

# VoIP Gateway Solution



***AddPac***

**AddPac Technology**





Sales and Marketing

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# Contents

- VoIP Gateway Service Diagram
- VoIP Gateway Comparison Table
  - VoIP Gateways for SOHO (1~2 Port)
  - VoIP Gateways for SMB (~4 Port)
  - VoIP Gateways for Medium Size Business (~8 Port)
  - VoIP Gateways (~24 Port)
  - VoIP Gateways(~32 Port)
  - Large Capacity Analog VoIP Gateways(~256 Port)
  - Digital VoIP Gateways(1~16 E1/T1)
- VoIP Modules for Rack Mountable Equipment
- AddPac VoIP Gateway Service Features
- AddPac VoIP Gateway Management




# VoIP Gateways for SOHO(1~2Port)

| Product     | AP100   |             | AP100B   |                   | AP190   | AP200   |                   | AP300   |                   |
|-------------|---|-------------|--|-------------------|---|---|-------------------|---|-------------------|
|             |  |             |  |                   |  |  |                   |  |                   |
| Model       | Type  | VoIP        | Type   | VoIP              |   | Type  | VoIP              | Type  | VoIP              |
|             | P   | PSTN Backup | B  | 2FXS, PSTN Backup |   | B   | 2FXS, PSTN Backup | B   | 2FXS, PSTN Backup |
|             |   |             |  |                   |   | D   | 2FXO              |   |                   |
|             |   |             |  |                   |   | E   | 1FXS, 1FXO        |   |                   |
| VoIP Ports  | 1   |             | 2  |                   | 1   | 2   |                   | 2   |                   |
| Signaling   | SIP, H.323  |             | SIP, H.323   |                   | SIP, H.323  | SIP, H.323  |                   | SIP, H.323  |                   |
| Module Slot | N/A   |             | N/A  |                   | N/A   | N/A   |                   | N/A   |                   |
| LAN Port    | 2   |             | 2  |                   | 2   | 2   |                   | 2   |                   |
| Console     | N/A   |             | N/A  |                   | Support   | Support   |                   | Support   |                   |
| Power       | External Adaptor  |             | External Adaptor   |                   | External Adaptor  | External Adaptor  |                   | External Adaptor  |                   |



# VoIP Gateways for SMB (4 Port)

| Product     | AP700   |                          | AP1000   | AP1002  | AP1005  | AP800   |                          |
|-------------|---|--------------------------|--|---|---|---|--------------------------|
|             |  |                          |  |  |  |  |                          |
| Model       | Type  | VoIP                     |  |   |   | Type  | VoIP                     |
|             | P   | 1-Port<br>PSTN<br>Backup |  |   |   | A   | 1-Port<br>PSTN<br>Backup |
|             |   |                          |  |   |   | B   | 4-Port<br>PSTN<br>Backup |
| VoIP Ports  | 4-Port FXS  |                          | 4-Port FXS   | 2-Port FXS &<br>2-Port FXO  | 4-Port FXO  | 4-Port FXS  |                          |
| Signaling   | SIP, H.323  |                          | SIP, H.323   | SIP, H.323  | SIP, H.323  | SIP, H.323  |                          |
| Module Slot | N/A   |                          | N/A  | N/A   | N/A   | N/A   |                          |
| LAN Port    | 2   |                          | 2  | 2   | 2   | 2   |                          |
| Console     | Support   |                          | Support  | Support   | Support   | Support   |                          |
| Power       | External<br>Adaptor   |                          | External<br>Adaptor  | External<br>Adaptor   | External<br>Adaptor   | External<br>Adaptor   |                          |




# VoIP Gateways for MB (8Port)

| Product     | AP900   |                 | AP1100  |                 | AP1200  |                 |
|-------------|---|-----------------|---|-----------------|---|-----------------|
|             |  |                 |  |                 |  |                 |
| Model       | Type  | VoIP            | Type  | VoIP            | Type  | VoIP            |
|             | A   | 4 FXS,<br>4 FXO | A   | 4 FXS,<br>4 FXO | A   | 4 FXS,<br>1 FXO |
|             | B   | 8 FXS           | B   | 8 FXS           | B   | 8 FXS,<br>1 FXO |
|             | C   | 8 FXO           | C   | 8 FXO           |   |                 |
| VoIP Ports  | Up to 8-Port  |                 | Up to 8-Port  |                 | Up to 8-Port  |                 |
| Signaling   | SIP, H.323  |                 | SIP, H.323  |                 | SIP, H.323  |                 |
| Module Slot | N/A   |                 | N/A   |                 | N/A   |                 |
| LAN Port    | 2   |                 | 2   |                 | 2   |                 |
| Console     | Support   |                 | Support   |                 | Support   |                 |
| Power       | External Adaptor  |                 | External Adaptor  |                 | External Adaptor  |                 |




# VoIP Gateways (~24Port)

| Product           | AP1700  | AP1800  | AP2610  | AP2620  | AP2120N   | AP2330  |
|-------------------|---|---|---|---|---|---|
|                   |  |  |  |  |  |  |
| Available Modules | AP-FXS4<br>AP-FXO4<br>AP-FXS2O2<br>AP-E&M4<br>AP-E1                               | AP-N1-FXS8<br>AP-N1-FXO8<br>AP-N1-FXS4O4<br>AP-N1-E1                              | AP-FXS4<br>AP-FXO4<br>AP-FXS2O2<br>AP-E&M4  | AP-FXS4<br>AP-FXO4<br>AP-FXS2O2<br>AP-E&M4<br>AP-E1                                 | AP-N1-FXS8<br>AP-N1-FXO8<br>AP-N1-FXS4O4  | AP-N1-FXS8<br>AP-N1-FXO8<br>AP-N1-FXS4O4  |
| Analog Ports      | Up to 8   | Up to 16  | Up to 4   | Up to 8   | Up to 16  | Up to 24  |
| Signaling         | SIP, H.323  | SIP, H.323  | SIP, H.323  | SIP, H.323  | SIP, H.323  | SIP, H.323  |
| Digital E1/T1     | Up to 2E1   | Up to 2E1   | N/A   | Up to 2E1   | N/A   | N/A   |
| E&M               | Support   | N/A*  | Support   | Support   | Support   | N/A*  |
| Module Slot       | Two(2)  | Two(2)  | One(1)  | Two(2)  | Two(2)  | Three(3)  |
| LAN Port          | 2   | 2   | 2   | 2   | 2   | 2   |
| Console           | 1   | 1   | 1   | 1   | 1   | 1   |
| Power             | Single PSU  | Single PSU  | Single PSU  | Single PSU  | Single PSU  | Single PSU  |

# VoIP Gateways (~32Port)





| Product           | AP2340  | AP2640  | AP2650  |
|-------------------|---|---|---|
|                   |  |  |  |
| Available Modules | AP-N1-FXS8<br>AP-N1-FXO8<br>AP-N1-FXS404  | AP-FXS8<br>AP-FXO8<br>AP-FXS404<br>AP-E&M8<br>AP-E1                                 | AP-FXS8<br>AP-FXO8<br>AP-FXS404<br>AP-E&M8<br>AP-E1                                 |
| Analog Ports      | Up to 32  | Up to 32  | Up to 32  |
| Signaling         | SIP, H.323  | SIP, H.323  | SIP, H.323  |
| Digital E1/T1     | N/A   | Up to 2E1   | Up to 2E1   |
| E&M               | N/A*  | Support   | Support   |
| Module Slot       | Four(4)   | Four(4)   | Four(4)   |
| LAN Port          | 2   | 2   | 2   |
| Console           | 1   | 1   | 1   |
| Power             | Single PSU  | Single PSU  | Dual PSU  |

# Large Capacity VoIP Gateways

| Product                     | AP3100P   | AP6500  | AP6800  |
|-----------------------------|---|---|---|
|                             |  |  |  |
| Available VoIP Modules      | AP-FXS4, AP-FXO4<br>AP-FXS2O2, AP-E&M4  | AP-N1-FXS32<br>AP-N1-FXO32  | AP-N1-FXS32<br>AP-N1-FXO32  |
| Analog Ports                | Up to 60<br>(4Port Module x 15)   | Up to 128<br>(32 Port Module x 4)   | Up to 256<br>(32 Port Module x 8)   |
| Signaling                   | SIP, H.323  | SIP, H.323  | SIP, H.323  |
| CPU Redundancy (Dual CPU)   | N/A   | Support (Option)  | Support (Option)  |
| E&M                         | Support   | N/A   | N/A   |
| Module Slot for VoIP Module | 15 Slots  | 4 Slots   | 8 Slots   |
| LAN Port                    | 2   | 2   | 2   |
| Console                     | 1   | 1   | 1   |
| Dual Power Supply (Option)  | Support   | Support   | Support   |




# Digital VoIP Gateways (1~16 E1/T1)

| Product           | AP1850  | AP-MG3000  | AP-MG3800   | AP-MG5000   |
|-------------------|---|--|---|---|
|                   |  |  |  |  |
| Available Modules | AP-N1-E1<br>AP-N1-2E1   | APv2-1E1<br>APv2-2E1<br>APv2-4E1   | HIM-VoIP4E1<br>(4 E1/T1 Module)   | HIM-4E1<br>(4 E1/T1 Module)   |
| VoIP Signaling    | SIP, H.323  | SIP, H.323   | SIP, H.323  | SIP, H.323  |
| Digital E1/T1     | Up to 4E1   | Up to 4E1  | Up to 8 E1  | Up to 16E1  |
| Digital Signaling | ISDN PRI, R2  | ISDN PRI, R2   | ISDN PRI, R2  | ISDN PRI, R2  |
| Module Slot       | Two(2)  | Two(2)   | Two(2)  | Four(4)   |
| LAN Port          | 2   | 2  | 2   | 2   |
| Console           | 1   | 1  | 1   | 1   |
| Power             | Single PSU  | Single PSU   | Single PSU  | Dual PSU  |









# VoIP Modules



Target :  
AP2610, AP2620, AP1700,  
AP3100P





# VoIP Modules

DSP

| Target                          | VoIP Modules       | Module Features              | Module Picture  |
|---------------------------------|--------------------|------------------------------|---|
| AP1700,AP2610<br>AP2620,AP3100P | <b>AP-FXS4</b>     | 4-Port FXS Module            |    |
| AP1700,AP2610<br>AP2620,AP3100P | <b>AP-FXO4</b>     | 4-Port FXO Module            |    |
| AP1700,AP2610<br>AP2620,AP3100P | <b>AP-FXS2O2</b>   | 2-Port FXS&2-Port FXO Module |    |
| AP1700,AP2610<br>AP2620,AP3100P | <b>AP-E&amp;M4</b> | 4-Port E&M Module            |   |
| AP1700,AP2610<br>AP2620,AP3100P | <b>AP-FXS3O1</b>   | 3-Port FXS&1-Port FXO Module |  |
| AP1700, AP2620                  | <b>AP-E1</b>       | 1-Port Digital E1/T1 Module  |  |

# Additional VoIP Modules

DSP







| Target            | Voice Modules | Module Features  | Module Picture  |
|-------------------|---------------|--|---|
| AP2610,<br>AP2620 | AP-MP3        | 1-Pair Audio-In/Out Port, Direct MIC-In, Headphone<br>High Quality <b>Audio Band</b> IP Broadcasting |    |
| AP2610<br>AP2620  | AP-AUDIO2     | 2-Pair Audio-In/Out Ports<br><b>Voice Band</b> IP Broadcasting                                       |    |
| AP2610,<br>AP2620 | AP-AUD1S3     | 1-Pair Audio-In/Out Ports, FXS Analog Interface<br><b>Voice Band</b> IP Broadcasting                 |  |
| AP2610,<br>AP2620 | AP-AUD1S2O1   | 1-Pair Audio-In/Out Ports, FXS 2-Ports, FXO 1-Port<br><b>Voice Band</b> IP Broadcasting              |  |




Target :  
AP2120N, AP2640, AP2650

# VoIP Modules

DSP

| Target                      | VoIP Modules       | Module Features              | Module Picture  |
|-----------------------------|--------------------|------------------------------|---|
| AP2120N<br>AP2640<br>AP2650 | <b>AP-FXS8</b>     | 8-Port FXS Module            |    |
| AP2120N<br>AP2640<br>AP2650 | <b>AP-FXO8</b>     | 8-Port FXS Module            |    |
| AP2120N<br>AP2640<br>AP2650 | <b>AP-FXS4O4</b>   | 4-Port FXS&4-Port FXO Module |    |
| AP2120N<br>AP2640<br>AP2650 | <b>AP-E&amp;M8</b> | 8-Port E&M Module            |  |
| AP2640<br>AP2650            | <b>AP-E1</b>       | 1-Port Digital E1/T1 Module  |  |
| AP2640<br>AP2650            | <b>AP-2E1</b>      | 2-Port Digital E1/T1 Module  |  |








Target :  
AP1800, AP2330, AP2340,  
AP1850



# VoIP Modules

DSP



| Target                     | VoIP Modules        | Module Features              | Module Picture  |
|----------------------------|---------------------|------------------------------|---|
| AP1800<br>AP2330<br>AP2340 | <b>AP-N1-FXS8</b>   | 8-Port FXS Module            |    |
| AP1800<br>AP2330<br>AP2340 | <b>AP-N1-FXO8</b>   | 8-Port FXO Module            |    |
| AP1800<br>AP2330<br>AP2340 | <b>AP-N1-FXS4O4</b> | 4-Port FXS&4-Port FXO Module |   |
| AP1800<br>AP1850           | <b>AP-N1-E1</b>     | 1-Port Digital E1/T1 Module  |  |
| AP1800<br>AP1850           | <b>AP-N1-2E1</b>    | 2-Port Digital E1/T1 Module  |  |



Target :  
AP6500, AP6800

# VoIP Modules

DSP




| Target           | VoIP Modules       | Module Features    | Module Picture  |
|------------------|--------------------|--------------------|---|
| AP6500<br>AP6800 | <b>AP-N1-FXS32</b> | 32-Port FXS Module |  |
| AP6500<br>AP6800 | <b>AP-N1-FXO32</b> | 32-Port FXO Module |  |



Target :  
AP-MG3000

# VoIP Modules

DSP


| Target    | VoIP Modules | Module Features             | Module Picture   |
|-----------|--------------|-----------------------------|--|
| AP-MG3000 | APv2-1E1     | 1-Port Digital E1/T1 Module |   |
| AP-MG3000 | APv2-2E1     | 2-Port Digital E1/T1 Module |   |
| AP-MG3000 | APv2-4E1     | 4-Port Digital E1/T1 Module |  |



Target :  
AP-MG3800, AP-MG5000

# VoIP Modules

DSP

| Target                  | VoIP Modules       | Module Features                | Module Picture   |
|-------------------------|--------------------|--------------------------------|--|
| AP-MG3800,<br>AP-MG5000 | <b>HIM-VOIP4E1</b> | 4-Port Digital E1/T1<br>Module |  |

