



# Windcatcher

Off – line analýza RAN

# Windcatcher

- ✔ Supports all major technologies: LTE, GSM/UMTS/HSPA+, CDMA/EVDO, WiMAX, iDEN, WiFi.

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- ✔ Provides layer 3 drilldown, PCAP (TCP/IP, SIP, RTP) and layer 2/layer 1 message extraction.

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- ✔ Features include: site/cluster/system acceptance, online maps, user defined events/reports, delta analysis, troubleshooting metrics, cal trace analysis.

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- ✔ Modules include: Automation, VoLTE, PTT, DAS and Small Cell Module.

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- ✔ **Licensing agreements with chipset vendors:** Qualcomm, Altair, HiSilicon, Sequans, Broadcom/RTM.

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- ✔ **Licensing agreements with data collection platforms:** Ascom, Anite, JDSU, Swissqual, Rohde & Schwarz, Verizon DataPro, ZK, Qualcomm, Accuver, PCTel, Dingli.

# Call Trace Module Overview

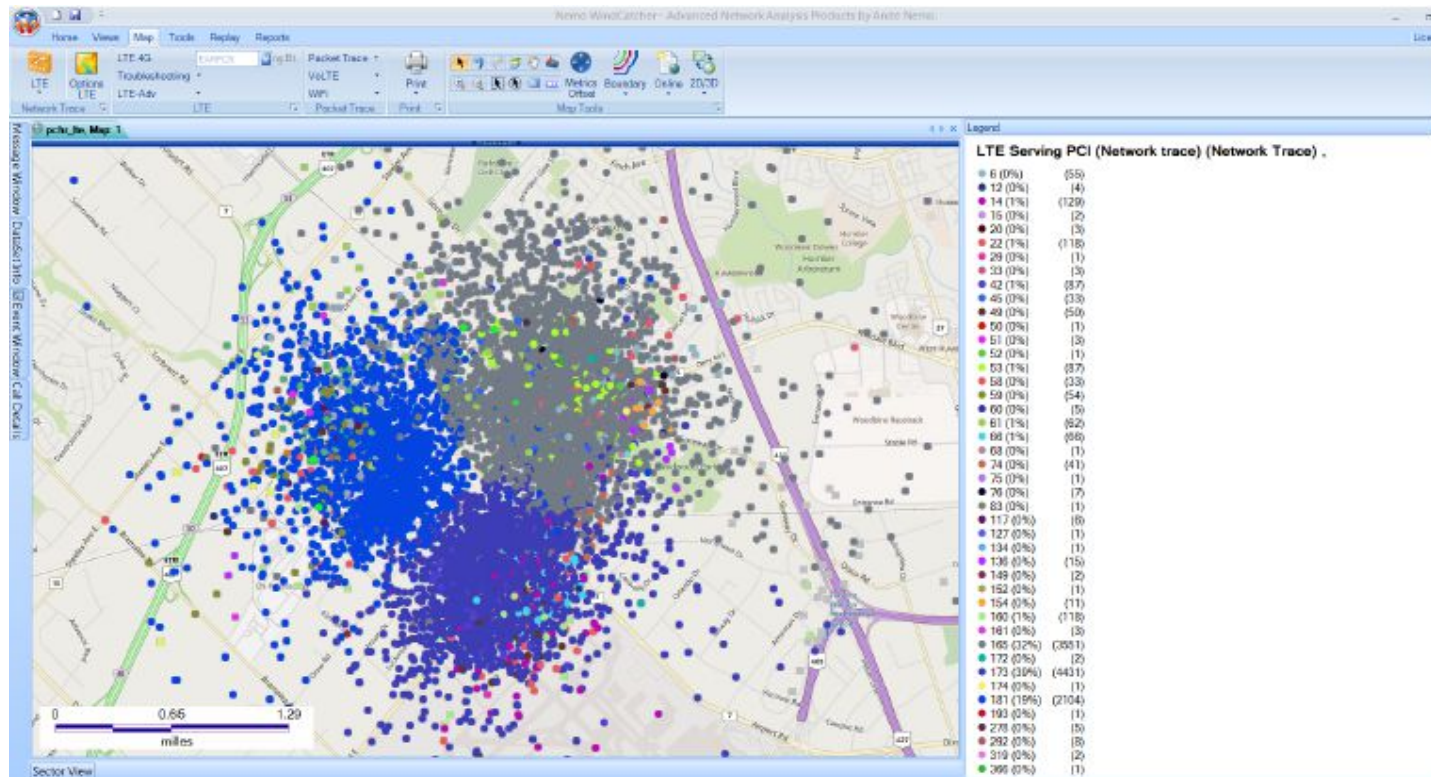
- WindCatcher module for call trace based analytics to perform network optimization with data collected by the network (no drive testing needed)
- Supports major infrastructure vendors Ericsson and Huawei
- Support for LTE and UMTS technology
- WindCatcher provides a single platform to look at call trace data with or without drive test data
- Uses same geolocation and parsing engine as Xynergy CEM

