# VoIP Gateway Solution




**AddPac Technology**

2010, Sales and Marketing

**www.addpac.com**

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# 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 PSTN Backup | | | | A | 1-Port PSTN Backup |
| | | | | | | B | 4-Port PSTN Backup |
| VoIP Ports | 4-Port FXS | | 4-Port FXS | 2-Port FXS & 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 Adaptor | | External Adaptor | External Adaptor | External Adaptor | External Adaptor | |

# VoIP Gateways for MB (8Port)

| Product | AP900 | | AP1100 | | AP1200 | |
|---|---|---|---|---|---|---|
| |  | |  | |  | |
| Model | Type | VoIP | Type | VoIP | Type | VoIP |
| | A | 4 FXS, 4 FXO | A | 4 FXS, 4 FXO | A | 4 FXS, 1 FXO |
| | B | 8 FXS | B | 8 FXS | B | 8 FXS, 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-FXS4O4 | AP-FXS8<br>AP-FXO8<br>AP-FXS4O4<br>AP-E&M8<br>AP-E1 | AP-FXS8<br>AP-FXO8<br>AP-FXS4O4<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<br>(Option) | Support<br>(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)

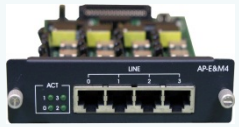
| Product | AP1850 | AP-MG3000 | AP-MG3800 | AP-MG5000 |
|---|---|---|---|---|
| |  |  |  |  |
| Available Modules | AP-N1-E1<br>AP-N1-2E1 | APv2-1E1<br>APv2-2E1<br>APv2-4E1 | HIM-VoIP4E1<br>(4 E1/T1 Module) | HIM-4E1<br>(4 E1/T1 Module) |
| VoIP Signaling | SIP, H.323 | SIP, H.323 | SIP, H.323 | SIP, 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 AP2620,AP3100P | AP-FXS4 | 4-Port FXS Module |  |
| AP1700,AP2610 AP2620,AP3100P | AP-FXO4 | 4-Port FXO Module |  |
| AP1700,AP2610 AP2620,AP3100P | AP-FXS2O2 | 2-Port FXS&2-Port FXO Module |  |
| AP1700,AP2610 AP2620,AP3100P | AP-E&M4 | 4-Port E&M Module |  |
| AP1700,AP2610 AP2620,AP3100P | AP-FXS3O1 | 3-Port FXS&1-Port FXO Module |  |
| AP1700, AP2620 | AP-E1 | 1-Port Digital E1/T1 Module |  |

