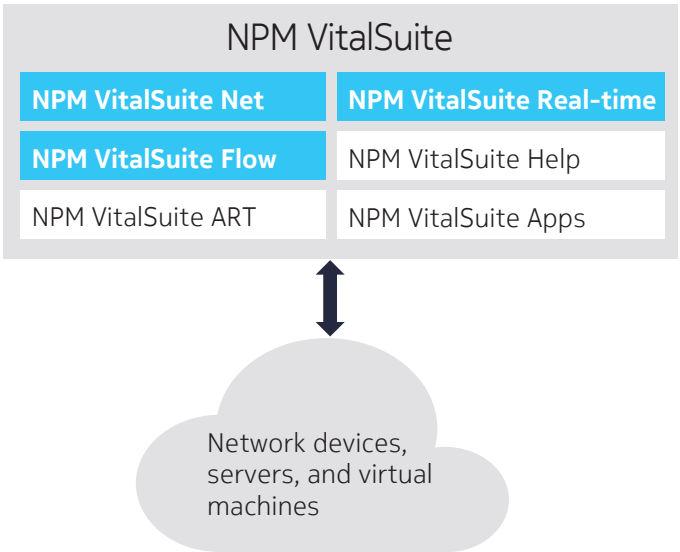
Nokia Performance Manager (NPM) VitalSuite software

Nokia Performance Manager (NPM) VitalSuite software (VitalSuite Net) provides the critical network information you need to monitor network performance, preempt problems, optimize resources, and plan ahead for maximum return on network and service investment. NPM VitalSuite Net provides end-to-end visibility of all kinds of networks—multivendor , multi-technology, and geographically dispersed, including routers, switches, servers, VMWare, Hyper-V, and Citrix hosts, VoIP devices, LAN, WAN, IP, Wi-Fi, ATM, and many other types of network devices. It enables network managers to monitor, analyze, manage and predict network performance from a single powerful easy-to-use Web 2.0 Graphical User Interface (GUI).

Figure 1. NPM VitalSuite



NPM VitalSuite Net can be deployed by itself, or together with other modules of the Nokia NPM VitalSuite software portfolio, including NPM VitalSuite Real-time Event Analysis software (NPM VitalSuite Realtime) and NPM VitalSuite Flow Analysis software (NPM VitalSuite Flow) to provide a powerful end-to-end performance management solution. NPM VitalSuite Net can also be integrated with other management systems. Easy installation, configuration, and an easy-to-use Web-based GUI make the system quick to deploy and able to deliver immediate benefits out of the box. A powerful feature set, extensibility, and scalability mean the NPM VitalSuite system will grow with you as your network management needs continue to expand.

Features

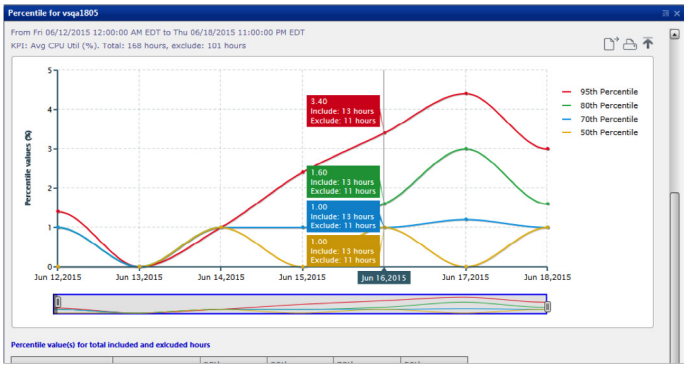
- Powerful multivendor and multitechnology support monitors 700+ different device types from leading vendors such as Cisco, Juniper, Nokia, and dozens more
- Industry-leading scalability leveraging big data architecture supports today's largest, most widely distributed networks from a single easy-to-use Web 2.0 GUI with custom portal views
- Versatile reporting provides real-time statistics for efficient, on-target troubleshooting, high-level performance summaries and long-term trends for capacity planning and quality of service (QoS) monitoring
- Out-of-the-box and configurable threshold alarms and reports
- Unique Quality Index displays – high level displays show problems at a glance, with easy drill down to detailed reports
- Web 2.0 GUI – easy-to-use GUI with powerful reporting, filtering, and searching capabilities for users and administrators; internationalized to support multiple languages
- Fully automated monitoring continuously gathers and aggregates network-wide performance data using a wide variety of device collector types
- Integrated with NPM VitalSuite – seamless integration with key NPM VitalSuite components, allowing you to configure a complete performance management solution to meet your individual needs
- Receives and analyzes incoming SNMP Traps from network devices
- Manages IPv4 and IPv6 network devices as well as mixed mode environments

