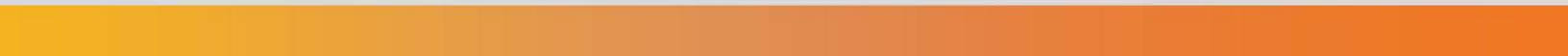
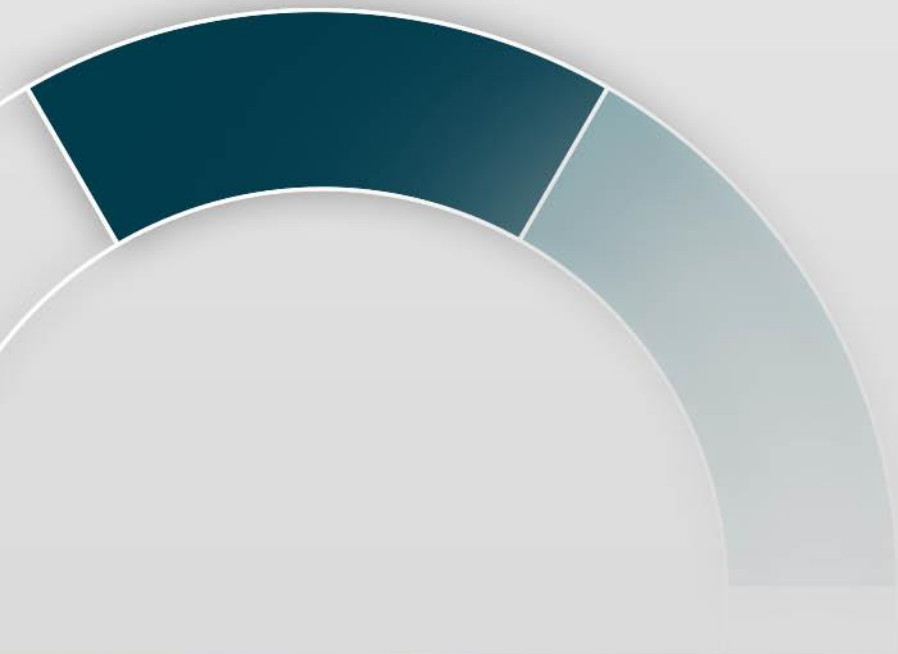




# VistaNEO

## *Technical Product Description*

February, 2015



## Table of Contents

1	Introducing VistaNEO .....	4
2	VistaNEO Benefits.....	4
2.1	Smarter Network Analytics & Optimization .....	4
2.2	Improving Network Experience for High-Value Subscribers .....	4
2.3	Visualize Network & Subscriber Behaviour .....	4
2.4	Scalable and Flexible .....	5
3	VistaNEO Use Cases.....	5
3.1	Subscriber Analytics.....	5
3.2	Problematic Area Identification .....	6
3.3	Network Troubleshooting .....	6
4	VistaNEO Architecture.....	7
4.1	Collector .....	8
4.2	Platform.....	8
4.3	Interface .....	9
5	VistaNEO Software Package .....	9
5.1	Call Trace Modules .....	10
6	VistaNEO Analytical Features .....	11
6.1	Subscriber Insight .....	12
6.1.1	Worst Subscriber Analysis .....	13
6.1.2	Single Subscriber Trend.....	13
6.1.3	Single User Summary.....	14
6.2	Network Insight .....	15
6.2.1	Worse Domain Analysis .....	16
6.2.2	Domain Trend Analysis .....	16
6.2.3	Worse Cell Analysis .....	17
6.2.4	Cell Trend Analysis.....	18
6.2.5	KPI Table .....	18
6.3	Quality of Service (QoS) Insight.....	19
6.3.1	Network / Cell Trend.....	20

- 6.3.2 *Worse Cell Analysis* ..... 21
- 6.4 Network Optimization ..... 22
  - 6.4.1 *Pollution, Missing Neighbour & Overshooting Analysis* ..... 23
  - 6.4.2 *RF Coverage Analysis* ..... 24
- 6.5 Live GeoAnalysis ..... 25
- 6.6 Server Client Search..... 26

## 1 Introducing VistaNEO

**VistaNEO** is an enterprise root cause analytics mobile network optimization platform for network quality teams and those managing high value subscribers to combat churn and pro-actively manage subscriber quality expectations by utilizing 24/7 geo-located subscriber aware data.

A powerful and scalable, client server-based solution, VistaNEO allows RAN engineers to drill down and carry out in-depth analysis of live, geo-located, subscriber data records to better understand how the network impacts the subscriber experience and to proactively solve network problems before they truly affect subscribers

VistaNEO is the platform that collects, processes, and stores data that represents the radio performance experienced by the mobile subscriber. The collected data consists of radio traces (also called as mobile call events), which is a very rich source of Layer 3 information and contains several valuable mobile measurements performed by the UE during connection with the network. This data lacks location information but through the use of sophisticated algorithms, it is possible to get an approximate location for the UE when the event is recorded.

## 2 VistaNEO Benefits

### 2.1 Smarter Network Analytics & Optimization

VistaNEO accelerates network quality enhancements by making available all the required types of mobile performance data, including rich and accurate subscriber and network intelligence from a single network optimizing platform.

With built-in optimization analytics, such as neighbor relations, interference troubleshooting and overshooting cells, VistaNEO increases optimization efficiency by quickly and seamlessly performing root-cause analyses for identified problems

### 2.2 Improving Network Experience for High-Value Subscribers

VistaNEO's built-in, subscriber-centric KPIs make it easy to quickly identify, analyze and solve QoE issues for a given subscriber, and to determine which subscribers are most impacted by network quality problems. RF engineers can prioritize optimization efforts for the most affected, high-value subscribers, ultimately maximizing customer satisfaction and revenue streams, while minimizing troubleshooting efforts.

### 2.3 Visualize Network & Subscriber Behaviour

VistaNEO provides network- and subscriber-level views of the network through accurate, subscriber geo-analytics such as traffic density and RF coverage plots, among numerous other subscriber-focused insights.

Its different dashboards, from those with a high-level view of the network to those with detailed, subscriber-specific KPI trends, allow RAN engineers to gain holistic insight into network performance quality and subscriber experience throughout the network across various vendor areas.

## 2.4 Scalable and Flexible

VistaNEO was built to be as flexible as possible. Built upon InfoVista's proven and powerful platform technology, VistaNEO scales according to MNOs' growth. Data processing agents are horizontally scalable and flexibly support multiple vendors and technologies. Network data and subscriber analytics and trends can be stored over a period of time for a complete network performance view.

## 3 VistaNEO Use Cases

In the current dynamic wireless network, operators must evolve to offer new technologies such as HSPA, LTE and LTE-Advance, supports multi-vendor and large amount of network data to analyze in order to provide the best subscriber performance and experience.

VistaNEO provides a number of solutions and benefits for operators to overcome these various challenges in the network. These solutions can be deployed individually as VistaNEO or combined with the various InfoVista server solution to provide the best end to end analysis and solution. VistaNEO subscriber management performance solution is a central to many of the daily activities by management, engineers and operation maintenance groups.

### 3.1 Subscriber Analytics

Subscribers is a key asset of any wireless operator, irrespective of the technology or vendor. High quality and performance for subscribers is the main focus for wireless operators. The objective of the operator is to ensure that it approaches this with the right operating conditions, strategic optimization and troubleshooting.

The implementation of Call Traces enables operator to perform deep analysis into the performance experienced by the subscriber's. The troubleshooting and analysis phase's focuses on establishing cost/benefit ratio for all of the various scenarios can be addressed with a full 24/7 live network environment which VistaNEO is the perfect solution to handle these large amount of network data.

Key capabilities:

- 24x7 Call Trace aggregation of the whole network provides higher granularity on the actual performance experienced by the subscribers
- Easy and flexible to search for key subscribers who is experiencing issues in the network

- Capable of geo-locating prioritize key subscribers and locations which provides higher quality of service as a result of quicker diagnostics and clearer focus of the network
- Analysis of group and individual subscriber-centric KPIs
- Seamless tracking of subscriber across areas in the network

### 3.2 Problematic Area Identification

Time and cost savings is an important factor in wireless network optimization and troubleshooting. With the rapidly evolving network, it have complicate the tasks of root cause analysis. It would require more time spent on locating the problems and understanding the actual network environment before solving the issue. VistaNEO offers several capabilities that are uniquely suited to help operators better manage and drill down the analysis from high to detail level.

Key capabilities:

- Enables creation of KPIs for a given customer segmentation (e.g. Call drop rate for corporate users)
- Top worse subscribers, cells and network that are causing issues in the network
- Automation on the source of fault detection by recommending solutions to the issue
- Reduced duplication of work in troubleshooting as both Quality Management and Operations teams are supported by the same platform for fault analysis

### 3.3 Network Troubleshooting

Analysis of large amount of call trace data is no small task. The production of useful optimization analysis, coverage bin plots, KPIs measurement is a demanding task with 24 x 7 call trace input. The user-friendliness of VistaNEO is the gateway to view the rich set of call trace data in an easy understanding thin-client.

