TEMS™ Visualization

Bridging the optimization gap

ERICSSON

TAKING YOU FORWARD

See your network in a whole new way

TEMS Visualization is revolutionizing the way network operators troubleshoot their networks. Ericsson infrastructure customers now have the possibility to find problems that were impossible to pinpoint before. TEMS Visualization provides this ability by analyzing event-based data generated by the infrastructure.

The optimization gap

TEMS Visualization processes event-based data, analyzing and organizing it so that it can be used for network optimization. For the first time, operators have easy access to comprehensive information based on measurement results and call events, all the way down to the individual call level. This information can be used for troubleshooting, monitoring, and verifying network functionality.

This ability to look at real individual call data from the infrastructure side bridges the gap between ordinary Performance Management systems and traditional drive testing. While Performance Management tools provide powerful statistical and trending functionality, and drive test tools capture a specific slice of the network in great detail, TEMS Visualization gives a closer look at every call from every mobile in the network.

Benefits

- Trap, track, and eradicate problems based on sequences and specific phone models
- Understand network problems by viewing the full details of calls made in the network- all calls, all phones
- Drill-down into subscriber issues easily using powerful filtering capabilities and fast browsing functions

Key features

- Processing of event-based data from both WCDMA and GSM networks
- Display of full details for all calls on networks with Ericsson infrastructure
- Easy optimization of today's very complex networks with built in optimization functionality
- Direct import of Network Configuration Data from OSS-RC through CNIA and BulkCM
- IRAT Call Tracing using UETR and MTR
- Automated task management

TEMS Visualization works with data gathered by the Ericsson OSS-RC. Supported formats are GPEH and UETR for WCDMA networks, and R-PMO and MTR for GSM. TEMS Visualization is compatible with the newest enhancements added on the event side for both technologies, including the updated handover cause list and extended drop call causes. TEMS Visualization follows calls over the BSC border, allowing the user to analyze Intra-BSC handovers and follow all calls made in the recording area. It is now also possible to trace calls between WCDMA and GSM.

By using TEMS Visualization, operators can do the following, and much more:

- Optimize daily Worst Cells
- Validate Channel Allocation (e.g. AMR, Overlaid/ Underlaid Optimization)
- Filter out calls originating from a selected cell and follow the movement of each call
- Find the location of dropped calls by following the progression of serving cells
- Optimize neighbor plans
- Identify problems where only one link suffered from poor quality (uplink and downlink measurement data is available in the tool)
- Analyze problems dependent on response time using the time difference histogram feature

The Call Event Analyzer shows detailed call information.

Call Event analyzer

The Call Event analyzer makes every call within the recorded cell set available for detailed analysis. It allows the operator to see the major events associated with a particular call in a history view. Using powerful filtering and sorting functions, it displays the flow of handovers as either an event list or plotted on a map. Calls with abnormal events (dropped, blocked, handover failure, etc.) are easily identified.

In addition, it is easy for the operator to follow the events, radio environment, and graphical presentation of the serving cell for every call. This helps operators identify the real reasons for dropped calls, understand traffic patterns, find missing neighbors, identify ping-pong handover areas, and perform a host of other optimization activities.

Measurement Result viewer

Used in conjunction with the Call Event analyzer, the Measurement Result viewer displays all call messages in a graph. It allows the user to see the common radio parameters associated with a particular call in a set of XY line graphs. All call events (originations, handovers, drops, terminations) will be shown with vertical lines upon the XY graphs, with associated event symbols. Supplementary data includes call beginning time and date, call duration, call service, and device IMEI.

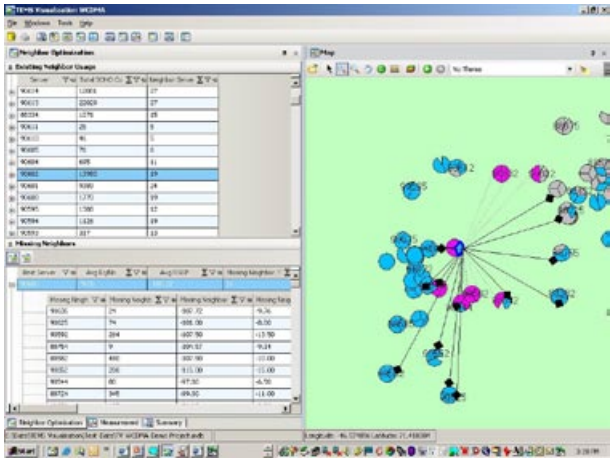
Time difference histogram

The enhanced time difference histogram feature makes it possible to analyze any problem related to network response time. The user can analyze the time difference between any two messages or any two events in the database. The results are displayed as cdf and pdf graphs.

WCDMA support

Neighbor Optimization

The Neighbor Optimization feature allows the operator to look simultaneously at missing neighbors as reported by actual users as well statistics on usage of existing neighbors in order to optimize neighbor relations. It is also possible to view both missing and existing neighbors on a map or in a spreadsheet view for easy analysis.