NPM VitalSuite Realtime – advanced thresholds and alarms applied to data collected by NPM VitalSuite Net

- Instantaneous notification through autoupdate GUI screens, e-mail, or trap messages
- Powerful visualization of real-time performance data using 2D 3D Topology Maps and end-to-end network paths

NPM VitalSuite Flow – collection and analysis of Netflow, CFlow, or sFlow records directly from flow-enabled network routers

- Powerful Top N analysis reports based on flow data reveal how your network capacity is being used.



NOKIA

Benefits

Network-wide visibility – monitor performance across the entire IT infrastructure

- Works out of the box – fast and easy deployment, with automatic network discovery and default configurations and a rich set of built-in data collectors
- Immediate return on investment (ROI) – quickly identify overutilized and underutilized network resources
- Cost effective – implement carrier-class management capabilities at a price that suits enterprise IT budgets
- Protects your investment – extensive configuration options and customizability so it easily integrates with existing management systems and emerging technologies
- Enhanced end-user satisfaction – resolve network and data center problems before they impact users
- Proactive monitoring – identify problems quickly in real time, reduce time needed to manage the network

Lower operations and ownership costs – minimize help desk calls and trouble tickets, and reduce the need for expensive hardware upgrades

Functions

Performance monitoring

Personalized web portal monitors quality of services being delivered.

- Heat charts provide intuitive, at-a-glance indicators of network performance problems, with efficient drill downs to additional performance details such as:
  - Quality Index, CPU/memory/file system utilization, logical disk space, free memory and availability, projected CPU utilization, highest utilized CPUs, highest memory resources
-
- Extensive set of access control mechanisms provide customizable views of network performance to a broad range of users
- Automatic discovery, update and inventory change identification of networked SNMP and RMON enabled devices
- Allows users to be proactive in requesting bandwidth and service requirement changes before performance is impacted

Trap Management

- Receives and Analyzes SNMP Traps from network devices
- Maps Traps to Alarm Events for detailed analysis and reporting

Executive reports

- Reports may be generated for the entire network, particular resource types (routers, servers, WANs, frame relay, ATM, wireless, VoIP, RMON2 probes or LANs), or specific functional or regional groups
  - View reports in the Web browser, or export to CSV, PDF or TXT formats
  - Network overview reports summarize networkwide performance
  - Group comparison reports contrast performance by functional or regional groups
  - Custom reports enable tailored performance reporting for individual users
  - Best/Worst charts identify resource exceptions
  - Historical alarm reports provide detailed and summary views of alarm information
- Reports can be scheduled to run at various times and output sent to e-mail aliases

Capacity planning

- Summarize network usage trends
- Planning view projects future utilization based on past performance for upgrade planning
- Trend graphs indicate predicted utilization for a single resource based on a configurable period of historical usage (six months by default)