Key capabilities:

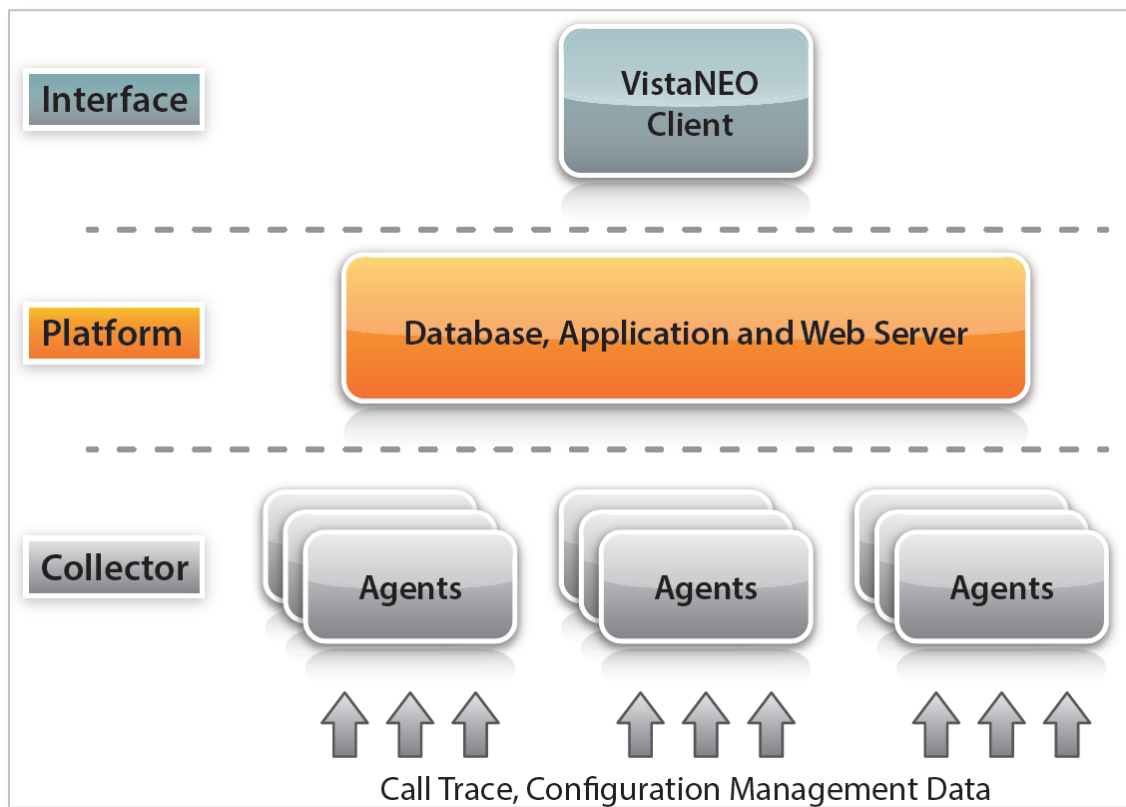
- RF Optimization diagnostics which provides intelligent suggestion on solving network quality issues
- Optimization Analysis such as Pollution Analysis, Missing Neighbour Analysis, Overshooting Analysis and RF Coverage Analysis are ready and available
- Integrated and interactive display of various optimization suggestion which can be view from a single dashboard

## 4 VistaNEO Architecture

The server solution is an ensemble of software servers which together collects, processes, aggregates, collates and serves the call trace data in both its raw form (e.g. complete layer 3 messages) or post-processed form. VistaNEO is a multi-vendor, multi-technology platform that supports all key network data sources and the general scope performed by the server are as follows:

- 24 x 7 Collection, Parsing and Aggregation of call traces
- Extraction of key information from call traces
- Geo-Location of call traces
- Storage of information into various databases
- Creation of KPIs (subscriber, cell, network, phone and etc.) for analysis
- Creation of various coverage maps
- Analysis of KPI trends
- Daily visualization, analysis and optimization capabilities through a thick client interface

VistaNEO server architecture can be easily describe into three different sections:



**Figure 1: Subscriber & Network Intelligence collected from the network available from one single and scalable subscriber geo-analytics platform**

### 4.1 Collector

All of the processing is performed by the **Collector Agents** which is distributed over multiple servers depending on the network size, with a single Agent running on a multi-processor server allowing for horizontal scalability.

These Collector Agents are auto-scheduled to collect and process raw Call Trace, Network Configuration and Site Data which can be managed by a central system which verifies the network configuration data is valid and aligned with the input data that are processed. Each processor on a Processing Agent is capable of processing volumes of data collected by a single RNC (3G) or approximately 800 eNodeB's in a LTE network.

### 4.2 Platform

InfoVista VistaNEO enterprise server 3-tier architecture can be scaled up or down to meet both large and small network deployments. The post-processed data from the Collector Agents are stored at **Database Server** as the main storage repository. These data is stored in a structure Oracle database which is easily scalable allowing call trace data to be brought together, synchronized and archived in a single location.

The following diagram provides a detail description of the interfaces and post-processed data flow in VistaNEO from Database Server into Application Server and Web Server respectively.

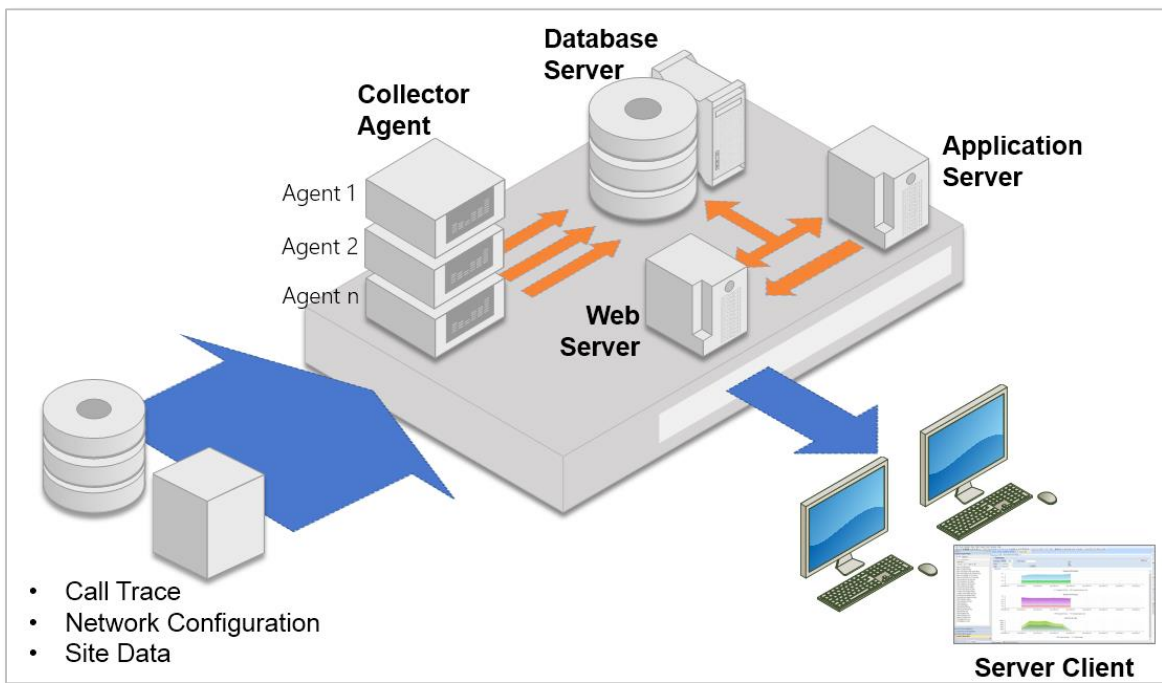


Figure 2: VistaNEO High-Level Architecture



### 4.3 Interface

Visualization and presentation of the large processed data and network configuration is one of the key components in VistaNEO. Both **Web Server** and **VistaNEO Client** works together to ensure these data are presented in a user-friendly and easy to understand. Web Server provides the storing, processing and delivery of web pages and services to be accessible by VistaNEO Client. All the collected call trace data and network configuration are view at VistaNEO Client which is used for interactive maps, charts, management reporting, various subscriber and cell analysis, and coverage traffic heat maps

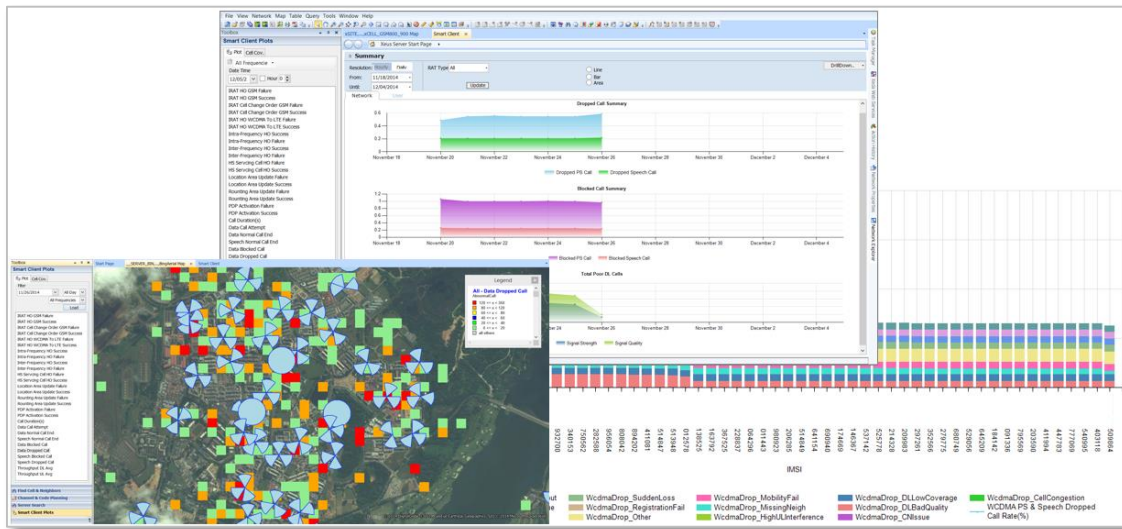


Figure 3: Screenshots from VistaNEO Client

## 5 VistaNEO Software Package

VistaNEO product family consists of a core Platform and a series of associated Call Trace Modules with the required Client presentation view that will meet your requirements. VistaNEO is a multi-vendor, multi-technology platform that supports all key network data sources, embedded advanced diagnostics and produces user-friendly visualization for optimization capabilities.

