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TEMS™ DISCOVERY DEVICE

TEMS Discovery Device 10.0, May 2013 © Ascom

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NT-13-20434 Rev A

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AGENDA

- Product Overview
- The Solution and Benefits
- Capabilities
- TEMS Discovery Options

- TEMS Discovery Suite
- Key Features
- Summary

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PRODUCT OVERVIEW

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PRODUCT OVERVIEW

TEMS Discovery Device is a wireless network reporting & analysis tool

- Automatic post processing of air interface measurement data

- Analyzing, organizing, storing, and sharing of information collected from wireless network devices

- On-demand data extraction, analyzing, presentation, visualization and reporting

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THE SOLUTION AND BENEFITS

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EFFICIENT USE OF ENGINEERING TIME

- **Automatic data processing**
  - Automate time-consuming tasks such as data import, and analyzing and pinpointing network issues

- **Background post processing**
  - Lets engineers continue to work while new files are being processed 'in the background'

- **Customized reporting capabilities**
  - Easily created, customized reports save time

- **Knowledge and best practice sharing**
  - All engineering teams can use the same methodology and processes

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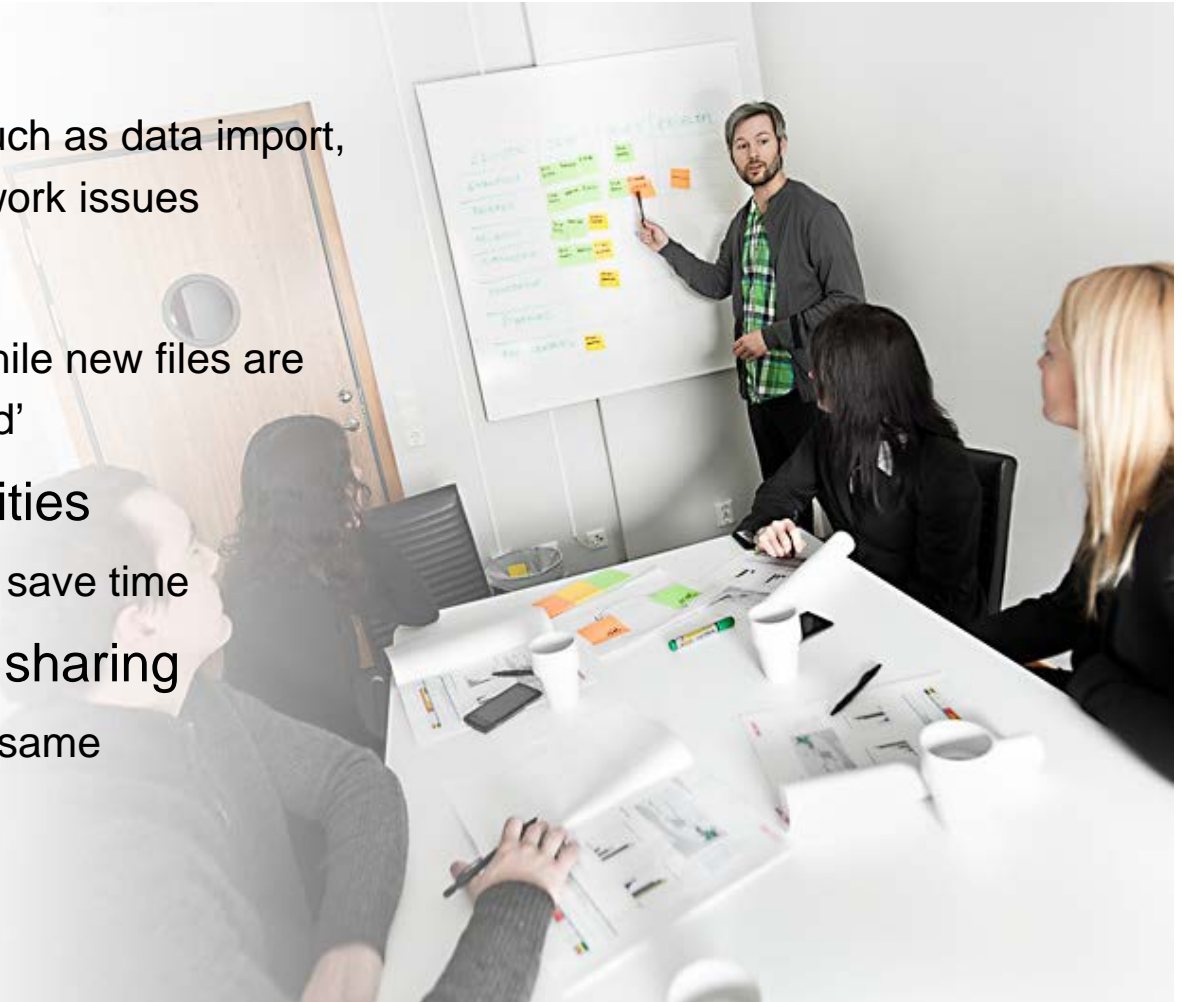
NETWORK ANALYSIS & REPORTING

- Full decoding of metrics and events

- Customizable problem detection and analysis

- Any KPI can be defined and reported automatically

- Supports all major wireless technologies

  LTE, TD-LTE, EV-DO (Rev. 0/A/B), WCDMA/HSDPA/HSUPA/HSPA+,

  WiMAX, IS-95/cdma2000 1x, GSM/GPRS/EDGE,

  TD-SCDMA, Wi-Fi

- Supports measurements from:

  TEMS™, JDSU™, Nemo™, Qualcomm™

  ZK Celltest™, LG™, PCTEL™, Rohde & Schwarz™

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AN APPROACH TO OPERATIONAL EFFICIENCY

Report and script packages that solve the problem.