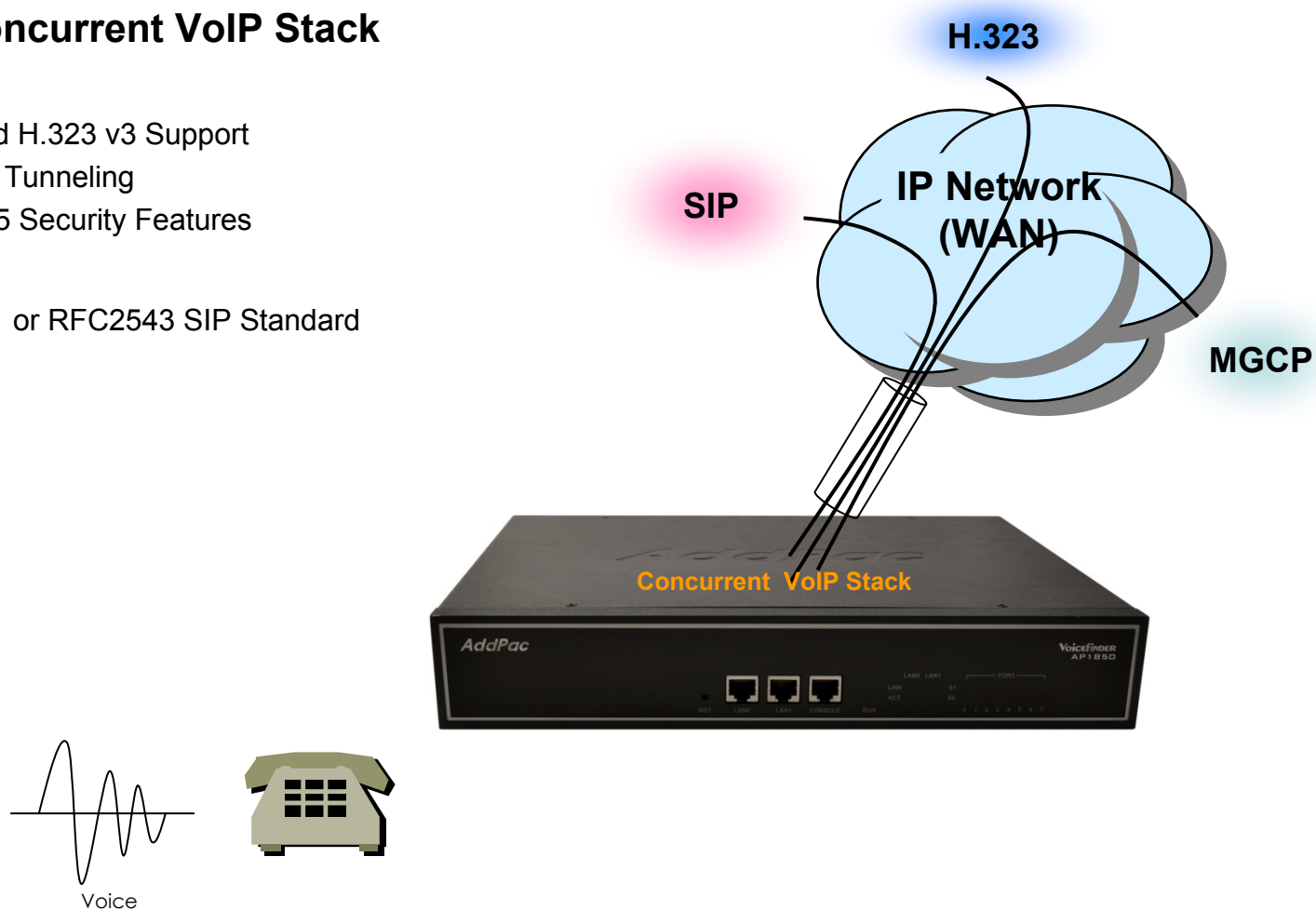


# VoIP Gateway Service Features



# VoIP (Voice over IP) Service

- **H.323, SIP Concurrent VoIP Stack**
- **H.323**
  - ITU-T Standard H.323 v3 Support
  - Support H.245 Tunneling
  - Including H.235 Security Features
- **SIP**
  - IETF RFC3261 or RFC2543 SIP Standard



# VoIP (Voice over IP) Service

- **H.323**

- Fast connect, normal connect support
- H.245 tunneling support
- Q.931 response message setting for inbound VoIP calls
- H.245 logical channel open timing selection function
- Start H.245 procedure support
- DTMF / Hook flash relay with H.245 alphanumeric / signal
- Secondary gatekeeper support
- Gatekeeper assignment according to the domain name
- Gatekeeper discovery with multicast
- Lightweight RRQ support
- Signaling TCP port assignment
- Resource threshold setting with RAI
- H.235 clear-token, crypto-token support
- canMapAlias support
- Technical prefix (supported prefix) support
- Public IP assignment in NAT environment

- **SIP**

- Gateway-based / Endpoint-based registration support
- Secondary proxy-server assignment function
- SIP signaling port change function
- SIP proxy server assignment according to the domain name
- T.38 real-time fax relay support
- DTMF relay support with RFC2833 / OPTION message
- Re-INVITE support

# VoIP (Voice over IP) Service

- **Voice Codec**

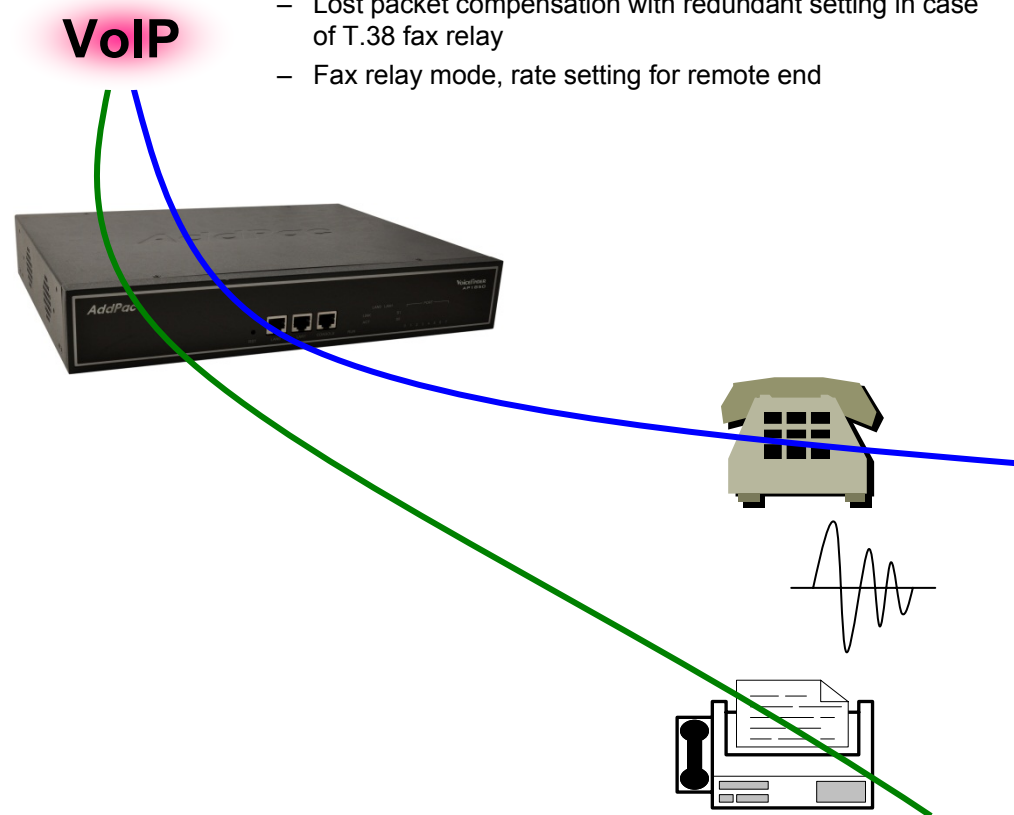
- G.711 A-Law, G.711 U-Law
- G.726 r16, G.726 r32
- G.729A
- G.723.1 r63, G.723.1 r53
- VAD (Voice Activity Detection) function support
- DTMF relay support (H.323, SIP, MGCP common) based on RFC2833

- **RTP**

- Redundant RTP packet transmission in case of severe packet loss
- Dynamic jitter buffer management and RTP packet jitter and loss compensation with heuristic & DSP error concealment
- Static jitter buffer setting support
- Voice frame per RTP packet number control for each codec
- In-band ring-back tone support
- Virtual ring-back tone support
- Tone parameter change support

- **FAX**

- Fax relay mode supporting T.38, inband-T.38, bypass mode
- Lost packet compensation with redundant setting in case of T.38 fax relay
- Fax relay mode, rate setting for remote end



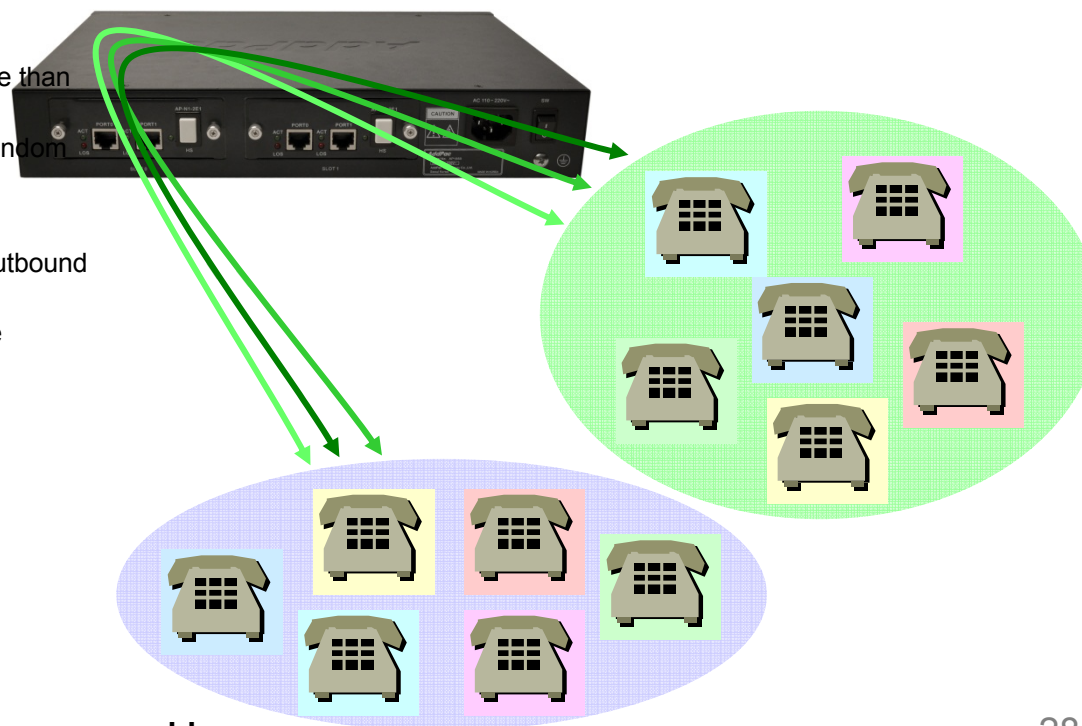
# VoIP (Voice over IP) Service

## • VoIP Call Controls

- Hot line connection function with PLAR (Private Line Auto Ring Down)
- Leased line emulation function
- Connection monitoring function
- Fault tolerant with Redundancy and Call Distribution among Gateways for load balancing
- Call attempt with IP address
- H.323, SIP, MGCP inbound call connection for each voice port
- Multiple E.164 setting for one voice port
- One E.164 or digit pattern can be assigned to more than one voice port
- Hunting with Longest match/ priority/ sequence/ random
- One stage call setup by Digit forwarding
- Call barring with specific digit patterns
- Calling and called number conversion for PSTN outbound calls
- PSTN rerouting in case of VoIP call attempt failure

## • VoIP Call Controls (cont.)

- Call transfer for internal calls
- Call pickup for internal calls
- Calling and called number conversion for VoIP outbound calls
- Calling and called number conversion for VoIP inbound calls
- Fax broadcasting call control



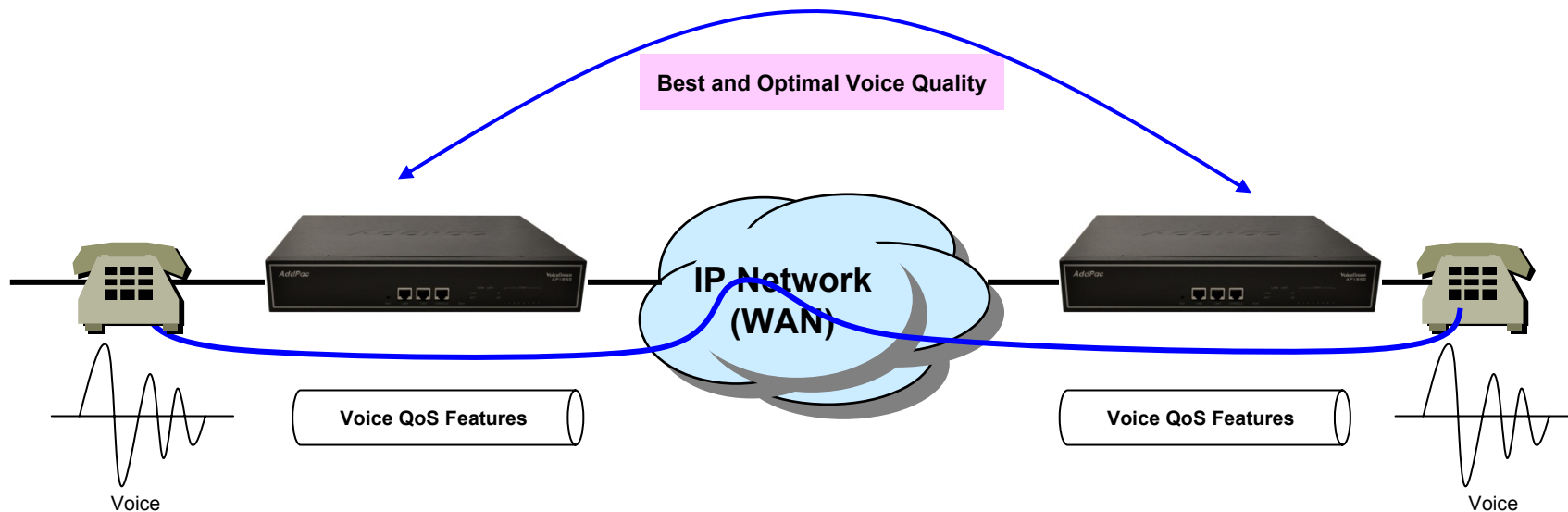
# Advanced QoS Features

- **Enhances Transmit Voice QoS Features**

- Voice Traffic Priority Queuing
- QoS Service Profiling
- Providing Virtual Network Transmit Algorithm
- Real-time Voice Traffic QoS Support
- RTP Packet Transmit Interval Control
- Supporting RTP Packet Redundancy Scheme
- IP Header Control such as ToS, Diffserv

- **Enhances Receive Voice QoS Features**

- Dynamic Jitter Buffer Management
- Error Concealment
- Support T.38 FAX Data Error Recovery Scheme



# Network Protocols

- **Basic Network Protocols**

- ARP, IPv4, TCP, UDP, ICMP, SCTP, IGMP, MLD

- **Routing Protocol**

- IPv4 : Static

- **Service Protocol**

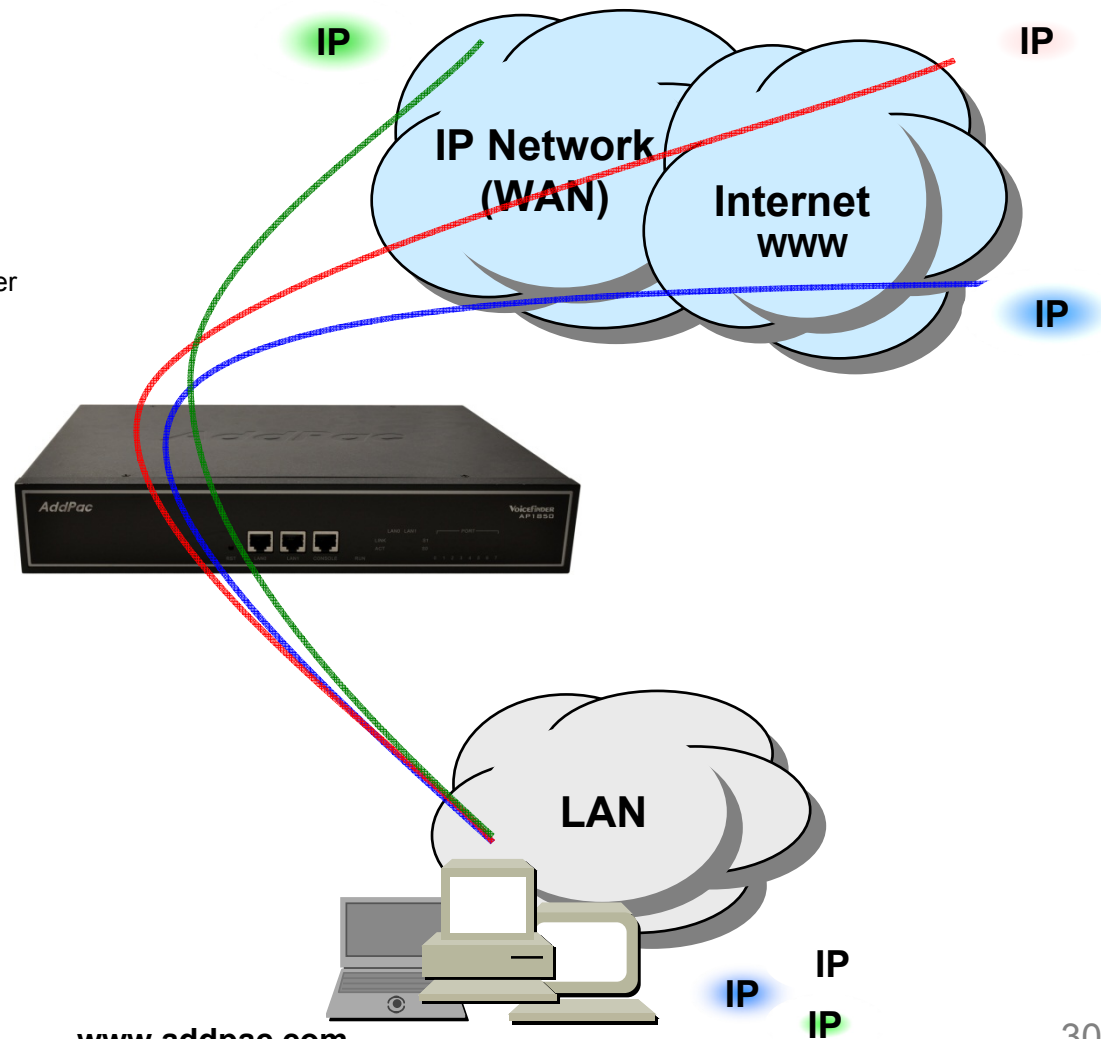
- FTP, Telnet, TFTP, DHCP Server/Relay, SNMP Server
- CDP (Cisco Discovery Protocol)
- DNS Resolver , DDNS(nsupdate)
- Bridge
- Syslog