# Additional VoIP Modules

DSP

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

# Target :
# AP2120N, AP2640, AP2650

# VoIP Modules

DSP

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

# Target :
# AP1800, AP2330, AP2340, AP1850

# VoIP Modules

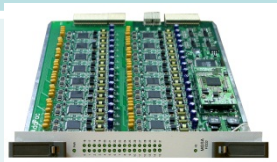
DSP

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

# Target :
# AP6500, AP6800

# VoIP Modules

DSP

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

# Target :
# AP-MG3000

# VoIP Modules

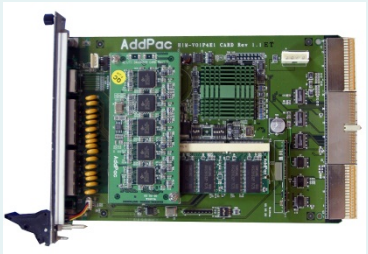
DSP

| 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

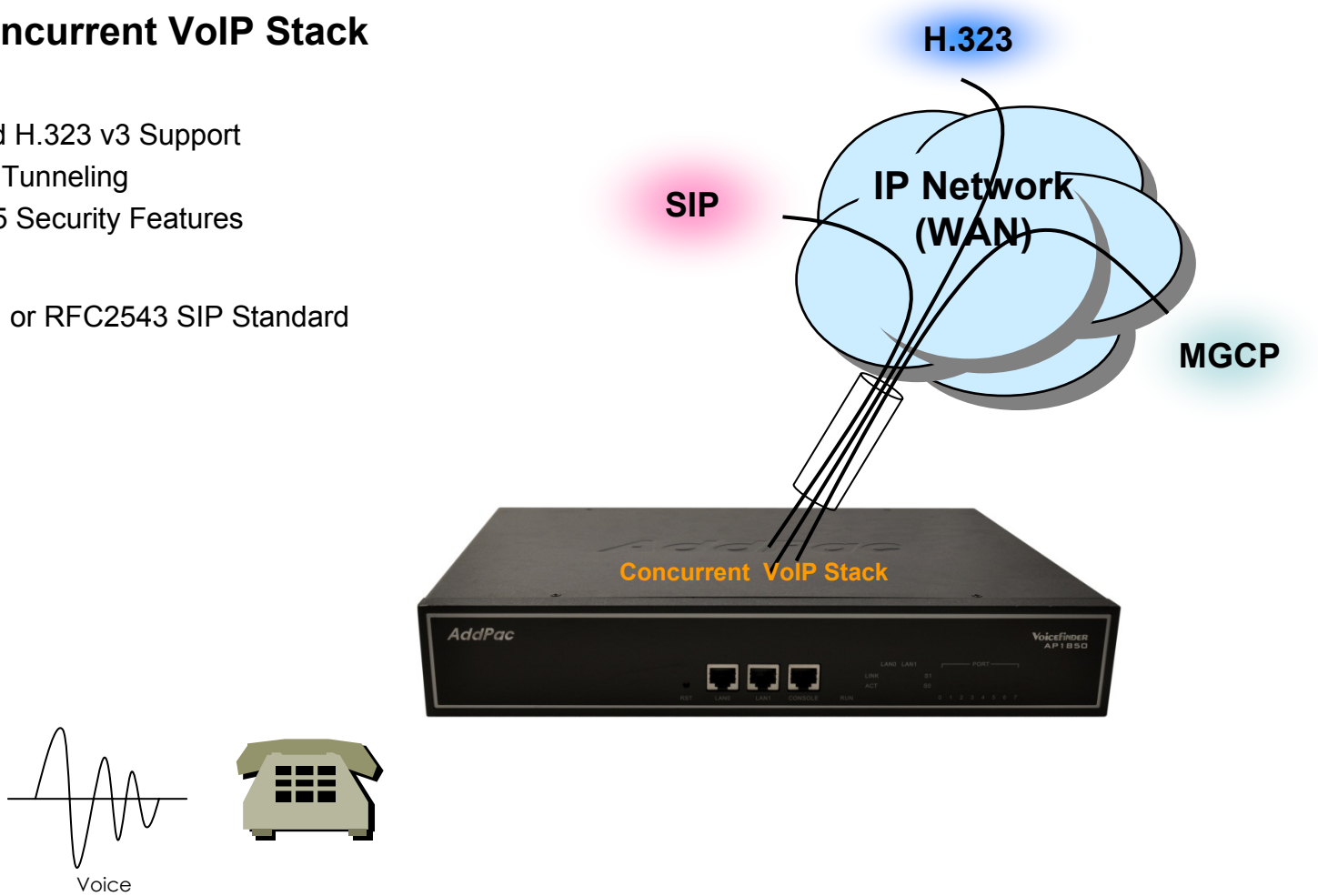
DSP

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

# 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

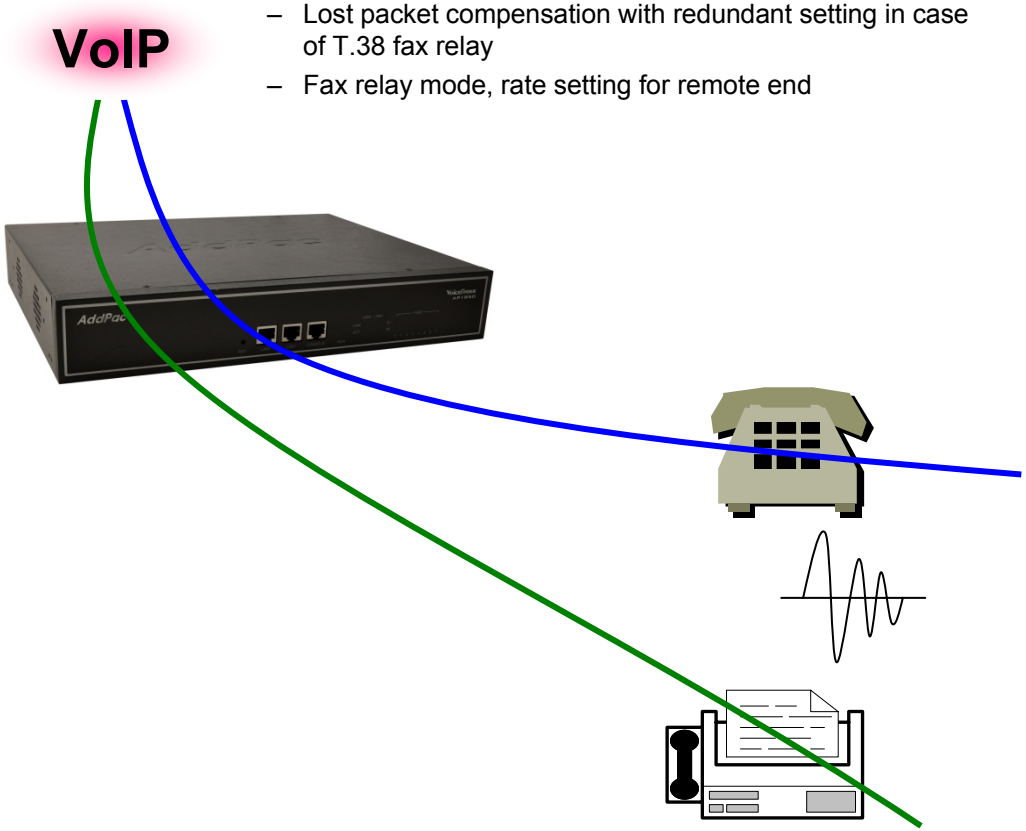
- **H.323**
  - Fast connect, normal connect support
  - H.245 tunneling support
  - Q.931 response message setting for inbound VoIP calls
  - H.245 logical channel open timing selection function
  - Start H.245 procedure support
  - DTMF / Hook flash relay with H.245 alphanumeric / signal
  - Secondary 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 RPT 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

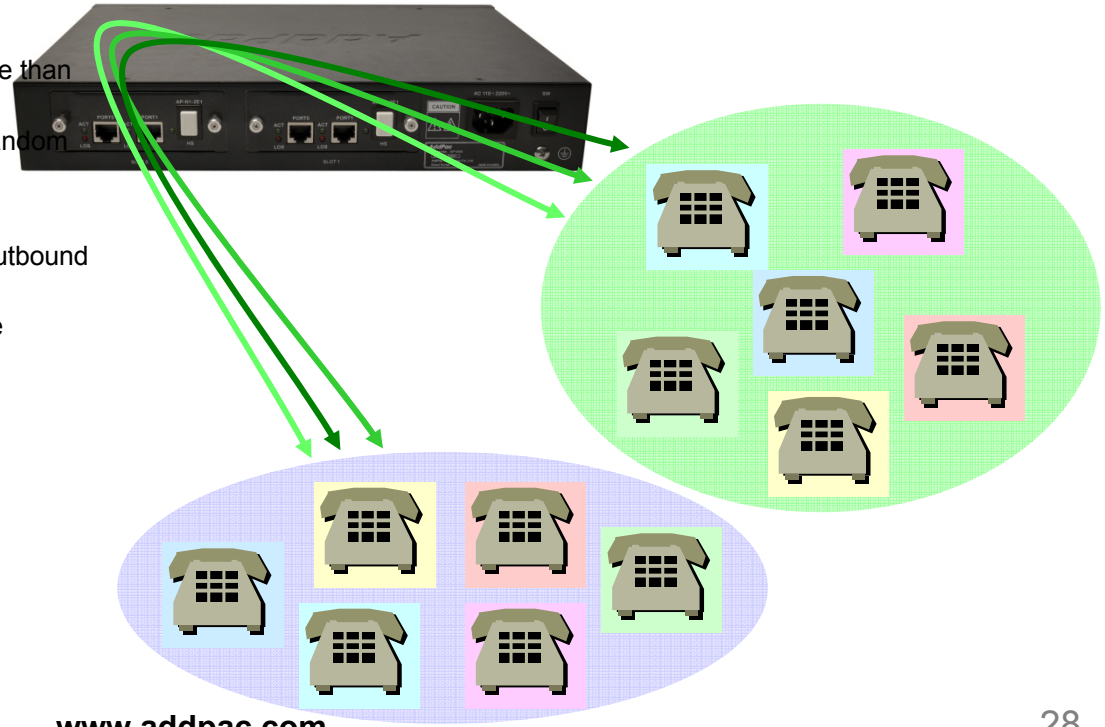
- **FAX**
  - Fax relay mode supporting T.38, inband-T.38, bypass mode
  - Lost packet compensation with redundant setting in case of T.38 fax relay
  - Fax relay mode, rate setting for remote end



# VoIP (Voice over IP) Service

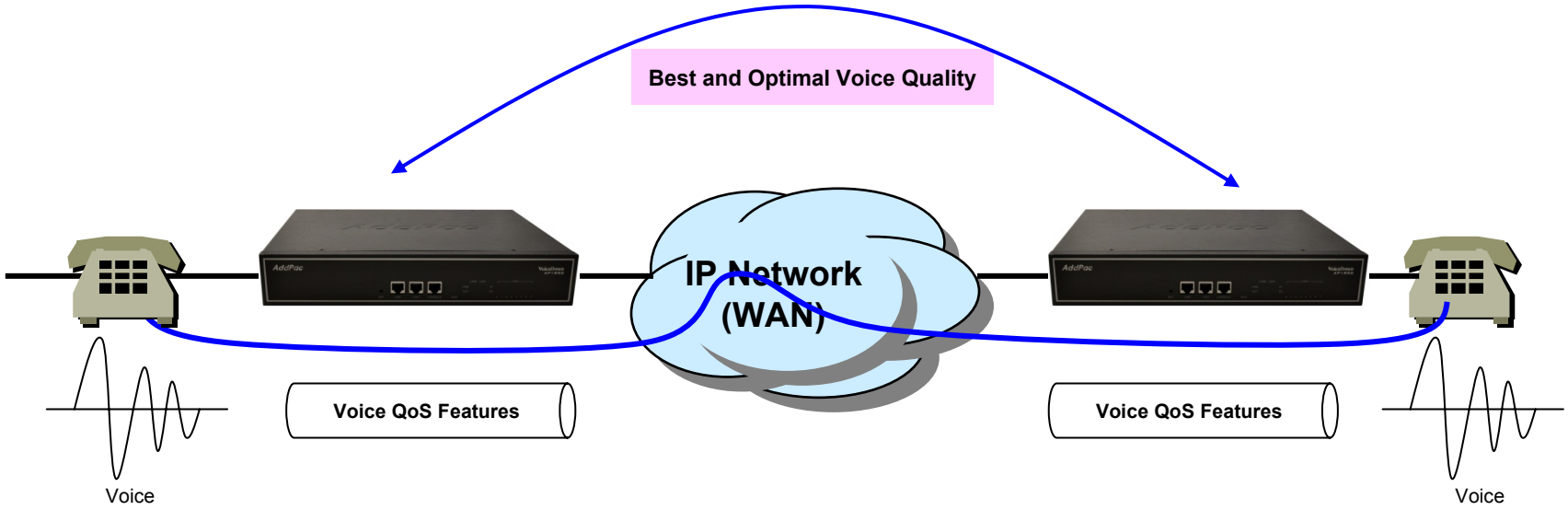
- **VoIP Call Controls**
  - Hot line connection function with PLAR (Private Line Auto Ring Down)
  - Leased line emulation function
  - Connection monitoring function
  - Fault tolerant with Redundancy and Call Distribution among Gateways for load balancing
  - Call attempt with IP address
  - H.323, 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