VistaNEO has a modular Call Trace architecture to allow users to select the preferred vendor and technology which provides targeted data management, analysis and optimization functionality. This software modular allows for a quick deployment of the focused solution to address the immediate problem and expand to other modules as required by the network operator.

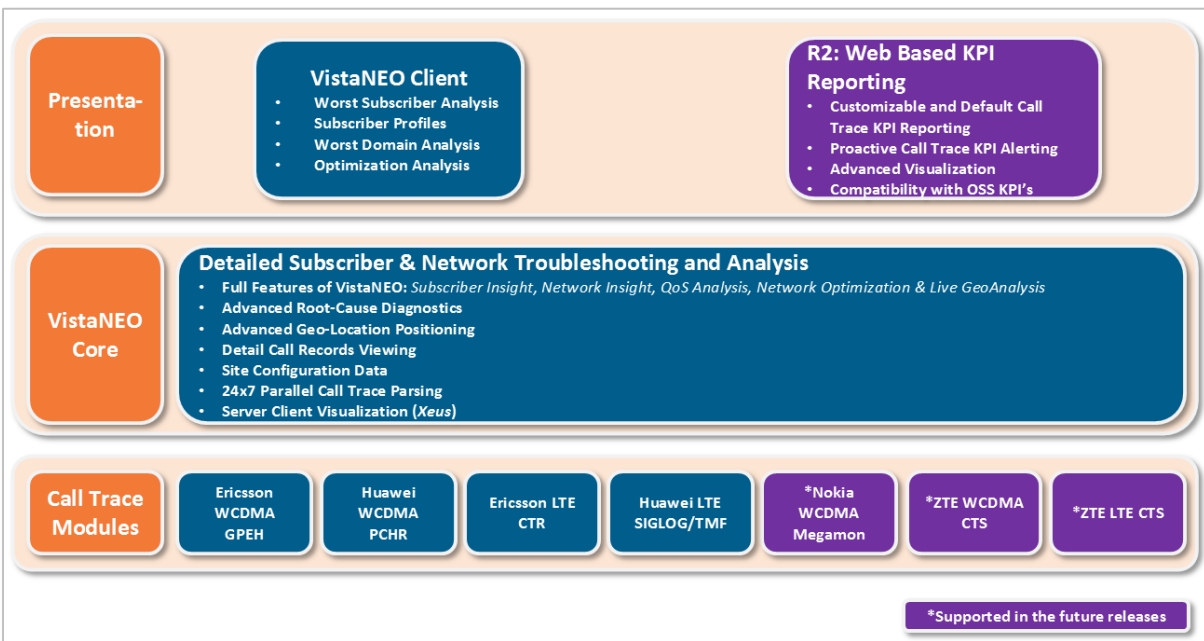


Figure 4: VistaNEO Core & Call Trace Modules

## 5.1 Call Trace Modules

VistaNEO Call Trace support is design to support the requirements of the operators on the particular call trace vendor that they required. This Call Trace Module is extended to both WCDMA and LTE. VistaNEO is always at the forefront to support the latest vendor Call Trace technology and the latest Call Trace version. The rich data that is collected from the Call Trace provides valuable information such as:

- Cell Information
- Call Events
- Radio Measurements
- Subscriber Measurements
- Phone related information

VistaNEO has extensive analytics and diagnostics capabilities which allow operators, network vendor or an engineering consulting firm to leverage on this rich customer experience data to troubleshoot and optimize the network accurately especially in areas where quality issues are hard to replicate via traditional drive test methods or Performance Monitoring statistics.

With the high 24x7 granularity data available in VistaNEO, users are able to analysis network issues close to real time and provides recommendation to solve this issue without much of a delay.

The current supported modules offered in VistaNEO are:

- **Ericsson WCDMA (GPEH) Call Trace Module** – Post-processing and analysis capabilities for Ericsson WCDMA (GPEH) Call Trace
- **Huawei WCDMA (PCHR) Call Trace Module** – Post-processing and analysis capabilities for Huawei WCDMA (PCHR) Call Trace
- **Ericsson LTE (CTR) Call Trace Module** – Post-processing and analysis capabilities for Ericsson LTE (CTR) Call Trace
- **Huawei LTE (TMF) Call Trace Module** – Post-processing and analysis capabilities for Huawei LTE (TMF) Call Trace

## 6 VistaNEO Analytical Features

VistaNEO is the next-generation enterprise analytical solution with the capabilities of performing optimization, troubleshooting and providing solution for wireless network. VistaNEO can be used across different departments to manage their mobile networks by vendor technology for key optimization and troubleshooting use cases.

With the selection of the vendor-technology Call Trace Module, an operator, network vendor or an engineering consulting firm has the capability of analyzing the call trace data with the extensive analysis which VistaNEO provides. The following figure shows the available analytical feature that is ready and available with VistaNEO Core.

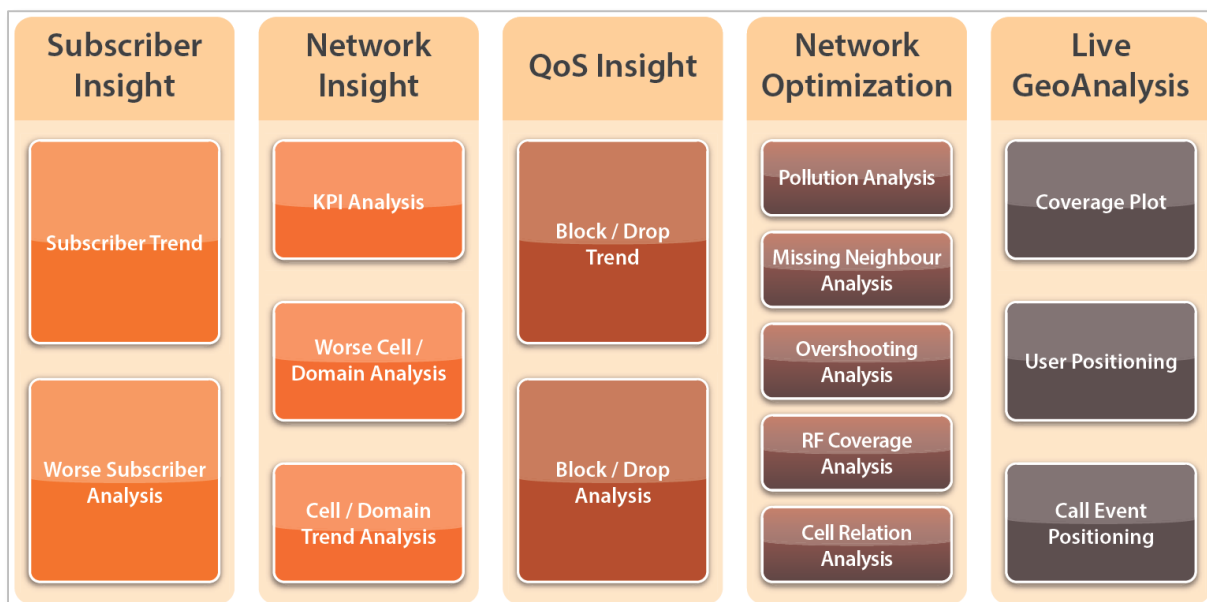


Figure 5: VistaNEO's Features

## 6.1 Subscriber Insight

VistaNEO provides a direct and unique approach to understand and addressing Subscriber experience. VistaNEO takes in 24x7 customer experience data to provide diagnostics which can improve customer experience in the network. This fine granularity enables users to have a deeper understanding of the subscriber performance trending.

With a live connection to VistaNEO via VistaNEO Client, users are able to view the relevant summary of the overall network user experience such as:

- Understanding the total users who are experiencing Poor Downlink Users in the WCDMA or LTE network over hourly period or daily distribution
- Identifying the total users who are experiencing High Call Failure such as Blocked Call or Dropped Call in the network
- Understanding the overall network user that is experiencing Poor Downlink Throughput in the network.

