

RADview

Carrier-Class Network Management System

- Integrated network management system, including service management (SM) and performance monitoring (PM) to manage advanced hybrid networks composed of virtual and non-virtual network resources
- Modern and easy-to-use D-NFV Orchestrator to orchestrates the virtual components
- Wizard-based end-to-end Carrier Ethernet service design, provisioning, testing and monitoring
- Fully featured performance monitoring system enabling SLA assurance for both service providers and their end customers

RADview NMS manages advanced networks. It includes the following optional modules:

- **D-NFV Orchestrator** – Uses the OpenStack framework to manage the physical and virtual resources required for effectively running Distributed VNF and for delivering service agility at the customer edge
- **Service Manager (SM)** – End-to-end intuitive, error-free and easy service management for MEF-based Carrier Ethernet services including off-line planning of network topologies and services
- **Performance Monitoring (PM)** – Service SLA assurance (OAM and throughput) for services provided by carriers and mobile operators.

RADview features an intuitive graphical user interface for discovery, topology, management and monitoring of the network elements. In addition, RADview includes the following utilities:

- Inventory and resource management, for displaying devices, ports and logical resources
- Jobs, for performing a variety of tasks on a large number of devices from one central location

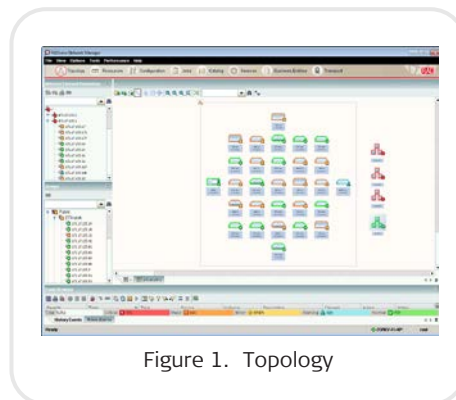


Figure 1. Topology

- Zero Touch, for automatically discovering and configuring a large number of devices
- Fault management, displaying current and history alarm records, enabling the forwarding to upper OSS systems.

D-NFV Orchestrator. The D-NFV Orchestrator creates, configures and manages virtual machines on the x86 D-VNF module within RAD's customer-edge devices. Manages the repository of RAD-certified VF (virtual function) applications and handles traffic flow between physical ports and virtual switch.

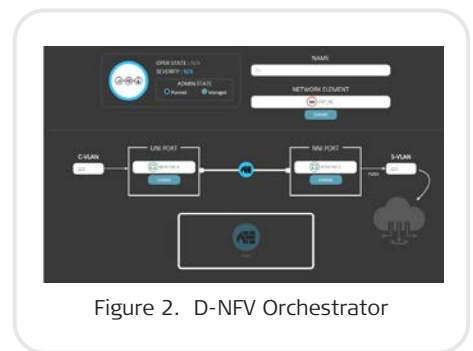


Figure 2. D-NFV Orchestrator



Figure 3. VNF Devices

RADview

Carrier-Class Network Management System



Figure 4. VNF Services

Service Manager. This module is designed to minimize the effort of setting up a multi-service Carrier Ethernet network. RADview-Service Manager enables easy wizard-based E-Line, ELAN and E-Tree Ethernet service creation, service activation tests (Y.1564), monitoring and SLA assurance for networks based on the RAD product family.

RADview-Service Manager allows users to quickly set up Ethernet services using the unique RADview template (Catalog) concept, which only requires entering a few service-specific parameters during service creation.

With its network planning capabilities, it allows service providers and network operators to tailor network and service architecture to their performance and capacity needs while ensuring resource optimization

Note: Service Manager supports ETX-2, ETX-5 and MinID.

Performance Monitoring. This module is an SLA assurance system, enabling long term monitoring of Ethernet service performance by collecting, analyzing and presenting KPI (key performance indicators) data from RAD devices. Service providers use the system to prove the SLA and monitor traffic of customers who utilize their service, and propose bandwidth upgrades.