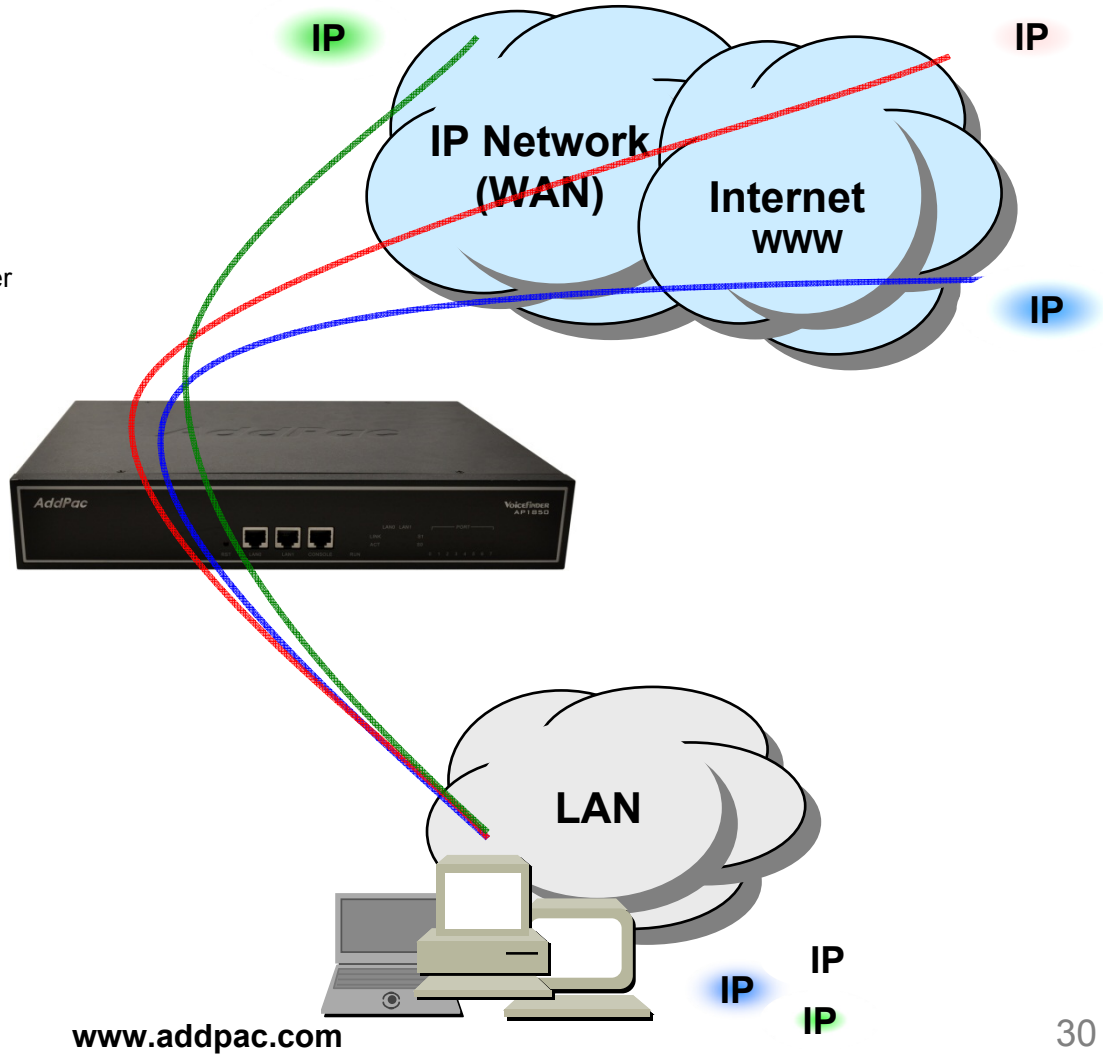
# Advanced QoS Features

- **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

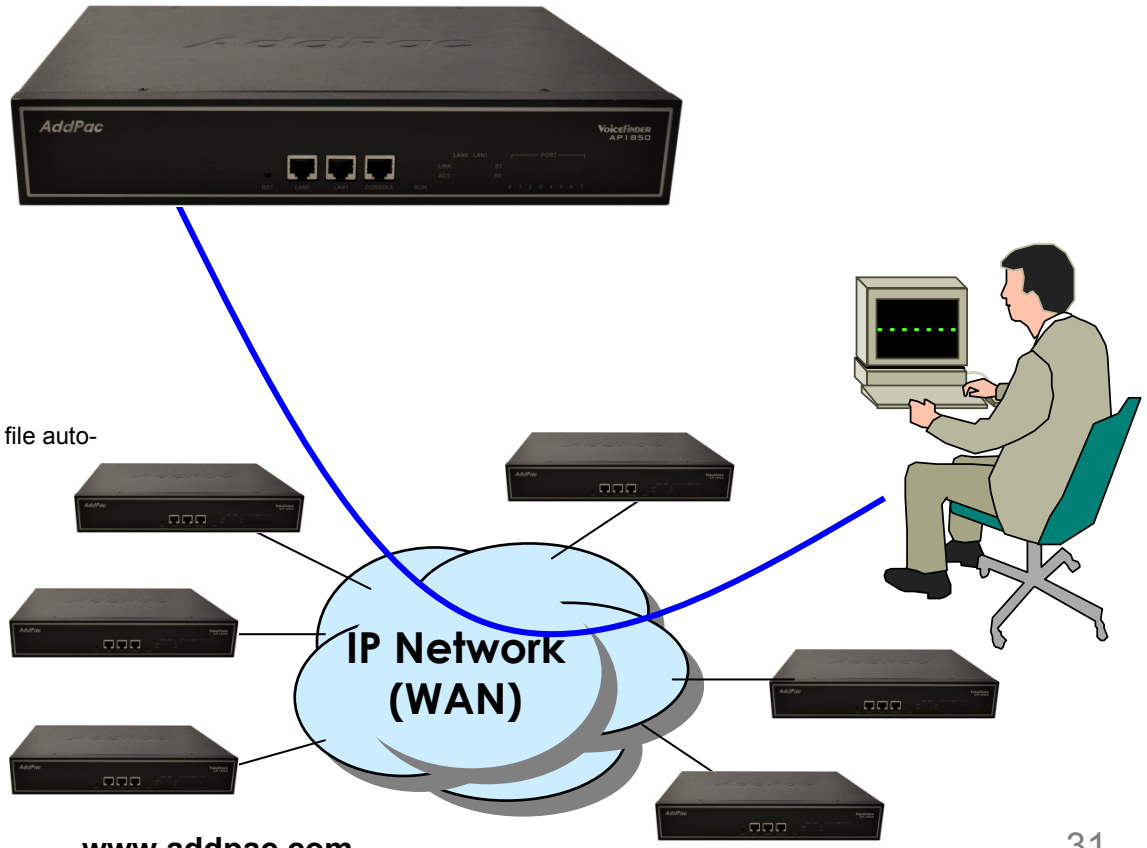
- **Basic Network Protocols**
  - ARP, IPv4, TCP, UDP, ICMP, SCTP, IGMP, MLD
- **Routing Protocol**
  - IPv4 : Static
- **Service Protocol**
  - FTP, Telnet, TFTP, DHCP Server/Relay, SNMP Server
  - CDP (Cisco Discovery Protocol)
  - DNS Resolver , DDNS(nsupdate)
  - Bridge
  - Syslog
- **IPv4 Address 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

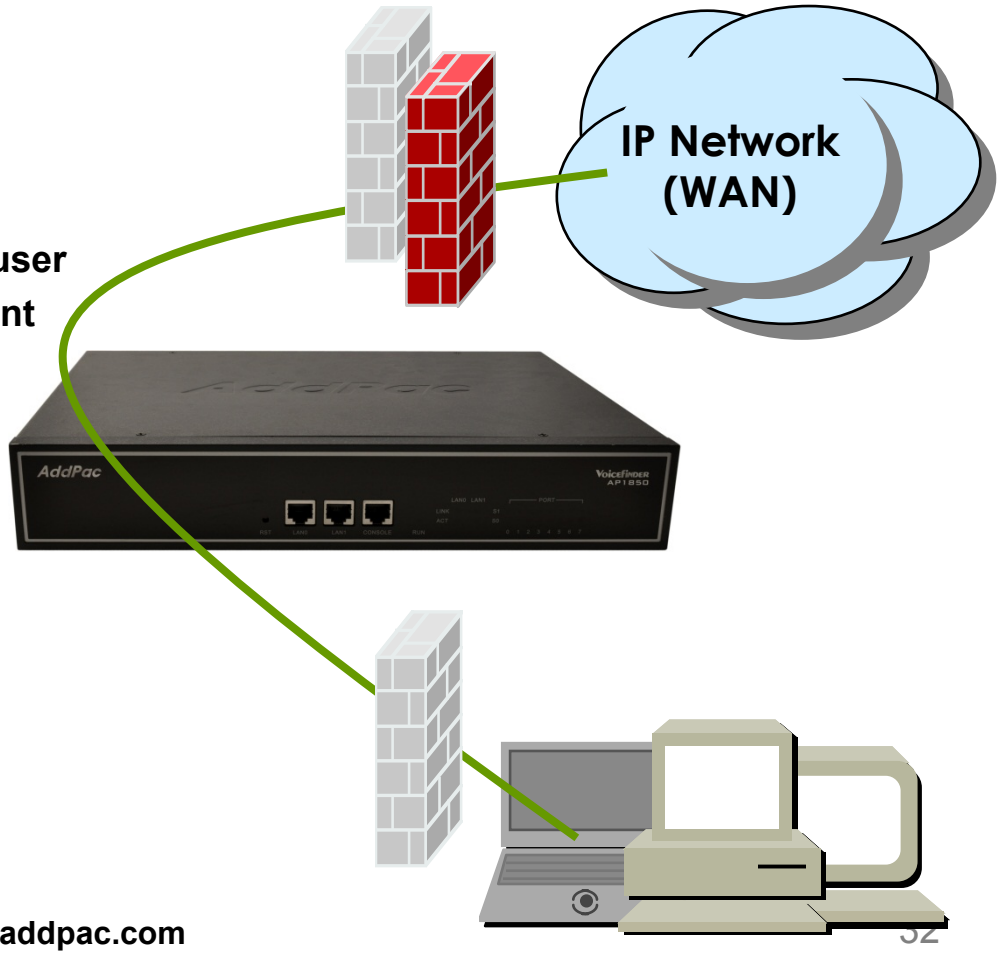
- SNMP
  - Standard Simple Network Management Protocol( SNMP) Agent support
  - MIB v1 and v2 Support
- Web-based Management
  - Smart Easy Setup
  - Standard Voice Interface
  - Standard PSTN Back-up Interface
- Watch-dog Function
  - Hardware, Software watch-dog services
- Remote Management
  - Telnet
  - 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)



