

# InfoVista's Mobile Knowledge Pack

*Proactive Service Assurance for Mobile Services*

## The Challenges & demands of the Mobile Operator

The world of mobile telecommunications is an ever evolving arena, bringing with it new technologies, new equipment, new standards, faster data, new roll outs, modernization activities, new best practices -, the list is endless. These new technological advances have revolutionized the way people communicate today; from simple pagers to voice, sms, emails, video conferencing etc.

Each new technology step brings along with it new exciting features, but also a big challenge for the mobile operator. The operator must keep up with the new demands on faster data rates for subscribers, continual flawless user experience to the subscriber, whilst optimizing the network to provide resources that meet demands of the subscriber and rolling out new technology networks.

The mobile operator can be thought of as a conductor of their network and they must ensure that all the changes and activity occurs seamlessly and simultaneously

The main pursuits for the mobile operator are

- Ongoing Optimization
- Continual Troubleshooting
- Event Coverage (e.g. stadiums)
- Addition of New Sites
- Roll out of a new technology
- Spectrum Refarming

This list is by no means complete; the needs of the operator are much more extensive and aggressive. The operator needs to understand their network at all times to address the challenges they face daily.

These challenges are typically

- Lack of visibility of the entire mobile network end to end (including backhaul transport) within a single dashboard for accurate problem identification and impact analysis.
- Ability to view high level quality metrics temporally analyzed in various conditions (busy hours, baselined weekdays, weekends, etc.) of as well as detailed counters for trouble shooting.
- A real-time Radio Network "Monitoring" platform that is suitable for Operations rather than a non-real time "reporting" tool.
- The inability to visualize and monitor neighbor relationships in a timely fashion. Also to analyze the neighbor flows on a single dashboard. Displaying all ANR activity and KPI information in real time.
- The flexibility and agility in mining value-added and vendor-agnostic KPIs/KQIs.
- The flexibility of having a tool that is multivendor and multi technology in one consolidated solution and reporting system.

The mobile operator requires a robust and intelligent system that enables a holistic understanding of the network. That will also provide comprehensive ability to troubleshooting the network and its elements in addition allowing complete drill down capabilities. Above all the system needs to be multi -technology and multi-vendor to provide a true insight to the network.

### InfoVista's Mobile Knowledge Pack

InfoVista's Mobile Knowledge Pack is a product that takes on the aforementioned challenges and equips service providers with the intelligence and topology awareness they need to manage their mobile end-to-end network infrastructures. Along with the application delivery environments and assure the performance and quality of the data and voice services they offer.

The InfoVista Mobile Knowledge Pack interoperates with InfoVista's award-winning Vistalsight<sup>®</sup> for Networks, thereby offering a single Performance Database of Record for the mobile and transport network infrastructures. Along with monitoring the entire end-to-end mobile infrastructure from packet or circuit switched core elements to radio access nodes, it also provides detailed visibility to the underlying transport entities along the entire path of service delivery. This allows service providers to standardize on a single tool for all of their infrastructure performance reporting needs and also achieve numerous efficiencies in operating and engineering their network.

The Mobile Knowledge Pack comes with completely open and flexible data extraction and mediation modules that allow a service provider to determine the value-added KPIs they would like to be reported on, by mining a multitude of raw counters from vendor element management systems (EMSs). This allows rapid adaptation to ever-changing vendor infrastructure release levels. It also helps to achieve a drastically reduced "time to operate" on new technology rollouts such as HSPA or LTE that are often driven by intense competition and market pressures.

Combining all the RAN components into one consolidated system bridging the gap between them and the need for other solutions, InfoVista's Mobile Knowledge pack provides a true end to end in-sight of the network. The product features advanced service modeling that understands the relationships between resources, the services they support and their respective performance indicators, enabling dynamic delivery of a wide range of workflow-efficient dashboards and reports.

The dashboards and intensive reporting bring a unique methodology to analyzing OSS data. The reports can be displayed in geo-located dashboards not only presenting the network element and its KPI information but the geolocation of the network element along with the whole network/cluster/RNC/Neighbors or display of choice.

Drill down capabilities from the map and other reports are enabled, for deeper root cause analysis.