- **IPv4 Address Configuration**

- Fixed (Static)
- DHCP
- PPPoE

- **Miscellaneous**

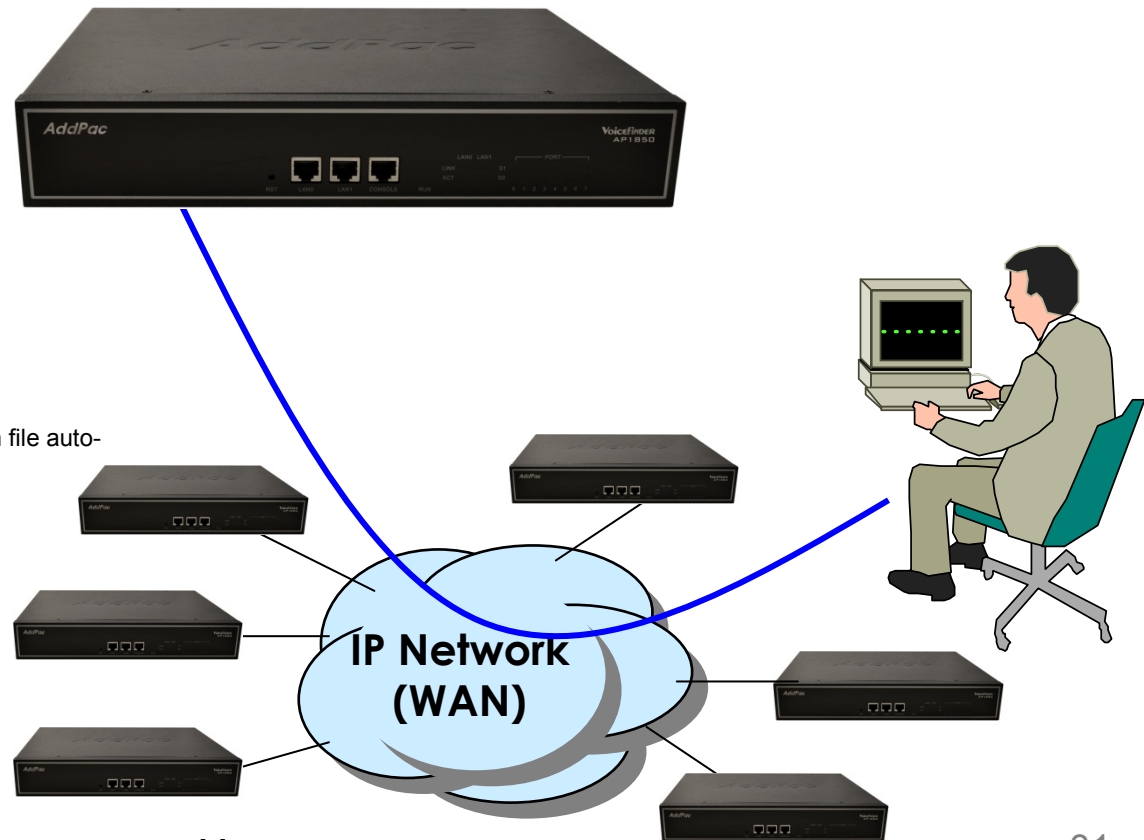
- Cisco Style CLI
- Standard & Extended IPv4 Access List
- Multi-level User Account Management
- IP accounting
- STUN Client



# Network Management

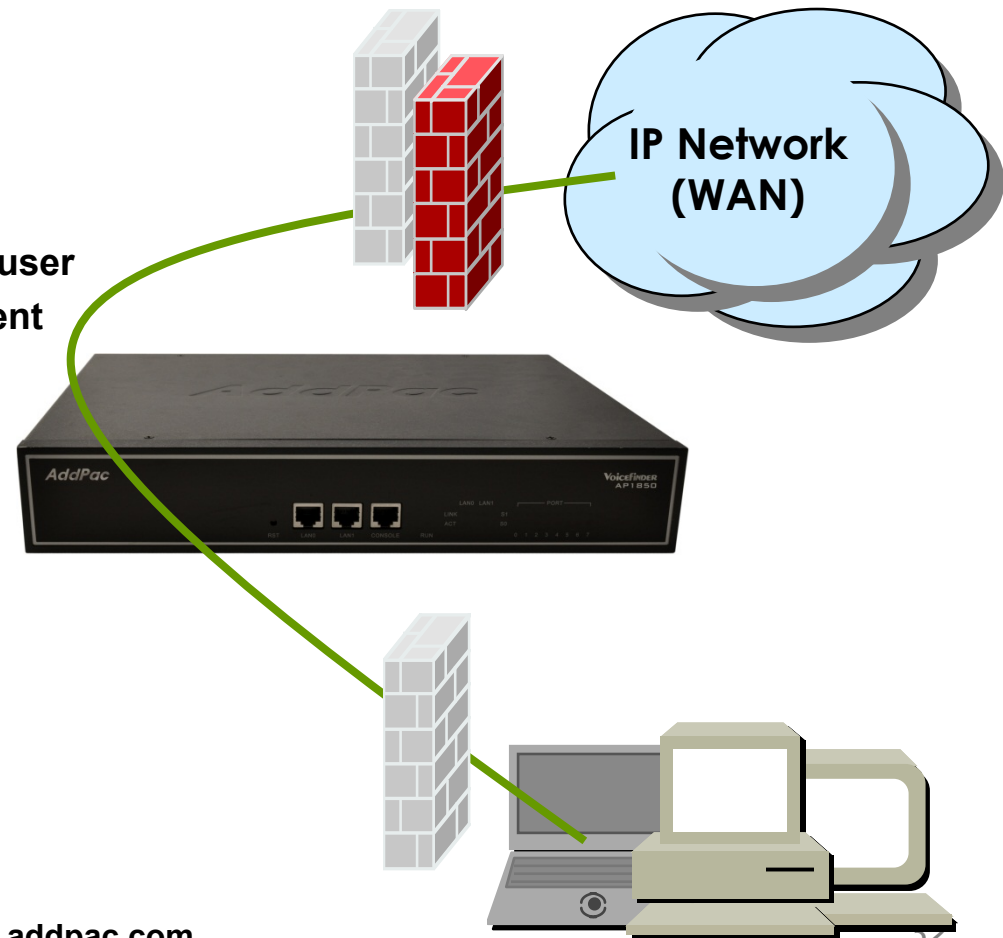
- **SNMP**
  - Standard Simple Network Management Protocol( SNMP) Agent support
  - MIB v1 and v2 Support
- **Web-based Management**
  - Smart Easy Setup
  - Standard Voice Interface
  - Standard PSTN Back-up Interface
- **Watch-dog Function**
  - Hardware, Software watch-dog services
- **Remote Management**
  - Telnet
  - Rlogin
- **Auto Upgrade Service**
  - HTTP server based APOS image and configuration file auto-upgrade support
- **Batch Job Function**
  - Text based script downloading

- **Interoperable with AP-VPMS Service**
  - AddPac VoIP Plug & Play Management System (AP-VPMS)



# Security Management

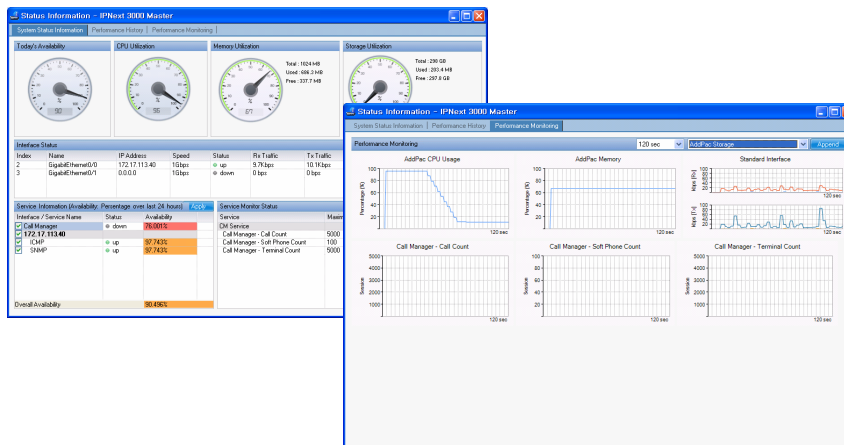
- IP packet filtering
- IP access list
- User authentication function
  - Password Authentication Protocol (PAP)
  - Challenge Handshake Authentication Protocol (CHAP)
- Enable/Disable specific protocols
- Auto-square connect of Telnet session
- Account Management function for multi-level user
- SNMP/TELNET/FTP/HTTP/TFTP port assignment function
- SNMP/TELNET/FTP access list management
- Boot mode security checking function





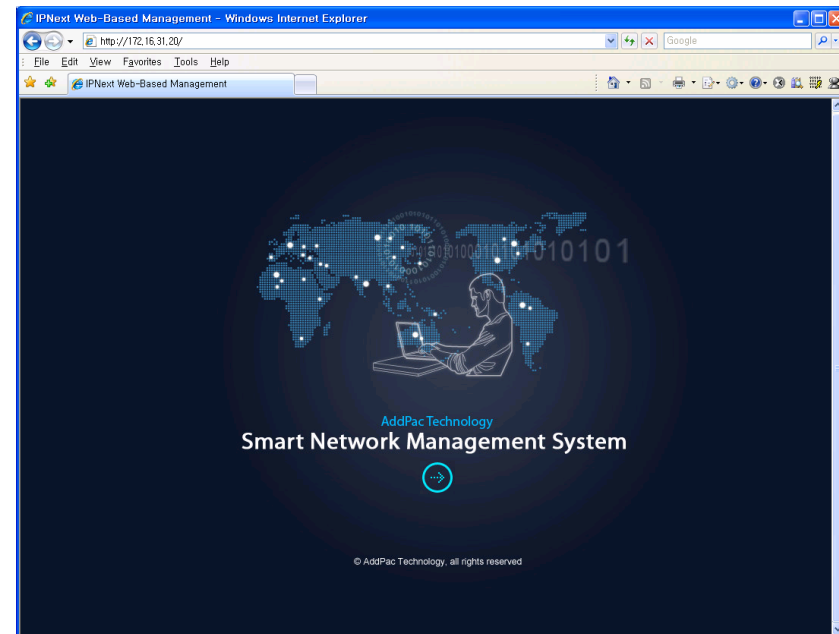
# Smart NMS

## Smart Network Management System for VoIP Gateway



# Contents

- System Requirement
- Smart NMS Networking Diagram
- Web-based Management
- Network Resource Management
- Device Fault Management
- Device Fault History Management
- Device Status Information
- Notification Management
- Fault Statistics
- Model & Service Management



# System Requirement

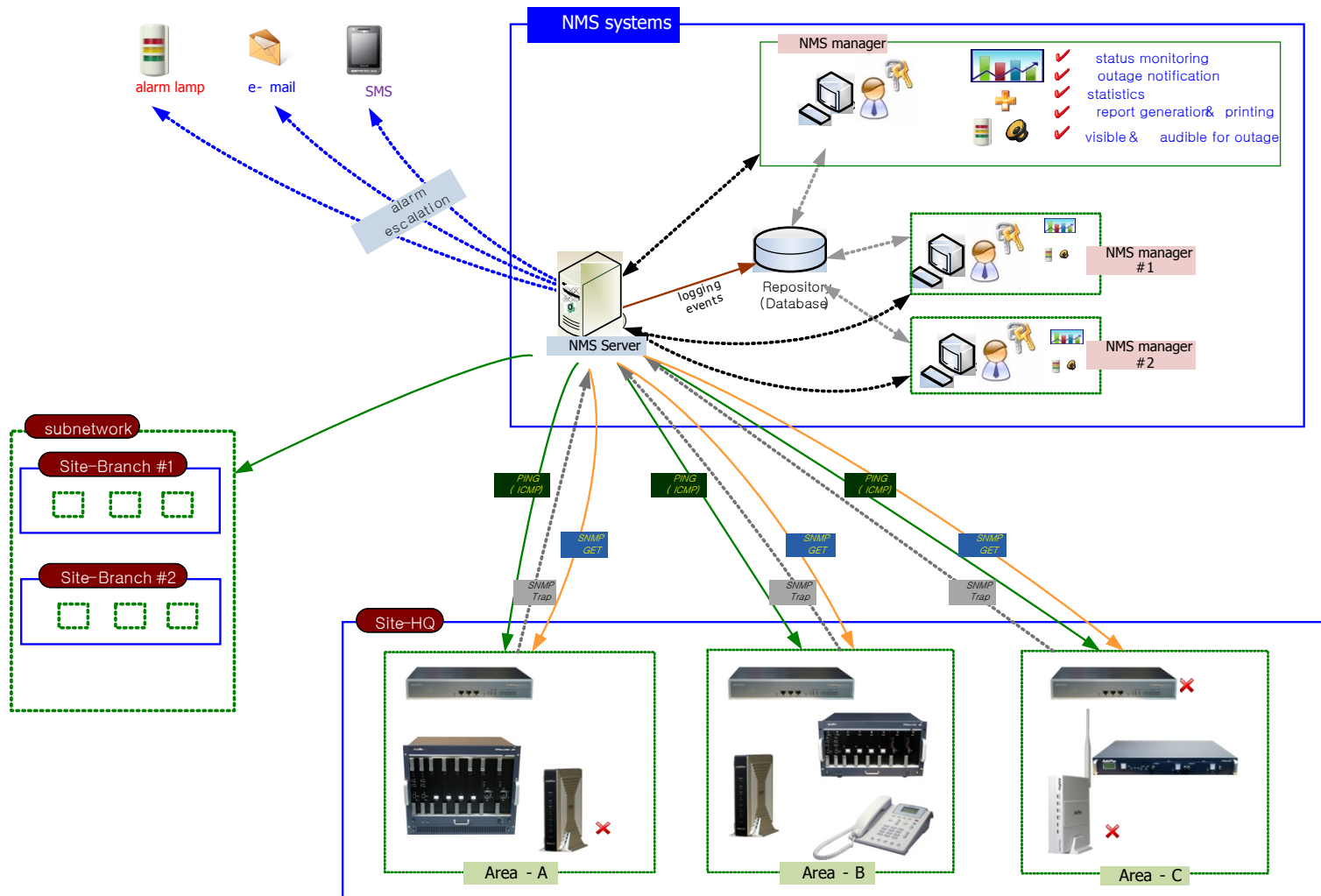
## NMS Server

- OS : RHEL (Redhat Enterprise Linux) 5.0 or higher
- CPU : Quad-Core 2.0 GHz / 1333MHz FSB 2x4 MB cache
- Physical Memory : 4 GB
- HDD : 300 G
- JRE (Java Runtime Environment) 1.5.1 or Higher
- Database : PostgreSQL 8.1.11

## NMS Client

- Windows XP, Vista, Windows Server 2000/2003
- Microsoft Internet Explorer 6.0 or higher

# NMS Networking Diagram



# Web-based Management

- **Easy Access via Web browser**
  - Microsoft Internet Explorer 6.0 or higher compatible
- **Version Control**
  - Automatic version check
  - New version software download feature
- **UI control**
  - User friendly GUI management

# Version Control

The screenshot displays the IPNext Web-Based Management interface within a Windows Internet Explorer browser window. The browser's address bar shows the URL `http://172.16.31.20/`. The main content area features a dark blue background with a world map and a person using a laptop, with the text "AddPac Technology Smart Network Management System" and a copyright notice "© AddPac Technology, all rights reserved." at the bottom.

