

Automated VoIP Deployments in Converged Networks

A solution from Siemens Enterprise Communications and Enterasys Networks



Unified communications and electronic collaboration technologies enable employees to work more productively and enhance overall business productivity and efficiency. Increasing adoption of these technologies has led IT organizations to implement “converged” networks, where the same IP network is used for both data applications as well as real-time applications like Voice over IP (VoIP) and video over IP. In the face of the business advantages and cost savings that converged applications bring, the challenge for IT departments is how to manage the delivery of services in this new converged environment while reducing costs and administrative effort.

According to a survey by IDC (“IDC’s Definition of the Unified Communications Ecosystem,” IDC Document #204737, January 2007), there are a variety of applications driving future investments in a company’s data and telephony network budget. There are clear indications that many of these applications will rely on a single, converged infrastructure to deliver critical business services. More than half (52.3%) of the respondents indicated that unified messaging will drive future investment, and videoconferencing (36.9%), dual-mode (WLAN/mobile) phones (35.7%), and audio services (24.2%) are all applications that will be delivered through the single, converged Ethernet/IP network.

Challenges for Deploying Converged Networks

A very specific challenge for a VoIP deployment involves adding and maintaining detailed information about the location and characteristics of every phone connected to the network. This information is often maintained manually in some type of spreadsheet or database. The effort and time required to keep this information up to date represents a significant labor cost, making the VoIP deployment expensive to manage. As the number of phones connected to the network increases, the time and effort necessary to keep the information accurate also increases. The result is longer wait times to provision new phones or to approve moves via change control systems and overall process inefficiency.

Solution Benefits

Business Alignment

- Increase employee productivity through improved availability and reliability of real-time applications
- Location-dependent adaptation of IP phones provides customized features
- IP phone monitoring for verification of compliance with company guidelines

Operational Efficiency

- Reduced administrative expenditures and costs
- Provisioning of accurate, up-to-date information (inventory, status, location) on IP phones connected to the network
- Automatic inventory management
- Automatic infrastructure configuration for adds, moves, and changes of IP Phones

Security

- Minimized risk when using non-standard end devices with potentially incorrect configuration or outdated software
- Enhanced security reduces the likelihood of downtime for real-time services and business processes
- Automatic assignment of QoS and security settings to the infrastructure where applicable

Support and Service

- Industry-leading customer satisfaction and first call resolution rates
- Personalized services, including site surveys, network design, installation, and training

**There is nothing more important
than our customers.**

Location Services — Critical Requirements of Converged Networks

For both safety (emergency response) and device management requirements, the VoIP administrator must have detailed information for every IP phone and other Session Initiation Protocol (SIP) capable endpoints connected to the network. This information includes the phone number assigned to the phone, identification information such as the phone's MAC address, the software and software version the phone is running, and any configuration templates such as speed dial assignments applied to the phone. The administrator also needs detailed location information including the switch and port the phone is connected to, the IP address of the switch, the switch and port physical location, the security posture of the phone, and the network policy applied to the phone.

Adding and maintaining this information for each phone connected to the network has typically been a manual process that does not scale well in large deployments and that increase the operational expenses significantly. Guaranteeing that the information remained accurate meant restricting the user's ability to move the phone.

Maintaining location information over time presents the biggest problem and is the most labor intensive. The reason is that the Voice over IP (VoIP) controller learns the MAC address, IP address, phone number, device type, software and software version of all the phones it registers; however, it does not automatically learn any of the location information.

Providing Automated Location Services

A unique, distinct, and valuable capability to provide automated location services for VoIP phones is available when adding Enterasys® NAC (Network Access Control) to a Siemens Enterprise Communications VoIP deployment. Enterasys NAC's location service detects an IP phone when it is first connected to the network. The phone and the phone number are automatically associated with detailed location information including the:

- Switch (or Wireless Controller) name
- Port (or SSID and WLAN Access Point) the phone is connected to
- IP address of the switch/controller
- Switch location description
- Port location description
- Port ELIN (Emergency Location Information Number)
- Security posture of the phone
- Network policy applied to the phone and its current state

This automatic association reduces administrative and operational costs since the information does not have to be manually entered into a database and maintained over time. This is also important because

the ability to quickly locate a phone is critical for supporting emergency services. Once an IP phone has been recognized and authorized, the "Siemens IP Phone" policy role can be applied to all traffic from that phone. This policy has two elements: the security element protects the VoIP server from attack by only permitting authorized IP Phones to send VoIP protocol packets to the server. The quality of service element of the policy marks and prioritizes all packets coming from the phone to minimize network delays and to improve the quality of the voice call. This prioritization will prevent increased network traffic levels from compromising voice call quality.