The Mobile Knowledge Pack has been designed to aid various user groups within a service provider organization. These include 'service managers & operations', 'product management & marketing', 'engineering & planning', and 'network operations'. Table 1 links specific functionalities to the roles likely to receive the most benefit from them.

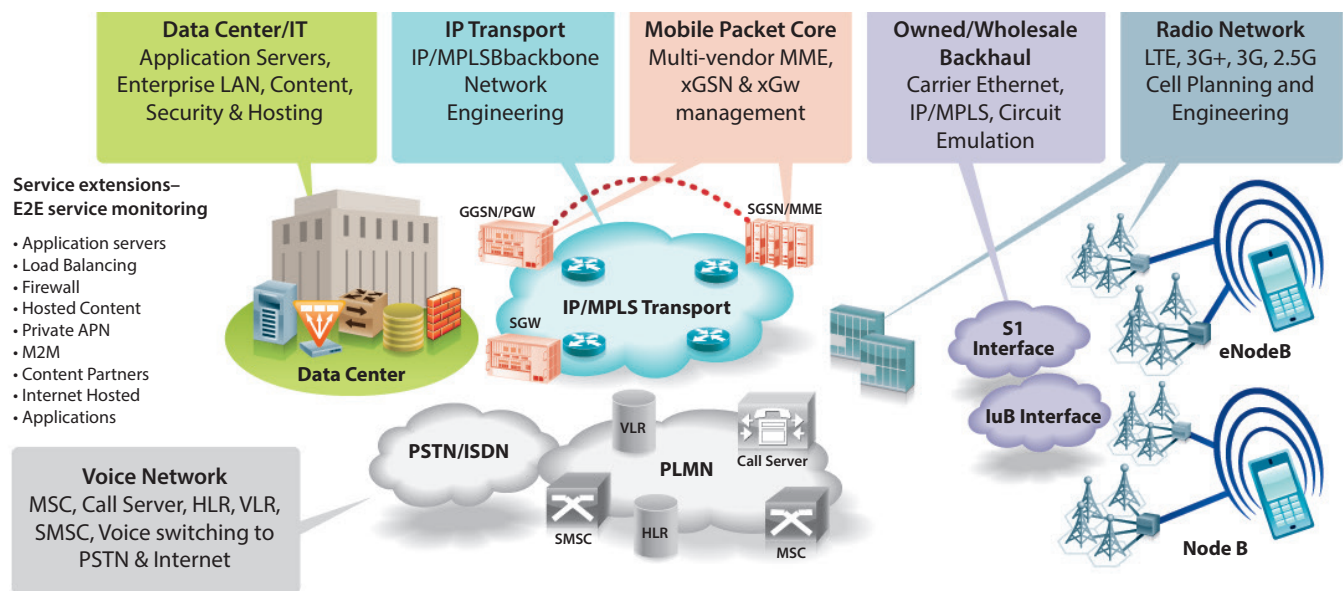


Figure 1. InfoVista's Broad Coverage of the Mobile Network

## InfoVista's Mobile VistaLinks

In mobile network environments, performance data is collected from the multiple domains that any service will transition and it can take the form of not only SNMP but also proprietary protocols. Data for some node types is often made available through vendor-specific EMSs. To that end, InfoVista offers corresponding adapters to collect this type of data, supporting Ericsson, Nokia and Huawei element management platforms. At the same time, providers require the ability to collect and process performance data from other multi-vendor devices. These vendor-specific and 'open' data collection modules are called VistaLinks. InfoVista's mobile VistaLinks are open and deliver the independence that providers need to dynamically collect the indicators they wish, drastically reducing development time for non-SNMP-based content. The concept of 'Open VistaLink' also reduces total cost of ownership by increasing the breadth of coverage for the solution from a common platform and reporting tool.

Aware of the mobile service providers' specific preferences among the network element vendors, InfoVista follows a modular approach to packaging. Vendor-specific VistaLinks are packaged separately from the Mobile Knowledge Pack's standard set of indicators, reports and dashboards and can be installed as needed based on the actual deployed network.