Example:

- VoLTE

- Indoor/DAS

- Benchmarking

- WCDMA – Root cause diagnostic

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CAPABILITIES

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WHAT IS NEW IN 10.0 (1 OF 2)

- Improved map functionality

- Enhanced composite functionality

- On-the-fly geographic binning to create "Heat Map" on any metrics and events

- IP Multimedia Subsystem (IMS) support for TEMS logfiles collected from Qualcomm-chipset based devices

- TEMS Investigation 15.0 support

- Support for Rohde & Schwarz ROMES

The world's most versatile data processing tool

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WHAT IS NEW IN 10.0 (2 OF 2)

- Data streaming

- Enhanced MIMO support for PCTEL scanners

- WCDMA root cause analysis

- VoLTE package

- Indoor package

- Benchmarking reports

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VERSATILE DATA ANALYSIS

- **Multiple data sources**

  - Measurement data

    – Scanner and UE drive-test data

    – IP data (libpcap)

    – User Equipment Traffic Recording (Ericsson UETR)

  - GIS data

    – Support for more than 100 GIS formats

    – Integrated Google™ Maps or Microsoft Bing™ Maps

  - Network cell configuration and parameters, neighbor lists

  - Antenna pattern
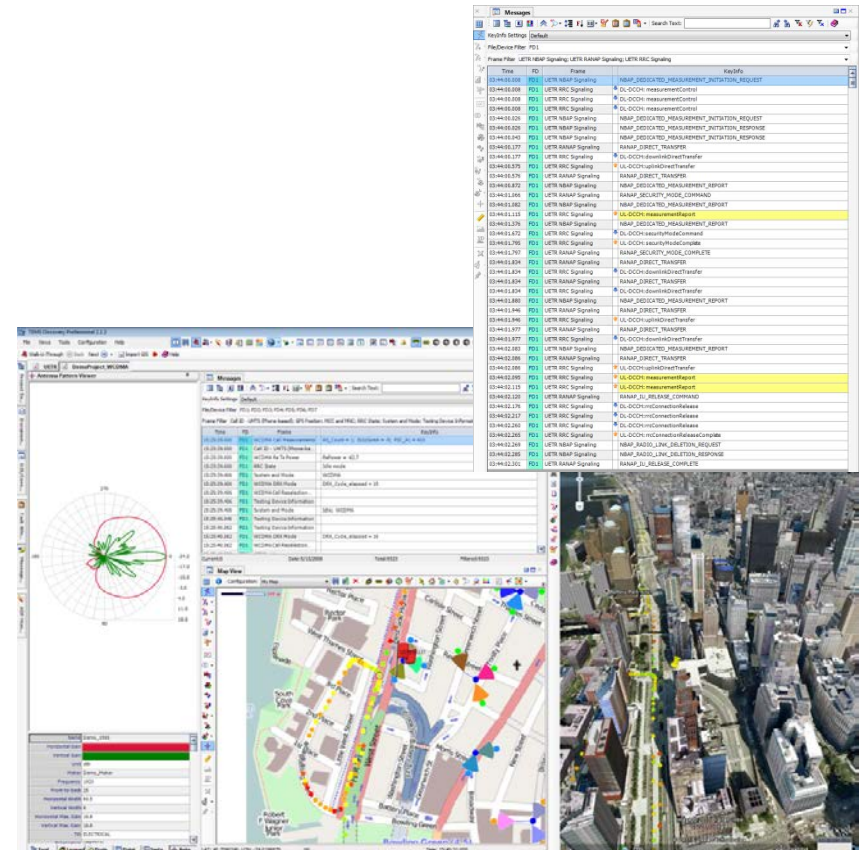
Relevant input for relevant analysis

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REPORTING & SCRIPTING

- Design your own reports, including tables, charts, and maps
  - Easy-to-use drag-and-drop configuration of report templates
- Make your own scripts for KPI calculations and problem finding and classification
  - Use Script Builder to create your own tailored scripts
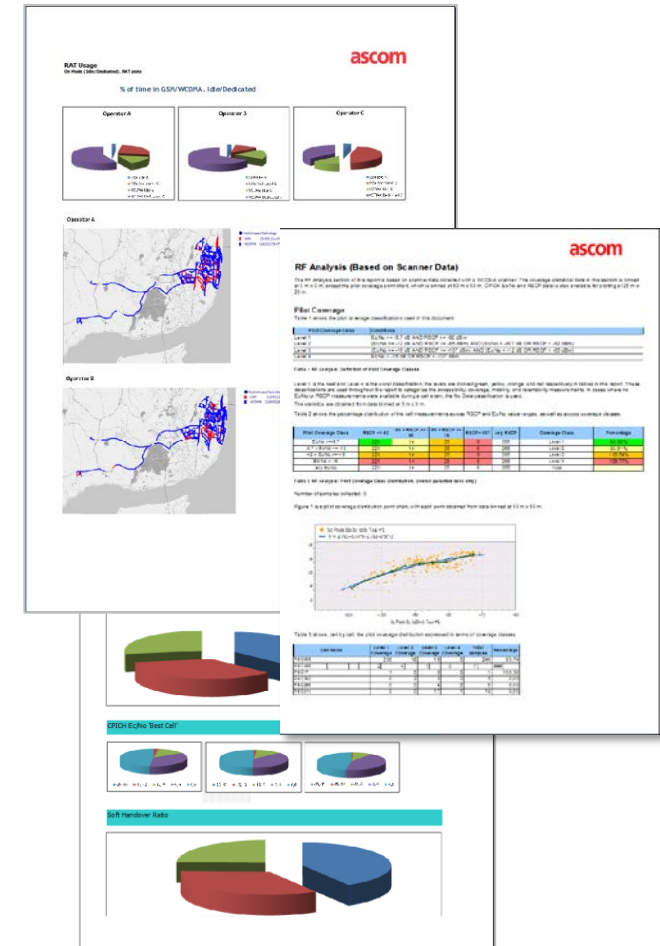
Built-in scripting and reporting

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AUTOMATIC DATA PROCESSING

- Monitoring and processing of incoming data

- Automatic creation of multiple projects and data sets according to user's configuration