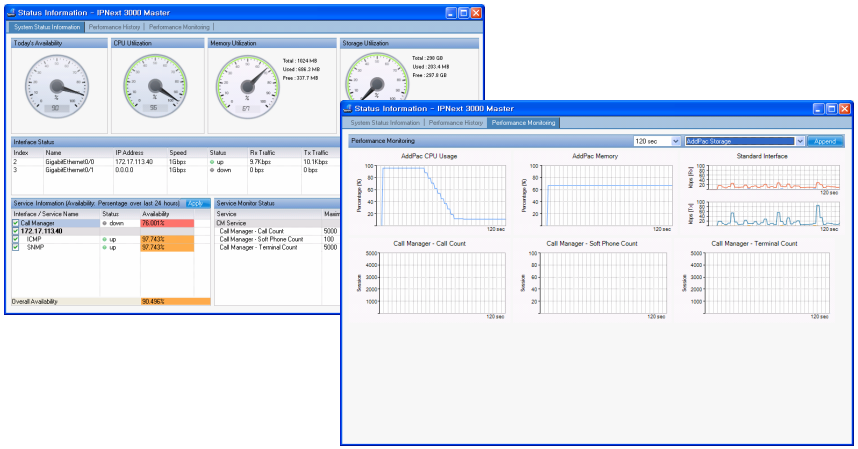
# Security Management

- **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**



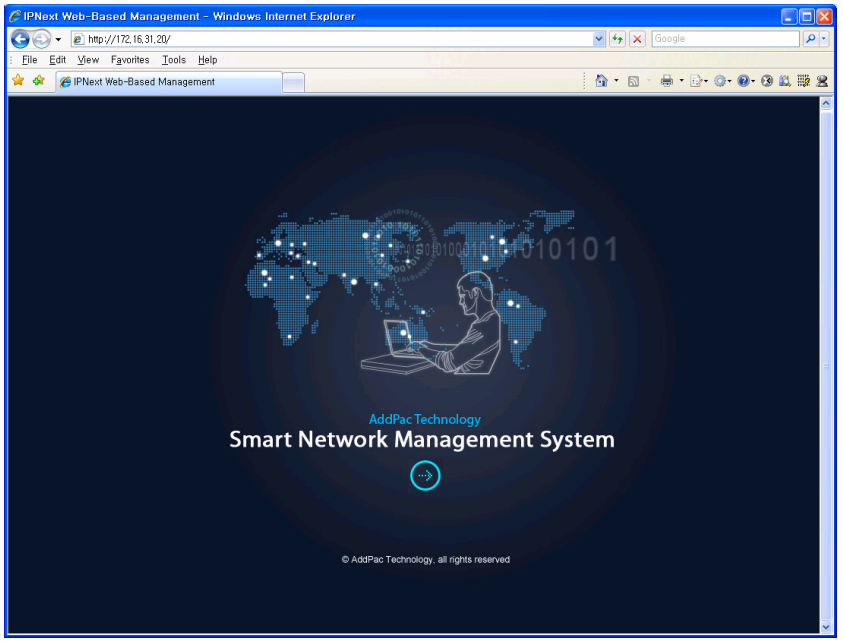
# Smart NMS

## Smart Network Management System for VoIP Gateway



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- Device Fault History Management
- Device Status Information
- Notification Management
- Fault Statistics
- Model & Service Management