Neighbor Optimizer view.

Pilot Pollution Detector

The Pilot Pollution Detector identifies and sorts those cells suffering from Pilot Pollution. The operator can identify the cells that are the most polluted, and drill down for a detailed analysis of possible polluting cells. The Pilot Pollution information is displayed as a detailed list, as well as graphically in a map. Knowing the location and cause of pollution allows operators to move quickly from identifying the problem to solving it.

Resource monitors

The Resource monitors analyze Channel Element usage per site and Uplink and Downlink power loads per cell.

IRAT analysis

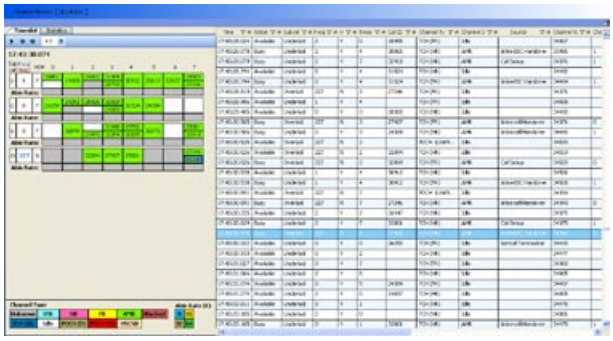
The IRAT analysis feature brings together information from the different GPEH events related to IRAT. Each occurrence of IRAT activity can be followed all the way from the initial measurements on GSM until its conclusion for further analysis.

GSM support

Cell Timeslot Monitor

The Cell Timeslot Monitor allows the operator to view all the timeslots of all the channels allocated to a cell/sector in a pictorial view.

- Users can browse through each state (change in the slot usage for any channel) for the selected cell and monitor the content of each event; for example, signal strength of UE.
- Each TRU has a frame that will show each timeslot color coded and by use (AMR, HR, FR, EFR, etc.).



The Cell Timeslot Monitor shows details of channel allocation.

Among many other benefits, this allows the operator to

- Dynamically show what actually happened when FR channels started to load the cell and dynamic HR adaptation stepped in.
- Provide input for multi-band cell optimization (LOL-TAOL-DTCB-SCLD).

The Cell Timeslot Monitor also includes a load factor, which makes it very easy to identify when the cell had a heavy load. This is very useful when analyzing the Channel allocation algorithms.

The Cell Timeslot Monitor also captures statistics of dropped calls and handover failures on both the TRU and the Timeslot level. This can be used to easily find hardware that is not working properly.

Tracing module
TEMS Visualization processes IMSI trace data from both WCDMA (UETR) and GSM (MTR). The tracing module makes it possible to analyze any IMSI recorded by the OSS. It is also possible to analyze Inter Radio Technology calls (IRAT), which are calls making handovers between WCDMA and GSM..

Task Manager
The Task Manager automates the handling of OSS data to improve the efficiency when working with TEMS Visualization. Four types of tasks are handled with the task manager. These include downloading of OSS data such as recordings and configuration files, parsing of the data into the databases, archiving of old records for ease of use and storage, and scheduling of all these tasks to automate the otherwise manual work.

Estimated positioning
It is possible to display estimated positions of measurement results and TEMS Visualization events in order to help identify areas of unwanted coverage.

Summary reports
Summary reports present statistical database information. Users can see statistics from one database, or create merged reports of aggregated data from multiple databases.

Faulty equipment analysis
This new feature implemented in the Summary View allows the user to quickly identify any equipment problems, not related to the air interface, which are causing dropped calls.

Import functionality
Special import features make it possible to create a cell file directly from an OSS export file. Both CNAI and BulkCM formats are supported. The import wizard also enables filtering and can import multiple files at the same time.

User interface
The user interface in TEMS Visualization is based on the latest UI features like auto-hiding of windows. The functionality in the windows also has the look and feel of the industry-leading air-interface test tool, TEMS Investigation. Updates to the display of radio measurements include distribution and scatter charts, making TEMS Visualization even more intuitive and informative.

Map views
The map view features call trace functionality. This allows the operator to view the actual flow of each call, giving a visual representation of how a particular end-user has been moving in the network.

State engine
TEMS Visualization includes a very sophisticated state engine developed by senior engineers at Ericsson; the state engine adds unique intelligence to the tool for easier analysis of the most complex problems.

Network requirements
GSM module
- R10-06B including RETD, RPMO and BSC IP connectivity

WCDMA module
- P4, P5 ED, and P5 MD including GPEH

Tracing module
- WCDMA P4, P5 ED, and P5 MD including UETR
- GSM R10-06B Including MTR

A revolutionary solution
TEMS Visualization is ideal both for finding network problems on a cell-by-cell basis and for regional optimization, because it allows operators to derive statistical data through scripting directly on the database. It also allows individual areas with poor performance to be identified, even in the midst of cells where performance is generally very good. TEMS Visualization gives operators the network information they need.

For more information, visit Ericsson TEMS on the **web at www.ericsson.com/tems**

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