

[TEMS™ PRODUCTS]

TEMS™ VISUALIZATION PROFESSIONAL BRIDGING THE OPTIMIZATION GAP



SEE YOUR NETWORK IN A WHOLE NEW WAY

TEMS Visualization Professional is the desktop version of Ascom Network Testing's wireless network troubleshooting and optimization tool. By analyzing event-based data generated by the infrastructure, it enables network operators to find problems that were impossible to pinpoint before.

For mobile operators that are serious about delivering ubiquitous quality and availability, traditional network performance management tools simply aren't enough. To home in on problems that were impossible to pinpoint before (those in difficult-to-drive-test spots or related to individual subscriber or phone model issues), operators must complement their network performance management and drive-testing tools with advanced network visualization and optimization capabilities.

TEMS Visualization Professional processes event-based data, analyzing and organizing it so that it can be used for network optimization. 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 enables operators to bridge 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 Professional gives a closer look at every call from every mobile in the network.

Designed to be installed and run on a single machine, TEMS Visualization Professional is the desktop version of Ascom Network Testing's wireless network troubleshooting and optimization tool. TEMS Visualization also comes in an **Enterprise Edition**, which utilizes dedicated servers for automated data processing, with multiple clients accessing the centralized database.

Benefits

- Trap, track, and eradicate network 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 CNAI and Bulk CM
- IRAT call tracing using UETR and MTR
- Automated task management



TROUBLESHOOT AND OPTIMIZE

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.

TEMS Visualization Professional works with data gathered by the Ericsson OSS RC. Supported formats are GPEH and UETR for WCDMA networks, and R-PMO, MTR, and CTR for GSM. TEMS Visualization Professional is compatible with the newest enhancements added on the event side for both technologies. The solution follows calls over BSC borders, 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 WCDMA neighbor plans
- Identify problems where only one link suffered from poor quality (uplink and downlink measurement data are available in the tool)
- Identify poorly performing mobile phones
- Analyze problems dependent on response time using the time difference histogram feature

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.

For WCDMA, it is also possible to keep track of the signaling between the mobile and the core network. Selected information elements such as the cause value for any 'location/routing area update reject' are decoded.

Exception Analysis

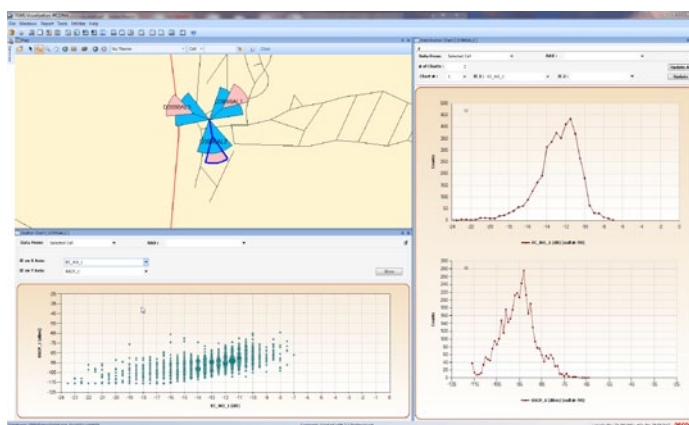
The exception analysis view gives a summary of all messages and TEMS Visualization Professional-generated events which occurred in any of the calls captured in the database. Any exceptional events can quickly be sent to the call list for investigation in more detail.

Measurement Result Viewer

The measurement result viewer allows the user to see the common radio measurements for a 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.

Time Difference Histogram

The 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.



EcNo and RSCP Distribution Charts

WCDMA SUPPORT

Phone List

For WCDMA, statistics are provided per IMSI. This allows individual customers that are having service problems to be identified. For both GSM and WCDMA, statistics are provided per IMEI TAC. This allows poorly performing mobile types to be identified.

Radio Performance Charts

Measurements of signal strength, quality, and power in uplink and downlink can be displayed in distribution and scatter charts for detailed investigation of radio performance.

Neighbor Optimization

The neighbor optimization feature allows the operator to simultaneously look at missing neighbors (as reported by actual users), as well as at statistics on usage of existing neighbors, in order to optimize neighbor relations. This is linked to the map view for easy analysis. Changes can be made and saved to a Bulk CM format file for import into the OSS-RC.