# System Requirement

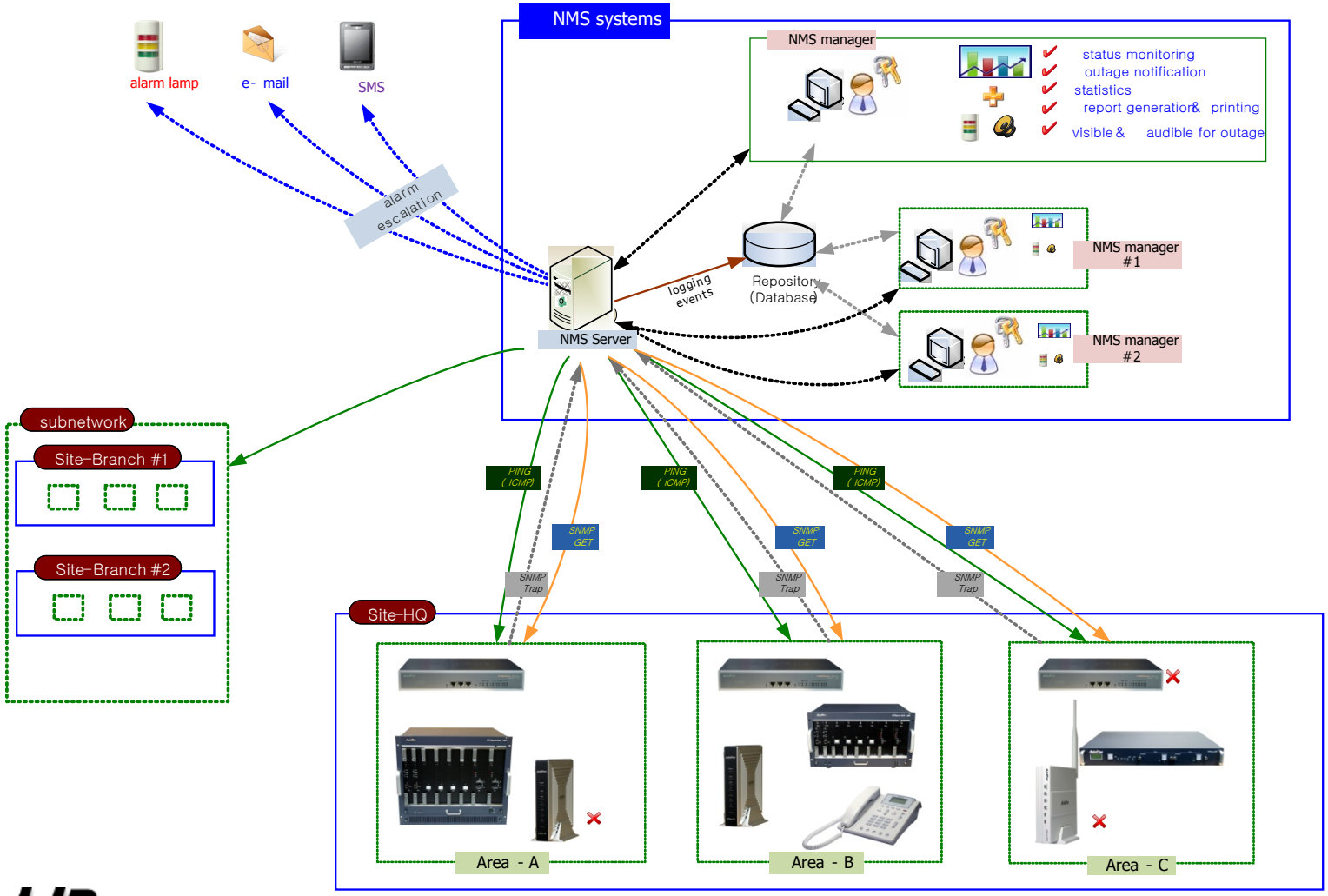
## NMS Server

- 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

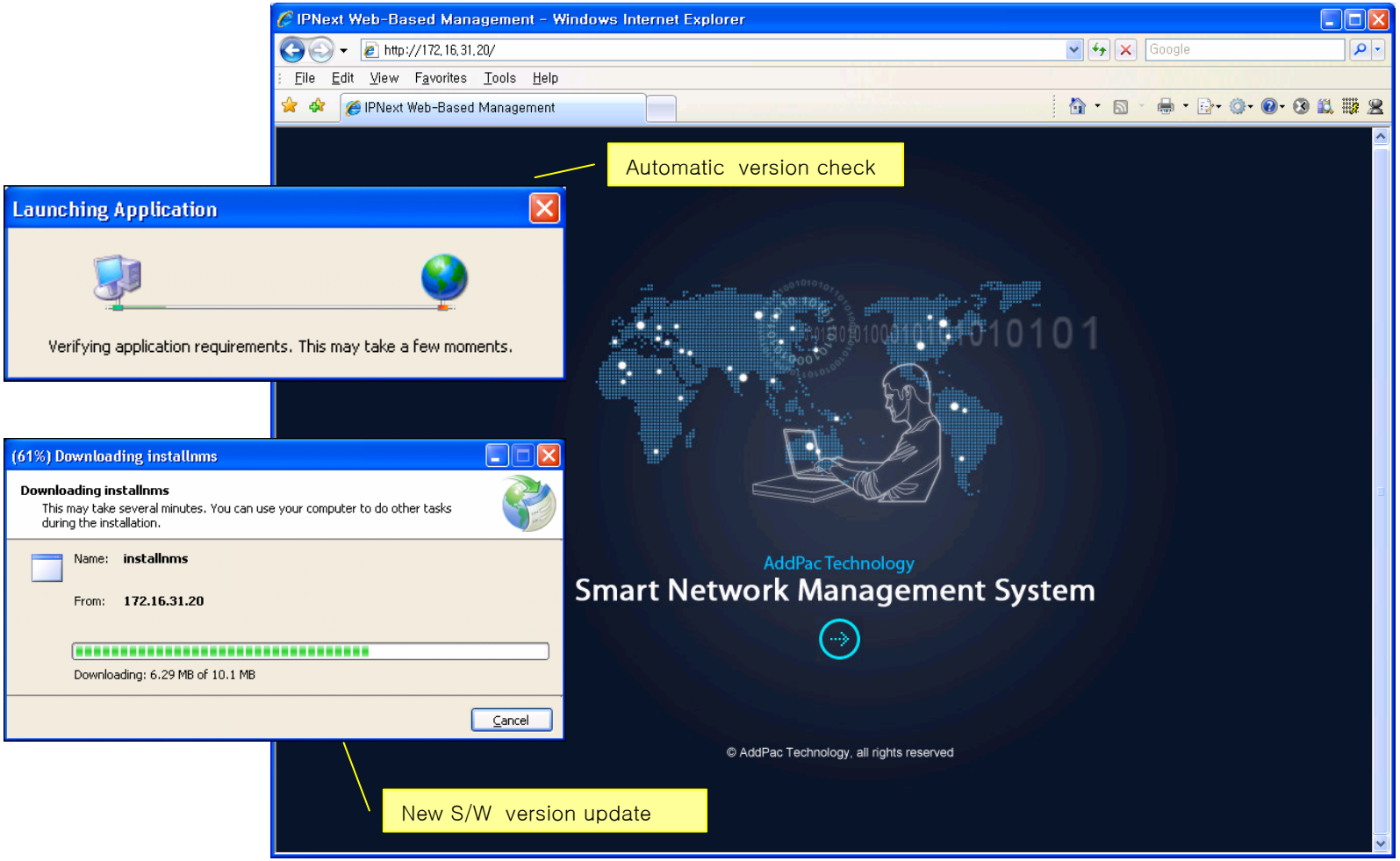
# NMS Networking Diagram



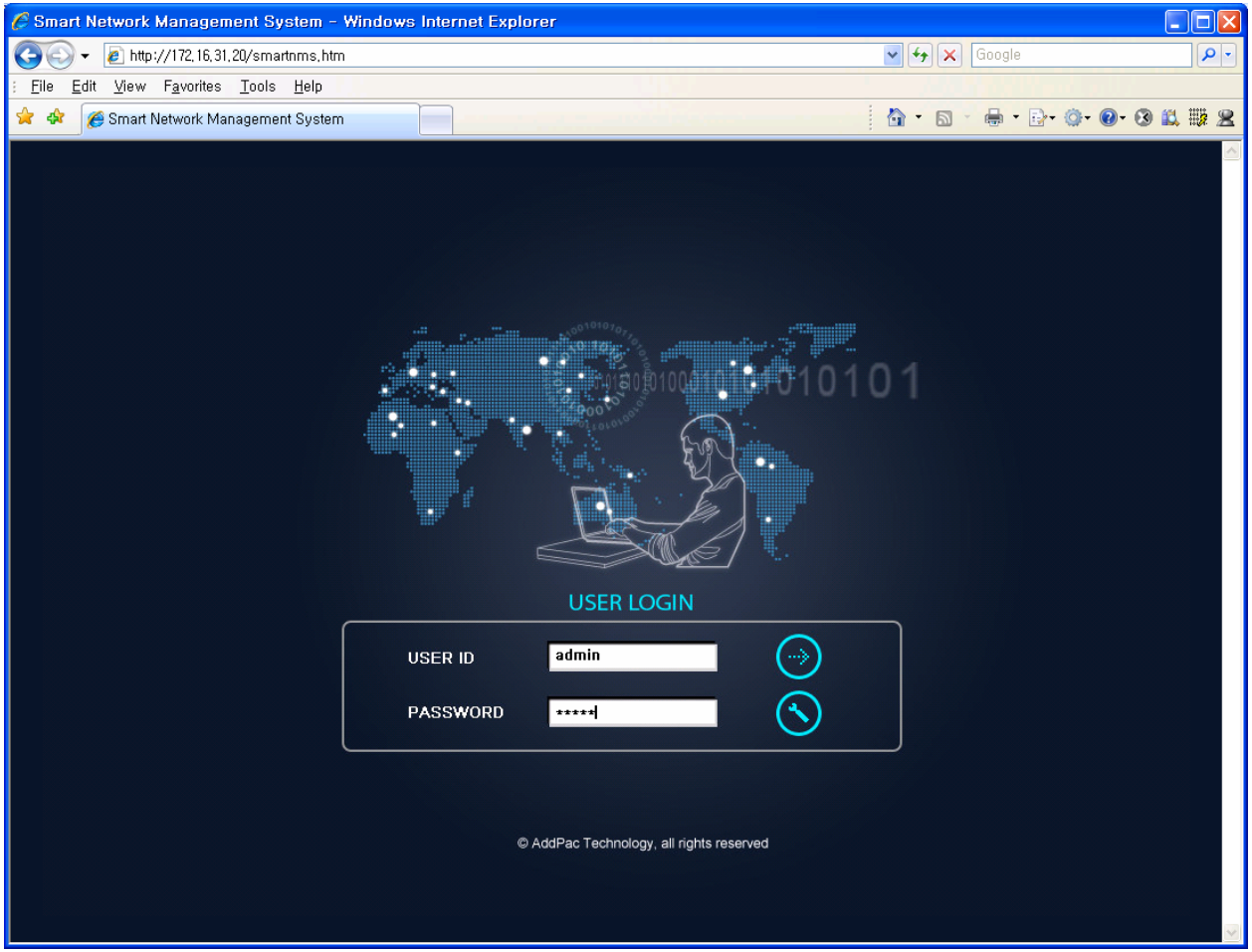
# Web-based Management

- **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