# Key functionality

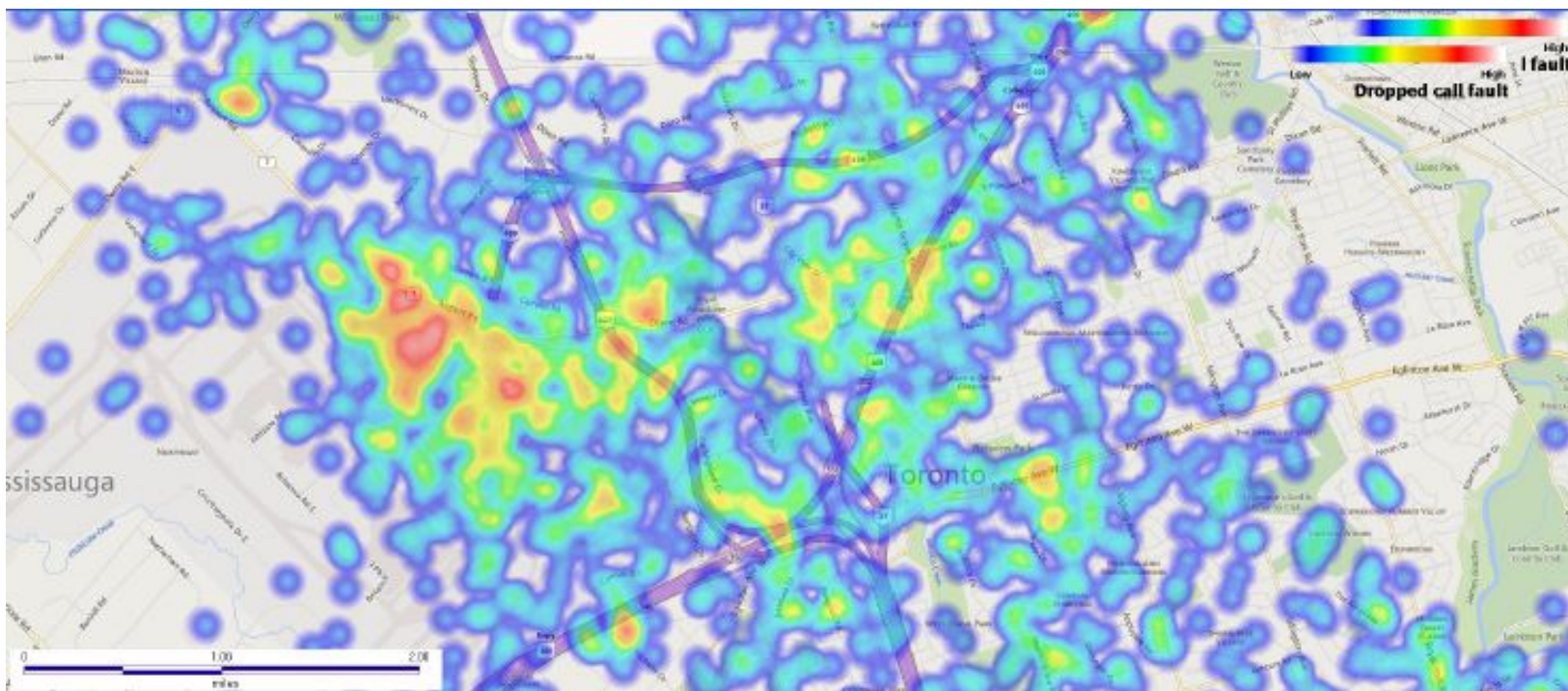
- Process call trace data in native OSS format
- Load few hours of call trace data (busy hour etc.)
- Based on portable Sqlite database for fast data loading
- Geolocated call trace
  - Plot coverage and quality KPIs
    - Areas with weak coverage, pollution, overshooting sectors, cross feed issues etc.
  - Plot event heat maps
    - Traffic localization and patterns
    - Areas with accessibility (access failures), retainability (drops) and mobility (handover failures) issues
- Analyze detailed call records, events and messages from every recorded subscriber call
  - Includes decoding of RRC, NAS, NABAP, S1, X1 etc. layer messages to trace call flow from RAN to core
- Customizable reports based on WindCatcher custom report module