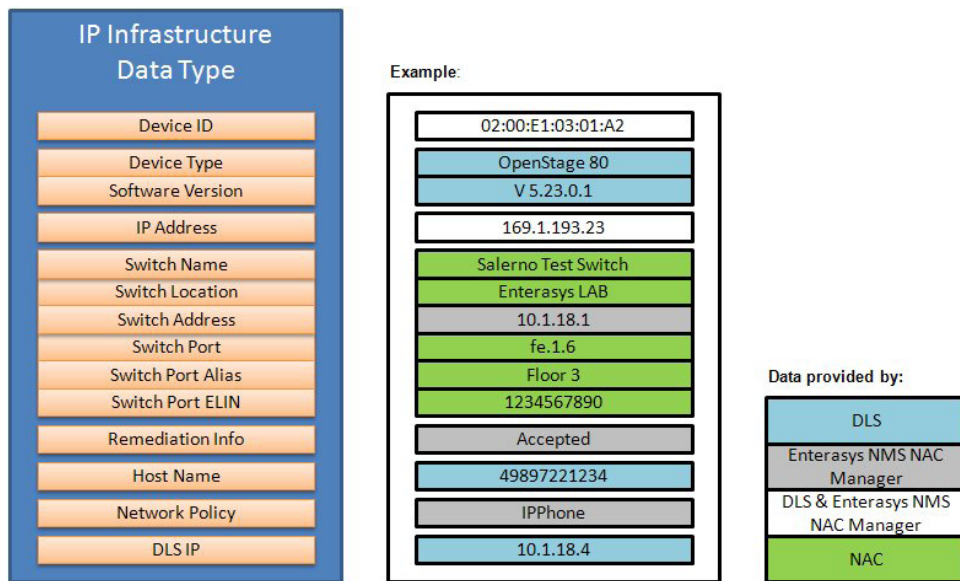
Solution Description

Siemens Enterprise Communications and Enterasys Networks have developed a Service Oriented Architecture (SOA) based solution using web services through the use of the XML (eXtended Markup Language) protocol that allows Enterasys NMS NAC Manager (also known as NetSight® NAC Manager) and the Siemens HiPath Deployment Service (DLS) to automatically share information. This enables administrators to quickly retrieve detailed information for all IP phones or telephone numbers in an IP infrastructure. Any changes such as reconfiguration of a phone, phone movement or state change through the allocation of a new telephone number will be automatically detected. This ensures that the data is always up-to-date and greatly reduces manual administrative effort associated with VoIP deployment.