Service level management

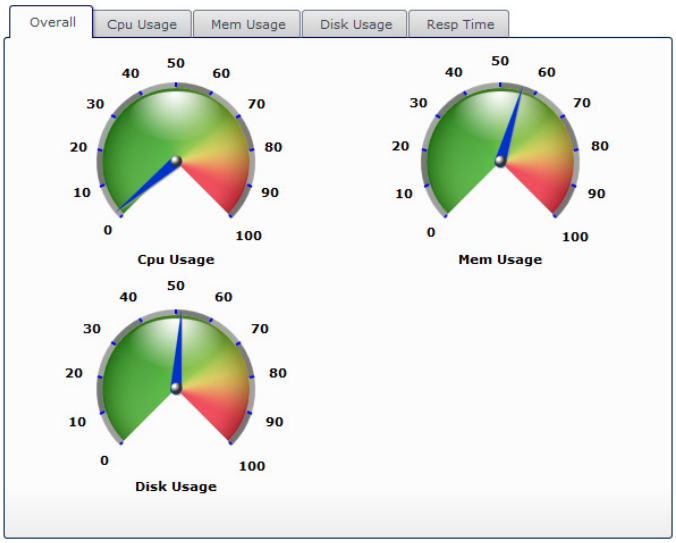
- Service level agreement (SLA) reports readily identify performance indicators to verify compliance
- Customizable Key Performance Indicators (KPIs)
- Threshold crossing alarms can be sent to northbound, end-to-end service management systems

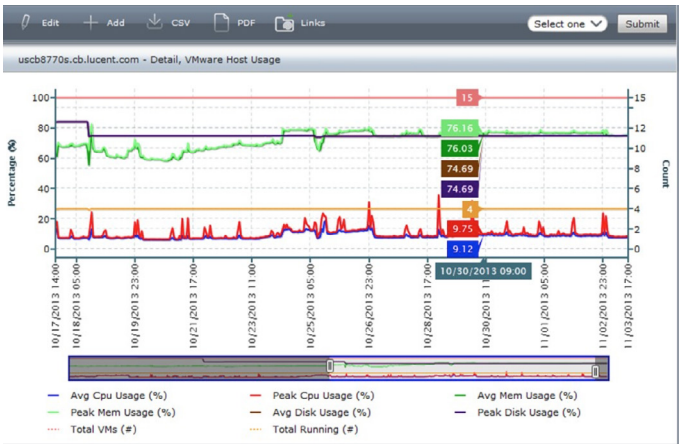
Managed Network Virtual Function (NFV) and other virtual components

- Dashboard displays for VMWare ESXi Virtual Server hosts and Virtual Server instances
- Support for Citrix XenServer and XenApps
- Support for Microsoft Hyper-V

Network Operations

- Network summary charts immediately expose network trouble spots, based on specific Quality Index settings
- Real-time Live Diagnostics provides detailed rapid troubleshooting features for specific devices
- Detailed graphs offer extensive visibility into the performance of individual managed resources - view up to 33 days of stored data in a single graph; powerful interactive graphs
- Flexible auto-discovery to import a device information file, specify a list of or initiate controlled device discovery
- Powerful dashboard displays for Citrix, and VoIP QoS Performance
- Powerful Flexible Percentile Analysis function with configurable inclusion and exclusion periods
- 95th percentile utilization data collection/ calculation for LAN MIB2, high-capacity LAN, WAN MIB2, and high-capacity WAN resource types - reports available through NPM VitalSuite ART
- Stores over a year of performance data in a relational database management system allowing SQL access
- Quick drill-down access to both current and historical performance data, without waiting for reports to run
- Automatic built-in aggregation by time periods, groups, and domains for quick and easy access to useful reports





Scalability

- Three-tier architecture for unsurpassed scalability
- Manages small to very large networks (millions of polled objects and thousands of devices)
- Supports dozens of simultaneous active users
- Efficient polling and data collection minimizes network load

Flexibility

- Domains and groups – powerful features for dividing large networks into easy-to-manage groups
- MIBWorks Utility for creating new SNMP based collectors
- DataWorks Utility for creating new bulk data collectors
- Flexible Data Model feature for creating custom KPIs

