Aries LTE

Mobile Network Performance Monitoring

Autonomous real-time network performance data collection using standard Android phones – analyse and display the results on any internet browser

Powerful, easy-to-use, affordable

Ideal for large users needing independent performance verification for mission-critical communications

Key features

- real-time monitoring of 2G/3G/4G network performance
- low-cost probes based on standard Android phones for handheld or vehicle use
- no technical knowledge required to operate the probe – can be used entirely autonomously
- logs engineering parameters plus ping, data download/ upload rates, voice call and SMS
- results uploaded from probe to server in real-time
- all results and analysis presented on secure web pages accessible from any browser
- built-in powerful analysis functions for calculating high-level key performance indicators (KPI)
- inherently scaleable design can easily manage 1000's of probes
- available as a complete dedicated system or as a service using RSI's own cloud server

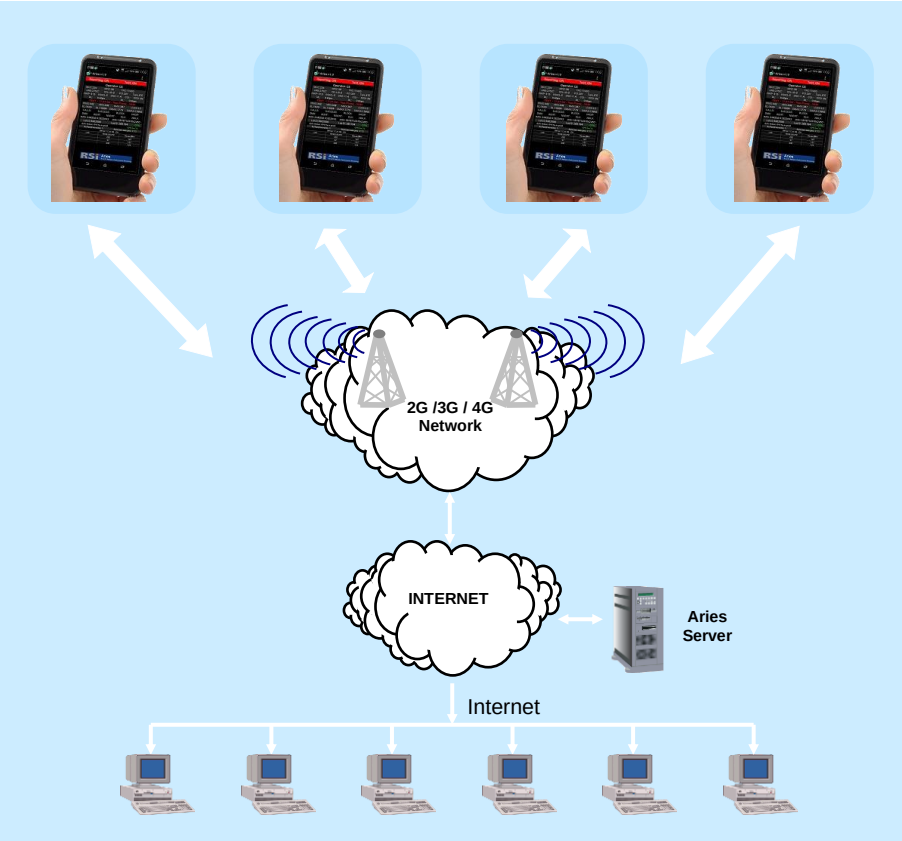
What is Aries LTE?

Aries LTE is an autonomous LTE network monitoring tool that provides real-time performance statistics. It consists of many low-cost probes based on standard Android phones as well as software that runs on a web server. As the probes travel across the network, data is sent from the probes back to a central web server so that a picture of network performance builds up. Results may be viewed in real-time as maps, graphs, tables and warnings using a secure password-protected web site available on any Internet connected PC using a standard browser.

Aries LTE provides first-line network monitoring of faults and problems with the facility to send warnings by SMS and email to service engineers when key metrics are exceeded. Problems can then be investigated further using the detailed technical data and powerful analysis functionality.