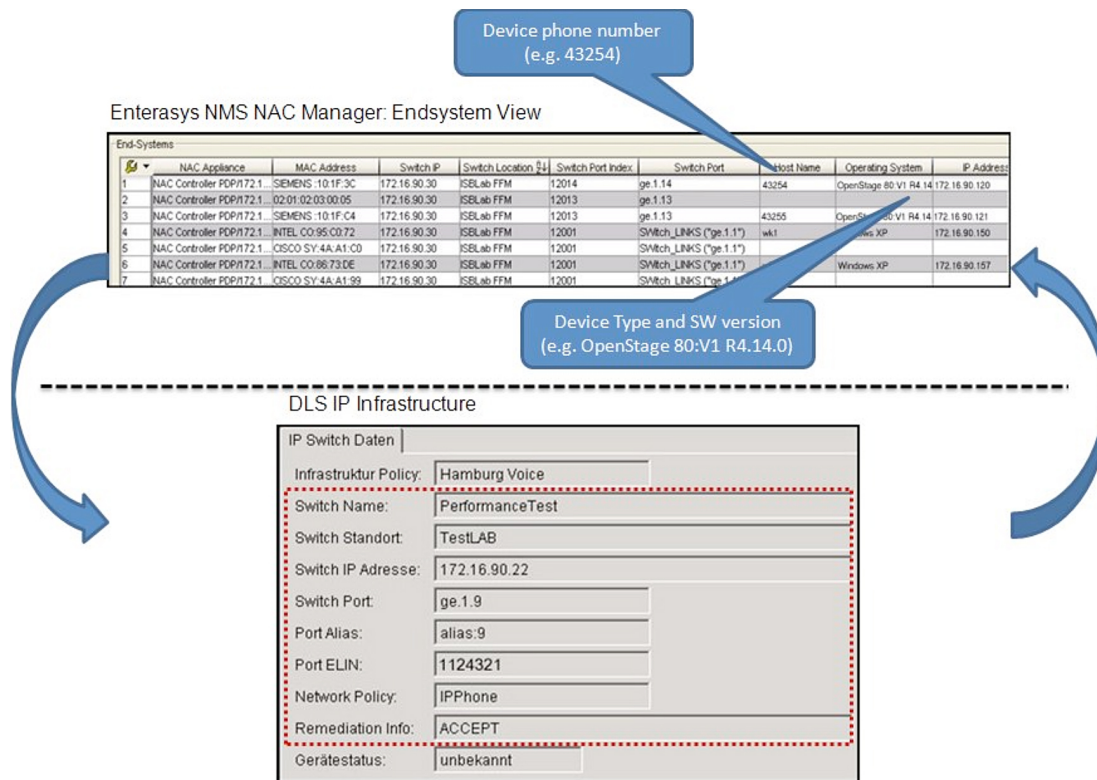
This solution secures VoIP deployments while optimizing system & localization management by providing the following services:

- Synchronization of end system (IP phone) data from the Enterasys NAC database to HiPath DLS
- Synchronization of VoIP phone number, type and software version from the HiPath DLS to the Enterasys NAC end system database
- Detection of HiPath DLS restarts (for full re-synchronization)
- Detection of new phones in HiPath DLS (for individual synchronization)
- Periodic cache cleanup to eliminate old outdated cache entries
- Retry mechanism in case of unreachable external systems
- Detection of IP mismatch due to VLAN configuration
- Flexible logging configuration

This solution integrates data from the HiPath DLS database, the Enterasys NAC database, and the network switch. The following diagram illustrates the data synchronized and the source of the data.



HiPath DLS maintained information like phone number, device type and software version of a VoIP device is synchronized with Enterasys NAC. On the other side, switch, port and policy relevant data maintained within Enterasys NAC and/or the edge switches, is synchronized with the DLS view of a device. This allows both the HiPath and Enterasys NAC management software to display detailed location and localization information.



This solution automatically updates both the HiPath DLS database and the Enterasys NAC database when either detects a change.

This eliminates the need for manual intervention when any of the following occurs:

- A new IP phone is connected to the network
- Enterasys NAC detects a change such as a phone being connected to a new port or AP and SSID
- HiPath DLS detects a phone number has changed or the software version of the phone has changed
- Any network switch information is changed, including:
 - Switch name
 - Switch location description
 - Switch IP/Controller IP
 - Port alias
 - ELIN number

Use Case Scenarios

This solution allows the administrator to automatically retrieve up-to-date inventory information or adapt configurations according to the location of the IP phone, for example, the automatic assignment of a first responder or helpdesk to speed-dial buttons. Typical usage scenarios include:

- Automatic inventory management
- Location-dependent adaptation of IP phones
- IP phone monitoring and verification of compliance with company guidelines
- Automatic troubleshooting & error display
- Automatic assignment of QoS and security settings to the network infrastructure where applicable.

Summary

This solution was developed jointly by Enterasys Networks and Siemens Enterprise Communications. The solution leverages Enterasys NAC functionality and the Siemens HiPath DLS to simplify and automate the process of managing a VoIP environment. The solution automatically updates detailed information about every phone connected to the network. This results in improvements in asset management, change management, emergency response, mobility, and troubleshooting. Most importantly, these improvements translate directly to significant cost savings and operational efficiencies for VoIP deployments.

Contact Us

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