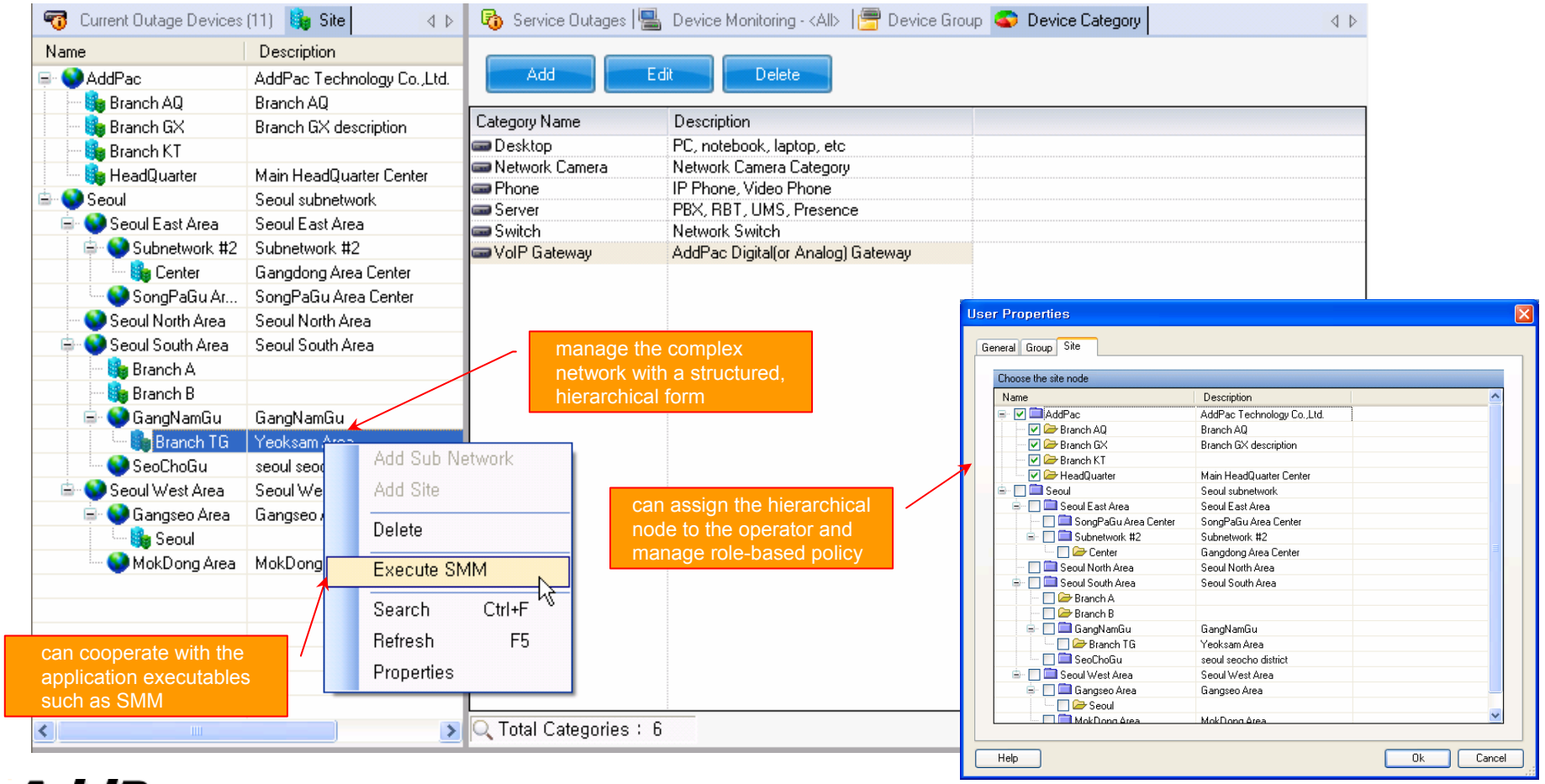


# Web-based Login



# Network Resource Management

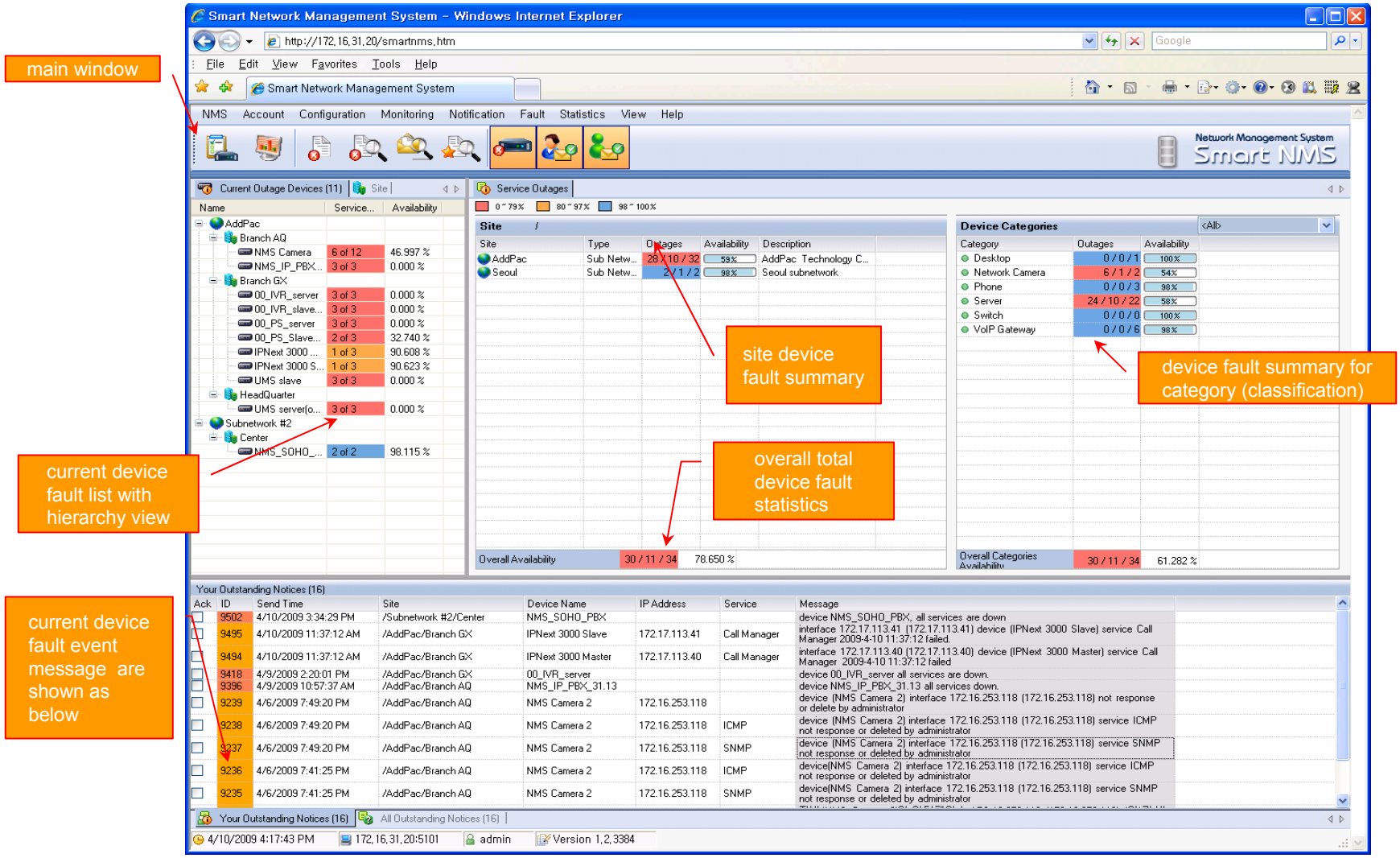
- Network resource management with hierarchical structure
- Role-based resource management for each administrator