- Automatic creation and distribution of reports

- Automatic email notifications to multiple recipients

- Easy and flexible configuration

Liberating precious and expensive RF engineering resources

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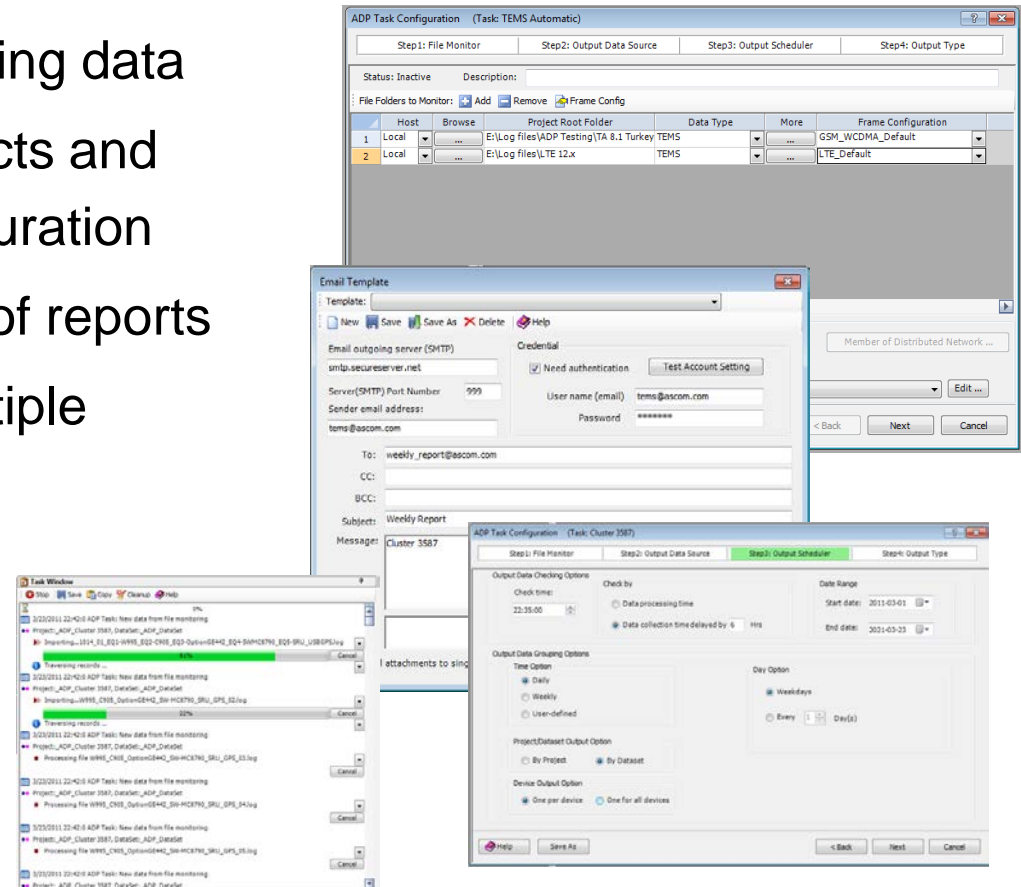
COLLABORATION ACROSS THE ORGANIZATION

- **Seamless data sharing**
  - Via peer-to-peer & public data
  - No need for reprocessing of data

- **Configuration sharing**
  - Seamless knowledge transfer
    - Share scripts
    - Share report templates
    - Share problem sets

- **Standardization of organizational processes**

Collaboration (and value) across the organization

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TEMS DISCOVERY DEVICE OPTIONS

TEMS DISCOVERY DEVICE OPTIONS

- **TEMS Discovery Device**

- **Standard Feature Set:**
  - Post-processing tool for TEMS Investigation multiple logfile analysis

- **Professional Feature Set:**
  - Post-processing tool that can be tailored to fit into and improve your processes by combining logfiles from the major drive-test tool vendors

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TEMS DISCOVERY SUITE
(COMPLEMENTARY PRODUCTS)

COMPLEMENTARY TEMS DISCOVERY PRODUCTS

- **TEMS™ Discovery Network** (formerly TEMS™ Visualization Professional)

  - Utilizes event data generated from large volumes of live subscriber traffic

  - Bridges the gap between performance management and drive test solutions

  - Cell, phone model, subscriber centric, and other advanced analysis, with ability to drill down to and geolocate individual calls

  - Prioritize and resolve larger volumes of problems, impossible to even identify before

  - Customer experience focused, operationally efficient, multivendor and multitechnology

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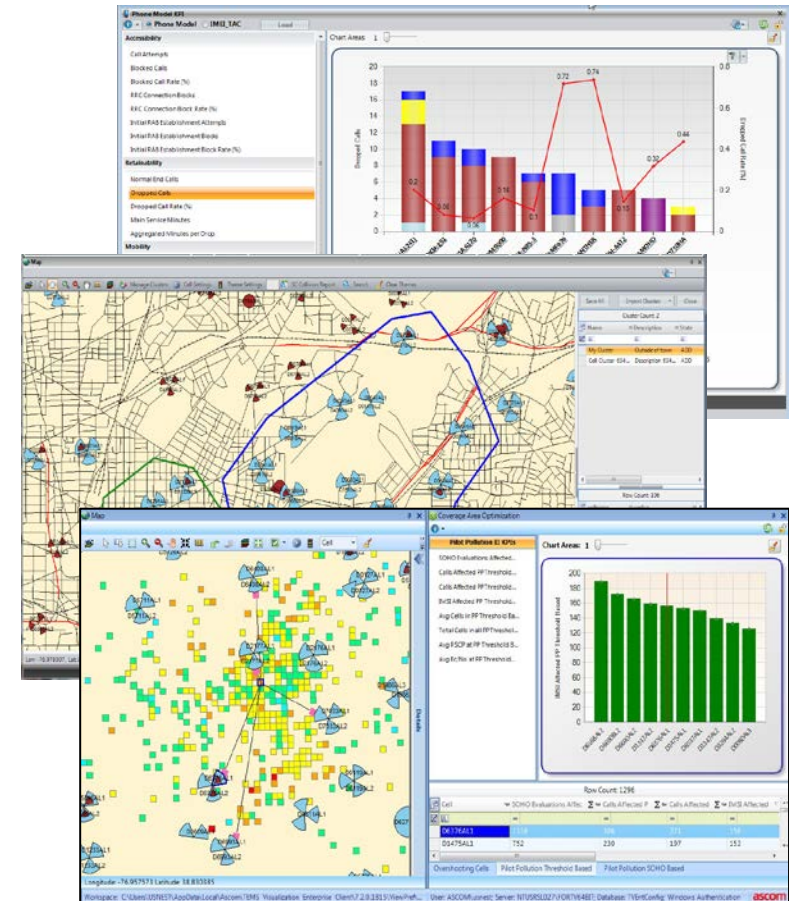
COMPLEMENTARY TEMS DISCOVERY PRODUCTS

- **TEMS™ Discovery Enterprise:**
  - New product added to TEMS Discovery product line
  - Server-based solution
  - Handles very large volumes of data
  - Statistical data storage and trending
  - Mobile dashboard
  - Works in conjunction with the existing TEMS Discovery product line (TEMS Discovery Device and TEMS Discovery Network)