# LTE call trace data - eNodeB coverage

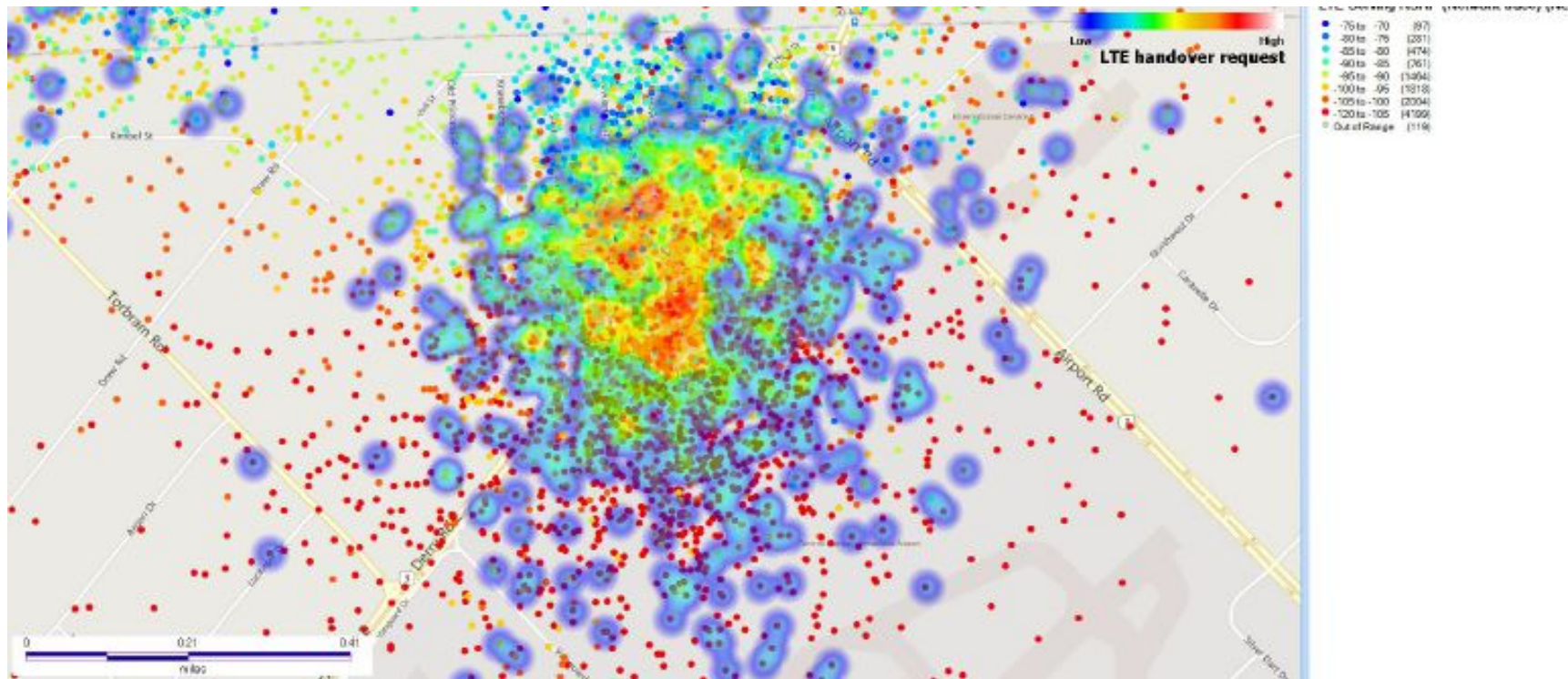


# Drop call heat map





# RSRP overlay on handover heatmap



## LTE call - event / detailed data

The screenshot displays a software interface with three main sections:

- Call Details Table:** A table listing call events with columns for Start Time, End Time, Call Index, TMSI, Protocol, Carries, Start Cell ID, Start MME/RNC Name, Start MME/RNC ID, Start Cell Name, and eNodeB/NodeB.
- Per Call Events Table:** A smaller table showing event details for call index 15308147, including Time, Call Index, Event Index, Event ID, and Event description.
- Message Data Table:** A table showing message details for call index 15308147, including Call Index, Message, Interface Link, and Cell IDs.
- DL COCH Message:** A detailed view of a DL COCH message for call index 15308147, showing the message structure and parameters.