Measured metrics are based on ITU-T Y.1731. These metrics include Frame Delay, Delay Variation, Frame Loss, and Availability. Latency and jitter results are based on round-trip measurements. This data allows service providers to easily

evaluate actual performance over time and compare it to their committed SLA agreements.

The Performance Monitoring system calculates the utilization based on configured CIR and EIR values.

In addition, it immediately detects service degradation, so that action can be taken to quickly restore committed performance levels at the end customer committed performance levels to the end customer.

The Performance Monitoring system also presents end-to-end throughput of Ethernet services in the network.

TECHNOLOGY

RADview is a Java-based, carrier-class network management system for deployment in Windows, Linux and Unix environments. The system features an embedded Oracle database and open standard interfaces for integration with OSS and BSS systems. It manages both Ethernet Access and AXCESS+ portfolios and provides third-party device monitoring to assure network reliability.

RADview conforms to the ITU-T Telecommunication Management Network (TMN) model with end-to-end visibility and standard-based interoperability. The system is scalable, providing solutions for small installations as well as growing networks.

RESILIENCY

RADview provides the following scalable solutions for disaster recovery to assure high system availability:

- Cold standby – This solution is the most simple and cost-effective. Data is periodically backed up by the active station via the RADview Backup/Restore utility without affecting service.
- High Availability – This solution provides local data protection with two servers as clusters sharing external storage. In case of a software or hardware failure, the system immediately switches to the backup server.

- Disaster Recovery wide-area clustering – This solution provides geo data protection with two servers in two separate locations in replication mode. In case of an operating outage at the primary site, all services can be moved to the backup site by a semi-automatic switchover. This solution is mainly used by customers wishing to backup their data to a remote site.

MANAGEMENT AND SECURITY

Zero-Touch Provisioning

RADview offers the Zero-Touch utility for automatic discovery of network elements and performing the tasks listed below according to user-defined rules:

- Uploading initial software and configurations
- Executing CLI scripts
- Handling the replacement of units in case of failure.

An unlimited number of security profiles and groups can be created, using the security management console.

Secure Access

Its advanced functions include tracking of user activities in the network and designating complex security access rights to the parameter level.

Delivery over secure communications protocols:

- SSH (secure shell)
- SNMPv3.

ARCHITECTURE

RADview is based on distributed client-server architecture, which optimizes the use of network resources.

As a modular management system, RADview is equipped with a number of standard northbound interfaces for easy integration with OSS and umbrella systems.

In addition to featuring a plug-in for connecting to IBM Tivoli's Netcool@/OMNibus™ fault management program, the system allows seamless communication with network-wide

platforms for inventory (resource) management, performance monitoring, and service provisioning, as well as with carriers' proprietary OSS.

Supporting various APIs, such as CORBA, XML MTOSI and SNMP, RADview smoothly interacts with higher management levels to communicate essential network information to service, operations and business management functions.

By serving as a mediation layer between the various network elements (NEs) and the umbrella system, RADview minimizes the integration costs associated with new NE additions.

OPERATION AND MAINTENANCE

New software, configurations and licenses can be distributed and uploaded by devices across the network. The system tracks version changes and keeps a software configuration history for backup and recovery. Easy management and provisioning is provided by a user-friendly point-and-click GUI (Shelf-View).

The system manages individual and group user accounts and passwords, generating network usage reports to monitor user activities.

MONITORING AND DIAGNOSTICS

RADview supports advanced fault detection, displaying a clear analysis of the probable causes of faults and suggested corrective measures. It allows the distribution of alarm messages to other managers in the network. In addition, users can configure sounds for specific alarms/events when triggered.

Specifications

WINDOWS-BASED SERVER

Hardware Requirements - ≤ 500 NEs

CPU: Core-i7-2xxx 2.1 GHz or higher (x=0-9), or newer architecture

RAM: 4 GB

Hard drive with NTFS-formatted partition and at least 40 GB free disk space

Note: Additional disk space may be required to collect statistics for the RADview Performance Portal, according to the amount of data collected and saved in the system

DVD drive

Note: For requirements to operate larger networks, please consult your RAD partner.