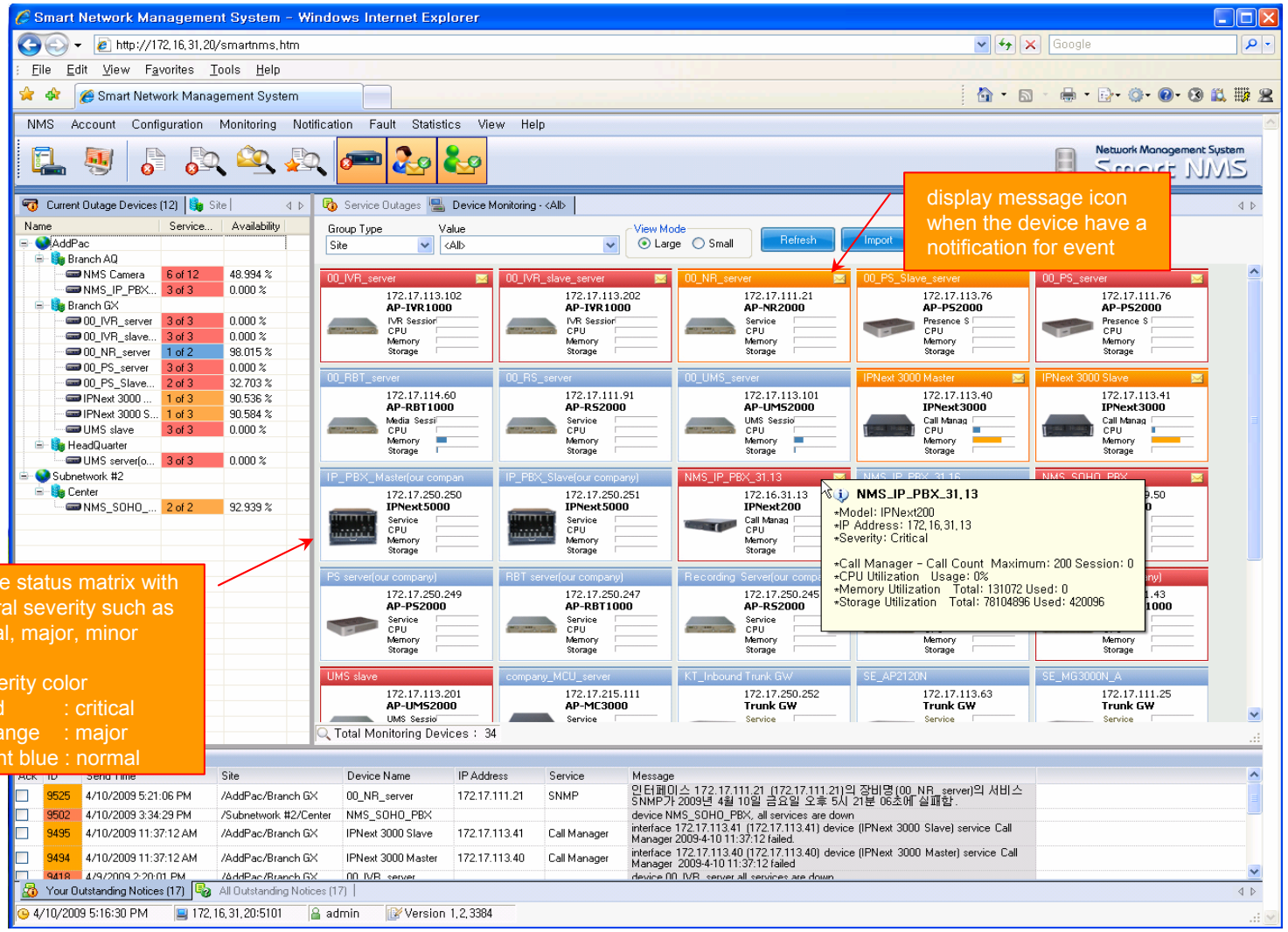
# Device Fault Management

- 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

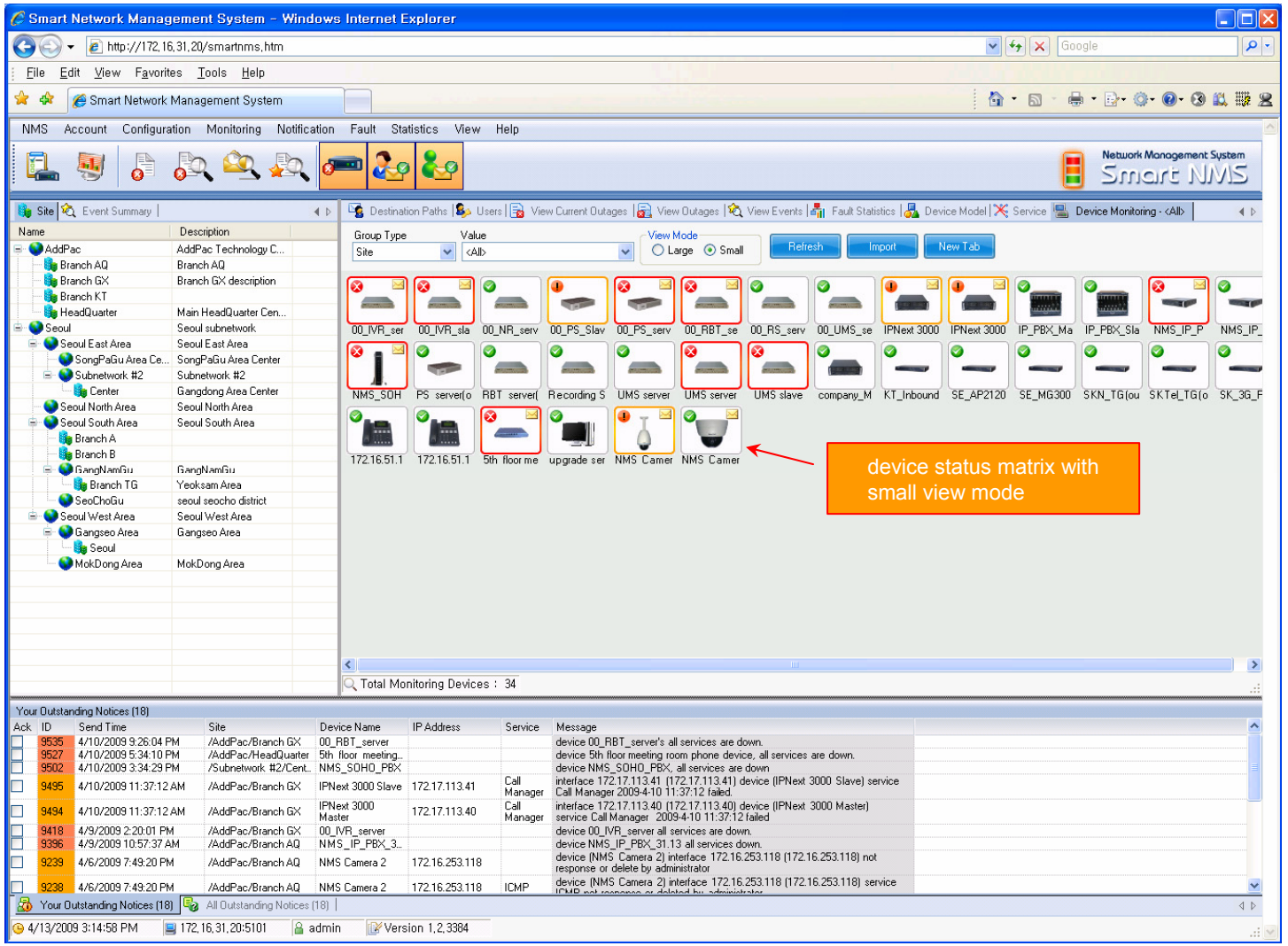
# Device Fault Management



# Device Fault Management



# Device Fault Management



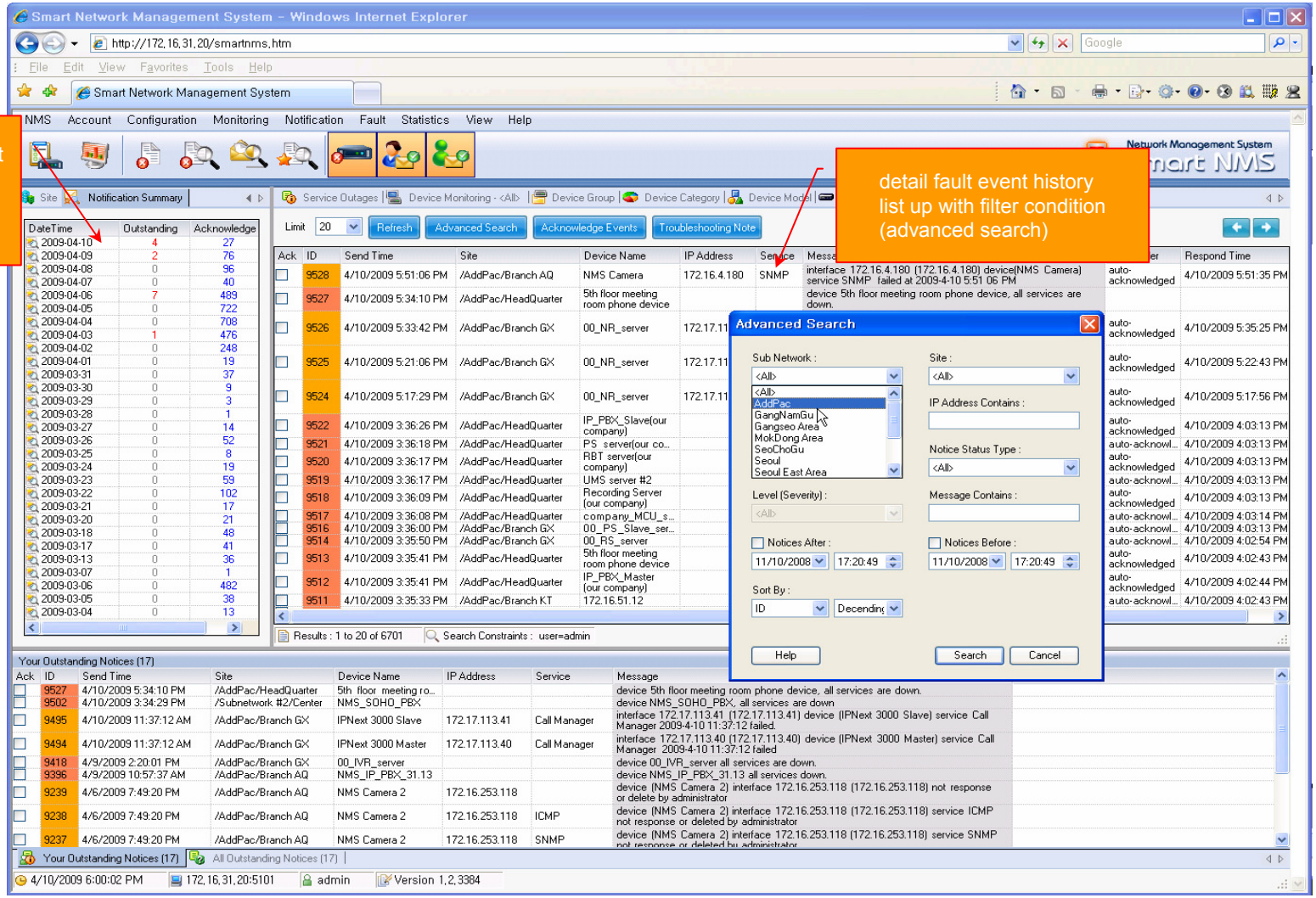