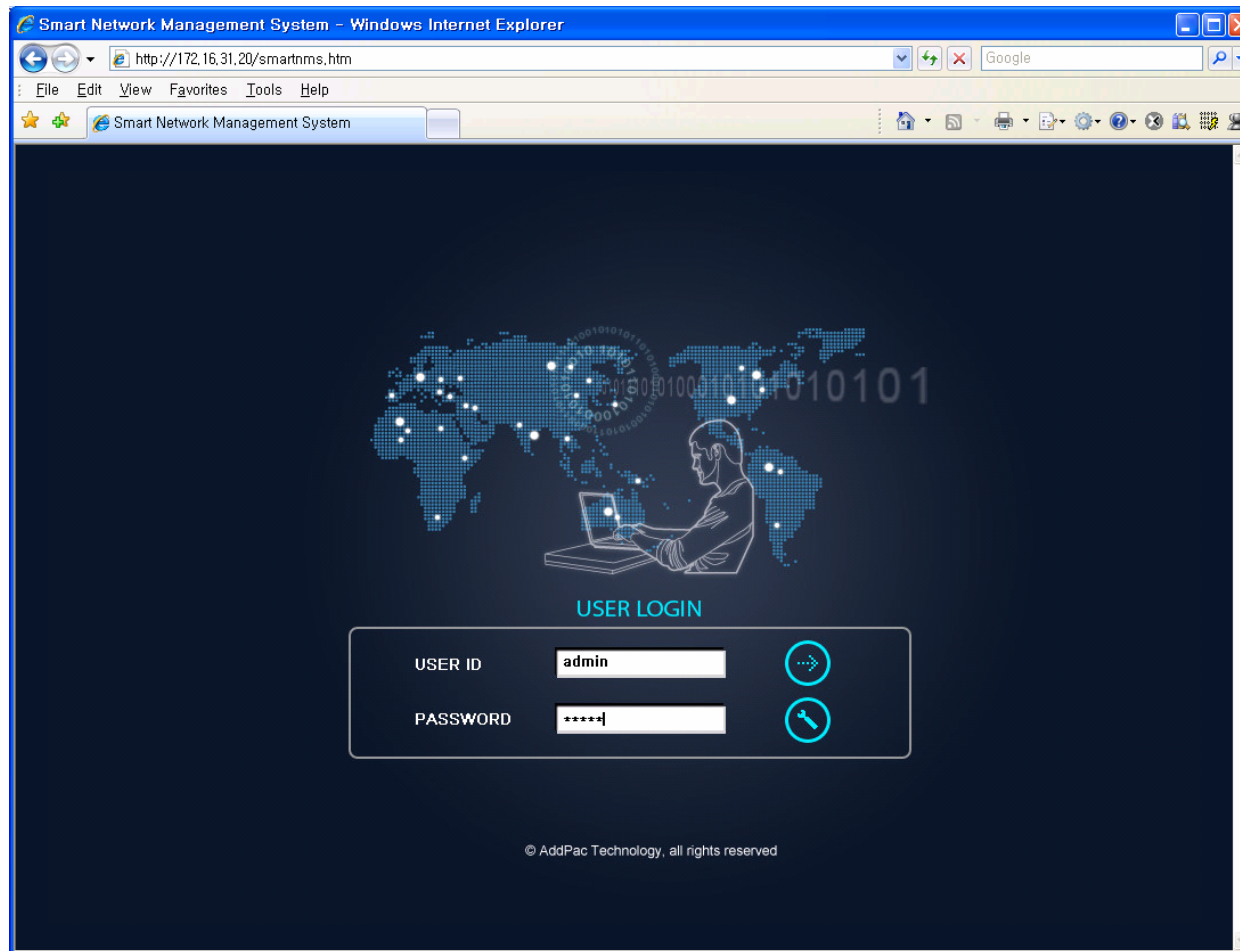
Two yellow callout boxes highlight key features:

- Automatic version check:** A yellow box with an arrow pointing to the top of the main interface.
- New S/W version update:** A yellow box with an arrow pointing to the bottom of the main interface.

Two Windows dialog boxes are overlaid on the interface:

- Launching Application:** A dialog box with a blue title bar and a close button. It contains a progress bar and the text: "Verifying application requirements. This may take a few moments."
- (61%) Downloading installnms:** A dialog box with a blue title bar and standard window controls. It contains the text: "Downloading installnms. This may take several minutes. You can use your computer to do other tasks during the installation." Below this is a progress bar showing 61% completion, with the text: "Name: installnms", "From: 172.16.31.20", and "Downloading: 6.29 MB of 10.1 MB". A "Cancel" button is at the bottom right.

# Web-based Login



# Network Resource Management

- Network resource management with hierarchical structure
- Role-based resource management for each administrator

The screenshot displays the AddPac Network Resource Management interface. On the left, a hierarchical tree structure shows the organization of network resources, including sites like 'AddPac' and 'Seoul', and various sub-networks and branches. A context menu is open over the 'GangNamGu' node, with 'Execute SMM' highlighted. An orange callout box points to this menu with the text: 'can cooperate with the application executables such as SMM'. In the center, a table lists device categories such as Desktop, Network Camera, Phone, Server, Switch, and VoIP Gateway. An orange callout box points to this table with the text: 'manage the complex network with a structured, hierarchical form'. On the right, a 'User Properties' dialog box is open, showing a 'Site' tab with a tree view of the same hierarchical structure. An orange callout box points to this dialog with the text: 'can assign the hierarchical node to the operator and manage role-based policy'. At the bottom, a status bar indicates 'Total Categories : 6'.



# Device Fault Management

- Centralized fault summary information in main window
- Display current fault device through tree view
- Notify administrator with detailed fault information
- Provide device availability information for 24hrs

# Device Fault Management

main window

The screenshot displays the Smart Network Management System (NMS) interface. The main window shows a navigation menu with options like NMS, Account, Configuration, Monitoring, Notification, Fault, Statistics, and View. The interface is divided into several sections:

- Current Outage Devices (11):** A tree view showing the hierarchy of devices. A red arrow points to this section, labeled "current device fault list with hierarchy view".
- Service Outages:** A table showing site-level outages. A red arrow points to the "AddPac" site row, labeled "site device fault summary".
- Overall Availability:** A summary bar at the bottom of the Service Outages table showing "Overall Availability 30 / 11 / 34 78.650%". A red arrow points to this bar, labeled "overall total device fault statistics".
- Device Categories:** A table showing the availability of various device categories. A red arrow points to the "Server" category row, labeled "device fault summary for category (classification)".
- Your Outstanding Notices (16):** A table showing a list of fault events. A red arrow points to the first row, labeled "current device fault event message as shown as below".

# Device Fault Management

Smart Network Management System - Windows Internet Explorer

http://172.16.31.20/smartnms.htm

NMS Account Configuration Monitoring Notification Fault Statistics View Help

Current Outage Devices [12]

| Name             | Service... | Availability |
|------------------|------------|--------------|
| Branch AQ        |            |              |
| NMS Camera       | 6 of 12    | 48.994 %     |
| NMS_IP_PBX...    | 3 of 3     | 0.000 %      |
| Branch GX        |            |              |
| 00_IVR_server    | 3 of 3     | 0.000 %      |
| 00_IVR_slave...  | 3 of 3     | 0.000 %      |
| 00_NR_server     | 1 of 2     | 98.015 %     |
| 00_PS_server     | 3 of 3     | 0.000 %      |
| 00_PS_Slave...   | 2 of 3     | 32.703 %     |
| IPNext 3000 ...  | 1 of 3     | 90.536 %     |
| IPNext 3000 S... | 1 of 3     | 90.584 %     |
| UMS slave        | 3 of 3     | 0.000 %      |
| HeadQuarter      |            |              |
| UMS serverfo...  | 3 of 3     | 0.000 %      |
| Subnetwork #2    |            |              |
| NMS_SOHO_...     | 2 of 2     | 92.939 %     |

Service Outages Device Monitoring - <All>

Group Type Value View Mode Refresh Import

display message icon when the device have a notification for event

device status matrix with several severity such as critical, major, minor

- \* severity color
- 1) red : critical
- 2) orange : major
- 3) light blue : normal

Total Monitoring Devices : 34

| ACK ID | Send Time             | Site                  | Device Name        | IP Address    | Service      | Message   |
|--------|-----------------------|-----------------------|--------------------|---------------|--------------|---|
| 9525   | 4/10/2009 5:21:06 PM  | /AddPac/Branch GX     | 00_IVR_server      | 172.17.111.21 | SNMP         | 인터페이스 172.17.111.21 (172.17.111.21)의 장비명(00_IVR_server)의 서비스 SNMP가 2009년 4월 10일 금요일 오후 5시 21분 06초에 실패함.             |
| 9502   | 4/10/2009 3:34:29 PM  | /Subnetwork #2/Center | NMS_SOHO_PBX       |               |              | device NMS_SOHO_PBX, all services are down  |
| 9495   | 4/10/2009 11:37:12 AM | /AddPac/Branch GX     | IPNext 3000 Slave  | 172.17.113.41 | Call Manager | interface 172.17.113.41 (172.17.113.41) device (IPNext 3000 Slave) service Call Manager 2009-4-10 11:37:12 failed.  |
| 9494   | 4/10/2009 11:37:12 AM | /AddPac/Branch GX     | IPNext 3000 Master | 172.17.113.40 | Call Manager | interface 172.17.113.40 (172.17.113.40) device (IPNext 3000 Master) service Call Manager 2009-4-10 11:37:12 failed. |
| 9418   | 4/9/2009 2:20:01 PM   | /AddPac/Branch GX     | 00_IVR_server      |               |              | device 00_IVR_server all services are down.   |

Your Outstanding Notices [17]

4/10/2009 5:16:30 PM 172.16.31.20:5101 admin Version 1.2,3384

# Device Fault Management

The screenshot displays the Smart Network Management System (NMS) interface within a Windows Internet Explorer browser. The main content area shows a 'device status matrix with small view mode' containing various network devices such as servers, routers, and cameras, each with a status icon (green for OK, red for fault). A red arrow points to a specific 'NMS Camera' device that is highlighted with a red box.

Below the device matrix, there is a section titled 'Your Outstanding Notices (18)' which contains a table of alerts:

| Ack                      | ID   | Send Time             | Site                 | Device Name        | IP Address     | Service      | Message  |
|--------------------------|------|-----------------------|----------------------|--------------------|----------------|--------------|--|
| <input type="checkbox"/> | 9535 | 4/10/2009 9:26:04 PM  | /AddPac/Branch GX    | 00_RBT_server      |                |              | device 00_RBT_server's all services are down.  |
| <input type="checkbox"/> | 9527 | 4/10/2009 5:34:10 PM  | /AddPac/HeadQuarter  | 5th floor meeting  |                |              | device 5th floor meeting room phone device, all services are down.   |
| <input type="checkbox"/> | 9502 | 4/10/2009 3:34:29 PM  | /Subnetwork #2/Cent. | NMS_SOHD_PBX       |                |              | device NMS_SOHD_PBX, all services are down   |
| <input type="checkbox"/> | 9495 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX    | IPNext 3000 Slave  | 172.17.113.41  | Call Manager | interface 172.17.113.41 (172.17.113.41) device (IPNext 3000 Slave) service Call Manager 2009-4-10 11:37:12 failed.   |
| <input type="checkbox"/> | 9494 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX    | IPNext 3000 Master | 172.17.113.40  | Call Manager | interface 172.17.113.40 (172.17.113.40) device (IPNext 3000 Master) service Call Manager 2009-4-10 11:37:12 failed   |
| <input type="checkbox"/> | 9418 | 4/9/2009 2:20:01 PM   | /AddPac/Branch GX    | 00_IVR_server      |                |              | device 00_IVR_server all services are down.  |
| <input type="checkbox"/> | 9396 | 4/9/2009 10:57:37 AM  | /AddPac/Branch AQ    | NMS_IP_PBX_3...    |                |              | device NMS_IP_PBX_31.13 all services down.   |
| <input type="checkbox"/> | 9239 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ    | NMS Camera 2       | 172.16.253.118 |              | device [NMS_Camera 2] interface 172.16.253.118 (172.16.253.118) not response or delete by administrator              |
| <input type="checkbox"/> | 9238 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ    | NMS Camera 2       | 172.16.253.118 | ICMP         | device [NMS_Camera 2] interface 172.16.253.118 (172.16.253.118) service ICMP not response or delete by administrator |

# Device Fault History Management

- Provide both summary view and detailed event message
- Can Write troubleshooting job note for each event manually
- Administrator can query for a history fault with search condition
- Each fault is related to the several raw events

# Device Fault History Management

The screenshot displays the Smart Network Management System (NMS) interface. The main window shows a list of fault events with columns for Date/Time, Outstanding status, and Acknowledge status. An orange callout box on the left points to the 'Notification Summary' table, labeled 'daily fault event summary statistics information'. Another orange callout box on the right points to the 'Advanced Search' dialog, labeled 'detail fault event history list up with filter condition (advanced search)'. The 'Advanced Search' dialog includes filters for Sub Network, Site, IP Address, Notice Status Type, Level (Severity), Message, and Notices After/Before. Below the main list, there is a section for 'Your Outstanding Notices (17)' with a detailed table of fault events.

| Date/Time  | Outstanding | Acknowledge |
|------------|-------------|-------------|
| 2009-04-10 | 4           | 27          |
| 2009-04-09 | 2           | 76          |
| 2009-04-08 | 0           | 96          |
| 2009-04-07 | 0           | 40          |
| 2009-04-06 | 7           | 489         |
| 2009-04-05 | 0           | 722         |
| 2009-04-04 | 0           | 708         |
| 2009-04-03 | 1           | 476         |
| 2009-04-02 | 0           | 248         |
| 2009-04-01 | 0           | 19          |
| 2009-03-31 | 0           | 37          |
| 2009-03-30 | 0           | 9           |
| 2009-03-29 | 0           | 3           |
| 2009-03-28 | 0           | 1           |
| 2009-03-27 | 0           | 14          |
| 2009-03-26 | 0           | 52          |
| 2009-03-25 | 0           | 8           |
| 2009-03-24 | 0           | 19          |
| 2009-03-23 | 0           | 59          |
| 2009-03-22 | 0           | 102         |
| 2009-03-21 | 0           | 17          |
| 2009-03-20 | 0           | 21          |
| 2009-03-18 | 0           | 48          |
| 2009-03-17 | 0           | 41          |
| 2009-03-13 | 0           | 36          |
| 2009-03-07 | 0           | 1           |
| 2009-03-06 | 0           | 482         |
| 2009-03-05 | 0           | 38          |
| 2009-03-04 | 0           | 13          |

| Ack                      | ID   | Send Time            | Site                | Device Name                         | IP Address   | Service | Message  | Status            | Respond Time         |
|--------------------------|------|----------------------|---------------------|-------------------------------------|--------------|---------|--|-------------------|----------------------|
| <input type="checkbox"/> | 9528 | 4/10/2009 5:51:06 PM | /AddPac/Branch AQ   | NMS Camera                          | 172.16.4.180 | SNMP    | interface 172.16.4.180 (172.16.4.180) device(NMS Camera) service SNMP failed at 2009-4-10 5:51 06 PM | auto-acknowledged | 4/10/2009 5:51:35 PM |
| <input type="checkbox"/> | 9527 | 4/10/2009 5:34:10 PM | /AddPac/HeadQuarter | 5th floor meeting room phone device |              |         | device 5th floor meeting room phone device, all services are down.                                   | auto-acknowledged | 4/10/2009 5:35:25 PM |
| <input type="checkbox"/> | 9526 | 4/10/2009 5:33:42 PM | /AddPac/Branch GX   | 00_NR_server                        | 172.17.11.1  |         |  | auto-acknowledged | 4/10/2009 5:22:43 PM |
| <input type="checkbox"/> | 9525 | 4/10/2009 5:21:06 PM | /AddPac/Branch GX   | 00_NR_server                        | 172.17.11.1  |         |  | auto-acknowledged | 4/10/2009 5:17:56 PM |
| <input type="checkbox"/> | 9524 | 4/10/2009 5:17:29 PM | /AddPac/Branch GX   | 00_NR_server                        | 172.17.11.1  |         |  | auto-acknowledged | 4/10/2009 5:17:56 PM |
| <input type="checkbox"/> | 9522 | 4/10/2009 3:36:26 PM | /AddPac/HeadQuarter | IP_PBX_Slave(our company)           |              |         |  | auto-acknowledged | 4/10/2009 4:03:13 PM |
| <input type="checkbox"/> | 9521 | 4/10/2009 3:36:18 PM | /AddPac/HeadQuarter | PS_server(our co...                 |              |         |  | auto-acknowledged | 4/10/2009 4:03:13 PM |
| <input type="checkbox"/> | 9520 | 4/10/2009 3:36:17 PM | /AddPac/HeadQuarter | RBT_server(our company)             |              |         |  | auto-acknowledged | 4/10/2009 4:03:13 PM |
| <input type="checkbox"/> | 9519 | 4/10/2009 3:36:17 PM | /AddPac/HeadQuarter | UMS_server #2                       |              |         |  | auto-acknowledged | 4/10/2009 4:03:13 PM |
| <input type="checkbox"/> | 9518 | 4/10/2009 3:36:09 PM | /AddPac/HeadQuarter | Recording Server (our company)      |              |         |  | auto-acknowledged | 4/10/2009 4:03:13 PM |
| <input type="checkbox"/> | 9517 | 4/10/2009 3:36:08 PM | /AddPac/HeadQuarter | company_MCU_s...                    |              |         |  | auto-acknowledged | 4/10/2009 4:03:14 PM |
| <input type="checkbox"/> | 9516 | 4/10/2009 3:36:00 PM | /AddPac/Branch GX   | 00_PS_Slave_ser...                  |              |         |  | auto-acknowledged | 4/10/2009 4:03:13 PM |
| <input type="checkbox"/> | 9514 | 4/10/2009 3:35:50 PM | /AddPac/Branch GX   | 00_PS_server                        |              |         |  | auto-acknowledged | 4/10/2009 4:02:54 PM |
| <input type="checkbox"/> | 9513 | 4/10/2009 3:35:41 PM | /AddPac/HeadQuarter | 5th floor meeting room phone device |              |         |  | auto-acknowledged | 4/10/2009 4:02:43 PM |
| <input type="checkbox"/> | 9512 | 4/10/2009 3:35:41 PM | /AddPac/HeadQuarter | IP_PBX_Master (our company)         |              |         |  | auto-acknowledged | 4/10/2009 4:02:44 PM |
| <input type="checkbox"/> | 9511 | 4/10/2009 3:35:33 PM | /AddPac/Branch KT   | 172.16.51.12                        |              |         |  | auto-acknowledged | 4/10/2009 4:02:43 PM |