Start Time	End Time	Call Index	TMSI	Protocol	Carries	Start Cell ID	Start MME/RNC Name	Start MME/RNC ID	Start Cell Name	eNodeB/NodeB
2015/03/2...		15308136	3264106596	LTE		2850	7 MME		1 LBHCN0540684...	
2015/03/2...		15308137	3270014050	LTE		2325	2 MME		1 LBHCN0540684...	
2015/03/2...		15308138	3324063845	LTE		2325	1 MME		1 LBHCN0540684...	
2015/03/2...		15308139	3329540201	LTE		2325	1 MME		1 LBHCN0540684...	
2015/03/2...		15308140	3328013500	LTE		2325	1 MME		1 LBHCN0540684...	
2015/03/2...		15308141	3333505083	LTE		2325	3 MME		1 LBHCN0540684...	
2015/03/2...		15308142	3457458353	LTE		2325	3 MME		1 LBHCN0540684...	
2015/03/2...		15308143	3281363023	LTE		2325	2 MME		1 LBHCN0540684...	
2015/03/2...		15308144	3308212367	LTE		2325	1 MME		1 LBHCN0540684...	
2015/03/2...		15308145	3258191959	LTE		2325	2 MME		1 LBHCN0540684...	
2015/03/2...		15308146	0	LTE		2325	1 MME		1 LBHCN0540684...	
2015/03/2...		15308147	3484352550	LTE		2325	3 MME		1 LBHCN0540684...	
2015/03/2...		15308148	0	LTE		2325	3 MME		1 LBHCN0540684...	
2015/03/2...		15308149	3409600771	LTE		2325	1 MME		1 LBHCN0540684...	
2015/03/2...		15308150	3246301305	LTE		2850	6 MME		1 LBHCN0540684...	
2015/03/2...		15308151	3225814200	LTE		2325	1 MME		1 LBHCN0540684...	
2015/03/2...		15308152	3379314737	LTE		2325	1 MME		1 LBHCN0540684...	

Time	Call Index	Event Index	Event ID	Event
2015/03/2...	15308147	155	20904	Call star
2015/03/2...	15308147	156	31165	S1 conb
2015/03/2...	15308147	157	30105	LTE RRC

Call Index	Message	Interface Link	Cell ID(1)	Cell ID(2)	Cell ID(3)
15308147	UU_RRC...	UU		3	
15308147	UU_RRC...	UU		3	
15308147	UU_RRC...	UU		3	
15308147	S1_MNTA...	S1		3	
15308147	S1_MNTA...	S1		3	
15308147	UU_SECUR...	UU		3	

```

DL COCH Message
message ->
  DL COCH MessageType index = 0 ( DL COCH MessageType index c1)
  c1 ->
    c1 index = 3 ( c1 index rrcConnectionSetup)
    rrcConnectionSetup ->
      rrc TransactionIdentifier = 1
      criticalExtensions index = 0 ( criticalExtensions index c1)
    c1 ->
      c1 index = 0 ( c1 index rrcConnectionSetup r3)
      rrcConnectionSetup r3 ->
        nonCriticalExtension included = 0
  
```



## Reports dashboards

Cumulative	Call Count	Access Failure Count	Access Fail %	Drop Count	Drop %	HO Count	HO Fail Count	HO Fail Rate %
	11481	570	5.0%	1201	11.0%	1117	100	9.0%



Carrier -2325



Carrier -2850

Carrier	Call Count	Access Failure Count	Access fail %	Drop Count	Drop %	HO Count	HO Fail	HO Fail Rate %
2325	8567	370	4.3%	590	7.2%	790	73	9.0%
2850	2914	200	6.9%	611	22.5%	327	27	9.0%