

ABSTRACT The WebSAM NetvisorPro realizes integrated network operation and management for the UNIVERGE IP routers, and L2SW and SIP servers as well as for multi vendors' network nodes. The WebSAM NetvisorPro provides a series of optional functions, Resource Manager, Device Configuration, Problem Diagnosis, Alert Analyzer, VLAN manager, QoS manager and Unified User Manager, which enable efficient network management for both enterprise and carrier users and significantly cuts their network operation costs.

KEYWORDS OAM&P, SNMP, Fault management, VLAN management, QoS management, VoIP management

1. INTRODUCTION

This paper describes the WebSAM NetvisorPro. The NetvisorPro enables low cost network operation and provides simple and easy network management solutions (**Fig. 1**).

2. NetvisorPro BASE LICENSE

The WebSAM NetvisorPro provides SNMP based network management: keep alive management, topology map visualization and alarm visualization. Operation Window is the main window in the NetvisorPro and the Alert Viewer shows integrated nodes status (**Fig. 2**). The NetvisorPro presents both physical and logical (VLAN) topology in addition to a general topology map in its IP layer. It also shows IEEE 802.3ad based link aggregation which is usually used for link protection and extra bandwidth purposes. The VLAN topology function automatically collects VLAN configuration status from all nodes in the network and visually presents how a port in a node is connected to a port in its neighboring node. The network topology function enables tracing a host or client location, how it is connected and to which port of which node, by specifying the IP address or hostname. Thus it is possible to detect a port that can be connected to a virus affected PC or a heavy traffic generating client.

3. ALARM AND FAULT MANAGEMENT

The Problem Diagnosis and the Alert Analyzer provide alarm and fault management. It is quite popular that alarm analysis is performed with not only SNMP Trap but also with SYSLOG. However, SYSLOG sometimes may be difficult for the network operators to understand. Therefore, the Problem Diagnosis provides knowledge based SYSLOG analyses that automatically detect root causes and how to recover. The Problem Diagnosis is able to report alarm notifications by e-mail to specified operators if alarm type or other conditions are satisfied.

The Alert Analyzer provides event correlation that correlates huge amounts of alarm notification (SNMP trap) based on analysis rules in the case of network alarm or status change. These analysis rules are based on: a) filtering of low severity alarms, b) aggregation by alarm type, c) repeating high severity alarm, d) overwriting alarm severity, e) aggregation and filtering of link up/down notification. SYSLOG based correlation is also supported as well as SNMP trap.

4. CONFIGURATION AND SOFTWARE MANAGEMENT

The Resource Manager enables remote software version up and configuration backup & restore. It also provides a scheduling mechanism for version up, backup and restore, then, restarts the target nodes after version up. The Resource Manager uploads the running configuration from a node, and an operator may update and apply it to the node. The Resource Manager monitors configuration status and

*1st Computers Software Division

automatically uploads a new configuration if it is locally updated.

The Device Configuration helps VLAN configuration and filter (ACL) setting. It provides vender inde-

pendent GUI and "point & click" manner VLAN configurations. The filtering function enables user defined policy deployment to network nodes.

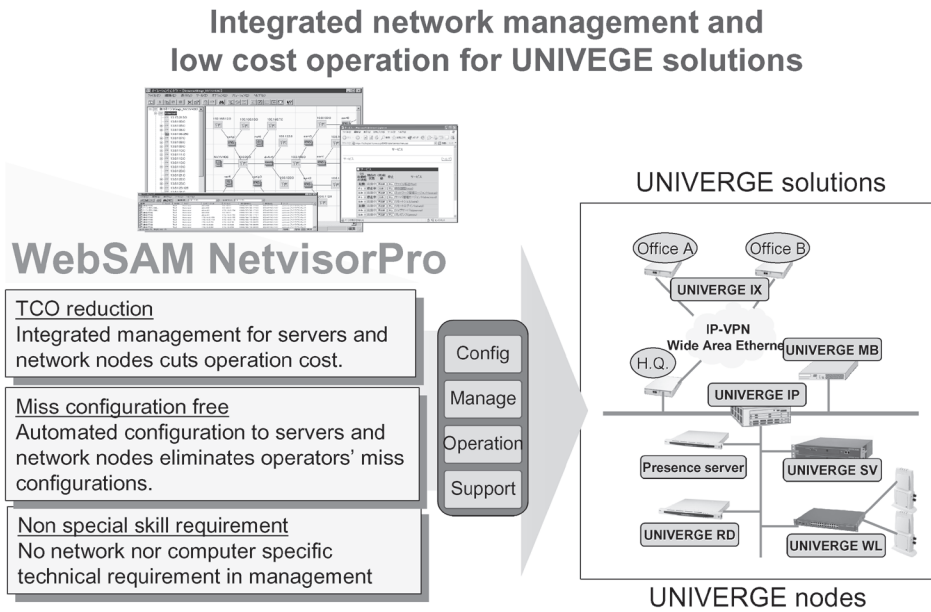


Fig. 1 WebSAM NetvisorPro overview.