| Ack                      | ID   | Send Time             | Site                  | Device Name             | IP Address     | Service      | Message   |
|--------------------------|------|-----------------------|-----------------------|-------------------------|----------------|--------------|---|
| <input type="checkbox"/> | 9527 | 4/10/2009 5:34:10 PM  | /AddPac/HeadQuarter   | 5th floor meeting ro... |                |              | device 5th floor meeting room phone device, all services are down.  |
| <input type="checkbox"/> | 9502 | 4/10/2009 3:34:29 PM  | /Subnetwork #2/Center | NMS_SOHD_PBX            |                |              | device NMS_SOHD_PBX, all services are down  |
| <input type="checkbox"/> | 9495 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX     | IPNext 3000 Slave       | 172.17.113.41  | Call Manager | interface 172.17.113.41 (172.17.113.41) device (IPNext 3000 Slave) service Call Manager 2009-4-10 11:37:12 failed.    |
| <input type="checkbox"/> | 9494 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX     | IPNext 3000 Master      | 172.17.113.40  | Call Manager | interface 172.17.113.40 (172.17.113.40) device (IPNext 3000 Master) service Call Manager 2009-4-10 11:37:12 failed.   |
| <input type="checkbox"/> | 9418 | 4/9/2009 2:20:01 PM   | /AddPac/Branch GX     | 00_IVR_server           |                |              | device 00_IVR_server all services are down.   |
| <input type="checkbox"/> | 9396 | 4/9/2009 10:57:37 AM  | /AddPac/Branch AQ     | NMS_IP_PBX_31.13        |                |              | device NMS_IP_PBX_31.13 all services down.  |
| <input type="checkbox"/> | 9239 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ     | NMS Camera 2            | 172.16.253.118 |              | device (NMS Camera 2) interface 172.16.253.118 (172.16.253.118) not response or delete by administrator               |
| <input type="checkbox"/> | 9238 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ     | NMS Camera 2            | 172.16.253.118 | ICMP         | device (NMS Camera 2) interface 172.16.253.118 (172.16.253.118) service ICMP not response or deleted by administrator |
| <input type="checkbox"/> | 9237 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ     | NMS Camera 2            | 172.16.253.118 | SNMP         | device (NMS Camera 2) interface 172.16.253.118 (172.16.253.118) service SNMP not response or deleted by administrator |

# Device Fault History Management

The screenshot displays the Smart Network Management System (Smart NMS) interface. The main window shows a list of events with columns for Ack, ID, Send Time, Site, Device Name, IP Address, Service, Message, Responder, and Respond Time. A 'Troubleshooting Note' dialog box is open, allowing users to add, edit, or delete notes for specific events. The dialog includes a 'Status' dropdown (set to 'Cleared'), a text area for the note, and buttons for 'Add', 'Edit', 'Delete', and 'Help'. An orange callout box with the text 'Can write troubleshooting note if needed' points to the text area in the dialog.

| DateTime   | Outstanding | Acknowledge |
|------------|-------------|-------------|
| 2009-04-10 | 4           | 27          |
| 2009-04-09 | 2           | 76          |
| 2009-04-08 | 0           | 96          |
| 2009-04-07 | 0           | 40          |
| 2009-04-06 | 7           | 489         |
| 2009-04-05 | 0           | 722         |
| 2009-04-04 | 0           | 708         |
| 2009-04-03 | 1           | 476         |
| 2009-04-02 | 0           | 248         |
| 2009-04-01 | 0           | 19          |
| 2009-03-31 | 0           | 37          |
| 2009-03-30 | 0           | 9           |
| 2009-03-29 | 0           | 3           |
| 2009-03-28 | 0           | 1           |
| 2009-03-27 | 0           | 14          |
| 2009-03-26 | 0           | 52          |
| 2009-03-25 | 0           | 8           |
| 2009-03-24 | 0           | 19          |
| 2009-03-23 | 0           | 59          |
| 2009-03-22 | 0           | 102         |
| 2009-03-21 | 0           | 102         |
| 2009-03-20 | 0           | 102         |
| 2009-03-19 | 0           | 102         |
| 2009-03-18 | 0           | 102         |
| 2009-03-17 | 0           | 102         |
| 2009-03-16 | 0           | 102         |
| 2009-03-15 | 0           | 102         |
| 2009-03-14 | 0           | 102         |
| 2009-03-13 | 0           | 102         |
| 2009-03-12 | 0           | 102         |
| 2009-03-11 | 0           | 102         |
| 2009-03-10 | 0           | 102         |
| 2009-03-09 | 0           | 102         |
| 2009-03-08 | 0           | 102         |
| 2009-03-07 | 0           | 102         |
| 2009-03-06 | 0           | 102         |
| 2009-03-05 | 0           | 102         |
| 2009-03-04 | 0           | 102         |

| Ack                                 | ID   | Send Time            | Site              | Device Name                         | IP Address   | Service | Message  | Responder         | Respond Time         |
|-------------------------------------|------|----------------------|-------------------|-------------------------------------|--------------|---------|--|-------------------|----------------------|
| <input checked="" type="checkbox"/> | 9528 | 4/10/2009 5:51:06 PM | /AddPac/Branch AQ | NMS Camera                          | 172.16.4.180 | SNMP    | interface 172.16.4.180 (172.16.4.180) device(NMS Camera) service SNMP failed at 2009-4-10 5:51 06 PM | auto-acknowledged | 4/10/2009 5:51:35 PM |
| <input type="checkbox"/>            | 9527 | 4/10/2009 5:34:10 PM | /AddPac/Branch AQ | 5th floor meeting room phone device |              |         | device 5th floor meeting room phone device, all services are down.                                   | to-acknowledged   | 4/10/2009 5:35:25 PM |
| <input type="checkbox"/>            | 9526 | 4/10/2009 5:33:42 PM | /AddPac/Branch GX |                                     |              |         |  | to-acknowledged   | 4/10/2009 5:35:25 PM |
| <input type="checkbox"/>            | 9525 | 4/10/2009 5:21:06 PM | /AddPac/Branch GX |                                     |              |         |  | to-acknowledged   | 4/10/2009 5:22:43 PM |
| <input type="checkbox"/>            | 9524 | 4/10/2009 5:17:29 PM | /AddPac/Branch GX |                                     |              |         |  | to-acknowledged   | 4/10/2009 5:17:56 PM |
| <input type="checkbox"/>            | 9522 | 4/10/2009 3:36:26 PM | /AddPac/Branch AQ | IP cor                              |              |         |  | to-acknowledged   | 4/10/2009 4:03:13 PM |
| <input type="checkbox"/>            | 9521 | 4/10/2009 3:36:18 PM | /AddPac/Branch AQ | PS RB cor                           |              |         |  | to-acknowledged   | 4/10/2009 4:03:13 PM |
| <input type="checkbox"/>            | 9520 | 4/10/2009 3:36:17 PM | /AddPac/Branch AQ | UW cor                              |              |         |  | to-acknowledged   | 4/10/2009 4:03:13 PM |
| <input type="checkbox"/>            | 9519 | 4/10/2009 3:36:17 PM | /AddPac/Branch AQ | UW cor                              |              |         |  | to-acknowledged   | 4/10/2009 4:03:13 PM |

# Current Device Fault (Outage)

The screenshot displays the Smart Network Management System (NMS) interface. The main window shows a tree view of network devices on the left and a table of 'Current Outage Devices' in the center. An 'Event Detail' window is open, showing information for event ID 45412, including the event time, site, device name, and a description of the fault.

**Current Outage Devices Table:**

| Name               | Service... | Availability |
|--------------------|------------|--------------|
| AddPac             |            |              |
| Branch AQ          |            |              |
| NMS Camera         | 6 of 12    | 50.000 %     |
| NMS_IP_PBX...      | 3 of 3     | 0.000 %      |
| Branch GX          |            |              |
| 00_IVR_server      | 3 of 3     | 0.000 %      |
| 00_IVR_slave...    | 3 of 3     | 0.000 %      |
| 00_PS_server       | 3 of 3     | 0.000 %      |
| 00_PS_slave...     | 2 of 3     | 33.333 %     |
| 00_RBT_server      | 3 of 3     | 0.000 %      |
| IPNext 3000 S...   | 1 of 3     | 66.667 %     |
| IPNext 3000 S...   | 1 of 3     | 66.667 %     |
| UMS slave          | 3 of 3     | 0.000 %      |
| HeadQuarter        |            |              |
| 5th floor meeti... | 1 of 1     | 0.000 %      |
| UMS serverfo...    | 3 of 3     | 0.000 %      |
| Subnetwork #2      |            |              |
| Center             |            |              |
| NMS_SOHO...        | 2 of 2     | 0.000 %      |

**Event Detail (ID: 45412) Information:**

- Event Time: 4/10/2009 9:26:04 PM
- Site: /AddPac/Branch GX
- Device Name: 00\_RBT\_server
- Service: Media
- Severity: Critical
- Device Model: AP-RBT1000
- Log Message: device 00\_RBT\_server down
- Description: device 00\_RBT\_server's all interface down. A new Outage record has been created and service level availability calculations will be impacted until this outage is resolved.

**Your Outstanding Notices (18) Table:**

| Ack                      | ID   | Send Time             | Site                   | Device Name          | IP Address     | Service      | Message   |
|--------------------------|------|-----------------------|------------------------|----------------------|----------------|--------------|---|
| <input type="checkbox"/> | 9535 | 4/10/2009 9:26:04 PM  | /AddPac/Branch GX      | 00_RBT_server        |                | Media        | device 00_RBT_server's all interface down.  |
| <input type="checkbox"/> | 9527 | 4/10/2009 5:34:10 PM  | /AddPac/HeadQuarter    | 5th floor meeting... |                |              | device 5th floor meeting room p...  |
| <input type="checkbox"/> | 9502 | 4/10/2009 3:34:29 PM  | /Subnetwork #2/Cent... | NMS_SOHO_PBX         |                |              | device NMS_SOHO_PBX...  |
| <input type="checkbox"/> | 9495 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Slave    | 172.17.113.41  | Call Manager | interface 172.17.113.40 (172.17.113.40) device (IPNext 3000 Slave) failed.                              |
| <input type="checkbox"/> | 9494 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Master   | 172.17.113.40  | Call Manager | interface 172.17.113.40 (172.17.113.40) device (IPNext 3000 Master) failed.                             |
| <input type="checkbox"/> | 9418 | 4/9/2009 2:20:01 PM   | /AddPac/Branch GX      | 00_IVR_server        |                |              | device 00_IVR_server all services are down.   |
| <input type="checkbox"/> | 9396 | 4/9/2009 10:57:37 AM  | /AddPac/Branch AQ      | NMS_IP_PBX_3...      |                |              | device NMS_IP_PBX_31.13 all services down.  |
| <input type="checkbox"/> | 9239 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.118 |              | device [NMS Camera 2] interface 172.16.253.118 (172.16.253.118) not response or delete by administrator |



# Device Event History

Smart Network Management System - Windows Internet Explorer

http://172.16.31.20/smartnms.htm

NMS Account Configuration Monitoring Notification Fault Statistics View Help

Site Event Summary Service Outages Event Notification Destination Paths Users View Current Outages View Outages View Events

| Event Time | Outsta... | Ackno... | Not Clea... | Cleared | In Pr... |
|------------|-----------|----------|-------------|---------|----------|
| 2009-04-13 | 40        | 0        | 40          | 0       | 0        |
| 2009-04-12 | 6         | 0        | 6           | 0       | 0        |
| 2009-04-11 | 314       | 0        | 314         | 0       | 0        |
| 2009-04-10 | 182       | 0        | 182         | 0       | 0        |
| 2009-04-09 | 290       | 0        | 290         | 0       | 0        |
| 2009-04-08 | 412       | 0        | 412         | 0       | 0        |
| 2009-04-07 | 448       | 0        | 448         | 0       | 0        |
| 2009-04-06 | 1453      | 0        | 1453        | 0       | 0        |
| 2009-04-05 | 1704      | 0        | 1704        | 0       | 0        |
| 2009-04-04 | 1712      | 0        | 1712        | 0       | 0        |
| 2009-04-03 | 1276      | 0        | 1276        | 0       | 0        |
| 2009-04-02 | 799       | 0        | 799         | 0       | 0        |
| 2009-04-01 | 271       | 0        | 271         | 0       | 0        |
| 2009-03-31 | 277       | 0        | 277         | 0       | 0        |
| 2009-03-30 | 212       | 0        | 212         | 0       | 0        |
| 2009-03-29 | 17        | 0        | 17          | 0       | 0        |
| 2009-03-28 | 2         | 0        | 2           | 0       | 0        |
| 2009-03-27 | 108       | 0        | 108         | 0       | 0        |
| 2009-03-26 | 292       | 0        | 292         | 0       | 0        |
| 2009-03-25 | 46        | 0        | 46          | 0       | 0        |
| 2009-03-24 | 121       | 0        | 121         | 0       | 0        |
| 2009-03-23 | 1904      | 0        | 1904        | 0       | 0        |
| 2009-03-22 | 2643      | 0        | 2643        | 0       | 0        |
| 2009-03-21 | 354       | 0        | 354         | 0       | 0        |
| 2009-03-20 | 172       | 0        | 172         | 0       | 0        |
| 2009-03-19 | 1         | 0        | 1           | 0       | 0        |
| 2009-03-18 | 1294      | 0        | 1294        | 0       | 0        |
| 2009-03-17 | 788       | 0        | 788         | 0       | 0        |
| 2009-03-16 | 14        | 0        | 14          | 0       | 0        |
| 2009-03-15 | 3         | 0        | 3           | 0       | 0        |