Network administration

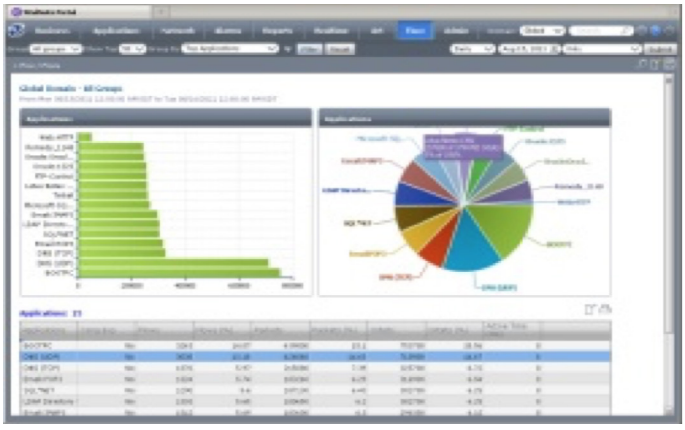
- Automatic discovery of network devices, ports, resources
- Role-based global and domain administration interfaces
- Domain policy profiles define configurations that can be applied to multiple domains
- Secure SSL (HTTPS) 128-bit encryption between client/master
- Busy hour period definition per device/resource

Redundancy/Failover options

- Poller Hot Standby – backup poller takes over if primary fails
- Reporting server – cold standby option for NPM VitalSuite Net master server

Monitored Devices/Resource types/Applications

- Supports over 700 device types from dozens of leading vendors
- Routers and switches: Cisco, Juniper, Nokia, Redback™, 3Com, Foundry, Riverbed, f5, Palo Alto, HP, and others
- Nokia devices: 7x50 Service Routers via 5620 SAM, ISAM/ASAM (DSL)
- Wi-Fi Access Points: Nokia, Cisco, Aruba, etc.
- WAN: Circuits, frame relay PVCs, ATM PVCs, ATM trunks, logical ports on WAN switches, Cisco WAN Manager, RMON2 ATM probes and routers
- LAN: Interfaces, Ethernet, token ring, switches/ hubs, SMON VLAN
- Servers: Microsoft® WMI, 2003/2008/2012, Exchange, Linux, SNMP Research, BMC, Cisco, CNT, Net-SNMP, Sun
- NPM VitalSuite Server Agent: process and service monitoring for popular server platforms