Software Requirements

Microsoft Windows 7 (64-bit) Professional Edition, or Microsoft Windows Server 2008 R2 (64-bit) Standard Edition

Windows default input language set to English

Mozilla Firefox installed as default web browser (required for Web-based access to devices)

TFTP/SFTP Server, TFTP Server required for collecting OAM statistics

TFTP/SFTP (enterprise), TFTP Server required for the Jobs and Zero Touch utilities

UNIX-BASED SERVER

Hardware Requirements - ≤ 1000 NEs

Oracle SPARC T4-1 Server with 1x8-core 2.85 GHz CPU

Two SAS hard drives (mirrored), with the following minimum requirements:

4 GB free disk space in the `/opt` partition

40 GB free disk space for Oracle in `/opt/oracle`

Note: Additional disk space may be required to collect statistics for the RADview Performance Portal, according to the amount of data collected and saved in the system

16 GB RAM or more

Swap file at least twice RAM size

For each additional simultaneous user via X-session, add 512 MB RAM and 1 CPU core

For each additional simultaneous open shelf view application via X session, add 128 MB RAM

DVD drive

Color monitor (17-inch minimum) supporting 1152 × 900 resolution or higher with depth 24 (for use in a Unix client-server configuration).

Note: For requirements to operate larger networks, please consult your RAD partner.

Software Requirements

SUN Solaris Ver. 10, Nov 2006 or later, with CDE

Note: The option to include Solaris 64-bit support should be selected during the Solaris installation.

Mozilla browser if you wish to work with the RADview Performance Portal (for use in a Unix client-server configuration).

WINDOWS CLIENT

Hardware Requirements

Intel Core-2 CPU 4300 1.79 GHz or higher

Memory: 4 GB or more

Color monitor (17-inch minimum), supporting 1280 × 1024 resolution or higher

DVD drive

Software Requirements

Microsoft Windows 7 (64-bit) or higher

Windows default input language set to English

Adobe Reader, latest version

Google Chrome web browser for working with the RADview Performance Portal.

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Carrier-Class Network Management System

Ordering

RECOMMENDED CONFIGURATIONS

RADview

Includes a license for five simultaneous users, as well as complimentary (Windows/Linux/Unix) ENW license points

RADview-PC

RADview system for installation on a Windows-based server, with 300 ENW license points (for Windows)

RADview-PC/PMSM

RADview system for installation on a Windows-based server, with Service Manager and Performance Monitoring system, 600 ENW license points

RADview-LINUX

RADview system for installation on a Linux-based server, with 400 ENW license points (for Linux)

RADview-LINUX/PMSM

RADview system for installation on a Linux-based server, with Service Manager and Performance Monitor, 800 ENW license points

RADview-UNIX

RADview system for installation on a Unix-based server, with 400 ENW license points (for Unix)

RADview-UNIX/PMSM

RADview system for installation on a Unix-based server, with Service Manager and Performance Monitor, 800 ENW license points

RADview Licenses

RV-LIC/PC/DNFV

RADview D-NFV Orchestrator for PC

RV-LIC/ENW

Additional 1 ENW

RV-LIC/ENW/R

Additional 1 ENW in Redundancy mode

RV-LIC/1-CLIENT

Additional 1 Client

RV-LIC/1-CLIENT/R

Additional 1 Client in Redundancy mode

RV-LIC/NETCOOL

Integration module for IBM

Netcool/OMNibus

Notes:

For additional information on license points for specific devices (network elements), contact your RAD partner.

RADview-Service Center is part of RADview-Unix/PMSM. RADview-Service Center does not support the respective Windows and Linux options.

International Headquarters

24 Raoul Wallenberg Street
Tel Aviv 69719, Israel
Tel. 972-3-6458181
Fax 972-3-6498250, 6474436
E-mail market@rad.com



<http://www.cbnetworks.fr>

12 avenue des prés
78059 St Quentin en Yvelines

Tel: 33 (0)1 77 55 03 00

Fax: 33 (0)1 30 44 11 95

E-mail: sales@cbnetworks.fr