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TEMS DISCOVERY SUITE OVERVIEW
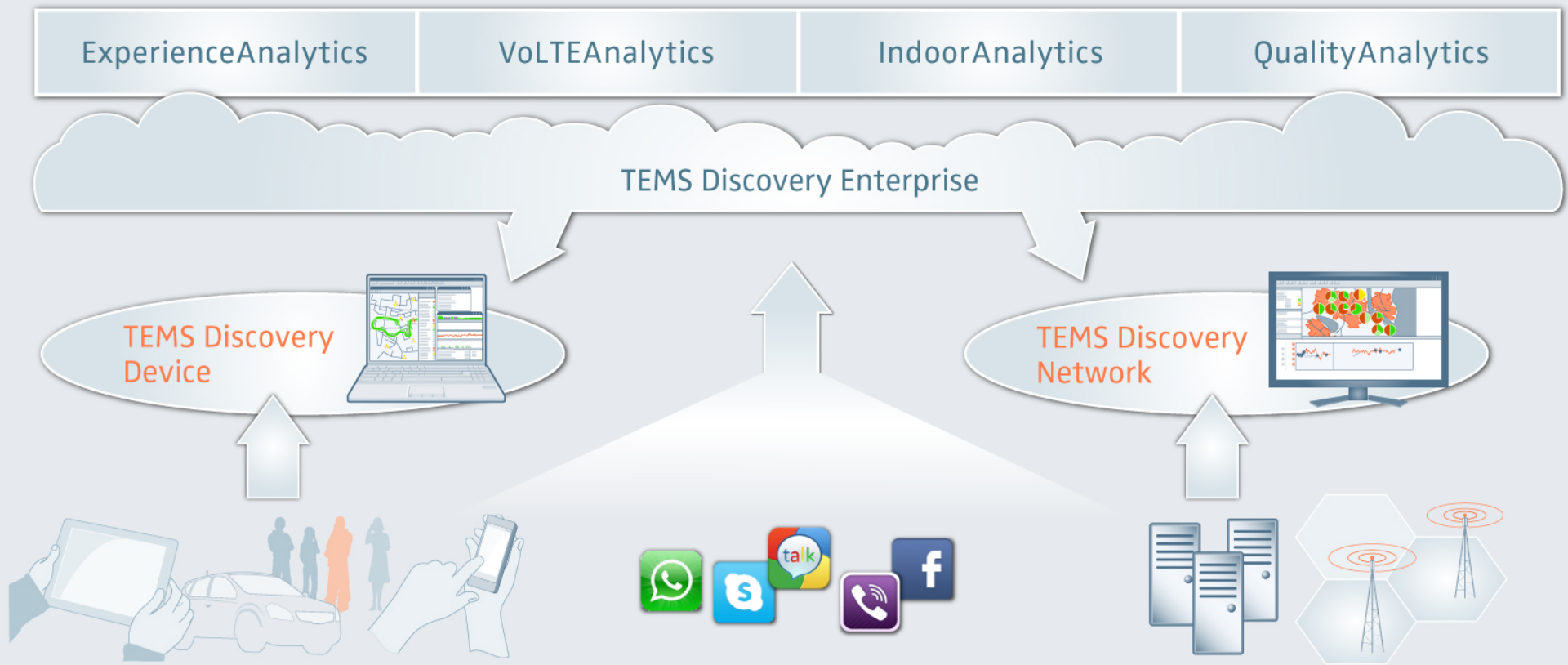
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KEY FEATURES

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AUTOMATIC DATA PROCESSING

- Monitoring and processing of incoming data
- Automatic creation of multiple projects and data sets according to user's configuration
- Automatic creation of KPI plots and reports
- Automatic email notifications to multiple recipients
- Multiple tasks can be configured
- Easy and flexible configuration

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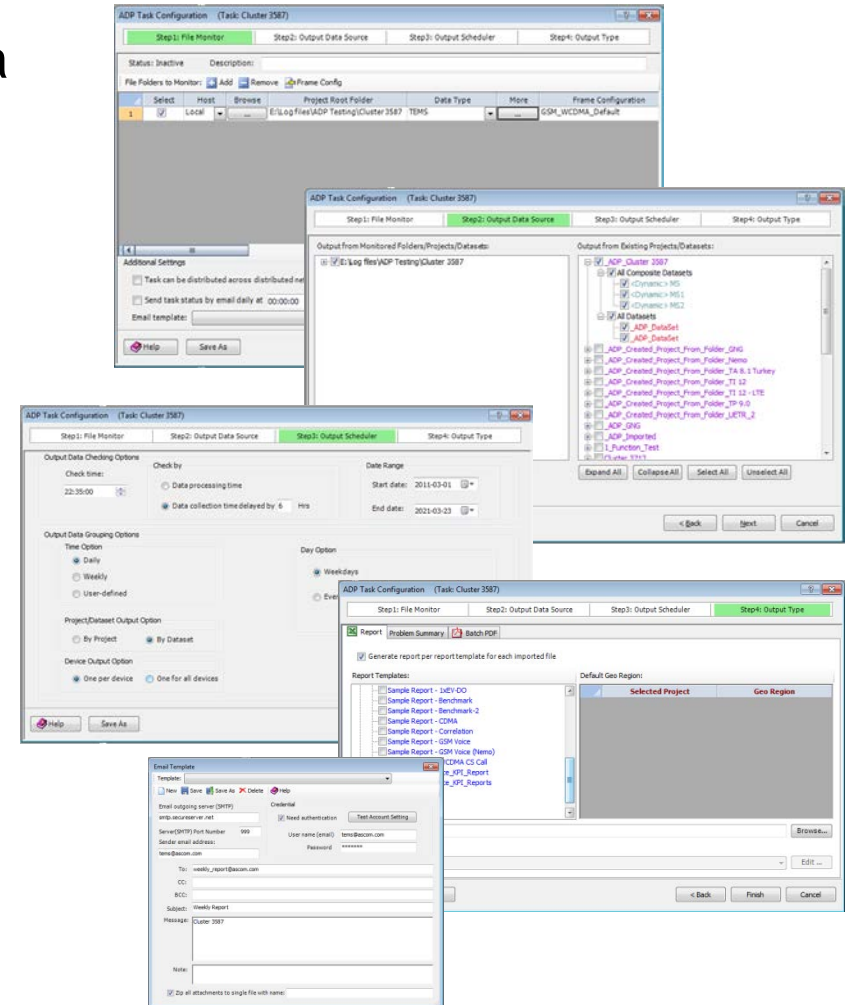
SCRIPTING

- Predefined or user-defined scripts

- Used for problem finding, analysis, and reporting

- Simple use of predefined scripts for pinpointing pilot pollution, missing neighbors, dropped calls, etc.