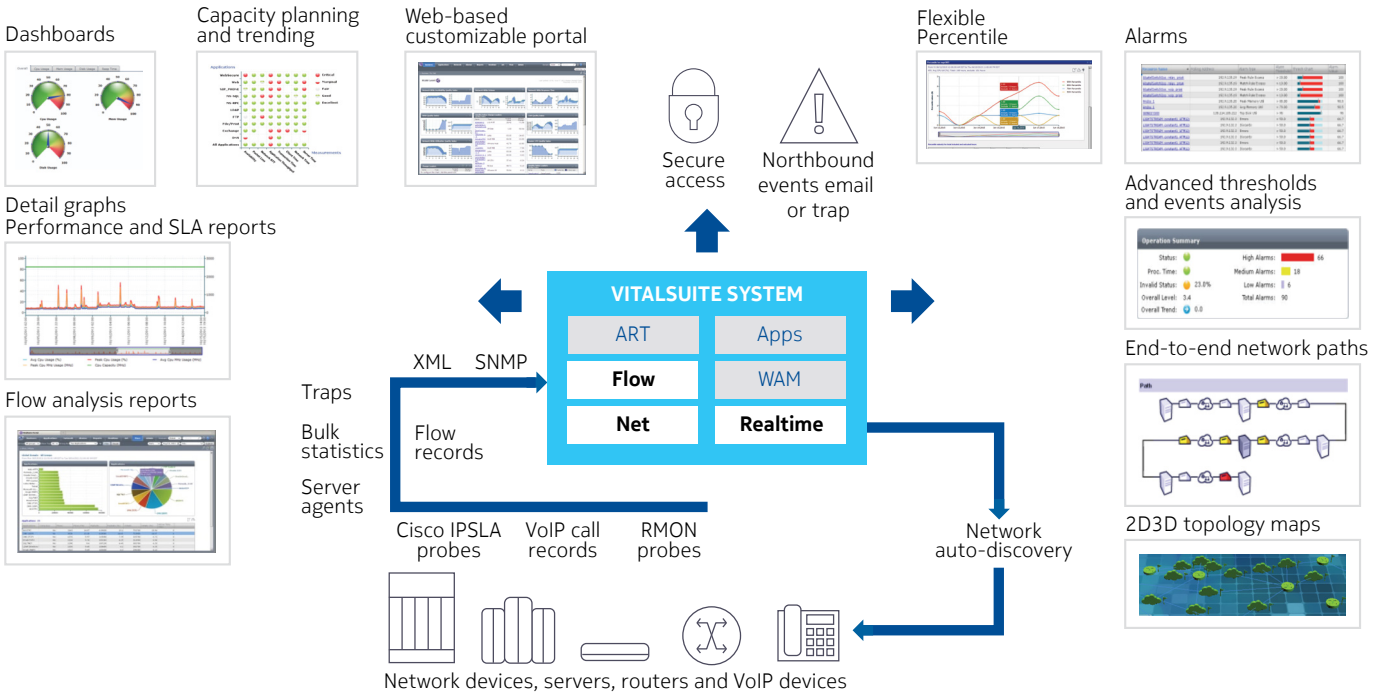


- Cisco CSS, Brocade, Nishan and McData SANs, Nokia VitalQIP DNS and DHCP and NPM VitalSuite AAA, Riverbed, Cisco WAAS, Cisco UBE, BlueCoat, F5, Palo Alto, ACME Packet
- Firewalls: Nokia, Cisco, and Juniper devices
- Supports SNMPv1/v2/v3, RMONI/II IPv4 and IPv6 standards
- Other applications: PostgreSQL DBMS, Apache Web Server, VMWare ESXi, VCenter, Citrix XenServer, XenApps, Netscaler
- MPLS Data and Tunnel Virtual Interface (TVI), LSP topology
- VoIP QoS: Alcatel-Lucent OmniPCX Enterprise™ (v10), Cisco VoIP CUCM (v8); Cisco IP SLA VoIP Jitter; BroadWorks application, media, network servers; Brix Networks SCCP, RTP, H323 Active Test Suites; Kagoor VF series, RTCP-XR VoIP records via SIP publish
- NPM VitalSuite Net VoIP Agent: Active VoIP QoS monitoring using optional NPM VitalSuite Net VoIP Agent feature – Conversation quality, MOS, SIP server call setup performance
- Active probes: Supports Cisco SAA/IP SLA including VoIP Jitter; supports Juniper RPM probes
- Genesys Contact Center – Genesys GVP, SCS, T-Server, SIP Server, Contact Center application and platform monitoring
- Unified Communications: Alcatel-Lucent Open Touch, Microsoft Lync
- Wireless LANs (802.11 MAC MIB), Cisco WLAN, Aruba, WiMax Alvarion BreezeMax, WMAN – WiMax

NPM VitalSuite Flow – flow data collection and analysis

- Collects flow records directly from flow-enabled routers in the network
- Powerful, visual reports – Top N reports, analysis reports and custom reports
  - Top endpoints, conversations, autonomous systems
  - Top talkers, listeners, conversations, overall
  - Top applications, protocols, ports, QoS settings

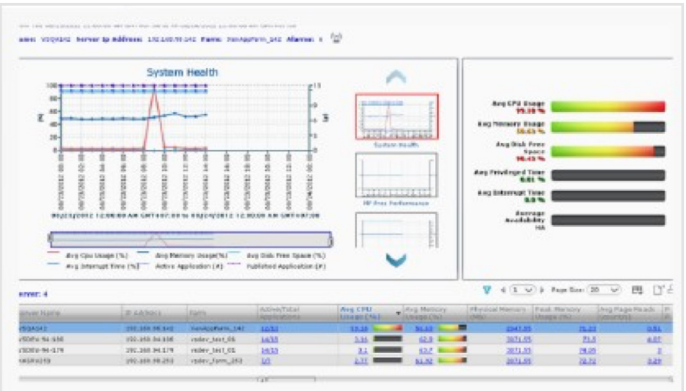
Figure 2. Input and Output of NPM VitalSuite Net and Related Modules.