Aries LTE provides a picture of the network performance that is not available from the standard network management logging. It takes failed calls and poor coverage areas into account to provide a true and independent measure of grade-of-service as perceived by the user.

Aries LTE probes can be used in vehicles or in the hand for walk-testing. They are ideal for fitting in any vehicle that regularly travels across the network service area - once installed they can be forgotten about.



Use Cases

End Users

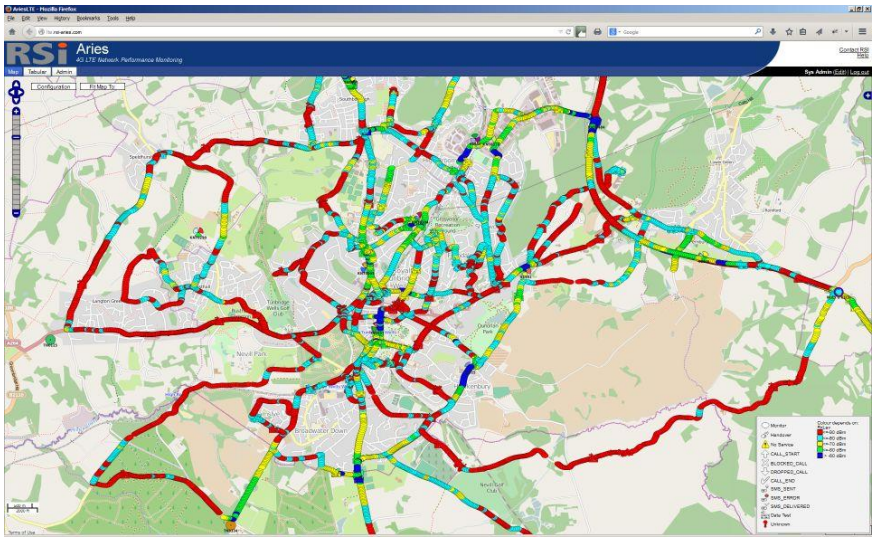
- contractual acceptance verification
- identify any network weaknesses before mission critical communications
- monitor ongoing performance for Service Level Agreement
- spot trends in performance, identifying problems before users do
- high-level KPI reporting for management

Network Operators

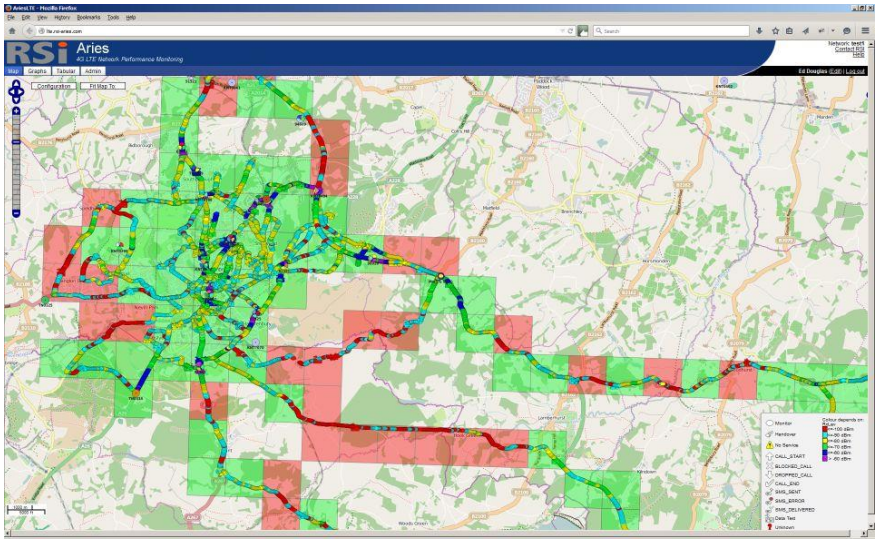
- collect network engineering data for troubleshooting and optimisation
- collect coverage data for feeding back into the network planning process
- early warning of faults and performance issues
- competitor benchmarking and comparison
- high-level KPI reporting for management
- identify performance bottleneck areas of weak coverage or capacity
- benchmark before and after performance when changes are made
- gain a better view of your network with continuous, real-time QoS data