- Use Script Builder to create your own tailored scripts for automated problem finding

- Findings displayed in Map View (or any other view) and included in a report
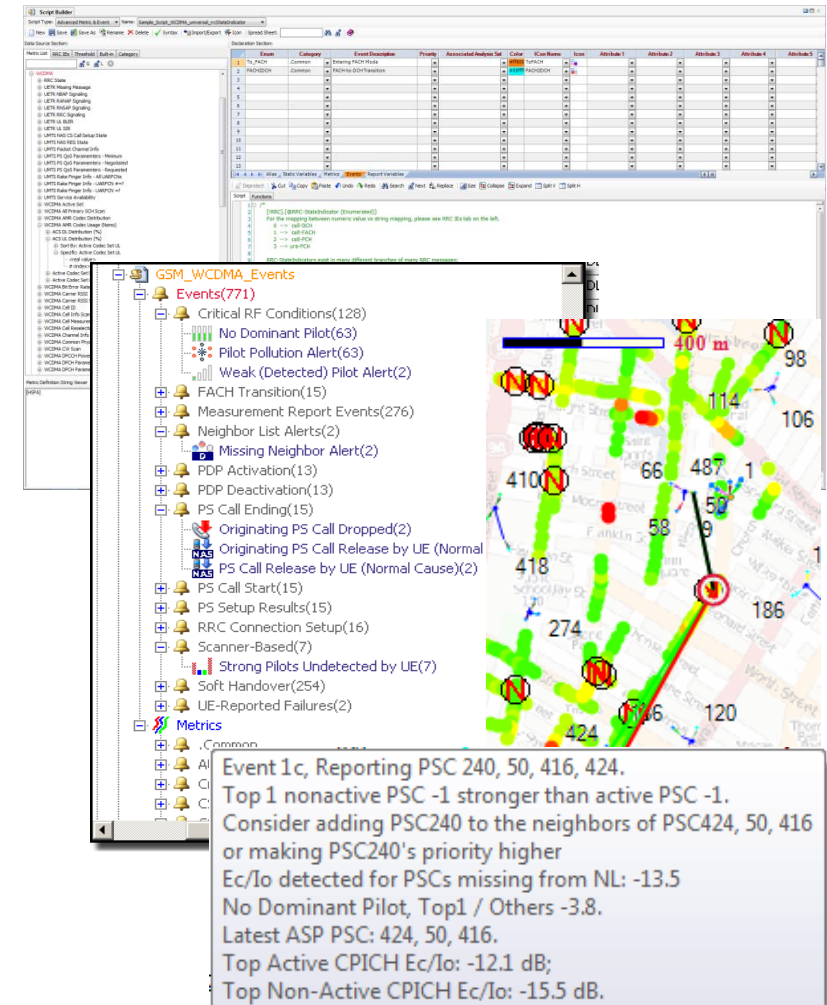
SCRIPT BUILDER

- **Simple drag-and-drop access to**
  - All metrics and events
  - All IEs in Layer 3 messages

- **Built-in functions, flags, and classes for easy script creation**

- **Embedding of proprietary algorithms for standardization across the organization**

- **Generation of any metrics, events, and report variables**

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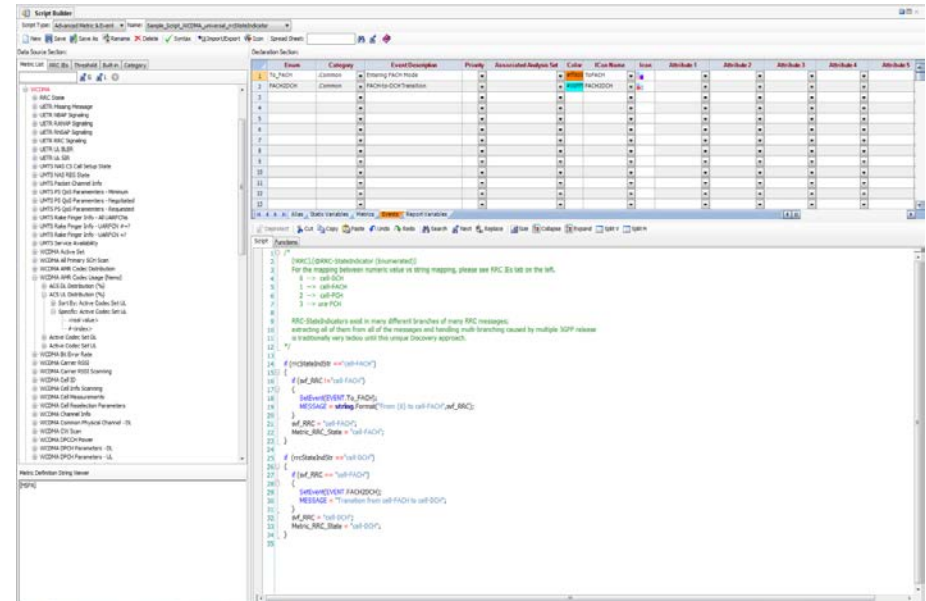
REPORTING

- Predefined and user-defined report templates

- Generate report on any data set, file, or device

- Scheduled or immediate generation of report based on selected template

- Create your own tailored report templates for specific interests and needs

- Sample report types:
  - TEMS acceptance reports
  - TEMS RAN tuning reports (WCDMA and/or GSM, voice and/or data)
  - ETSI KPI reports
  - Benchmarking reports