- Report time frames – flow data is available for hourly, daily, weekly and monthly aggregate views
  - Up-to-the-minute data is available on charts
- Alerts – users can configure Vital Real-time alarms on flow data to generate alarms for unusual flow traffic (Note: NPM VitalSuite Realtime is a required module for NPM VitalSuite Flow)
- Custom reports – flow data records are also available for custom reports using NPM VitalSuite ART
- Supports several flow record formats – Netflow v1, v5, v7, v9 and IPFIX, sFlow version 5 Flow Sample types (Raw Packet Header, IPv4 Data, IPv6 Data, Extended Switch Data), CFlow
- Scalable data collection – simply add NPM VitalSuite Flow collectors to your existing NPM VitalSuite Net deployment
- Provides detailed information on how your network capacity is being used

NPM VitalSuite Realtime – advanced thresholds and analysis

- Flexible threshold capability (includes default, user-configurable and automatic adaptive thresholds) with multiple Alarm severity levels
- Customizable "business-aware" thresholds can be set for different times of the day or week
- Rate-based thresholds enable alerts based on multiple occurrences of an event over a time period
- Exception conditions configurable per Domain or Reporting group-ideal for SLA monitoring
- E-mail notification of threshold alarms; configurable for specific conditions or device groups
- SNMP traps with alarm details for generated alarms can be sent to multiple northbound destinations such as SMARTS, Aprisma, HP OpenView, NetCool®, or other systems
- Users can suppress events and annotate Alarms
- Flexible configuration options allow specific messages (or messages about specific devices) to go to specified individuals
- Event Index feature automatically ranks multiple network events in order of severity
- Powerful 2D 3D Topology maps shows devices and subnetwork connections with realtime alarm status auto-updates.
  - Supported Map layers include Layer 3, Layer 2, MPLS, Virtualization, and VoIP.
  - Rich feature set for Map navigation, drill-down, configuration, and map publishing
  - Switch between 2D and 3D views with navigation
- Automatic (IP) and manual path and subnetwork generation and analysis, maps display route paths through the network
- Device/Alarm summary with drill-down expansion



Specifications

NPM VitalSuite

NPM VitalSuite Module	Latest supported OS version/DB version
NPM VitalSuite Net	• MS Windows 2012 R2/MS SQL 2014 • Linux Red Hat 7.1 or later/Oracle 12cR1 • Linux Red Hat 7.1 or later/MariaDB 10.1
NPM VitalSuite Apps	• MS Windows 2012 R2/MS SQL 2014
NPM VitalSuite ART	• MS Windows 2012 R2/MS SQL 2014 • Linux Red Hat 7.1 or later/Oracle 12cR1 • Linux Red Hat 7.1 or later/MariaDB 10.1

NPM VitalSuite Agents	Latest supported OS version
VitalNet Server Agent	• MS Windows 2012 R2 • Linux Red Hat 7.1 or later
VitalNet VoIP Agent	• MS Windows 7
VitalApps VitalAgent	• MS Windows 7, 8.1 (64-bit) and 10
VitalApps Mid-Tier Agent	• MS Windows 2012 and 2012 R2
NPM VitalSuite WAM	• Client Web Browser: must support JavaScript and cookies • Application Web Server • Apache HTTP 2.x • Nginx 1.4.x • MS IIS 7.0 or 8.5 • Node.js

User and Admin Interface	Latest supported Browser
NPM VitalSuite	• MS IE 10, 11 • Firefox 48 or Firefox ESR 45.3.0

To learn more about these and other management solutions, contact your Nokia sales representative, authorized reseller or sales agent, or visit our web site.

About Nokia

We create the technology to connect the world. Powered by the research and innovation of Nokia Bell Labs, we serve communications service providers, governments, large enterprises and consumers, with the industry's most complete, end-to-end portfolio of products, services and licensing.

From the enabling infrastructure for 5G and the Internet of Things, to emerging applications in digital health, we are shaping the future of technology to transform the human experience. networks.nokia.com

Nokia Oyj
Karaportti 3
FI-02610 Espoo, Finland
Tel. +358 (0) 10 44 88 000

Document code: SR1710017526EN (February)