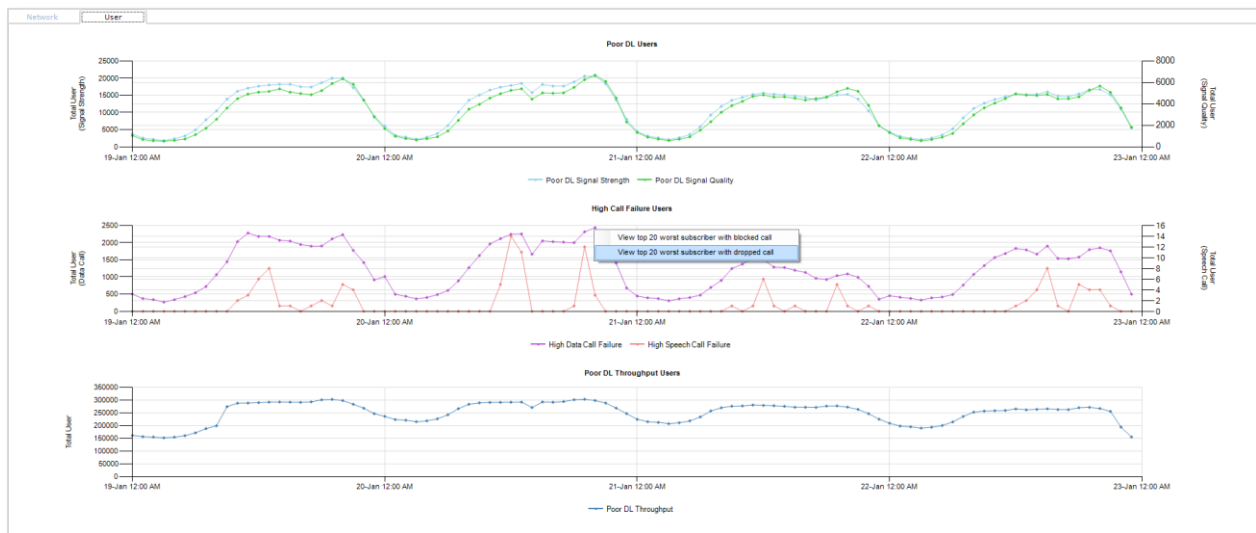


Figure 6: Network Health Trend

From the Front Page of Subscriber Analysis, users could perform further analysis of the specific subscriber or from a subscriber network point of view. The aim of prioritizing to solve key subscribers impacting issues can now be realized with various breakdown analysis such as:

- **Worse Subscriber Analysis**
- **Single Subscriber Trend**
- **Single User Summary**

### 6.1.1 Worst Subscriber Analysis

VistaNEO brings in value for operators, vendor or engineering consultation firm to have an easy understanding of the issues face by the VIP Subscriber in this Worst Subscriber Analysis. This valuable analysis provides the opportunity for users to list down Top 10 – Top 100 Worst Subscriber performance in the network through various Subscriber KPI. With this Worst Subscriber Analysis, users can;

- Display up to Top 100 Worst Subscriber according to the selected Subscriber KPI provided: *Quality KPI, Throughput KPI, Accessibility KPI, Retainability KPI and Mobility KPI*
- Overview of the entire network subscriber performance
- Different resolution view of the Worst Subscriber Analysis in terms of hourly and daily resolution
- Further drilldown on the selected subscriber from the chart to view its trending, summary and other related KPI's

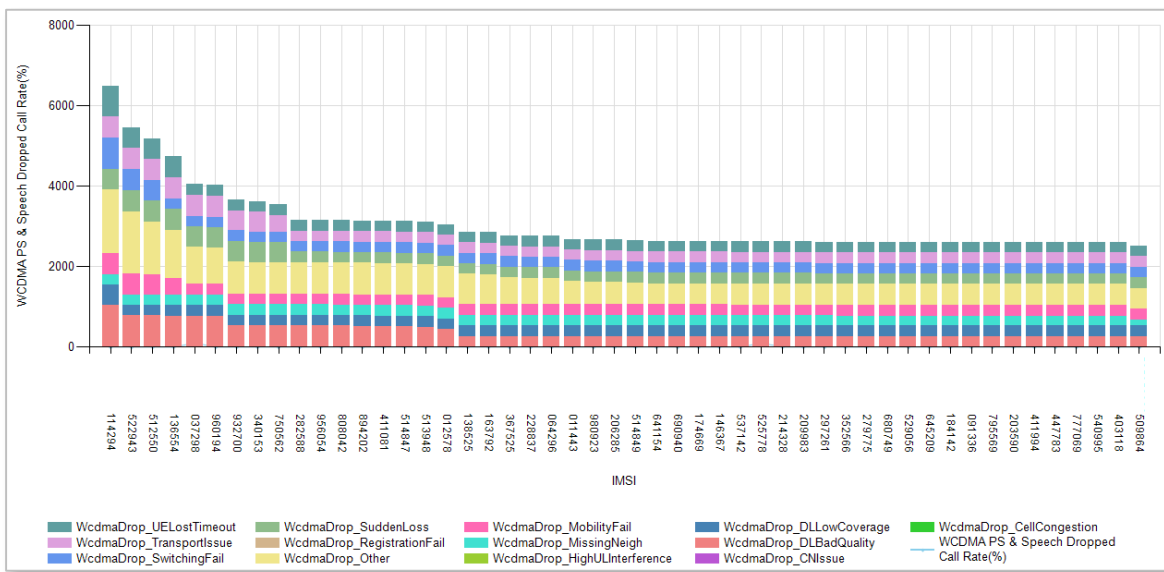


Figure 7: Worst Subscriber Dropped Call Rate Distribution

### 6.1.2 Single Subscriber Trend

Single Subscriber Trend focuses on the specific VIP subscriber performance over a selected period. With the hourly and daily resolution options to be selected to analyze the VIP subscriber, users can:

- Key in the specific VIP Subscriber IMSI for analysis
- Analysis of VIP subscriber performance in terms of: *RF Quality KPI, Throughput KPI, Accessibility KPI, Retainability KPI and Mobility KPI*
- View both WCDMA and LTE Subscriber related KPI
- View different resolution of the Subscriber KPI trending in terms of hourly and daily
- Zoom In and Out to pinpoint quickly of any abnormal trending of the user

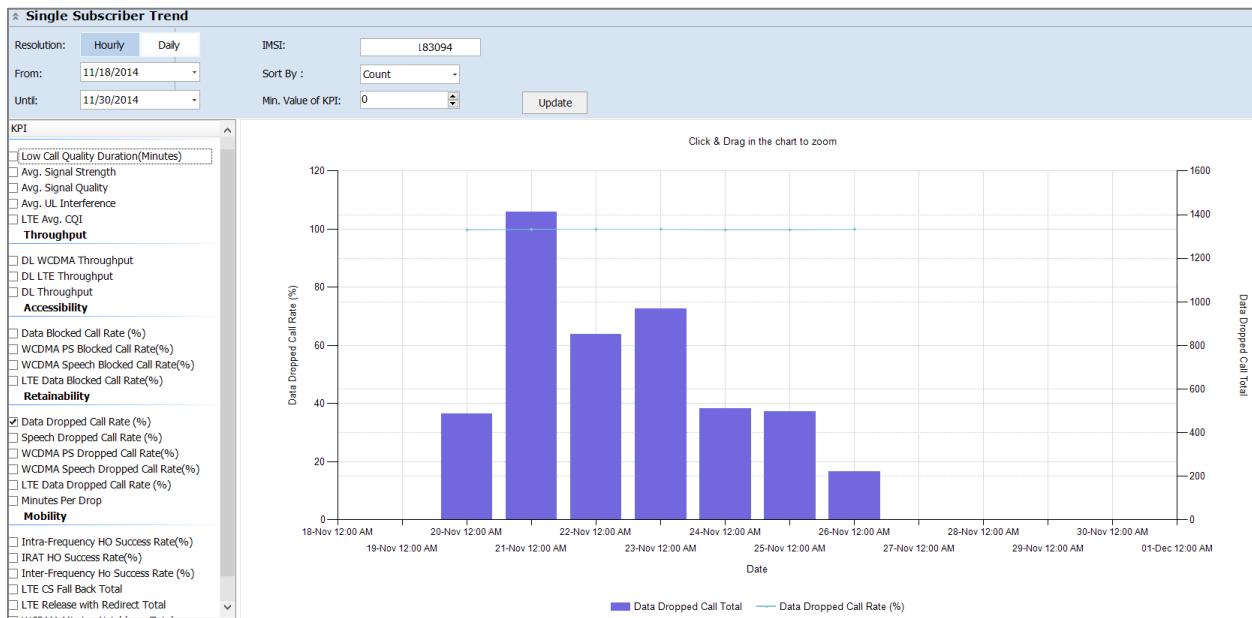


Figure 8: Single Subscriber Trending

### 6.1.3 Single User Summary

VistaNEO Single User Summary provides a quick summary of the overall performance experience of the VIP Subscriber which requires detail investigation of it. This feature allow users to:

- Key in the specific VIP Subscriber IMSI for analysis
- View all the Subscriber KPI Value as experience by the VIP Subscriber which is categorize to *General KPI, Quality KPI, Throughput KPI, Accessibility KPI, Retainability KPI and Mobility KPI*
- Graphical overview of the WCDMA/LTE Dropped Call and Blocked Call distribution and causes experience by the selected VIP Subscriber
- View different resolution of the Subscriber KPI Summary in terms of hourly and daily resolution

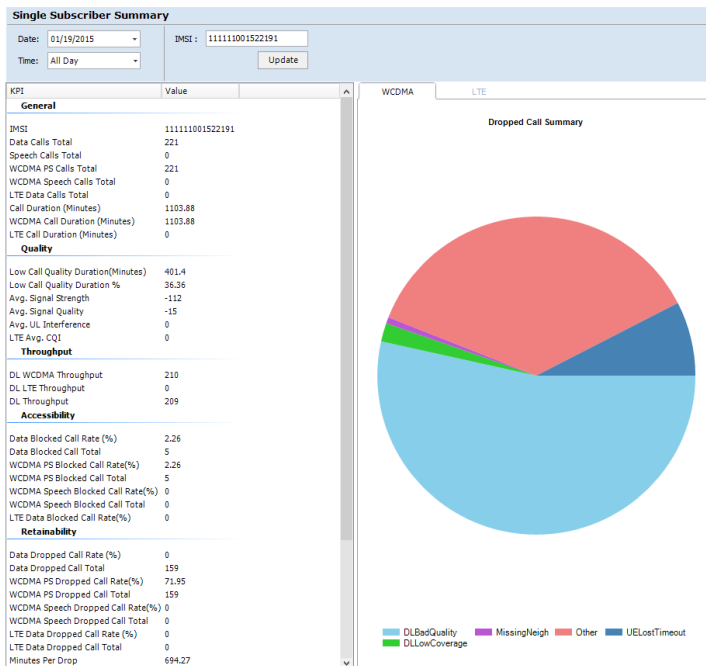


Figure 9: Single Subscriber Summary

## 6.2 Network Insight

VistaNEO provides valuable Network KPI information which users are capable of analyzing various performance over a period of 24 x 7. This fine granularity enables users to have a deeper understanding of the Domain and Cell performance in the network.