The following VistaLinks are available for the mobile environment and are included in the Mobile Knowledge Pack:

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### VistaLink for Ericsson OSS-RC:

InfoVista's VistaLink for Ericsson collects data directly from Ericsson OSS-RC via the 3GPP-based standard XML and ASN.1 specification for performance measurements (TS 32.401, TS 32.432, and TS 32.345).

### VistaLink for Nokia NetAct:

InfoVista's VistaLink for Nokia NetAct collects performance data from the Nokia NetAct Regional Cluster. Raw performance counters are retrieved at specified intervals, based on how Nokia NetAct is configured. These raw counters are synthesized into a rich set of vendor-agnostic KPIs and presented in the Mobile Knowledge Pack.

### VistaLink for Huawei M2000:

InfoVista's VistaLink for Huawei M2000 collects performance data from the M2000, leveraging Huawei's northbound NE-based performance data interface. Numerous raw performance counters are retrieved on a near-real-time basis from the M2000 and synthesized into a rich set of vendor-agnostic KPIs for presentation in the Mobile Knowledge Pack.

Table 1. Features and Benefits From the InfoVista Mobile Knowledge Pack

Features	Benefitting Role	Benefits
Sophisticated built KPIs for all mobile categories including Accessibility, Retainability, mobility etc. (3GPP Compliant) for 3G, 3.5G and 4G	✓ RAN Performance and Engineering	Open and flexible collection mechanism provides these groups with the control over KPIs in real time
Open and flexible support for legacy (2G) RAN	✓ RAN Performance and Engineering	Single reporting platform for a multi-generation, co-located RAN
Open and flexible reporting for circuit switched core elements	✓ Circuit Switched Core Performance and Engineering	Detailed reporting down to signaling links and trunks helps quickly identify core voice outage issues and also engineer or right-size circuit switched core elements for time-varying traffic demands
Integration of RAN regional categories and groups. Seamless drill down from higher levels for in-depth analysis	✓ RAN Performance and Engineering	Ability to view all sub regional categories (such as RAN markets, RAN clusters and RAN super clusters) in reporting. In addition a unique seamless drill down capability is offered for in-depth drill down analysis.
Intelligent & contextual Raw Counter drill down from all reports and applications.	✓ RAN Performance and Engineering	Powerful Raw counter drill down mechanism available in all reporting systems for in-depth analysis
Sophisticated customized KQI's for various RAN Conditions	✓ RAN Performance and Engineering	<p>Informative KQI's built into the solution as required for the identification of conditions affecting the network.</p> <p>The KQI can be built with a blend of different mobile categories such as accessibility, Retainability, integrity etc. to produce sophisticated metric such as Network Quality Indicator</p>
Real time Neighbor monitoring, reporting and geographical presentation.	✓ RAN Performance and Engineering	<p>Truly unique and sought after neighbor monitoring mechanism. The solution will monitor the neighbor relationships, handover activities and the capacity to visualize the neighbor flows in their geographical location.</p> <p>Cross check &amp; verify vendor ANR functionality and immediate Neighbor change monitoring &amp; preparation , impact verification</p>
Extensive mobile RAN network reports	✓ RAN Performance and Engineering	Comprehensive reporting for RAN. Satisfying network surveillance for all conditions and exceptions
All types of busy hour reporting, network element level and service level	✓ RAN Performance and Engineering	Incorporated busy hour options for all network element levels and bouncing busy hour, service levels. Providing a real analysis of the network
Adaptive thresholding and benchmarking	✓ RAN Performance and Engineering	Solution contains an intelligent approach to learning the network over time. Using its adaptive threshold capabilities to identify an abnormal radio performance, if detected the user is alerted
Open and flexible non-standard indicator development capability	<ul style="list-style-type: none"> <li>✓ Engineering</li> <li>✓ Network Operations</li> </ul>	Dramatically improved time to market for new performance indicators. Extended breadth of coverage from a single performance solution, creating visibility into neighboring domains and multi-vendor devices
Features like 95th percentile, busy hour and 3-month forecasts together with topology awareness	<ul style="list-style-type: none"> <li>✓ Engineering</li> <li>✓ Planning</li> </ul>	Facilitates planning and engineering of Mobile RAN network elements
Monitoring of Public and Private APN quality across data centers	✓ Service Operations	<p>Service-oriented organizations like the service operations center (SOC) and customer care organization can now report on availability and quality of consumer and enterprise data services</p> <p>The same organizations can also quickly drill down to identify the network root causes of service issues</p>
Forecast of aggregated service traffic and sessions for each APN service	<ul style="list-style-type: none"> <li>✓ Product Management/ Marketing</li> <li>✓ Business Operations</li> </ul>	<p>Helps product management and marketing groups view/compare the uptake of each data service to better plan future offerings</p> <p>Helps business operations compare and establish priorities across private enterprise accounts</p>