Results and Analysis

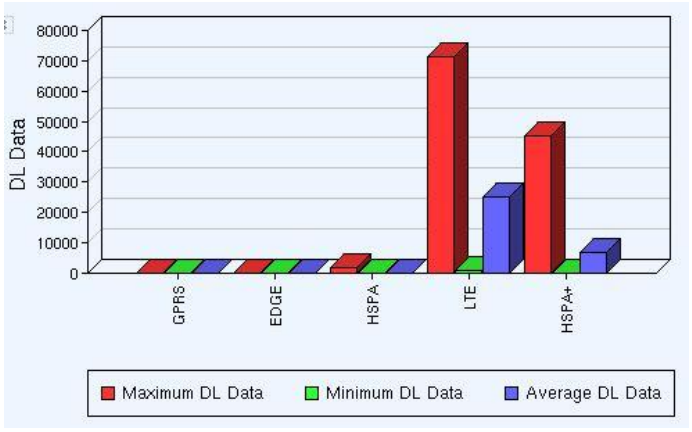
All data collected from the probes is viewed and analysed from a standard web browser with secure login to the Aries LTE server. The screenshots below show just some of the types of analysis available:



◄ Aries coverage map showing samples coloured by received signal strength. Base station sites are clearly displayed. Data samples may be coloured by many other measured parameters.



◄ Aries map showing the square km analysis option – in this case each square km is coloured green for 'Pass' or red for 'Fail' based on whether the data meets the test criteria. This provides a higher level of statistical analysis and is ideal for performance acceptance testing.



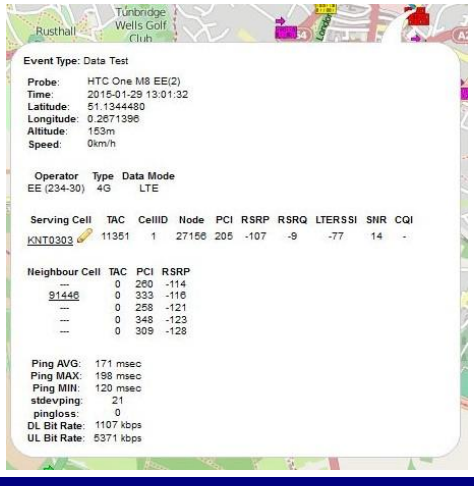
◄ Aries graph showing the download data rate achieved for different network data modes. Many different combinations of parameters may be displayed as a graph.

Map detail showing ► option for displaying site affiliation lines – clearly displaying the sectored coverage areas

Date Range: last 3 months

	TW_East	TW_South	TW_West
Event count: total number of events (greater than 50)	2950	1136	1503
Signal Level: % samples greater than -110dBm (greater than 95%)	80.3%	97.5%	86.4%
Call Success: % of calls successfully completed (greater than 80%)	0%	0%	20%
Call Blocked: % of call attempts blocked (less than 2%)	0%	0%	0%
Call Dropped: % of call attempts dropped (less than 2%)	100%	100%	80%
SMS Success: % of SMS sent successfully delivered (greater than 95%)	100%	100%	100%
No Service: % of events are No Service (less than 1%)	0.1%	0.1%	0%
Network Type: % of samples are 4G or better (greater than 70%)	82.1%	97.7%	75.2%
Data Mode: % of samples are UMTS type or better (greater than 90%)	100%	100%	100%
UL Data Rate: % of samples with data rate greater than 500kbps (greater than 90%)	77.8%	91.7%	92.3%
DL Data Rate: % of samples with data rate greater than 2000kbps (greater than 90%)	63%	100%	61.5%
Ping Time: % of samples with average time less than 700msec (greater than 90%)	100%	100%	100%
Data Fail: % of samples with failed data connection (less than 1%)	22.2%	8.3%	7.7%

A typical info box ► showing all of the raw data logged for a single data sample



◄ Aries KPI analysis showing 3 sets of results for 3 separate geographical areas. Results are coloured green or red indicating if they have passed or failed the test criteria.