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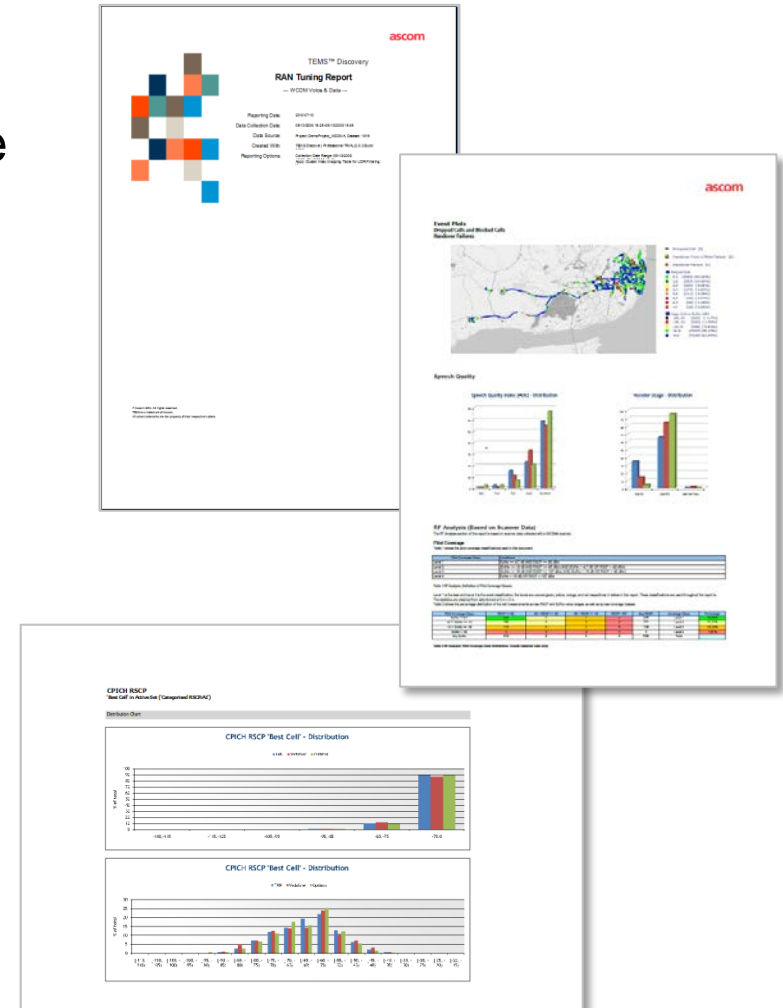
REPORT BUILDER

- **All TEMS Discovery events and metrics**
  - Full array of statistical attributes
  - Drag and drop to any desired cells
- **All Microsoft Excel® functions**
  - Formulas and equations
  - Styles and formatting
  - Charting
- **Data filtering per any file/device attributes**
  - Operators: for benchmarking
  - Date: for trending
- **Uses universal templates or specific data**
- **Auto-grow functions**

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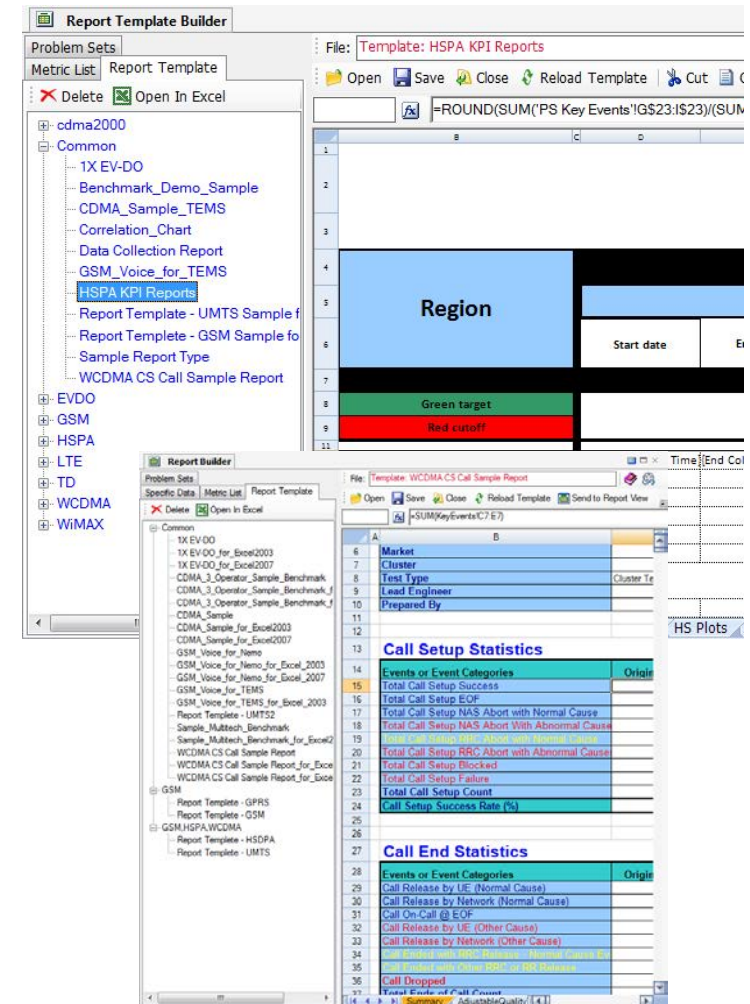
INDOOR MAPPING FUNCTIONALITY

- Seamless import of TEMS Pocket and TEMS Investigation maps and logfiles

- Logfiles, bitmap floor plan images, and metadata all in one zip file

- Simply drag and drop metric into Map View and the metric is displayed on the corresponding floor plan image

- Simple three-step geolocation of map and measurements

- Repositioning of indoor waypoints to improve the appearance of the measurements on the map

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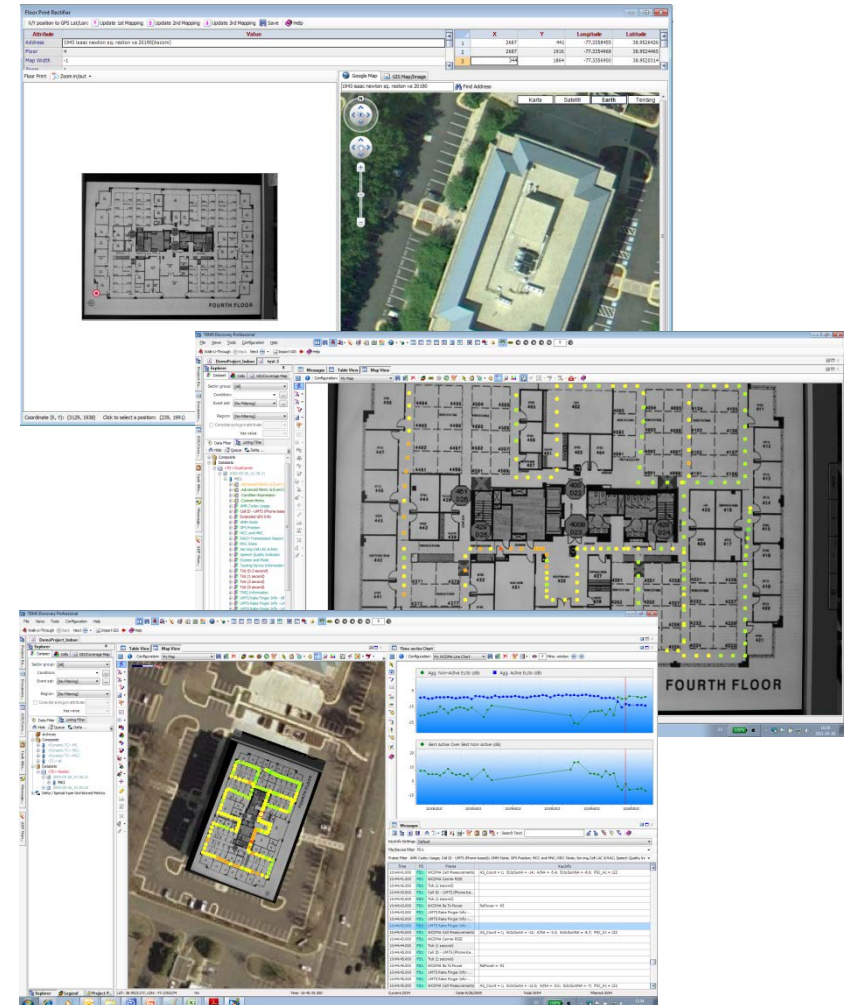
GENERIC TEXT FILE IMPORT