With VistaNEO KPI Analysis overview, users are capable of performing the following analysis:

- Summary of both WCDMA and LTE overall Network performance over the selected period
- Total number of Cell with Dropped Call and Blocked Call in the network with the selected hour and day
- Total number of Cell with Bad Downlink Quality and Poor Downlink Throughput in the network



Figure 10: Network KPI Summary

From the Front Page of Cell Analysis, users could perform further analysis on the specific Cell. The aim of prioritizing to solve various Cell impacting issues can now be realized with various breakdown analysis such as:

- **Worse Domain Analysis**
- **Domain Trend Analysis**
- **Worse Cell Analysis**
- **Cell Trend Analysis**
- **KPI Analysis**

### 6.2.1 Worse Domain Analysis

Worse Domain Analysis provides graphical overview of the Top 10 – Top 100 worse RNC or LTE Group performance in the entire network. With the real-time Call Trace data, this analysis provides valuable insight into the worse performing RNC or LTE Group that enables users to quickly identify it and provide recommendation to improve the network performance. This Worse Domain Analysis feature allows users to:

- Select the required Radio Access Technology (WCDMA or LTE or Both) on the worse domain performer
- Select from Top 10 – Top 100 Worse Domain
- Sort Chart by Primary X-axis or Secondary Y-axis
- Select the Domain KPI that users require for further analysis: *Quality KPI, Accessibility KPI, Retainability KPI and Mobility KPI*

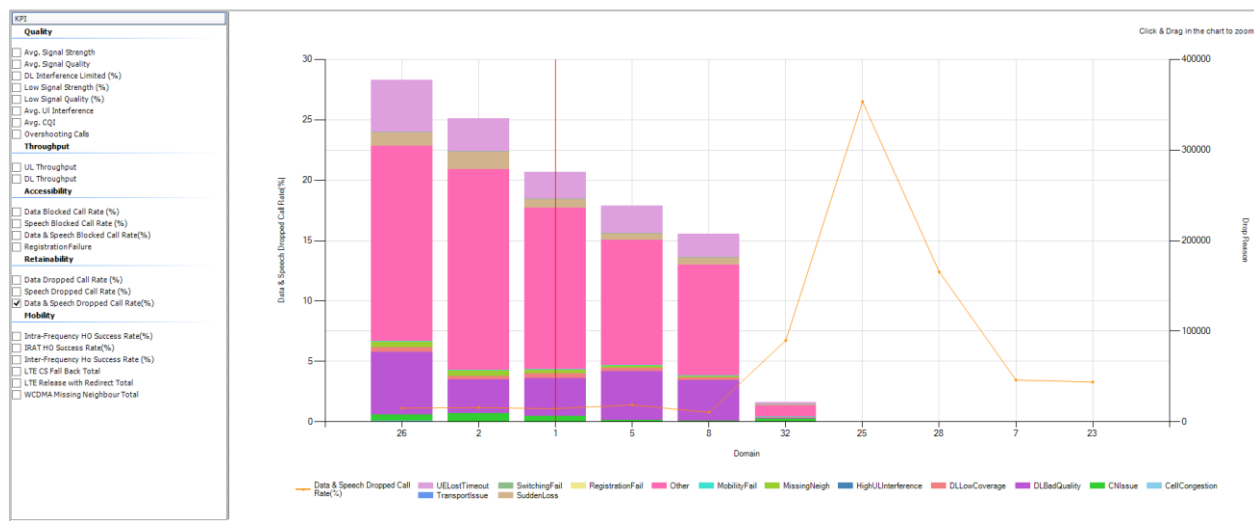


Figure 11: Worse Domain KPI Distribution

### 6.2.2 Domain Trend Analysis

The objective of Domain Trend Analysis in VistaNEO is to allow users to study the Domain (RNC or LTE or Both) trending over a selected period. This valuable information enables users to pinpoint any abnormal issues found in the network over time. In Domain Trend Analysis, user can:

- Select the required Radio Access Technology (WCDMA or LTE or Both) with a further breakdown of the selected Domain ID (RNC ID or eNodeB Group)
- Analyze the selected Domain RAT and ID with the given *Quality KPI, Accessibility KPI, Retainability KPI and Mobility KPI* which can provide further breakdown of the Domain’s performance
- Set hourly or daily resolution for better granularity as required by the user



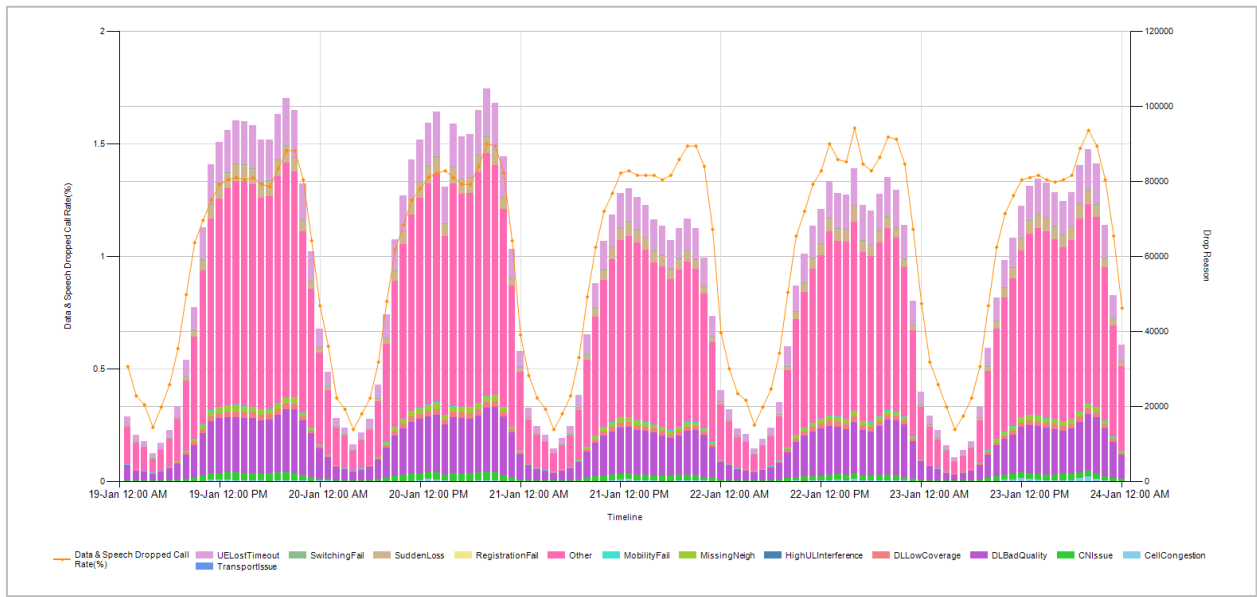


Figure 12: Domain KPI Trending

### 6.2.3 Worse Cell Analysis

Worse Cell Analysis provides graphical overview of the Top 10 – Top 100 worst Cell performance in the entire network both WCDMA and LTE. With the real-time Call Trace data, this analysis provides valuable insight into the worse performing Cell that enables users to quickly identify it and provide recommendation to improve the network performance. This Worse Cell Analysis feature allows users to:

- Select the required Radio Access Technology (WCDMA or LTE or Both) on the Worse Cell performer
- Select from Top 10 – Top 100 Worse Cell
- Sort Chart by Primary X-axis or Secondary Y-axis
- Select the Cell KPI that users require for further analysis: *Quality KPI, Accessibility KPI, Retainability KPI and Mobility KPI*

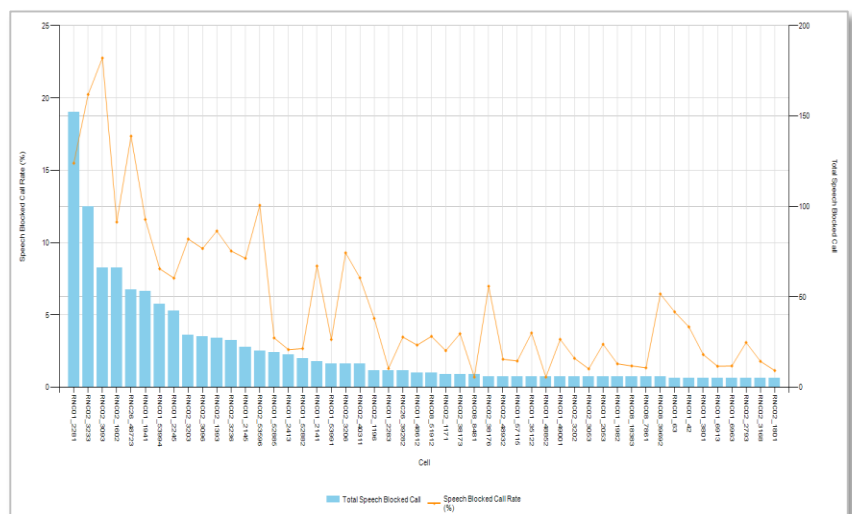


Figure 13: Worse Cell Analysis

### 6.2.4 Cell Trend Analysis

Cell Trend Analysis in VistaNEO is to allow users to analyze the Cell (RNC or LTE or Both) trending over a selected period. This valuable information enables users to pinpoint any abnormal issues found in the network over time. In Cell Trend Analysis, user can:

- Select the require Radio Access Technology (WCDMA or LTE or Both) with a further breakdown of the selected Cell Name which needs investigation
- Analyze the selected Cell RAT and ID with the given *Quality KPI*, *Accessibility KPI*, *Retainability KPI* and *Mobility KPI* which can provide further breakdown of the Domain’s performance
- Set hourly or daily resolution for better granularity as required by the user

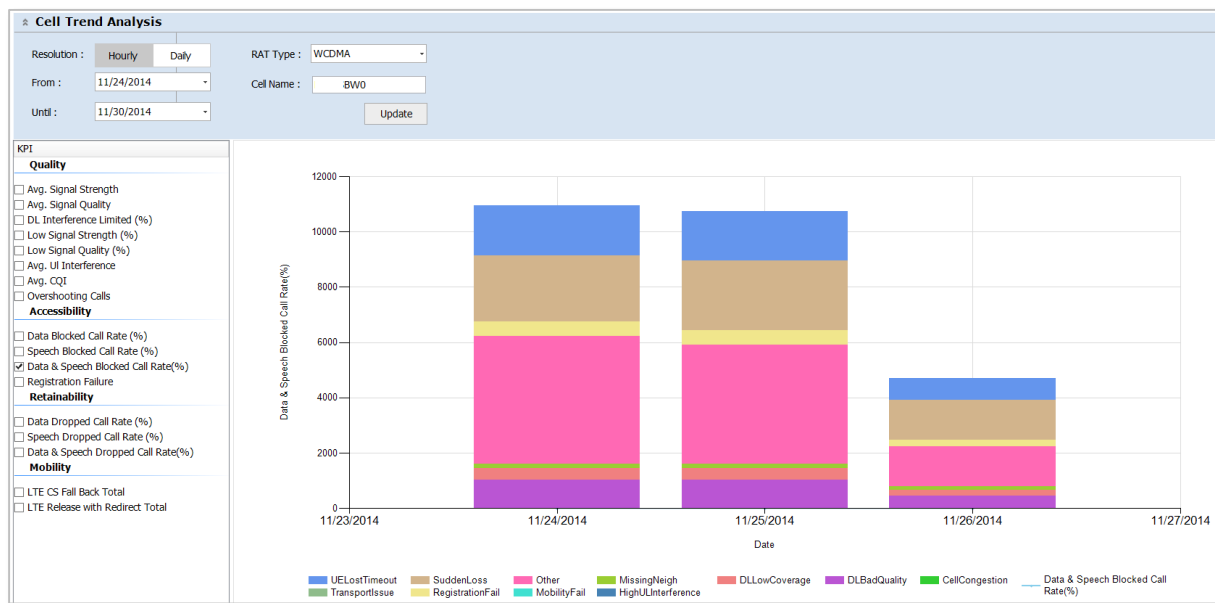


Figure 14: Cell KPI Trend

### 6.2.5 KPI Table

VistaNEO KPI Table provides user with the functionality to view all Cell or Domain KPI’s over a period selected by the user in a tabular form. This feature allow user to perform the following capability:

- Selection of different resolution and data ranges for Cell or Domain KPIs
- Selection of Radio Access Technology for analysis
- Viewing of the Cell or Domain KPI which provides further breakdown of the performance experience by the Cell or Domain over the selected resolution and data ranges

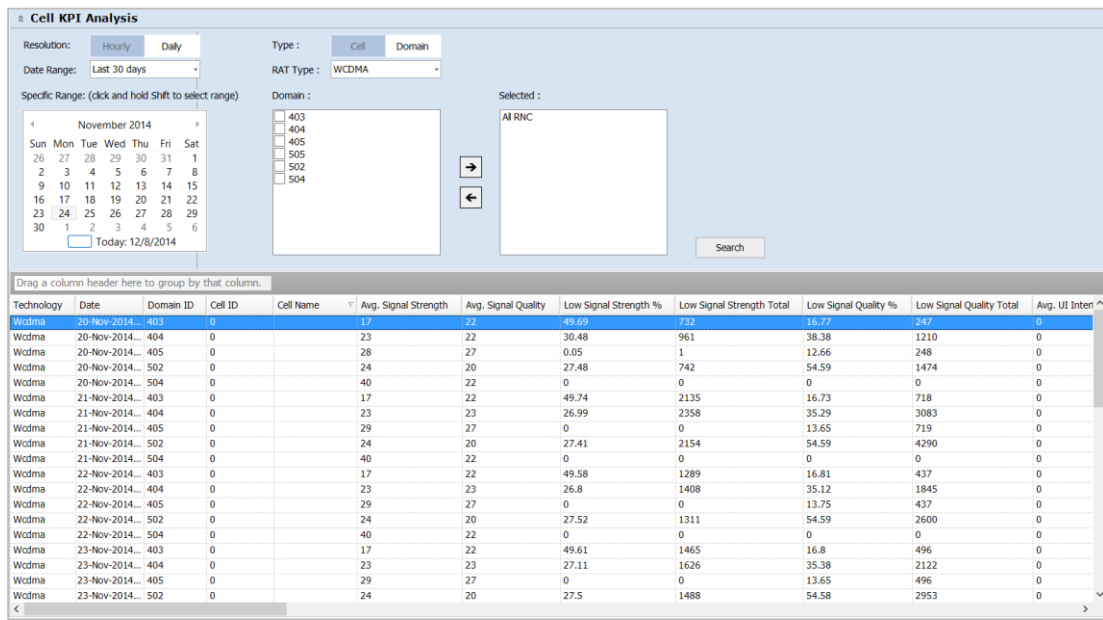
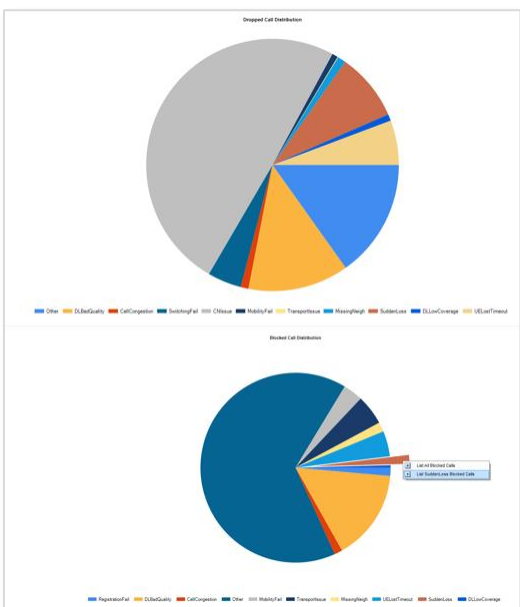


Figure 15: Cell/Network Detail KPI Table

### 6.3 Quality of Service (QoS) Insight

VistaNEO QoS Insight provides the best in the class of analyzing Blocked Calls and Dropped Calls in the network with simple and easy-to-understand graphical view of Dropped/Blocked Calls Distribution by Cause Type. This easy to use interface enables users to view all the Dropped/Blocked Calls in the network with the selected period as required.



Dropped/Blocked Call Analysis graphical view launches users into a deeper analysis of the Dropped/Blocked Calls in VistaNEO workbench. With this interface, users can:

- View different days and time of the Dropped/Blocked Call distribution
- Select the required Radio Access Technology (WCDMA or LTE) with a further selection of the Domain (All, RNC or eNodeB Group)
- Option to List All Dropped/Blocked Calls or Dropped/Blocked Calls Cause Type
- Further investigate the Dropped/Blocked Calls cause in VistaNEO Workbench with additional information available
- Further investigation can be conducted at the Workbench with the viewing of the Call Records and the detail Layer 3 Messages

Figure 16: Dropped/Blocked Call Summary

### 6.3.1 Network / Cell Trend

VistaNEO Network / Cell Trending allows users to view the trending of the selected Network / Cell performance over a time period. This trending provides an overview for the users to understand total number of dropped or blocked calls that has impacted the Network / Cell which launches user to further investigate the selected Network / Cell. In this Network / Cell Trending, users is capable of performing:

- Ability to set different hour or daily resolution over a selected period of the Call Trace data.
- Ability to select either Cell or Domain and RAT Type for a concentrated Dropped/Blocked Call Analysis of the network
- Ability to filter Dropped/Blocked Call to either PS or Speech or Both
- Graphical Zooming In and Out to have a better view of the Dropped/Blocked Call trending in order to pinpoint the abnormal spike from it.
- Listing all of the Dropped/Blocked Calls from the selected hourly or daily from the graph and displaying it at VistaNEO Workbench
- Further investigation can be conducted at the Workbench with the viewing of the Call Records and the detail Layer 3 Messages