Specification

Aries App

- Compatible with any Android mobile phone running Android V4.0 or later
- Parameters logged depend on specific mobile phone but the following are logged for HTC One M8:
    - 2G: LAC, Cell ID, RxLev, RxQual, Neighbour cells
    - 3G: LAC, Cell ID, Node, PSC, RSCP, Neighbour cells
    - 4G: TAC, Cell ID, Node, PCI, RSRP, RSRQ, LTE RSSI, SNR, Neighbour cells
    - Data Mode: e.g. GPRS, EDGE, UMTS, HSPA, HSPA+, LTE
- Parameters logged every 15m distance (configurable)
- Location uses phone's internal GPS receiver
- Auto Indoor mode interpolates samples on line between known good GPS points when GPS sync is lost
- Samples reported back to the Aries server every 60secs (configurable)
- In the event of no network data, samples are held in memory until they can be sent back
- App runs in the background taking low CPU and memory resources. Other applications may be used at the same time as the Aries App.
- App keeps display on to ensure logging is not interrupted
- Configurable test call sequence:
    - Ping test: logs Min, Avg and Max Ping times
    - Data upload test: logs data rate in kbps over 5secs (configurable)
    - Data download test: logs data rate in kbps over 5secs (configurable)
    - Voice call test: logs successful, blocked and dropped calls
    - SMS test: logs successfully delivered SMS

Aries Server Application

- Runs on dedicated server at customer premises or secure and private access to RSI's servers is available
- Capable of supporting 1000's of probes limited by server resources
- Capable of supporting 100's of users logged in simultaneously limited by server resources
- Application enforces password complexity and expiry rules
- Different level of user account provide different levels of access and functionality
- All Data is logged in a MySQL database. A user-friendly interface is provided to allow the following methods of selecting data for analysis: Filter by Data, Filter by Probe, Filter by Base Site, Filter by Area, Filter by Event Type, Filter by parameter value
- Analysis may be done using maps, graphs, tables, KPI
- A base site database is included allowing display of base site icons on the map
- Map icons may be coloured by: Speed, Altitude, LAC/TAC, Cell ID, Node, PSC/PCI, RxLev/RSCP/RSRP, RxQual/EcNo/RSRQ, LTERSSI, SNR, CQI, Operator, Network Type, Data Mode, Ping Time Min/Avg/Max, UL Data Rate, DL Data Rate
- Map Square KM analysis mode, calculates performance statistics for each square km and colours them Pass/Fail
- Maps include support for data from Google Maps, Google Satellite, Google Terrain, Open Street Map
- Maps can be exported to kmz format for use in Google Earh
- Graph 'Values' mode: X Axis=Time; Y Axis= RxLev/RSCP/RSRP, RxQual/EcNo/RSRQ, LTERSSI, SNR, CQI, Ping Time Min/Avg/Max, UL Data Rate, DL Data Rate, Speed
- Graph 'Summary' mode: X Axis= Time, Time of Day, Base Site, Probe ID, Network Operator, Network Type, Data Mode; Y Axis= RxLev/RSCP/RSRP Min/Avg/Max, All Events Total, UL Data Min/Avg/Max, DL Data Min/Avg/Max, Ping Time Min/Avg/Max
- KPI Analysis: KPIs may be grouped for comparison by: Network Operator, Network Type, Data Mode, Area, Date/Time Range; available KPI's: Signal Level, Call Success, Calls Blocked, Calls Dropped, SMS Success, No Service, Network Type, Data Mode, UL Data Rate, DL Data Rate, Data Fail
- Polygons in kml format may be uploaded to be used as Areas in the analysis
- Warnings are sent by SMS and email when key parameters or KPIs exceed preset thresholds

Try Aries LTE now

If you would like to try using Aries LTE with some test data then go to **www.rsi-uk.com** and select 'Contact RSI' to request a username and password.

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