Flexible delimited text file import:

- Create user-defined metric groups

- Define group-by and sort-by keys

- Exclude exception values

- Manipulate data in various views in essentially the same way as other standard metrics

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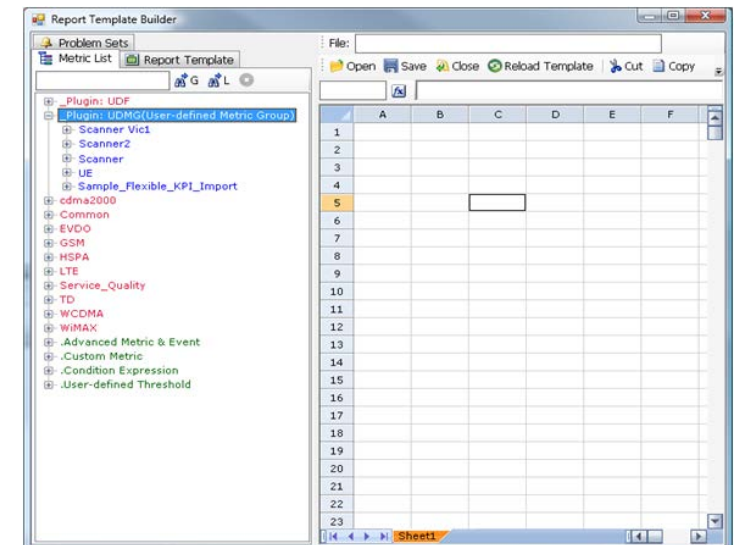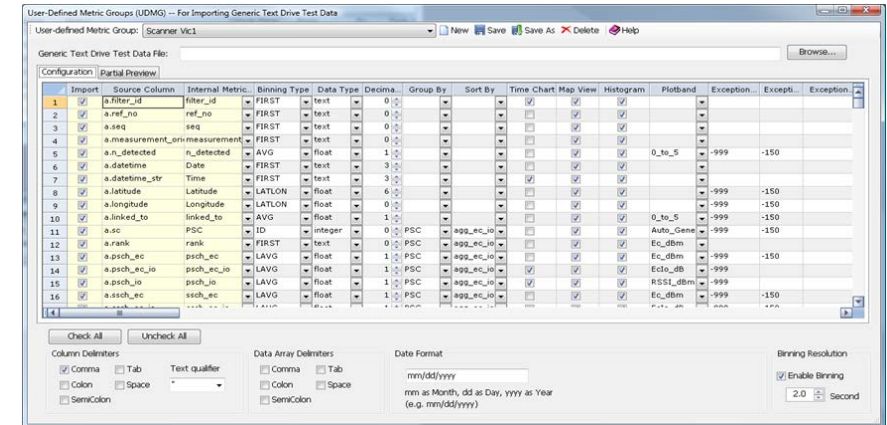
VERSATILE DATA BINNING

- Time binning during data import
  - Frame level resolution
  - Smart selection
    - No binning for event-triggered messages
    - Binning for periodic messages

- Geo-binning
  - Distance binning
  - Grid binning
  - Per-region mixed resolution (example: fine resolution in dense urban areas and coarse resolution in rural areas)

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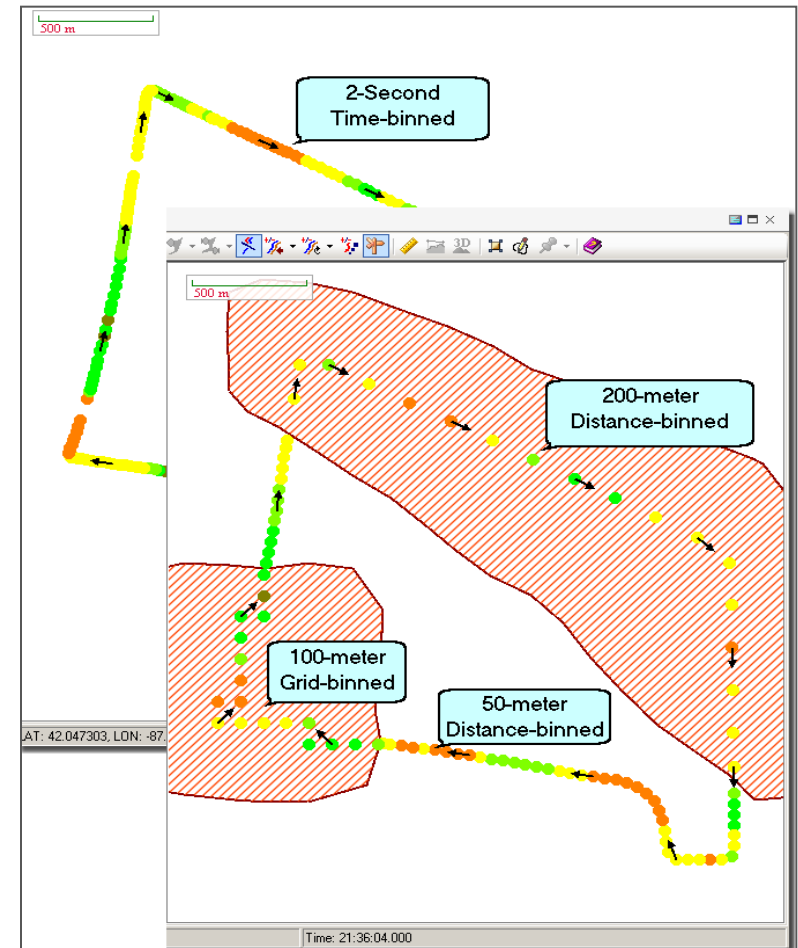
LINE-OF-SIGHT TOOL