### 6.3.2 Worse Cell Analysis

VistaNEO event engine is capable of processing large 24x7 Call Trace data in order to analyze and compute the Worse Cell Analysis. With this ranking analysis, users are able to attend to the problematic cell or RNC instantly in order to sustain good customer experience in the network. For example here allows the user to list the worse ranking of PS + Speech Call Type for the particular time or day. In this Worse Cell Analysis, users is capable of performing:

- Ability to set different hour or daily resolution over a selected period of the Worse Cell Analysis.
- Ability to select either Cell or Domain and RAT Type for a concentrated Dropped/Blocked Call Analysis of the network
- Ability to filter Dropped/Blocked Call to either PS or Speech or Both
- Listing all of the Dropped Calls from the selected hourly or daily from the graph and displaying it at VistaNEO Workbench
- Further investigation can be launched at the Workbench with the viewing of the Call Records and the detail Layer 3 Messages on the selected Cell or Domain

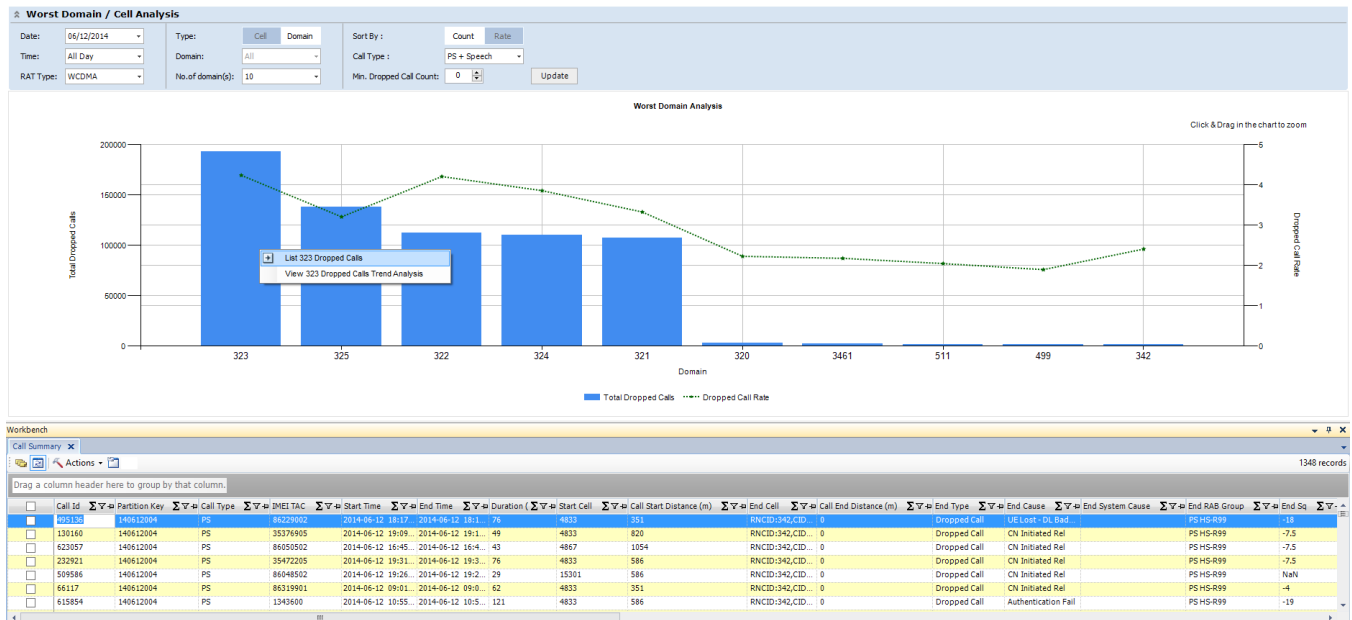


Figure 17: Worse Cell KPI Analysis

### 6.4 Network Optimization

InfoVista VistaNEO embedded Network RF Optimization feature ensures capacity, coverage, interference and neighbor analysis optimization are addressed accordingly. Users are capable to drill down from various analysis into a more detail understanding and diagnostics of the network issue. In Network RF Optimization summary, users are able to view and diagnose the following:

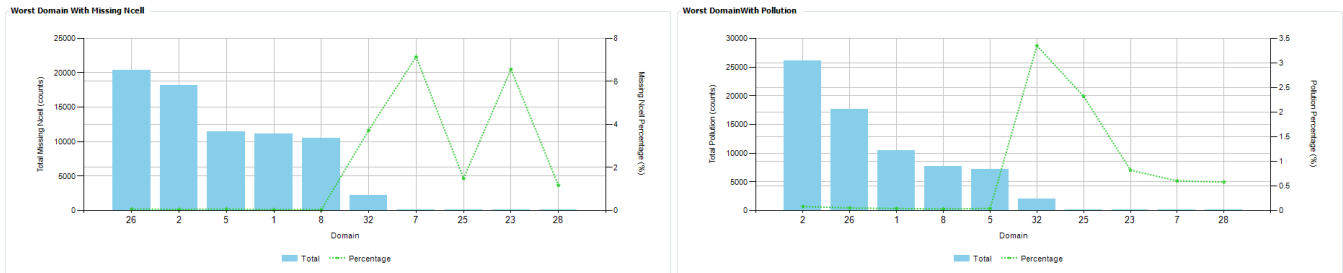


Figure 18: RF Network Optimization

- Ranking of the worse Domain which is experiencing high number of Missing Neighbour Relation, Pollution and Overshooting.
- High level summary of the network RF Coverage Summary distribution across the network – Signal Strength & Signal Quality.
- Users are able to perform further filtering on the required RAT Type or number of domain that will help provide the right diagnostics as required by different users.

	High (Ss ≥ -85 dBm)	Med (-100 dBm < Ss < -85 dBm)	Low (Ss ≤ -100 dBm)	Total (%)
High (Sq ≥ -12 dB)	29.3	56.9	4.1	90.3
Med (-15 dB < Sq < -12 dB)	0.7	4.8	1.3	6.8
Low (Sq ≤ -15 dB)	0.3	1.6	1.0	2.9
Total (%)	30.3	63.4	6.4	100

Figure 19: RF Coverage Summary Table

Network RF Optimization functionality provides user the choice to perform further network optimization task to ensure a healthy network experience. The aim of prioritizing is to solve various impacting issues can now be realize with various breakdown analysis such as:

- **Pollution, Missing Neighbour & Overshooting Analysis**
- **RF Coverage Analysis**

### 6.4.1 Pollution, Missing Neighbour & Overshooting Analysis

VistaNEO Pollution Analysis provides a comprehensive understanding of the selected domain that is impacted by pollution and the related cell that is subjected to it. Missing Neighbour Cell Analysis provides the visualization of the cell that requires attention on the missing neighbor found from the Call Trace based on the selected filter. VistaNEO Overshooting Analysis provides a different view into the network by understanding which cell is heavily overshooting to its neighbouring cell which may potential lead to pollution.

This diagnostic feature allow user to perform the following capability:

- Selection of different resolution and data ranges for better visualization
- Ranking of the worse cells with pollution, missing neighbor cell & worse cells with overshooting with 7-days of trending of the selected RNC
- Further investigation that allows users to view the cell relations table and the distance

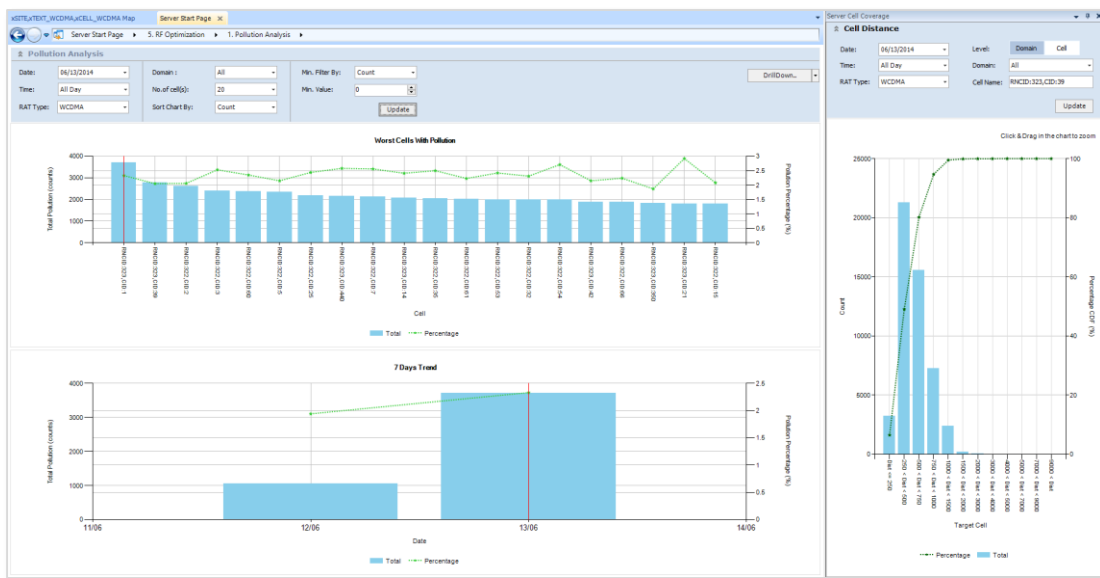


Figure 20: Pollution Analysis



Figure 21: Various RF Analytics Graphs and Tables

### 6.4.2 RF Coverage Analysis

VistaNEO RF Coverage Analysis provides an overall signal distribution of the network Signal Strength and Signal Quality. With the RF Coverage Analysis, users are able to filter the date, time, RAT Type and the various domain. Therefore, the drilldown is possible from a network wide perspective to the selected RNC/TAC for further breakdown of the signal distribution.