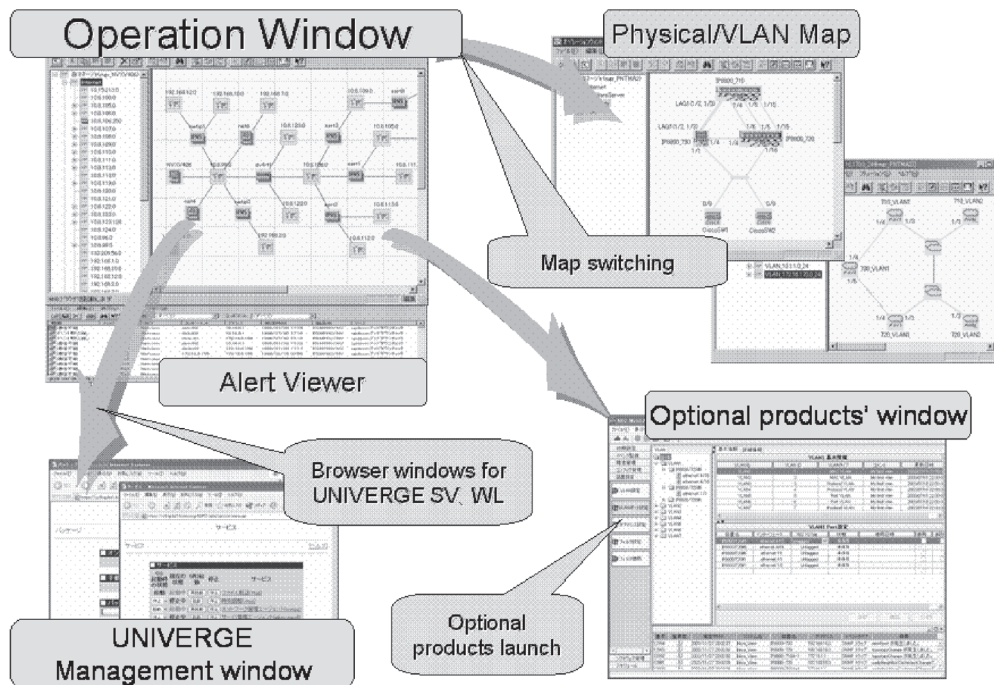


Fig. 2 NetvisorPro GUI.

5. VLAN AND QOS MANAGEMENT

The VLAN Manager consists of three functions: VLAN map function, Network resource management function and VLAN service function. VLAN map function visualizes current VLAN configuration status. Network resource function enables the design of a new VLAN configuration in consideration of the current configuration status. VLAN service function applies VLAN configuration to all nodes, then, it may notify an inconsistency between the designed configuration and applied configuration to the operator, if this happens by cable miss wiring or other reasons.

The QoS Manager provides QoS aware routing design and deployment. In general, routing in an IP network is managed by dynamic routing protocol, however, policy-based routing by the QoS Manager enables a QoS guarantee for high priority traffic. The QoS Manager provides end-to-end path calculations, such as the shortest path, and reserves links on the route as well as configuring QoS parameters to the node.

6. INTEGRATED VOIP USER MANAGEMENT

The VoIP system with FOMA dual-phone & SV7000 with WLAN is an outstanding solution in

UNIVERGE. This VoIP system is realized by the SIP server (SV7000), Presence Server and Radius Server. It has been a headache for network operators that each server required specific user management. The Unified User Manager provides integrated user management solutions to solve this problem. The Unified User Manager provides LDAP, Active Directory and CSV based interface to other directory systems. It also enables user access control with SSO (Single Sign On), which reduces management costs. The group management function in the Unified User Manager enables the same user name (or extension number) in a different group as each user is managed group by group.

7. CONCLUSION

As presented, the WebSAM NetvisorPro provides integrated UNIVERGE network management and operation solutions. The NetvisorPro plans to enhance its security functions and VoIP functions in the next stage of its development and promises to reduce network management costs and enable efficient network operations.

Received August 28, 2004

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Su-Hun YUN received his B.E. and M.S. in Electrical Engineering from Osaka City University in 1991 and Columbia University in 1999, respectively. He joined NEC Corporation in 1991, where he was engaged in development of Cable Modem, IP Routers, SONET/SDH & WDM management system and MPLS/GMPLS control plane. Currently, he is a Manager at 1st Computers Software Division, NEC Corporation. His current interest is network control and management in VoIP, WLAN and security.

Mr. Yun is a member of IEEE.

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