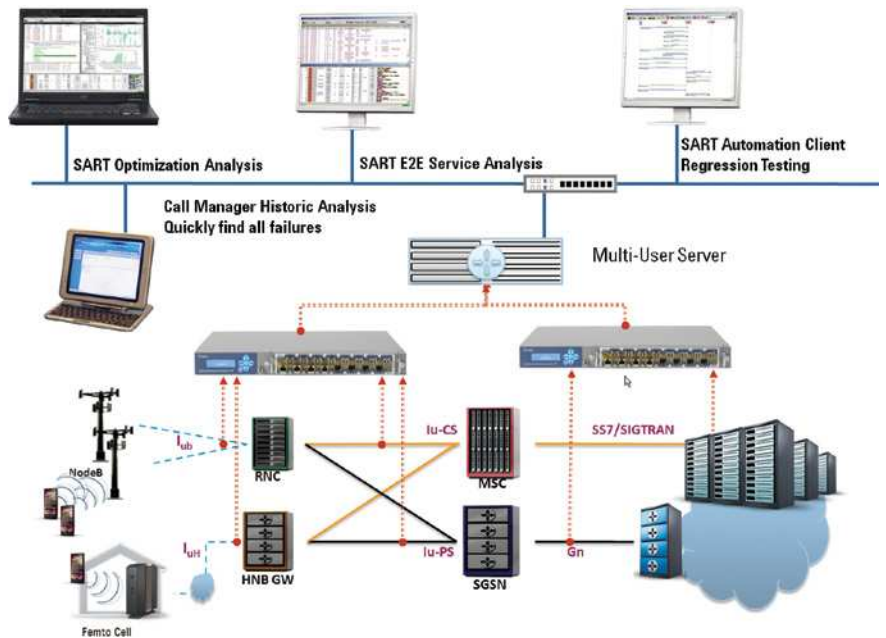
- Easy visualization of message flows with key parameters displayed



**Signaling Analyzer
Multi-user Server**

The JDSU patented Signaling Analyzer multi-user system enables high-performance analysis by one or more clients concurrently. All clients have simultaneous, independent access to all data from the same hardware probes without impacting or limiting real-time processing performance. This solution provides the most flexible, high-performance approach to multi-user functionality in the industry today.

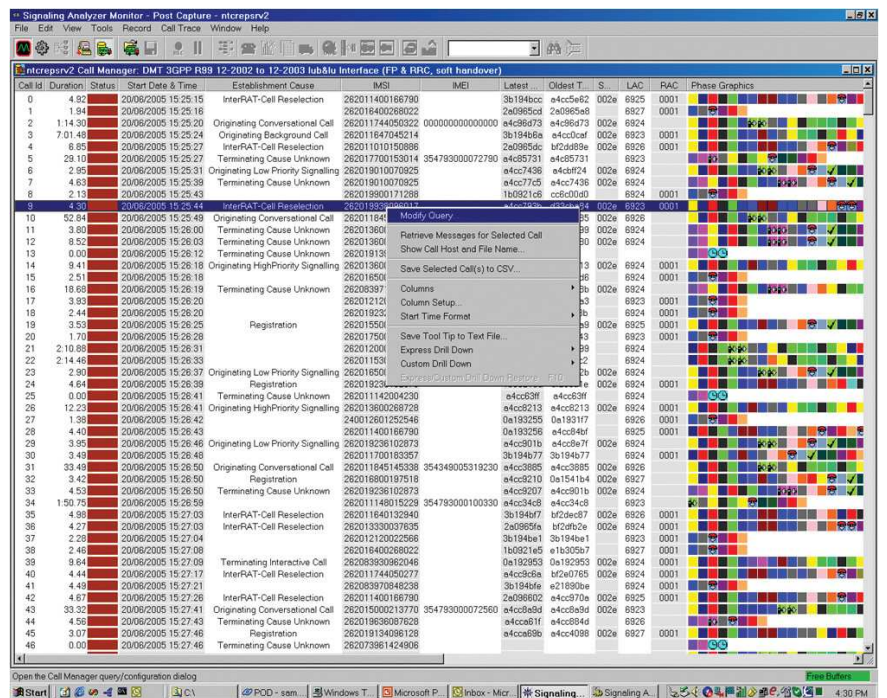
- True client server architecture provides high performance analysis for all clients
- Enables users to isolate their test domains with integrated per client filtering
 - Logical links, physical links and probes
 - IP Address, VLANs, TCP/UDP Ports, session types
- Centralized configuration for entire system
- Upgrade the multi-user server and all connected clients will be automatically upgraded
- The multi-user application offers multi-user administrator’s visibility to system load levels and performance management



Signaling Analyzer Call Manager

The JDSU patented and fully scalable Signaling Analyzer Call Manager enables historical high-performance multi-client analysis by several clients in various locations. All clients have simultaneous yet fully independent access to all historical data for the following capabilities:

- Drill-down analysis from calls to decodes
- Shares Call Trace and analysis GUI from Signaling Analyzer
- Historical CDR analysis and long-term trending for millions of calls
- Quickly identify all failed calls or calls of a specific type, from a specific location or subscriber



Supported Protocols

This list is not a comprehensive list of all protocols supported. It is intended to highlight the key protocols related to femtocell monitoring. Please contact your JDSU sales representative for more details regarding supported versions and the full list of protocols.

Supported Protocols

RUA	3GPP TS 25.468
HNBAP	3GPP TS 25.469
RANAP	3GPP TS 25.413
TR-069	CPE WAN Mgmt, DSL Forum
DMTAP	3GPP TS 24.008
SMS	3GPP TS 24.011
SS	3GPP TS 24.080
RRC	3GPP TS 25.331

Ordering Information and Product Compatibility

J7361A UMTS 3GPP Iuh Femtocell Software Option

This product enables the Signaling Analyzer to analyze 3GPP Iuh signaling links together with the UMTS UTRAN and core network. The Iuh interface is used for communication between the Home NodeB's and Femtocell Gateway/ Access Controller in UMTS networks.

Required Software

J7830A	Signaling Analyzer software
J7843A	UMTS R99/R4 technology option
J7837A	UMTS R6+R5 HSPA support

Optional Software

J7831A	Multi-user server
J7833A	Call Manager database
J7834A	Call Manager Client software
J7861A	SART XML API for automation
J7857A	UMTS R7+R6+R5 HSPA+
J7328A	3GPP deciphering
J6825A	Inverse multiplexing for ATM
J7839A	Import of E6474A drive test data

Hardware Platforms

J6801B	Distributed Network Analyzer
J6804A	Distributed Network Analyzer HD

Recommended LIMS

For the DNA

J6832A	1000BaseX Ethernet LIM
J6810B	STM-4/OC-12/STM-1/OC-3 LIM
J6828A	4-Port OC-3/STM-1 LIM multiplexer

For the DNA-HD

J6850A	8 Port 10/100/100 Ethernet LIM
J6851A	16 Port 10/100/1000 Ethernet LIM

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