Limit: 20 Refresh Advanced Search Acknowledge Events Troubleshooting Note

| Ack                      | ID    | Severity | Event Time            | Site                   | Device Name          | IP Address     | Service | Message  |
|--------------------------|-------|----------|-----------------------|------------------------|----------------------|----------------|---------|--|
| <input type="checkbox"/> | 45786 | Critical | 4/13/2009 11:24:42 AM | /AddPac/Branch GX      | SE_MG3000N_A         | 172.17.111.25  |         | Agent Up with enterprise: 1.3.6.1.4.1.4855.3.2.255 args [1.1.3.6.1.4.1.4855.3.2.255]   |
| <input type="checkbox"/> | 45785 | Cleared  | 4/13/2009 11:15:59 AM | /AddPac/Branch GX      | 00_NR_server         | 172.17.111.21  | SNMP    | SNMP data collection on interface 172.17.111.21 previously failed and has been restored. Node 00_NR_server is up.                                |
| <input type="checkbox"/> | 45784 | Cleared  | 4/13/2009 11:15:52 AM | /AddPac/Branch GX      | 00_NR_server         | 172.17.111.21  |         | Agent Up with Possible Changes (coldStart Trap) enterprise: 1.3.6.1.4.1.4855.3.2.10 [1.1.3.6.1.4.1.4855.3.2.10] args [1.1.3.6.1.4.1.4855.3.2.10] |
| <input type="checkbox"/> | 45783 | Critical | 4/13/2009 11:15:51 AM | /AddPac/Branch GX      | 00_NR_server         | 172.17.111.21  |         | Node 00_NR_server is down.   |
| <input type="checkbox"/> | 45782 | Critical | 4/13/2009 11:15:13 AM | /AddPac/Branch GX      | 00_NR_server         | 172.17.111.21  | SNMP    | SNMP data collection on interface 172.17.111.21 failed.  |
| <input type="checkbox"/> | 45781 | Warning  | 4/13/2009 11:14:57 AM | /AddPac/Branch GX      | 00_NR_server         | 172.17.111.21  | SNMP    | SNMP thresholding on interface 172.16.31.13 failed.  |
| <input type="checkbox"/> | 45780 | Warning  | 4/13/2009 10:00:15 AM | /AddPac/Branch AQ      | NMS_IP_PBX_31...     | 172.16.31.13   | SNMP    | SNMP thresholding on interface 172.16.31.16 failed.  |
| <input type="checkbox"/> | 45779 | Warning  | 4/13/2009 10:00:15 AM | /Subnetwork #2/Cent... | NMS_IP_PBX_31...     | 172.16.31.16   | SNMP    | SNMP data collection on interface 172.17.113.201 failed.   |
| <input type="checkbox"/> | 45778 | Warning  | 4/13/2009 9:59:51 AM  | /AddPac/Branch GX      | UMS slave            | 172.17.113.201 | SNMP    | SNMP data collection on interface 172.17.113.201 failed.   |
| <input type="checkbox"/> | 45777 | Warning  | 4/13/2009 9:59:46 AM  | /AddPac/Branch GX      | UMS slave            | 172.17.113.201 | SNMP    | SNMP data collection on interface 61.33.161.43 failed.   |
| <input type="checkbox"/> | 45776 | Warning  | 4/13/2009 9:59:42 AM  | /AddPac/HeadQuarter    | UMS server(our co... | 61.33.161.43   | SNMP    | SNMP data collection on interface 61.33.161.43 failed.   |
| <input type="checkbox"/> | 45775 | Warning  | 4/13/2009 9:59:41 AM  | /AddPac/HeadQuarter    | UMS server(our co... | 61.33.161.43   | SNMP    | SNMP data collection on interface 172.16.19.50 failed.   |
| <input type="checkbox"/> | 45774 | Warning  | 4/13/2009 9:59:36 AM  | /Subnetwork #2/Cent... | NMS_SDHO_PBX         | 172.16.19.50   | SNMP    | SNMP data collection on interface 172.16.19.50 failed.   |
| <input type="checkbox"/> | 45773 | Warning  | 4/13/2009 9:59:33 AM  | /Subnetwork #2/Cent... | NMS_SDHO_PBX         | 172.16.19.50   | SNMP    | SNMP data collection on interface 172.16.19.50 failed.   |
| <input type="checkbox"/> | 45772 | Warning  | 4/13/2009 9:59:32 AM  | /Subnetwork #2/Cent... | NMS_SDHO_PBX         | 172.16.19.50   | SNMP    | SNMP data collection on interface 172.16.19.50 failed.   |
| <input type="checkbox"/> | 45771 | Warning  | 4/13/2009 9:59:27 AM  | /Subnetwork #2/Cent... | NMS_SDHO_PBX         | 172.16.19.50   | SNMP    | SNMP data collection on interface 172.16.19.50 failed.   |
| <input type="checkbox"/> | 45770 | Warning  | 4/13/2009 9:59:24 AM  | /Subnetwork #2/Cent... | NMS_SDHO_PBX         | 172.16.19.50   | SNMP    | SNMP data collection on interface 172.16.19.50 failed.   |
| <input type="checkbox"/> | 45769 | Warning  | 4/13/2009 9:59:23 AM  | /Subnetwork #2/Cent... | NMS_SDHO_PBX         | 172.16.19.50   | SNMP    | SNMP data collection on interface 172.16.19.50 failed.   |
| <input type="checkbox"/> | 45768 | Warning  | 4/13/2009 9:59:18 AM  | /AddPac/Branch AQ      | NMS_IP_PBX_31...     | 172.16.31.13   | SNMP    | SNMP data collection on interface 172.16.31.13 failed.   |
| <input type="checkbox"/> | 45767 | Warning  | 4/13/2009 9:59:15 AM  | /AddPac/Branch AQ      | NMS_IP_PBX_31...     | 172.16.31.13   | SNMP    | SNMP data collection on interface 172.16.31.13 failed.   |

Results: 1 to 20 of 25346 Search Constraints: user=admin

summarize daily event statistics data

| Site                     | Device Name          | IP Address            | Service           | Message  |
|--------------------------|----------------------|-----------------------|-------------------|--|
| /AddPac/Branch GX        | 00_RBT_server        |                       |                   | device 00_RBT_server's all services are down.                      |
| /AddPac/HeadQuarter      | 5th floor meeting... |                       |                   | device 5th floor meeting room phone device, all services are down. |
| /Subnetwork #2/Cent...   | NMS_SDHO_PBX         |                       |                   | device NMS_SDHO_PBX, all services are down.                        |
| <input type="checkbox"/> | 9495                 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX | IPNext 3000 Slave 172.17.113.41                                    |
| <input type="checkbox"/> | 9494                 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX | IPNext 3000 Master 172.17.113.40                                   |
| <input type="checkbox"/> | 9418                 | 4/9/2009 2:20:01 PM   | /AddPac/Branch GX | 00_IVR_server  |
| <input type="checkbox"/> | 9396                 | 4/9/2009 10:57:37 AM  | /AddPac/Branch AQ | NMS_IP_PBX_3...  |
| <input type="checkbox"/> | 9239                 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ | NMS Camera 2 172.16.253.118  |

Your Outstanding Notices (18) All Outstanding Notices (18)

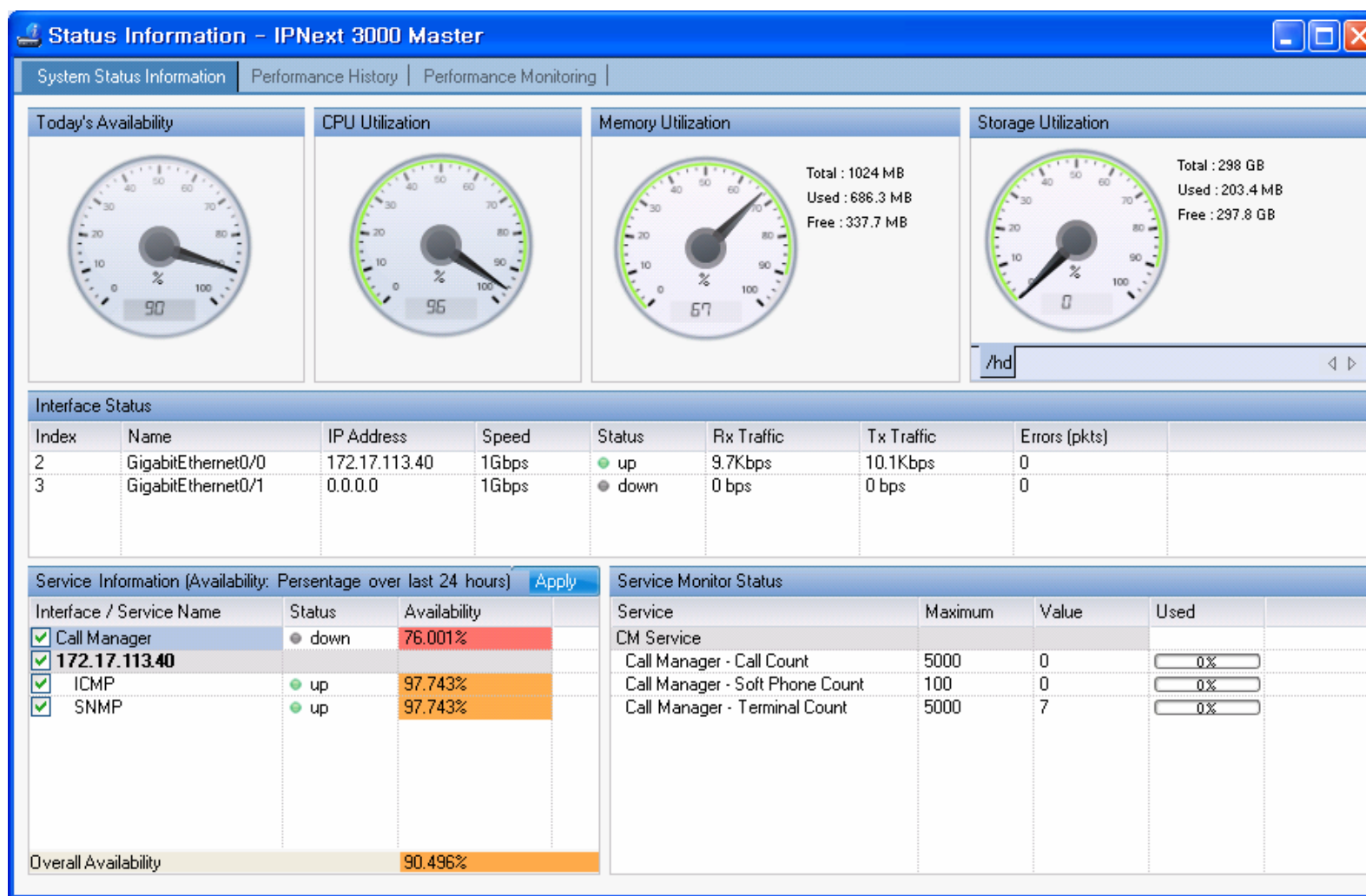
4/13/2009 11:46:45 AM 172.16.31.20:5101 admin Version 1.2.3384

Can view all events for devices with search condition

# Device Status Information

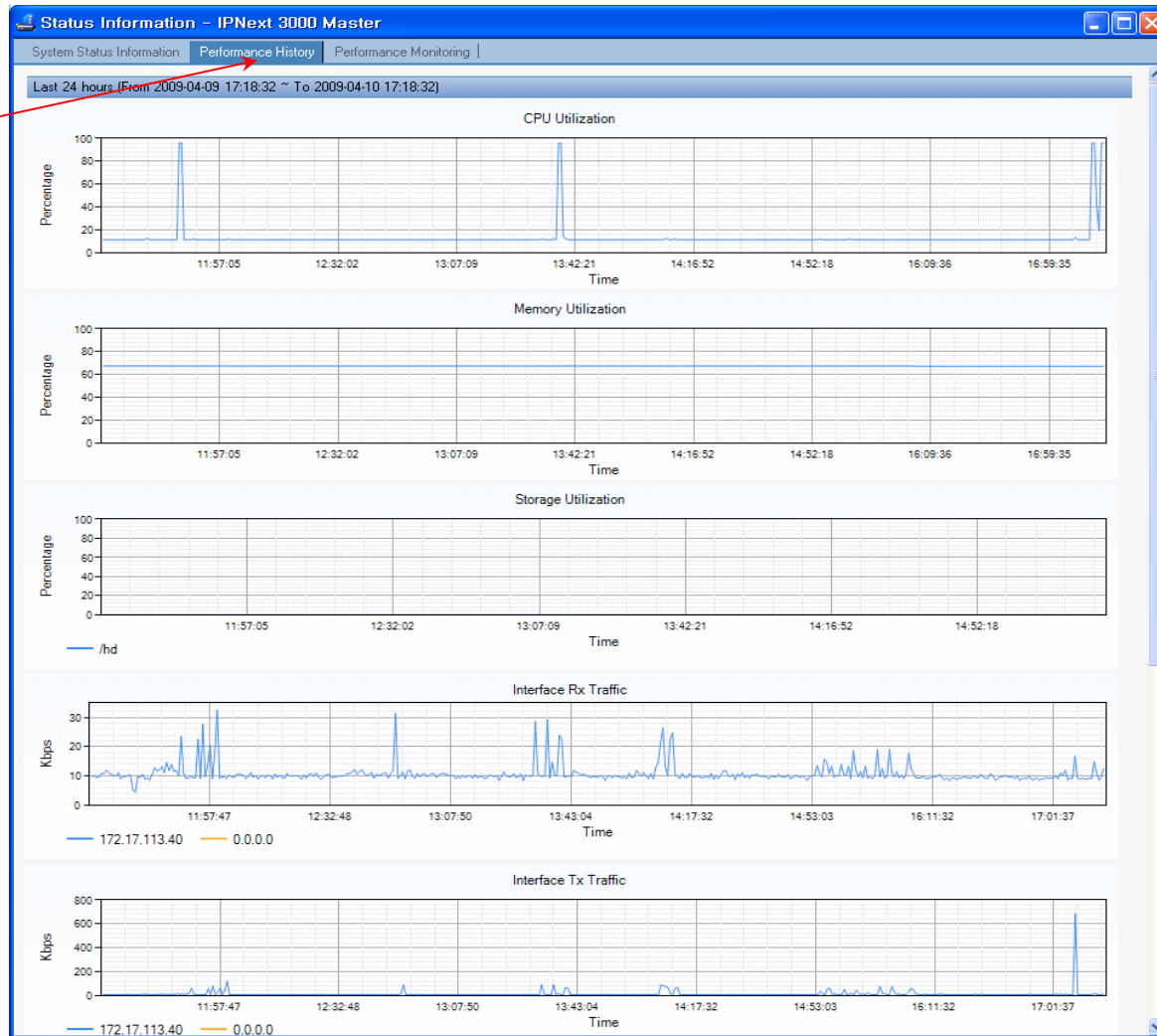
- System Performance Information (CPU, HDD, Memory,...)
- Provide device current service status (up/down)
- Provide device main status (max value vs current value)
- Display Graph Series with System Performance Information
- Monitor Main Status Flow with System Monitoring View

# Device Status Information

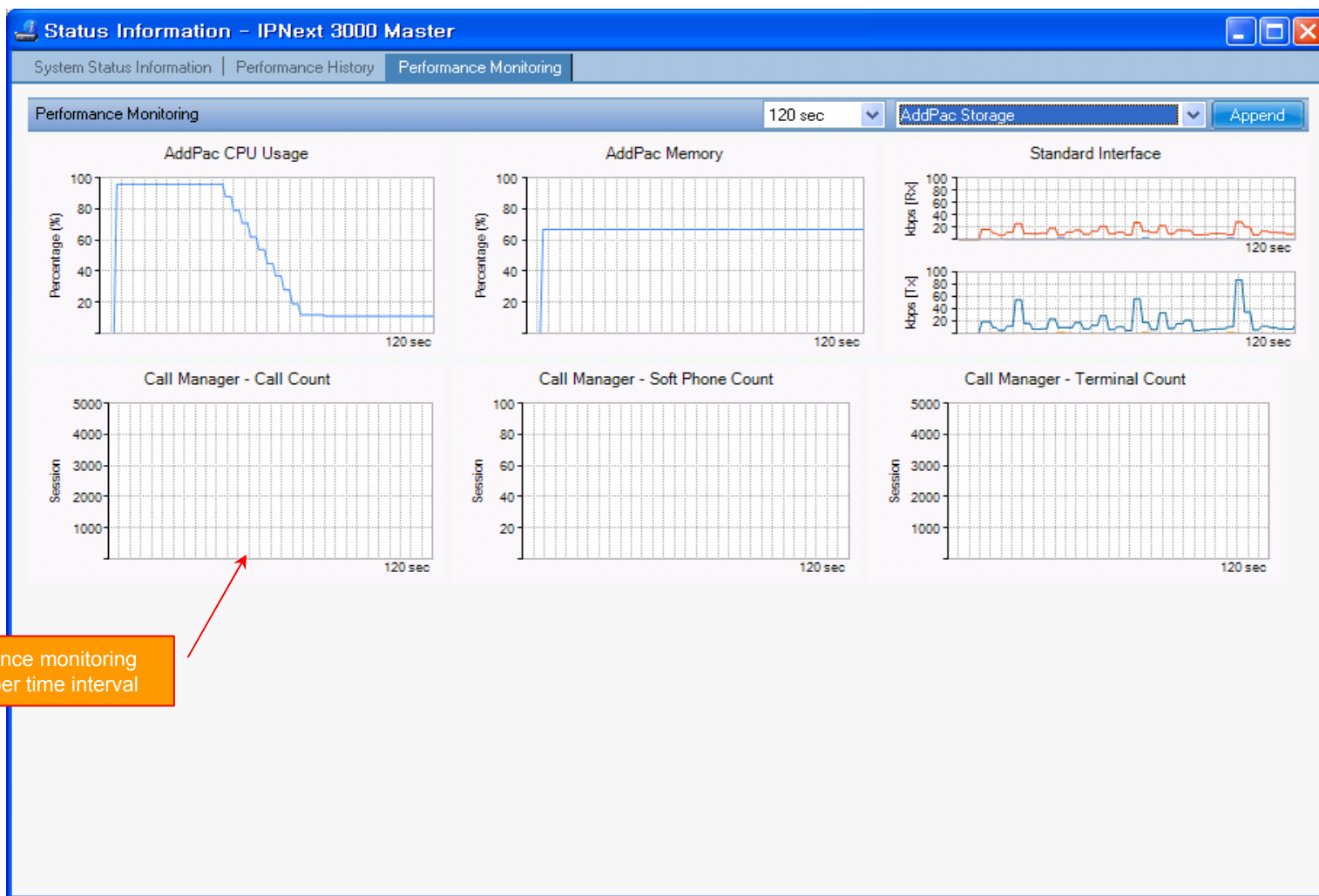


# Device Status Information

performance analysis graph for last 24 hours



# Device Status Information



# Notification Management

- Notify administrator for important event such as critical device fault when proper action needs
- Provide several notification channel such as SMS, e-mail, alarm lamp
- Notification channel configuration for each event
- Manage notification with device category such as Server, Terminal, PC, etc
- Provide Alarm with audible (play sound), visible (alarm lamp) form

# Event Notification Management

The screenshot shows the Smart Network Management System (NMS) interface. The main window displays a tree view of devices on the left and a table of event notifications in the center. A dialog box titled 'Event Notification Properties' is open on the right, showing configuration details for a specific event notification.