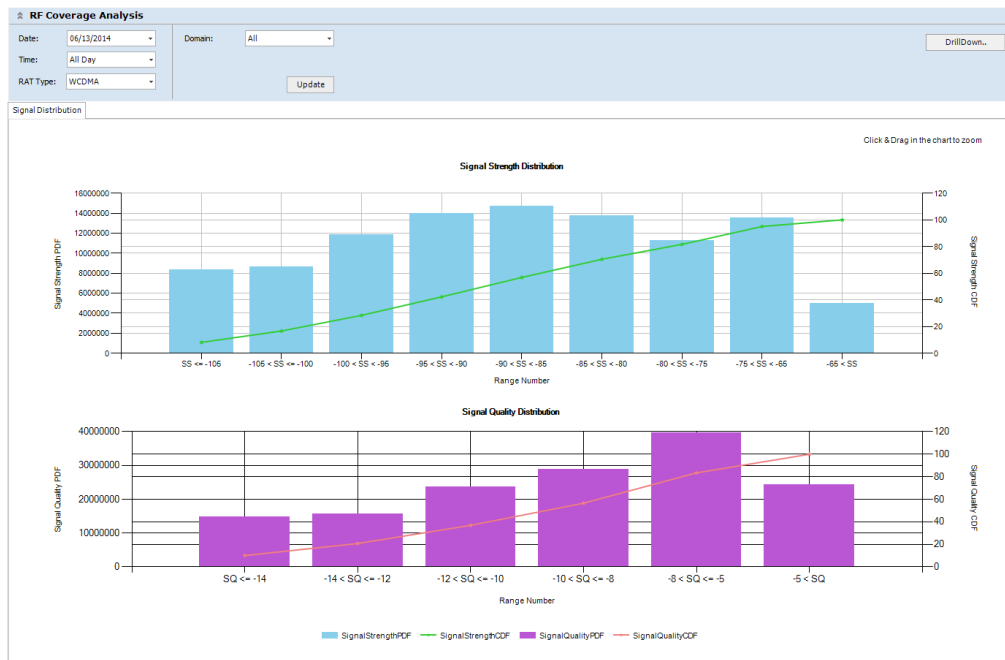


Figure 22: RF Coverage Distribution



### 6.5 Live GeoAnalysis

InfoVista Live GeoAnalysis enables user to estimate a location using non-GPS based Call Trace recordings by using a combination of OTDDA multi lateration and relative signal strength. By having the Collector Agent automatically processing the Call Trace into the Database Server on a 24/7 basis, it is capable of generating highly detail plots for selected date and time.

With InfoVista Live GeoAnalysis, geolocated events and measurements can be plotted and areas where significant pilots overlaps is easily identified.

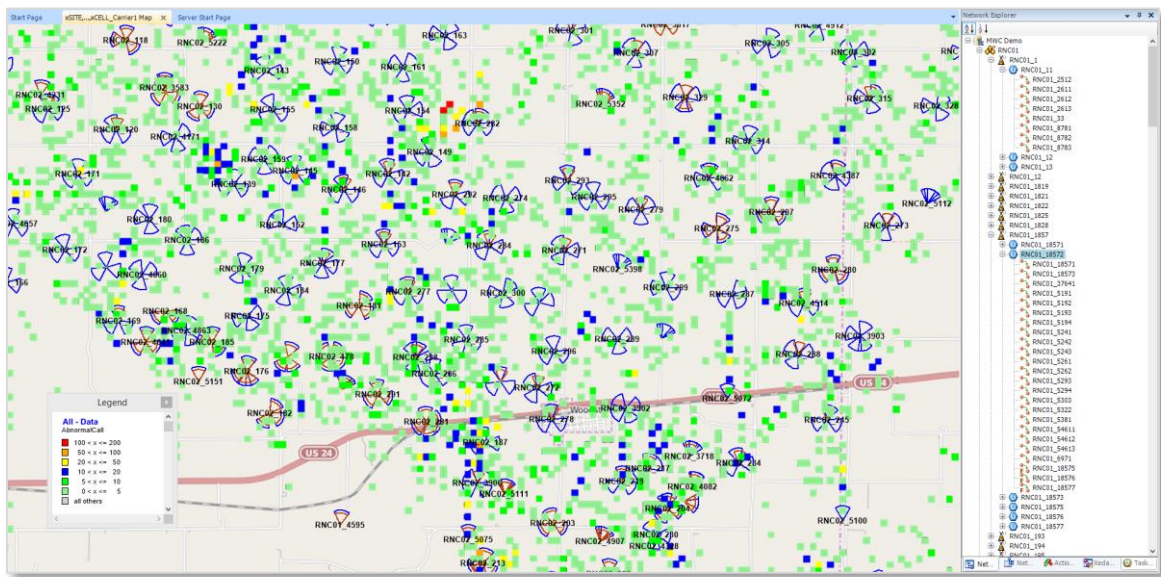
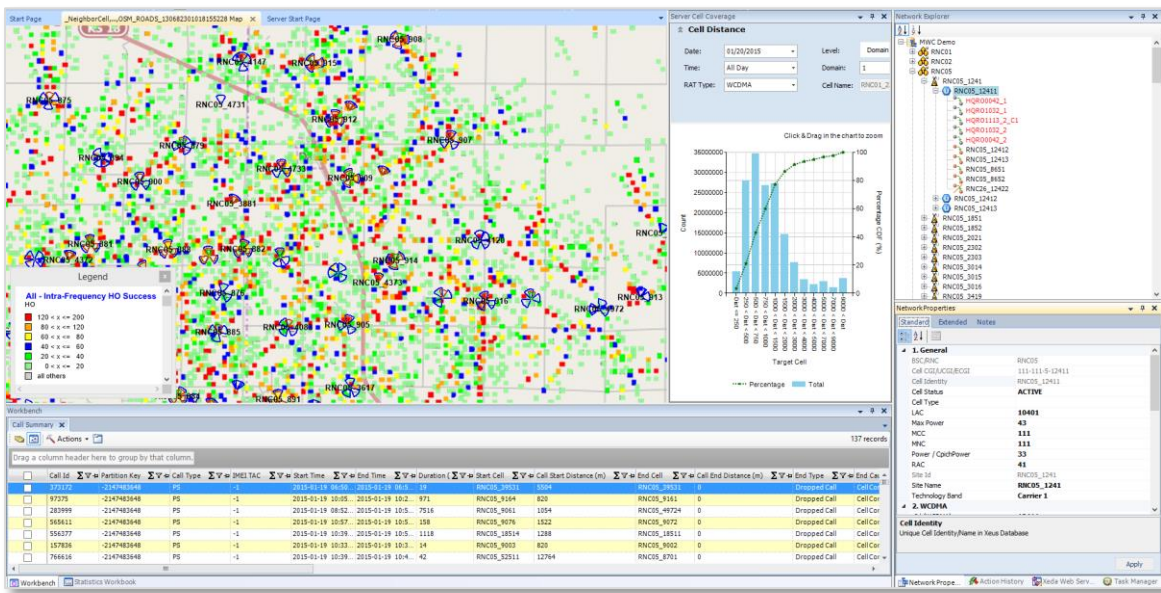


Figure 23: Geo-located Abnormal Events

## 6.6 Server Client Search

InfoVista Server Client Search allows flexibility for users who want to create customizable search to query the millions of call records from the database. With this value added functionality, user can now easily create query for a selected data range period with various field filter such as IMSI, Start/End Cell, Start Cell and etc. This functionality allows users to save time searching over millions of call records and displaying the call records in one single Workbench for easy viewing.

By selecting the call records from VistaNEO Workbench, users can now launch open Layer 3 messages for a detail analysis or export the query call records onto Excel sheet for further investigation. There is no limitation on the number of saved queries that can be created within VistaNEO.

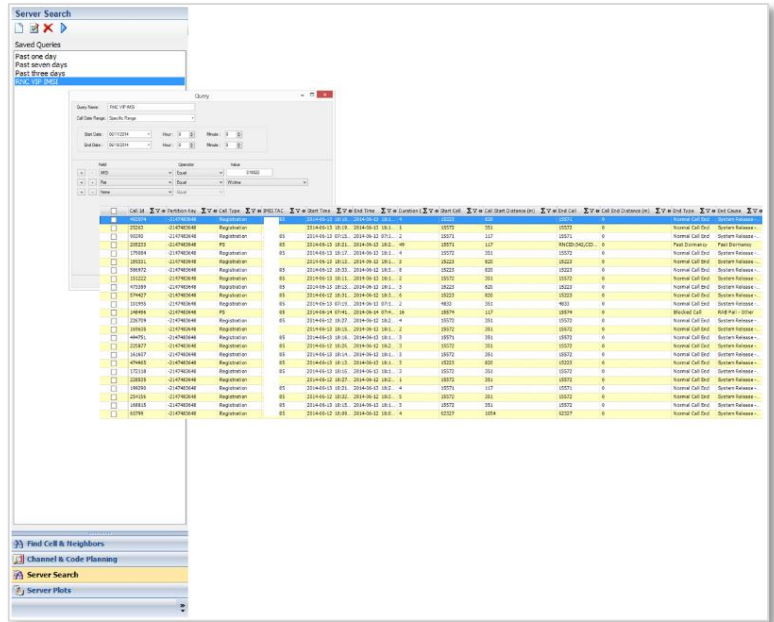


Figure 24: VistaNEO Client Search