▪ Line of sight between two points in Map View is possible with terrain elevation data
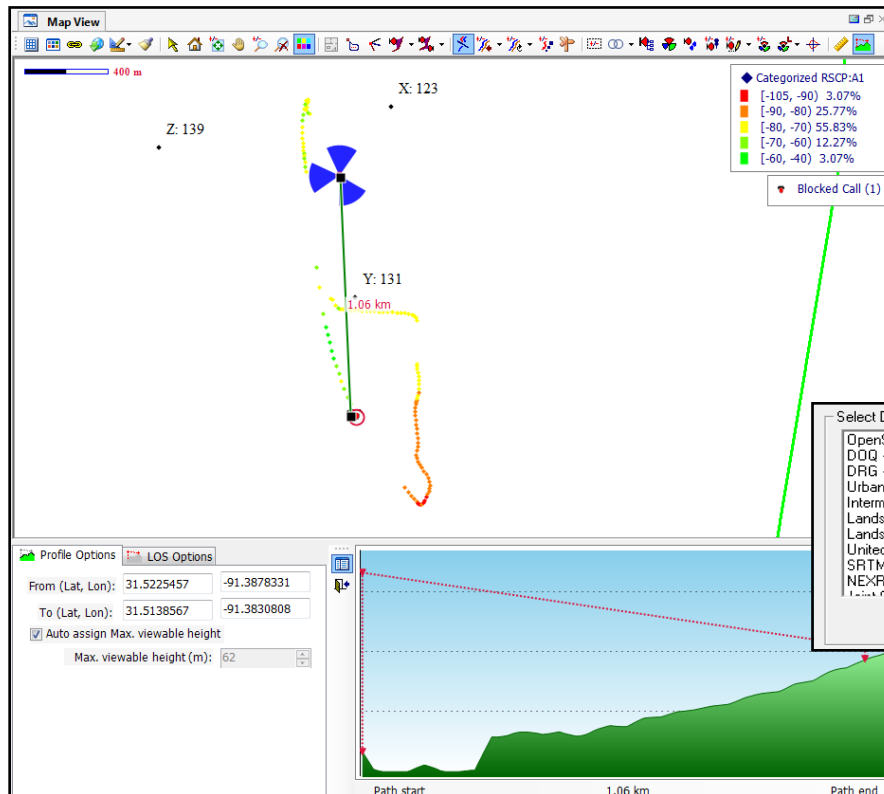
User can download elevation data from many free Web databases

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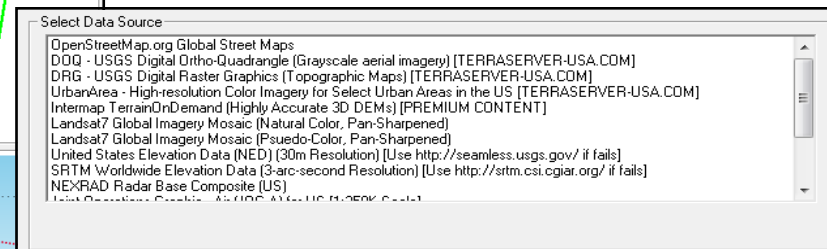
ANTENNA PATTERN VIEWER

- Preloaded antenna pattern can be displayed for each antenna
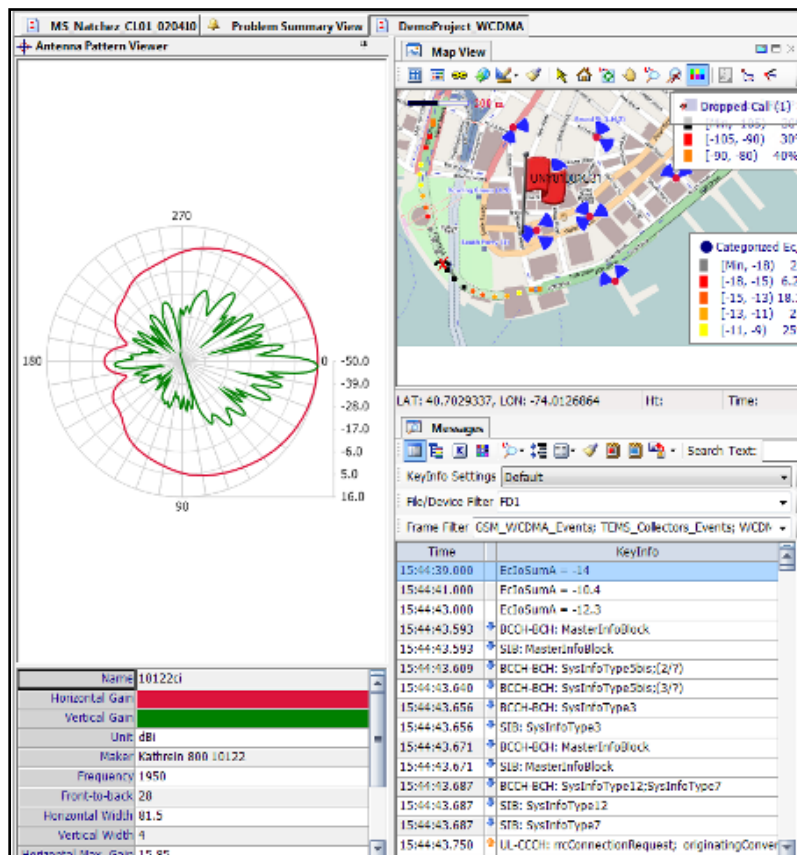
INSTANT CHART

- **The Instant Chart monitor is a user-configurable monitor to graphically display a set of array data.**
  - Multiple configurations
  - Instant Bar Chart View with optional table view
  - Multiple chart space & multiple metrics
  - Fixed or metric-based coloring
- **Sample Usage:**
  - Scanner or phone data: Ec/Io, RSCP for all pilots for one or multiple UARFCNs
  - Transport Channel Information: Configuration, state, throughput of concurrent channels
  - Adjacent channel analysis: Graphically visualize channel strength of adjacent channels

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SUMMARY

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IMPROVE OPERATIONAL EFFICIENCY WITH TEMS DISCOVERY

- Flexible and innovative post processing

- Liberating precious and expensive RF engineering resources so they can focus on troubleshooting

- Share best practices within the organization

The world's most versatile data processing tool

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