**Event Notification Properties Dialog:**

- Notification Name: serviceUnresponsive
- Description: test
- Event: Node event: serviceUnresponsive
- Destination Path: default
- Notification Type: sms, alarmLamp, email
- Current Rule: IPADDR IPLIKE \*\*\*\* (Filter)
- Apply Category: Desktop, Network Camera, Phone, Server, Switch (all checked)
- Email Subject: Notice #noticeid%: %service% service on %interfaceresolve% (%interface%)
- Text Message: The %service% poll to interface %interfaceresolve% (%interface%) on node %nodelabel% successfully completed a synthetic connection to the service listener on the remote machine. However, the synthetic transaction failed to complete within %iparm(timeout)% milliseconds, over %iparm(attempts)% attempts. This event will NOT impact service level agreements, but may be an indicator of other problems on that node.
- Special Values: Can be used in both the text message and email subject.
  - %noticeid% = notification ID number
  - %time% = time sent
  - %severity% = event severity
  - %nodelabel% = may be IP address or empty
  - %interface% = IP address, may be empty
  - %service% = service name, may be empty
  - %eventid% = event ID, may be empty
- Note: If the alert exceeds 80 bytes then the notification will be dispatched in two or more sms.
- Enable Notification:

**Event Notification Table:**

| Notification Name      | Event                           | Destination Path | Description |
|------------------------|---------------------------------|------------------|-------------|
| serviceUnresponsive    | Node event: serviceUnresponsive | NMS Admin        | test        |
| serviceResponsive      | Node event: serviceResponsive   | NMS Admin        |             |
| interfaceDown          | Node event: interfaceDown       | NMS Admin        |             |
| nodeDown               | Node event: nodeDown            | NMS Admin        |             |
| interfaceUp            | Node event: interfaceUp         | NMS Admin        |             |
| nodeUp                 | Node event: nodeUp              | NMS Admin        |             |
| nodeLostService        | Node event: nodeLostService     | NMS Admin        |             |
| nodeRegainedService    | Node event: nodeRegainedService | NMS Admin        |             |
| coldStart              | SNMP Cold Start                 | NMS Admin        |             |
| warmStart              | SNMP Trap: SNMP Warm Start      | NMS Admin        |             |
| authenticationFailure  | SNMP Trap: SNMP Authn Failure   | NMS Admin        |             |
| serviceDeleted         | Node event: serviceDeleted      | NMS Admin        |             |
| nodeAdded              | Node event: nodeAdded           | NMS Admin        |             |
| nodeInfoChanged        | Node event: nodeInfoChanged     | NMS Admin        |             |
| interfaceDeleted       | Node event: interfaceDeleted    | NMS Admin        |             |
| High Threshold         | highThresholdExceeded           | NMS Admin        |             |
| Low Threshold          | lowThresholdExceeded            | NMS Admin        |             |
| High Threshold Rearmed | highThresholdRearmed            | NMS Admin        |             |
| Low Threshold Rearmed  | lowThresholdRearmed             | NMS Admin        |             |

**Your Outstanding Notices (18) Table:**

| Ack                      | ID   | Send Time             | Site                 | Device Name          | IP Address     | Service      | Message                                |
|--------------------------|------|-----------------------|----------------------|----------------------|----------------|--------------|--|
| <input type="checkbox"/> | 9535 | 4/10/2009 9:26:04 PM  | /AddPac/Branch GX    | 00_RBT_server        |                |              | device 00_RBT_server's all services... |
| <input type="checkbox"/> | 9527 | 4/10/2009 5:34:10 PM  | /AddPac/HeadQuarter  | 5th floor meeting... |                |              |  |
| <input type="checkbox"/> | 9502 | 4/10/2009 3:34:29 PM  | /Subnetwork #2/Cent. | NMS_SOHO_PBX         |                |              |  |
| <input type="checkbox"/> | 9495 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX    | IPNext 3000 Slave    | 172.17.113.41  | Call Manager |  |
| <input type="checkbox"/> | 9494 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX    | IPNext 3000 Master   | 172.17.113.40  | Call Manager |  |
| <input type="checkbox"/> | 9418 | 4/9/2009 2:20:01 PM   | /AddPac/Branch GX    | 00_IVR_server        |                |              |  |
| <input type="checkbox"/> | 9396 | 4/9/2009 10:57:37 AM  | /AddPac/Branch GX    | NMS_IP_PBX_3...      |                |              |  |
| <input type="checkbox"/> | 9239 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ    | NMS Camera 2         | 172.16.253.118 |              |  |

apply notification policy with event-based filter  
(example : notify me when network link of device is downed through SMS, e-mail)

specify category when each event occurs

describe notification message content for e-mail or SMS

# Event Notification Management

The screenshot shows the Smart NMS interface with the 'Event Notification' tab selected. A 'Destination Path Properties' dialog box is open, showing the configuration for a destination path named 'default'. The dialog includes a table for defining notification channels:

| Notification Type | Target    | Auto Notify |
|-------------------|-----------|-------------|
| alarmLamp         | alarmLamp | on          |
| email             | admin     | on          |
| sms               | admin     | on          |

A red callout box points to the 'alarmLamp' entry in the table, with the text: "define notification channel such as e-mail, sms, or alarmlamp".

Below the dialog, the 'Your Outstanding Notices (18)' table is visible, showing a list of notifications with columns for Ack, ID, Send Time, Site, Device Name, IP Address, Service, and Message.

| Ack                      | ID   | Send Time             | Site                   | Device Name          | IP Address     | Service      | Message  |
|--------------------------|------|-----------------------|------------------------|----------------------|----------------|--------------|--|
| <input type="checkbox"/> | 9535 | 4/10/2009 9:26:04 PM  | /AddPac/Branch GX      | 00_RBT_server        |                |              | device 00_RBT_server's all services are down.  |
| <input type="checkbox"/> | 9527 | 4/10/2009 5:34:10 PM  | /AddPac/HeadQuarter    | 5th floor meeting... |                |              | device 5th floor meeting room phone device, all services are down.   |
| <input type="checkbox"/> | 9502 | 4/10/2009 3:34:29 PM  | /Subnetwork #2/Cent... | NMS_SOHD_PBX         |                |              | device NMS_SOHD_PBX, all services are down   |
| <input type="checkbox"/> | 9495 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Slave    | 172.17.113.41  | Call Manager | interface 172.17.113.41 (172.17.113.41) device (IPNext 3000 Slave) service Call Manager 2009-4-10 11:37:12 failed  |
| <input type="checkbox"/> | 9494 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Master   | 172.17.113.40  | Call Manager | interface 172.17.113.40 (172.17.113.40) device (IPNext 3000 Master) service Call Manager 2009-4-10 11:37:12 failed |
| <input type="checkbox"/> | 9418 | 4/9/2009 2:20:01 PM   | /AddPac/Branch GX      | 00_IVR_server        |                |              | device 00_IVR_server all services are down.  |
| <input type="checkbox"/> | 9396 | 4/9/2009 10:57:37 AM  | /AddPac/Branch AQ      | NMS_IP_PBX_3...      |                |              | device NMS_IP_PBX_31.13 all services down.   |
| <input type="checkbox"/> | 9239 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.118 |              | device (NMS Camera 2) interface 172.16.253.118 (172.16.253.118) not response or delete by administrator            |



# Event Notification Management

The screenshot displays the Smart Network Management System (NMS) interface. The main window shows a tree view of network devices and their availability. Overlaid on this are two configuration dialog boxes: 'Destination Path Properties' and 'Target Properties'.

The 'Target Properties' dialog is the primary focus, showing the following configuration:

- Choose the notification type: sms
- Target Information: alarmLamp
- Send to select user: Account Administrator
- Send to Email or Mobile: (unchecked)
- Mobile Number: (empty field)
- Choose the desired behavior for automatic notification on responded events: on

An orange callout box with a red arrow pointing to the 'Account Administrator' dropdown in the 'Send to select user' field contains the text: "user account (administrator) setting for SMS, E-mail Notification or specify e-mail address or SMS phone number".

At the bottom of the NMS interface, there is a table titled 'Your Outstanding Notices (18)'. Below is a partial view of this table:

| Ack                      | ID   | Send Time             | Site                   | Device Name        | IP Address     | Details  |
|--------------------------|------|-----------------------|------------------------|--------------------|----------------|--|
| <input type="checkbox"/> | 9535 | 4/10/2009 9:26:04 PM  | /AddPac/Branch GX      | 00_RBT_server      |                | device 00_RBT_server's all services are down.  |
| <input type="checkbox"/> | 9527 | 4/10/2009 5:34:10 PM  | /AddPac/HeadQuarter    | 5th floor meeti... |                | device 5th floor meeting room phone device, all services are down.   |
| <input type="checkbox"/> | 9502 | 4/10/2009 3:34:29 PM  | /Subnetwork #2/Cent... | NMS_SOHO_PBX       |                | device NMS_SOHO_PBX, all services are down   |
| <input type="checkbox"/> | 9495 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Slave  | 172.17.113.41  | interface 172.17.113.41 (172.17.113.41) device (IPNext 3000 Slave) service Call Manager 2009-4-10 11:37:12 failed  |
| <input type="checkbox"/> | 9494 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Master | 172.17.113.40  | interface 172.17.113.40 (172.17.113.40) device (IPNext 3000 Master) service Call Manager 2009-4-10 11:37:12 failed |
| <input type="checkbox"/> | 9418 | 4/9/2009 2:20:01 PM   | /AddPac/Branch GX      | 00_IVR_server      |                | device 00_IVR_server all services are down.  |
| <input type="checkbox"/> | 9396 | 4/9/2009 10:57:37 AM  | /AddPac/Branch AQ      | NMS_IP_PBX_3...    |                | device NMS_IP_PBX_31.13 all services down.   |
| <input type="checkbox"/> | 9239 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ      | NMS Camera 2       | 172.16.253.118 | device (NMS Camera 2) interface 172.16.253.118 (172.16.253.118) not response or delete by administrator            |

# Configuration

Smart Network Management System - Windows Internet Explorer

http://172.16.31.20/smartnms.htm

NMS Account Configuration Monitoring Notification Fault Statistics View Help

Current Outage Devices [13] Site

| Name             | Service... | Availability |
|------------------|------------|--------------|
| AddPac           |            |              |
| Branch AQ        |            |              |
| NMS Camera       | 6 of 12    | 50.000 %     |
| NMS_IP_PBX...    | 3 of 3     | 0.000 %      |
| Branch GX        |            |              |
| 00_IVR_server    | 3 of 3     | 0.000 %      |
| 00_IVR_slave...  | 3 of 3     | 0.000 %      |
| 00_PS_server     | 3 of 3     | 0.000 %      |
| 00_PS_Slave...   | 2 of 3     | 33.333 %     |
| 00_FBT_server    | 3 of 3     | 0.000 %      |
| IPNext 3000 ...  | 1 of 3     | 66.667 %     |
| IPNext 3000 S... | 1 of 3     | 66.667 %     |
| UMS slave        | 3 of 3     | 0.000 %      |
| HeadQuarter      |            |              |
| 5th floor meeti  | 1 of 1     | 0.000 %      |
| UMS server(o...  | 3 of 3     | 0.000 %      |
| Subnetwork #2    |            |              |
| Center           |            |              |
| NMS_S0HD_...     | 2 of 2     | 0.000 %      |

Configure Notification

External Notification Alarm Lamp

E-Mail SMS

Sender Email Address nms@addpac.com

SMTP Server Host 61.33.161.2

Authentication

Username

Password

Help Ok Cancel

global notification channel configuration

Your Outstanding Notices (18)

| Ack                      | ID   | Send Time             | Site                   | Device Name          | IP Address     | Service      | Message  |
|--------------------------|------|-----------------------|------------------------|----------------------|----------------|--------------|--|
| <input type="checkbox"/> | 9535 | 4/10/2009 9:26:04 PM  | /AddPac/Branch GX      | 00_FBT_server        |                |              | device 00_FBT_server's all services are down.  |
| <input type="checkbox"/> | 9527 | 4/10/2009 5:34:10 PM  | /AddPac/HeadQuarter    | 5th floor meeting... |                |              | device 5th floor meeting room phone device, all services are down.   |
| <input type="checkbox"/> | 9502 | 4/10/2009 3:34:29 PM  | /Subnetwork #2/Cent... | NMS_S0HD_PBX         |                |              | device NMS_S0HD_PBX, all services are down   |
| <input type="checkbox"/> | 9495 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Slave    | 172.17.113.41  | Call Manager | interface 172.17.113.41 (172.17.113.41) device (IPNext 3000 Slave) service   |
| <input type="checkbox"/> | 9494 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Master   | 172.17.113.40  | Call Manager | interface 172.17.113.40 (172.17.113.40) device (IPNext 3000 Master) service Call Manager 2009-4-10 11:37:12 failed |
| <input type="checkbox"/> | 9418 | 4/9/2009 2:20:01 PM   | /AddPac/Branch GX      | 00_IVR_server        |                |              | device 00_IVR_server all services are down.  |
| <input type="checkbox"/> | 9396 | 4/9/2009 10:57:37 AM  | /AddPac/Branch AQ      | NMS_IP_PBX_3...      |                |              | device NMS_IP_PBX_31.13 all services down.   |
| <input type="checkbox"/> | 9239 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.118 |              | device (NMS_Camera 2) interface 172.16.253.118 (172.16.253.118) not response or delete by administrator            |