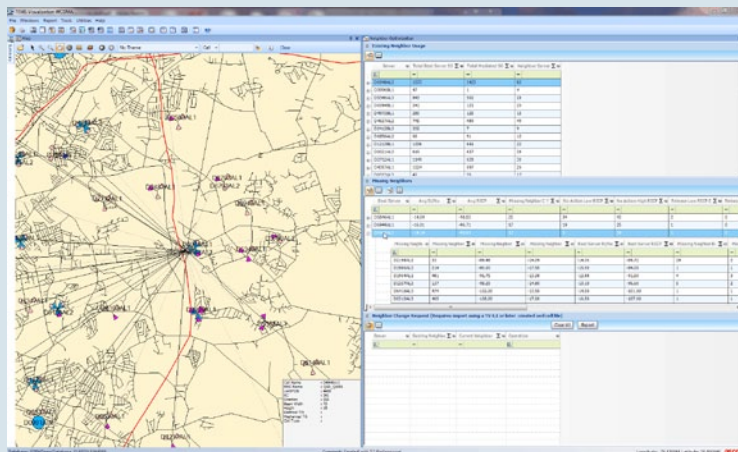
Pilot Pollution Detector

The pilot pollution detector identifies cells suffering from pilot pollution. The operator can then drill down for a detailed analysis of possible polluting cells. The pilot pollution information is displayed as a detailed list, as well as graphically on the 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 allow the usage of resources to be analyzed. Quantities such as power, channel elements, ASEs, and more can be plotted in time or distribution graphs.

Neighbor Optimization View



GSM SUPPORT

IRAT Analysis

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

Cell Timeslot Monitor

The Cell Timeslot Monitor allows the operator to view all of 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 user equipment (UE)
- Each TRU has a frame that will show each timeslot color coded and by use (AMR, HR, FR, EFR, etc.)

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 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 for 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.

Estimated Positioning

TEMS Visualization Professional makes it possible to display estimated positions of measurement results and events. This information can be used to identify where cells are covering too far and also gaps in WCDMA coverage (from positioning of incoming intersystem handover events).

Binned Maps

When estimated positions have been calculated, one or more databases can be loaded into the tool and binned maps created. These present not predictions but rather the actual conditions as experienced by the live traffic in the network.

Binned maps can be created for signal strength, interference, speech quality, traffic density, and traffic channel (TCH) dropped calls. A typical use case would be using the traffic density maps to determine the advisability of investing in a new site in areas of poor signal strength.

Faulty Equipment Analysis

Statistics are given per cell for non-air interface-related dropped calls (i.e., dropped calls due to transmission problems can be immediately identified and dispatched to the correct department). Performance statistics are also given down to the TX and RX level and then graphs of radio performance per TX or RX can be presented for more detailed analysis.

Tracing Module

Tracing for both GSM and WCDMA using MTR and UETR makes it possible to analyze calls in both WCDMA and GSM in the same database, a feature unique to TEMS Visualization Professional. Also, for GSM the CTR format from the OSS-RC is now supported. Calls passing through a specific cell (up to 16 at a time) can be recorded and the resulting CTR file analyzed, enabling engineers to investigate the performance of a single cell in great detail.

Task Manager

Handling of OSS data is automated to improve efficiency when working with TEMS Visualization Professional. Tasks include connection to different OSS or other FTP servers, downloading of OSS data such as recordings and configuration files, parsing of data into databases and cell files, archiving of old records for ease of use and storage, scheduling of all these tasks to automate the otherwise manual work, cleanup of old file download history and error messages, and deletion or saving of old data.

Reports

Cell performance reports for both GSM and WCDMA provide a wide array of useful information, and reports are available for antenna and speech quality measurements in GSM. Summary reports for both GSM and WCDMA present key performance indicators for entire databases.

Configuration Data Handling

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

User Interface

The user interface (UI) in TEMS Visualization Professional is based on the latest UI features such as 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.

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

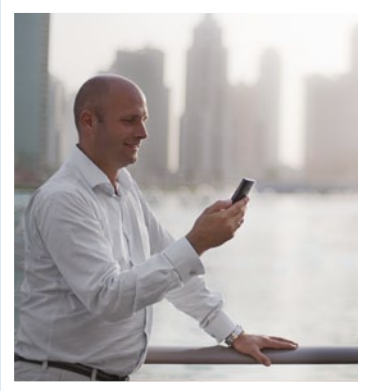
TEMS Visualization Professional contains a highly sophisticated state engine. The unique intelligence the state engine contributes to the tool provides easy analysis of the most complex problems.



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Understand network problems by viewing
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Identify the real reasons for dropped calls, understand traffic patterns, find missing neighbors, and more.

NETWORK REQUIREMENTS

GSM module

- Ericsson GRAN R12-G10B with RTED (Real-Time Event Data) feature
- Ericsson OSS-RC with R-PMO feature

WCDMA module

- Ericsson WRAN P5-W11A with GPEH feature
- Ericsson OSS-RC with GPEH feature

Tracing module

- Ericsson WRAN, UETR P5-W11A
- Ericsson GRAN, MTR R12-
- Ericsson GRAN, CTR 06A-

Revolutionary Solution

TEMS Visualization Professional is ideal for finding network problems on a cell-by-cell basis and for regional optimization. It also enables individual areas with poor performance to be identified, even in the midst of cells where performance is generally very good. TEMS Visualization Professional gives operators the network information they need.

For more information, visit TEMS on the web at www.ascom.com/tems.