# Solution Requirements

## Mobile Knowledge Pack

Application Compatibility and Prerequisites:

Mobile Knowledge Pack 3.2 - VistaFoundation Kit 4.3

Mobile Knowledge Pack 3.1 - VistaInsight for Networks 4.0/4.2/5.0, VistaFoundation Kit 4.2

*Note: Although compatibility with other release levels (from the same vendors) is likely, it is not guaranteed.*

Network Compatibility – the Mobile Knowledge Pack has been tested against the following network/vendor release levels:

Vendor EMS Levels	Ericsson OSS-RC	Nokia NetAct	Huawei M2000
	5.3 through 12.3	5.1 through 5.3 CD3	V200R006C01 V200R008C01, V200R010SPC240, V200R011, V200R010C01SPC022, V200R010C00SPC260
	Ericsson	Nokia	Huawei
<b>eNode-B</b>	<b>11.B</b>		DBS3900 - V100R004C00B030, V100R001C00SPC310 BTS3900L - V100R002C00SPC200
<b>RNC</b>	P5: CXP 901 2014 RXX P6: CXP 901 2842 RXX P7.1: CXP 901 3831 RXX W10.1B: CXP 901 4711/X_RXX W10B	RN4.0 , RN2.2ED, 152.2	BSC6810/6900 - V200R010SPC240, V200R011C00SPC100 ("RAN 12")
<b>Node-B</b>	P5: CXP 901 1610 RXX P6: CXP 901 2014 RXX CXP 901 2073 RXX P7.1: CXP 901 2959 RXX W10.1B: CXP 901 4346/X_RXX CXP 901 6141 RXX CXP 901 6868 RXX CXP 901 8350	WN5.0 WN3.3 WN2.0 WN4.0 WN2E2	As supported by the above M2000 release level
<b>GGSN</b>	R4, R8.0, 2009A	3.6, 3.8, 5.0, Flexi ISN (3.2, 4.0)	R6, GGSN9811
<b>SGSN</b>	R8.0, 13a, 13b	SG6	R6, SGSN9810
<b>MME</b>	11B, 13a, 13b		V900R001C05
<b>SGw/PGw</b>			As supported by the above M2000 release level
<b>BSS</b>	R12, R06A, R06B, R07A, R07B, G10A, G10B, G11B.	S9 through S14	As supported by the above M2000 release level
<b>HLR</b>	R11, R12, R13.2	M11, M12	As supported by the above M2000 release level
<b>MSC/MSC Server</b>	R11, R12, R13.2	M12, M14.0, M14.4	As supported by the above M2000 release level
<b>MGW</b>	V5.1	U4.2, U1	As supported by the above M2000 release level

In addition, the following Layer 2 and Layer 3 entities are supported:

- Cisco Content Services Gateway Version 1.4
- Layer 2/3 Transport Nodes – all of the major vendor releases using industry standard MIBs (InfoVista deployments have included platforms from popular vendors such as Cisco, Juniper, Alcatel-Lucent and Huawei).
- Cisco IP SLA is supported on Cisco IOS 12.0(5)T and later releases
- Juniper RPM is supported on JUNOS 7.4 and later releases
- Firewall versions: NetScreen 200 Series, Check Point FireWall-1 version 4.0, Cisco PIX Security Appliance versions 6.3 and 7.x
- Load balancer is supported on F5 BIG-IP 9.1 or higher



For more information, please visit [www.infovista.com](http://www.infovista.com)  
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