4/13/2009 11:26:16 AM 172.16.31.20:5101 admin Version 1.2.3984

# Audible & Visible Alarm

Smart Network Management System - Windows Internet Explorer

http://172.16.31.20/smartnms.htm

Smart Network Management System

NMS Account Configuration Monitoring Notification Fault Statistics View Help

notify operator (or administrator)  
1. Alarm lamp blink (on&off) (visible)  
2. play alarm sound (audible)

can synchronize with alarm lamp equipment

| Site   | Type        | Outages      | Availability | Description            |
|--------|-------------|--------------|--------------|------------------------|
| AddPac | Sub Netw... | 32 / 12 / 32 | 92%          | AddPac Technology C... |
| Seoul  | Sub Netw... | 2 / 1 / 2    | 93%          | Seoul subnetwork       |

| Category       | Outages      | Availability |
|----------------|--------------|--------------|
| Desktop        | 0 / 0 / 1    | 100%         |
| Network Camera | 6 / 1 / 2    | 57%          |
| Phone          | 1 / 1 / 3    | 66%          |
| Server         | 27 / 11 / 22 | 42%          |
| Switch         | 0 / 0 / 0    | 100%         |
| VoIP Gateway   | 0 / 0 / 6    | 100%         |

| Overall Availability            |  | 34 / 13 / 34 | 27.690 % |
|---------------------------------|--|--------------|----------|
| Overall Categories Availability |  | 34 / 13 / 34 | 49.470 % |

| Ack                      | ID   | Send Time             | Site                   | Device Name          | IP Address     | Service      | Message   |
|--------------------------|------|-----------------------|------------------------|----------------------|----------------|--------------|---|
| <input type="checkbox"/> | 9535 | 4/10/2009 9:26:04 PM  | /AddPac/Branch GX      | 00_RBT_server        |                |              | device 00_RBT_server's all services are down.   |
| <input type="checkbox"/> | 9527 | 4/10/2009 5:34:10 PM  | /AddPac/HeadQuater     | 5th floor meeting... |                |              | device 5th floor meeting room phone device, all services are down.  |
| <input type="checkbox"/> | 9502 | 4/10/2009 3:34:29 PM  | /Subnetwork #2/Cent... | NMS_S0HQ_PBX         |                |              | device NMS_S0HQ_PBX, all services are down  |
| <input type="checkbox"/> | 9495 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Slave    | 172.17.113.41  | Call Manager | interface 172.17.113.41 (172.17.113.41) device (IPNext 3000 Slave) service Call Manager 2009-4-10 11:37:12 failed.    |
| <input type="checkbox"/> | 9494 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Master   | 172.17.113.40  | Call Manager | interface 172.17.113.40 (172.17.113.40) device (IPNext 3000 Master) service Call Manager 2009-4-10 11:37:12 failed    |
| <input type="checkbox"/> | 9418 | 4/9/2009 2:20:01 PM   | /AddPac/Branch GX      | 00_IVR_server        |                |              | device 00_IVR_server all services are down.   |
| <input type="checkbox"/> | 9396 | 4/9/2009 10:57:37 AM  | /AddPac/Branch AQ      | NMS_IP_PBX_3...      |                |              | device NMS_IP_PBX_31.13 all services down.  |
| <input type="checkbox"/> | 9239 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.118 |              | device (NMS Camera 2) interface 172.16.253.118 (172.16.253.118) not response or delete by administrator               |
| <input type="checkbox"/> | 9238 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.118 | ICMP         | device (NMS Camera 2) interface 172.16.253.118 (172.16.253.118) service ICMP not response or deleted by administrator |
| <input type="checkbox"/> | 9237 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.118 | SNMP         | device (NMS Camera 2) interface 172.16.253.118 (172.16.253.118) service SNMP not response or deleted by administrator |
| <input type="checkbox"/> | 9236 | 4/6/2009 7:41:25 PM   | /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.118 | ICMP         | device(NMS Camera 2) interface 172.16.253.118 (172.16.253.118) service ICMP not response or deleted by administrator  |
| <input type="checkbox"/> | 9235 | 4/6/2009 7:41:25 PM   | /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.118 | SNMP         | device(NMS Camera 2) interface 172.16.253.118 (172.16.253.118) service SNMP not response or deleted by administrator  |

4/13/2009 11:52:14 AM 172.16.31.20:5101 admin Version 1.2.3384

# Fault Statistics

- analyze for a fault event with graph and detailed list data
- Report form generation and print out for statistics result

# Fault Statistics

The screenshot displays the Smart Network Management System (NMS) interface. The main content area is titled "Fault Statistics (Site)" and shows a bar chart of fault counts over time for various sites. Below the chart is a detailed data table for the date 4/9/2009, showing fault counts for different branches and a total count.

**Search Condition:** Hour: 4/ 9/2009 ~ 3/30/2009, Site: Branch A, Branch AQ, B

**Fault Statistics (Site) Legend:** Seoul, HeadQuarter, Center, Branch TG, Branch KT, Branch GX, Branch B, Branch AQ, Branch A

**4/9/2009 Data Table:**

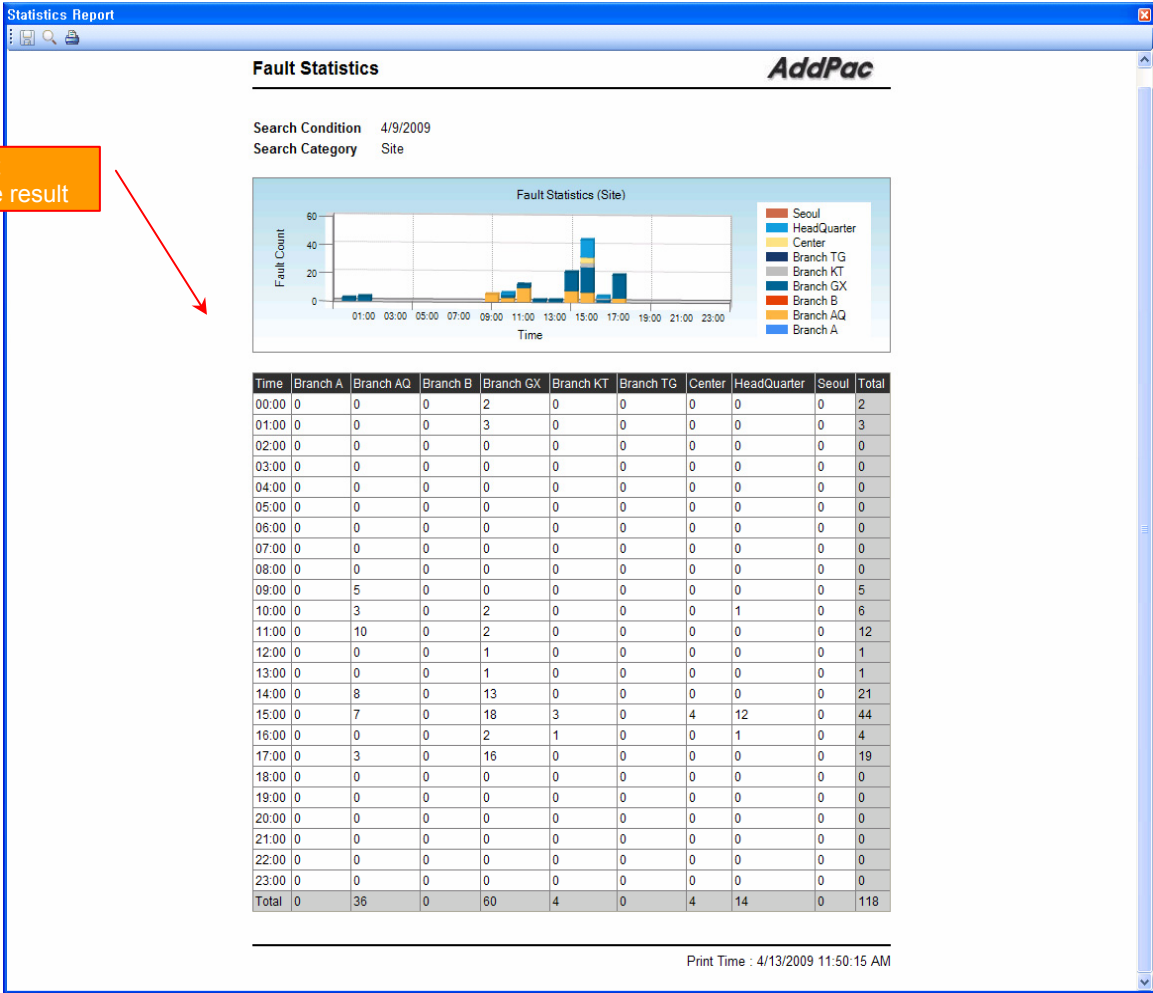
| Time         | Branch A | Branch AQ | Branch B | Branch GX | Branch KT | Branch TG | Center   | HeadQuarter | Seoul    | Total      |
|--------------|----------|-----------|----------|-----------|-----------|-----------|----------|-------------|----------|------------|
| 07:00        | 0        | 0         | 0        | 0         | 0         | 0         | 0        | 0           | 0        | 0          |
| 08:00        | 0        | 0         | 0        | 0         | 0         | 0         | 0        | 0           | 0        | 0          |
| 09:00        | 0        | 5         | 0        | 0         | 0         | 0         | 0        | 0           | 0        | 5          |
| 10:00        | 0        | 3         | 0        | 2         | 0         | 0         | 0        | 1           | 0        | 6          |
| 11:00        | 0        | 10        | 0        | 2         | 0         | 0         | 0        | 0           | 0        | 12         |
| 12:00        | 0        | 0         | 0        | 1         | 0         | 0         | 0        | 0           | 0        | 1          |
| 13:00        | 0        | 0         | 0        | 1         | 0         | 0         | 0        | 0           | 0        | 1          |
| 14:00        | 0        | 8         | 0        | 13        | 0         | 0         | 0        | 0           | 0        | 21         |
| 15:00        | 0        | 7         | 0        | 18        | 3         | 0         | 4        | 12          | 0        | 44         |
| 16:00        | 0        | 0         | 0        | 2         | 1         | 0         | 0        | 1           | 0        | 4          |
| 17:00        | 0        | 3         | 0        | 16        | 0         | 0         | 0        | 0           | 0        | 19         |
| 18:00        | 0        | 0         | 0        | 0         | 0         | 0         | 0        | 0           | 0        | 0          |
| 19:00        | 0        | 0         | 0        | 0         | 0         | 0         | 0        | 0           | 0        | 0          |
| 20:00        | 0        | 0         | 0        | 0         | 0         | 0         | 0        | 0           | 0        | 0          |
| 21:00        | 0        | 0         | 0        | 0         | 0         | 0         | 0        | 0           | 0        | 0          |
| 22:00        | 0        | 0         | 0        | 0         | 0         | 0         | 0        | 0           | 0        | 0          |
| 23:00        | 0        | 0         | 0        | 0         | 0         | 0         | 0        | 0           | 0        | 0          |
| <b>Total</b> | <b>0</b> | <b>36</b> | <b>0</b> | <b>60</b> | <b>4</b>  | <b>0</b>  | <b>4</b> | <b>14</b>   | <b>0</b> | <b>118</b> |

**Callout 1:** display graph for fault statistics with various search condition

**Callout 2:** display detailed data for fault statistics

# Fault Statistics – Report Generation

report generation for fault statistics and print out the result



# Model & Service Management

- Define new model with provided template image & properties
- Customize data collection with standard protocol such as TCP, SNMP

# Device Model Management

manage device model with various properties such as model image

model image repository for selection

| Model Name | Category       |
|------------|----------------|
| AP-IP200   | Phone          |
| AP-IP300   | Phone          |
| AP-IPC     | Network Camera |
| AP-IPC250M | Network Camera |
| AP-IVR1000 | Server         |
| AP-MC1000  | Server         |
| AP-MC3000  | Server         |
| AP-MC5000  | Server         |
| AP-NR2000  | Server         |
| AP-PS2000  | Server         |
| AP-RBT1000 | Server         |
| AP-RS2000  | Server         |
| AP-UMS1000 | Server         |
| AP-UMS2000 | Server         |
| AP-VC2000  | Phone          |
| AP-VP200   | Phone          |
| AP-VP300   | Phone          |
| AP-VP350   | Phone          |
| AP-VP500   | Phone          |
| IPNext100  | Server         |
| IPNext1000 | Server         |
| IPNext180  | Server         |
| IPNext200  | Server         |

| Site                | Description             |
|---------------------|-------------------------|
| AddPac              | AddPac Technology C...  |
| Branch AQ           | Branch AQ               |
| Branch GX           | Branch GX description   |
| Branch KT           |                         |
| HeadQuarter         | Main HeadQuarter Cen... |
| Seoul               | Seoul subnetwork        |
| Seoul East Area     | Seoul East Area         |
| SongPaGu Area Ce... | SongPaGu Area Center    |
| Subnetwork #2       | Subnetwork #2           |
| Branch TG           | Yeoksam Area            |
| SeoChoGu            | seoul seocho district   |
| Seoul West Area     | Seoul West Area         |
| Gangseo Area        | Gangseo Area            |
| Seoul               |                         |
| MokDong Area        | MokDong Area            |

| Site                   | Device Name          | IP Address     | Service      | Message   |
|------------------------|----------------------|----------------|--------------|---|
| /AddPac/Branch GX      | 00_RBT_server        |                |              | device 00_RBT_server's all services are down.         |
| /AddPac/HeadQuarter    | 5th_floor_meeting... |                |              | device 5th floor meeting room phone device, all se... |
| /Subnetwork #2/Cent... | NMS_S0HD_PBX         |                |              | device NMS_S0HD_PBX, all services are down            |
| /AddPac/Branch GX      | IPNext 3000 Slave    | 172.17.113.41  | Call Manager | interface 172.17.113.41 (172.17.113.41) device (IP... |
| /AddPac/Branch GX      | IPNext 3000 Master   | 172.17.113.40  | Call Manager | Call Manager 2009-4-10 11:37:12 failed.               |
| /AddPac/Branch GX      | 00_IVR_server        |                |              | device 00_IVR_server all services are down.           |
| /AddPac/Branch AQ      | NMS_IP_PBX_3...      |                |              | device NMS_IP_PBX_31.13 all services down.            |
| /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.118 |              | device (NMS Camera 2) interface 172.16.253.118...     |
| /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.118 | ICMP         | device (NMS Camera 2) interface 172.16.253.118...     |
| /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.11  |              | response or delete by administrator                   |
| /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.11  |              | device (NMS Camera 2) interface 172.16.253.118...     |
| /AddPac/Branch AQ      | NMS Camera 2         | 172.16.253.11  |              | ICMP not response or deleted by administrator         |



# Service Definition

The screenshot displays the Smart Network Management System (NMS) interface. The main window shows a tree view of sites and a table of services. A red arrow points from an orange callout box to the 'Camera Operation Status' service in the table. Two 'Service Properties' dialog boxes are open, showing configuration details for this service.

**Service Properties (Top Dialog):**

- General | SNMP
- Service Name: Camera Operation Status
- Protocol: SNMP
- Port: 161
- Interval: 30000 (msec)
- Timeout: 3000 (msec)
- Retry: 3

**Service Properties (Bottom Dialog):**

- General | SNMP
- Service OID: 1.3.6.1.4.1.4855.7.51.1.3.0
- Service Condition:
  - Operator: =
  - Operand: 1

**Service Table:**

| Service Name            | Protocol | Port |
|-------------------------|----------|------|
| Call Manager            | SNMP     | 161  |
| Presence                | SNMP     | 161  |
| Media                   | SNMP     | 161  |
| IPX                     | SNMP     | 161  |
| RtpProxy                | SNMP     | 161  |
| MCU                     | SNMP     | 161  |
| IVR                     | SNMP     | 161  |
| Recording               | SNMP     | 161  |
| Tomcat                  | TCP      | 8080 |
| FTP                     | TCP      | 21   |
| Camera Pan              | SNMP     | 161  |
| Camera Tilt             | SNMP     | 161  |
| Camera Zoom             | SNMP     | 161  |
| Camera Operation Status | SNMP     | 161  |

**Your Outstanding Notices (18):**

| Ack                      | ID   | Send Time             | Site                   | Device Name         | IP Address     | Service      | Message                                  |
|--------------------------|------|-----------------------|------------------------|---------------------|----------------|--------------|--|
| <input type="checkbox"/> | 9535 | 4/10/2009 9:26:04 PM  | /AddPac/Branch GX      | 00_RBT_server       |                |              | device 00_RBT_serv                       |
| <input type="checkbox"/> | 9527 | 4/10/2009 5:34:10 PM  | /AddPac/HeadQuarter    | 5th floor meetin... |                |              | device 5th floor meet                    |
| <input type="checkbox"/> | 9502 | 4/10/2009 3:34:29 PM  | /Subnetwork #2/Cent... | NMS_SDHD_PBX        |                |              | device NMS_SDHD_                         |
| <input type="checkbox"/> | 9495 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Slave   | 172.17.113.41  | Call Manager | interface 172.17.113                     |
| <input type="checkbox"/> | 9494 | 4/10/2009 11:37:12 AM | /AddPac/Branch GX      | IPNext 3000 Master  | 172.17.113.40  | Call Manager | interface 172.17.113                     |
| <input type="checkbox"/> | 9418 | 4/9/2009 2:20:01 PM   | /AddPac/Branch GX      | 00_IVR_server       |                |              | device 00_IVR_serv                       |
| <input type="checkbox"/> | 9396 | 4/9/2009 10:57:37 AM  | /AddPac/Branch AQ      | NMS_IP_PBX_3...     |                |              | device NMS_IP_PBX                        |
| <input type="checkbox"/> | 9239 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ      | NMS Camera 2        | 172.16.253.118 |              | device (NMS Camera response or delete by |
| <input type="checkbox"/> | 9238 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ      | NMS Camera 2        | 172.16.253.118 | ICMP         | device (NMS Camera ICMP not response o   |
| <input type="checkbox"/> | 9237 | 4/6/2009 7:49:20 PM   | /AddPac/Branch AQ      | NMS Camera 2        | 172.16.253.118 | SNMP         | device (NMS Camera SNMP not response     |
| <input type="checkbox"/> | 9236 | 4/6/2009 7:41:25 PM   | /AddPac/Branch AQ      | NMS Camera 2        | 172.16.253.118 | ICMP         | device(NMS Camera ICMP not response o    |

define the service for data collection, current status with standard protocol such as TCP or SNMP



# Thank you!

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