# Device Fault History Management

- 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

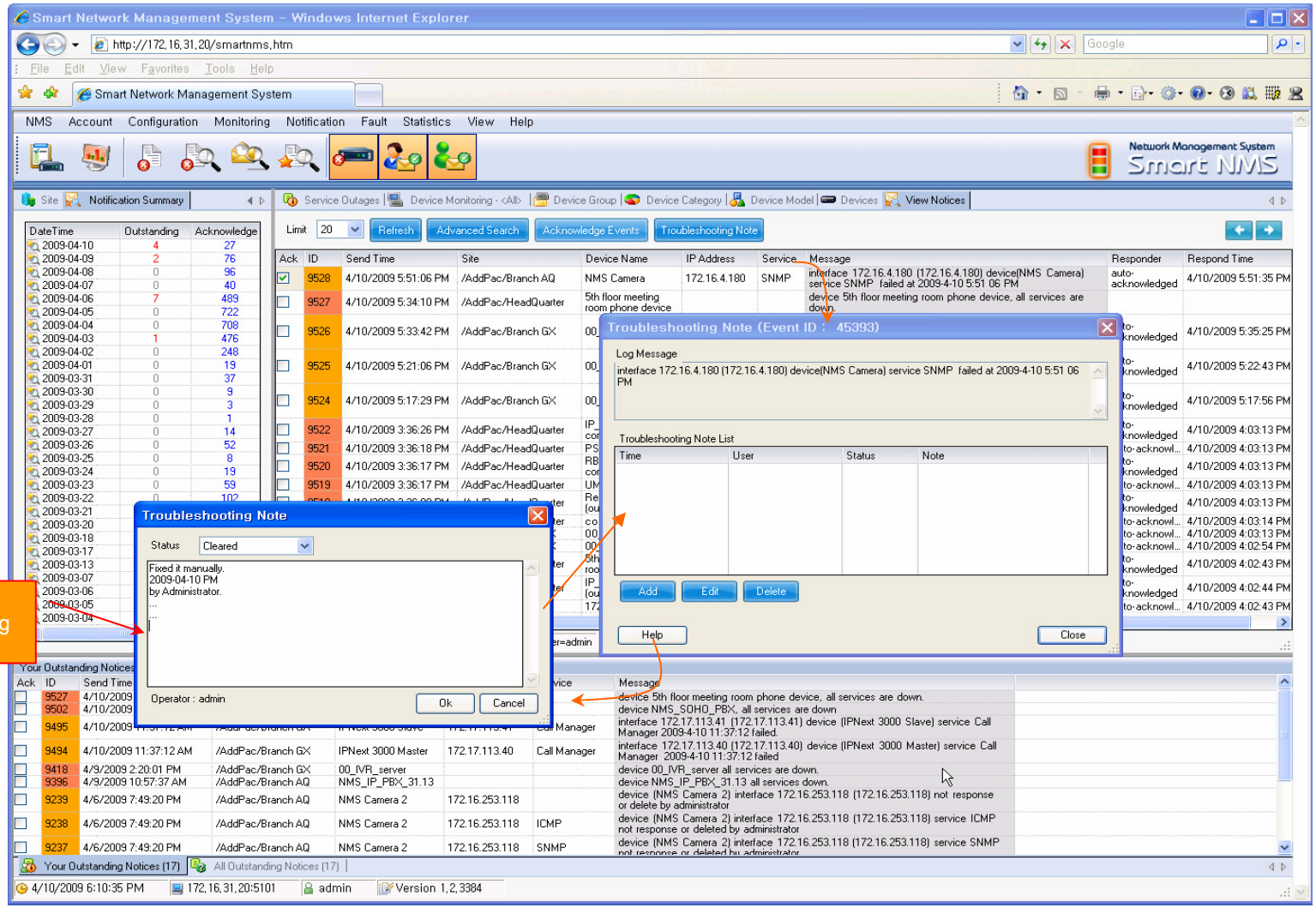
# Device Fault History Management

daily fault event summary statistics information

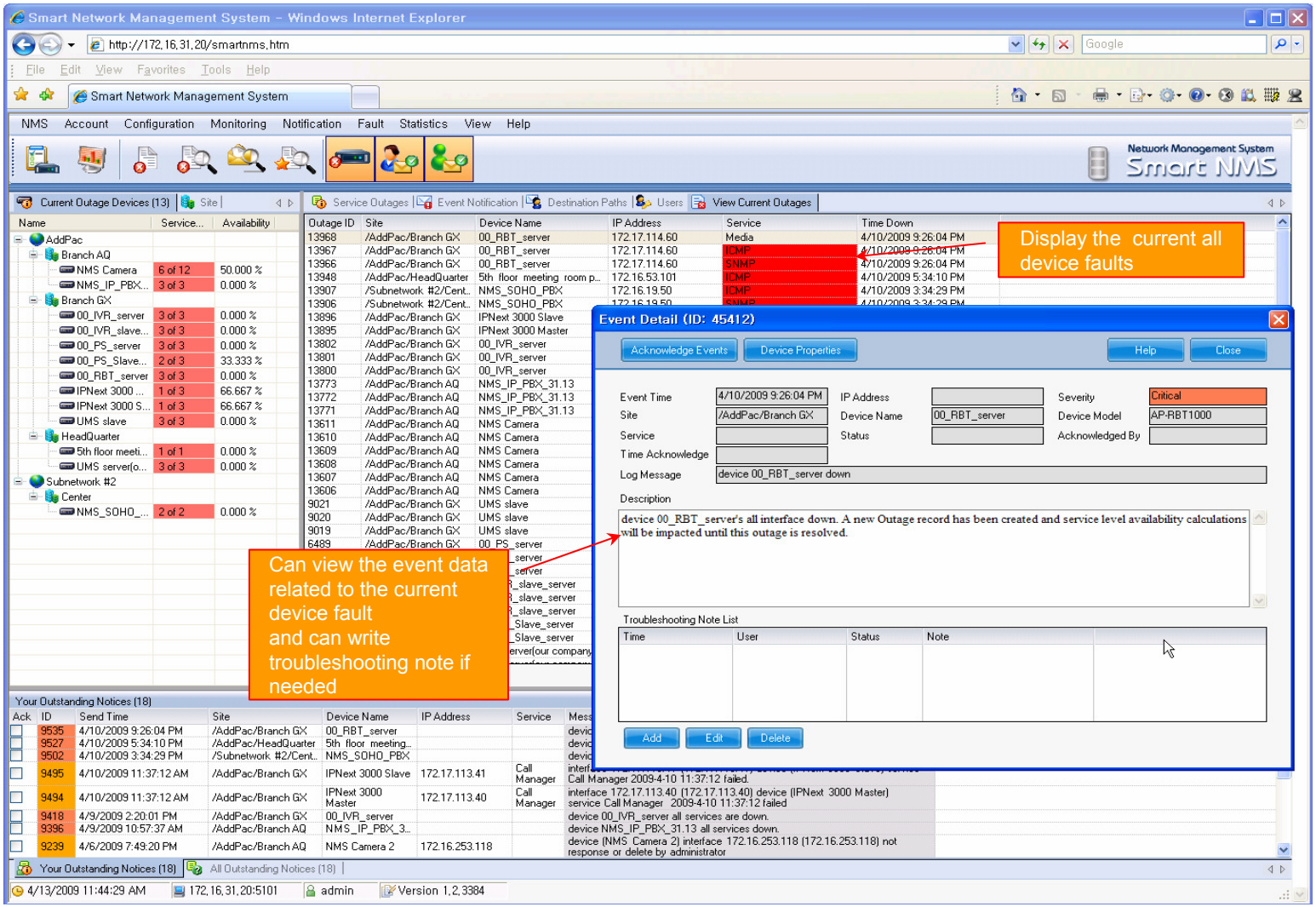
detail fault event history list up with filter condition (advanced search)



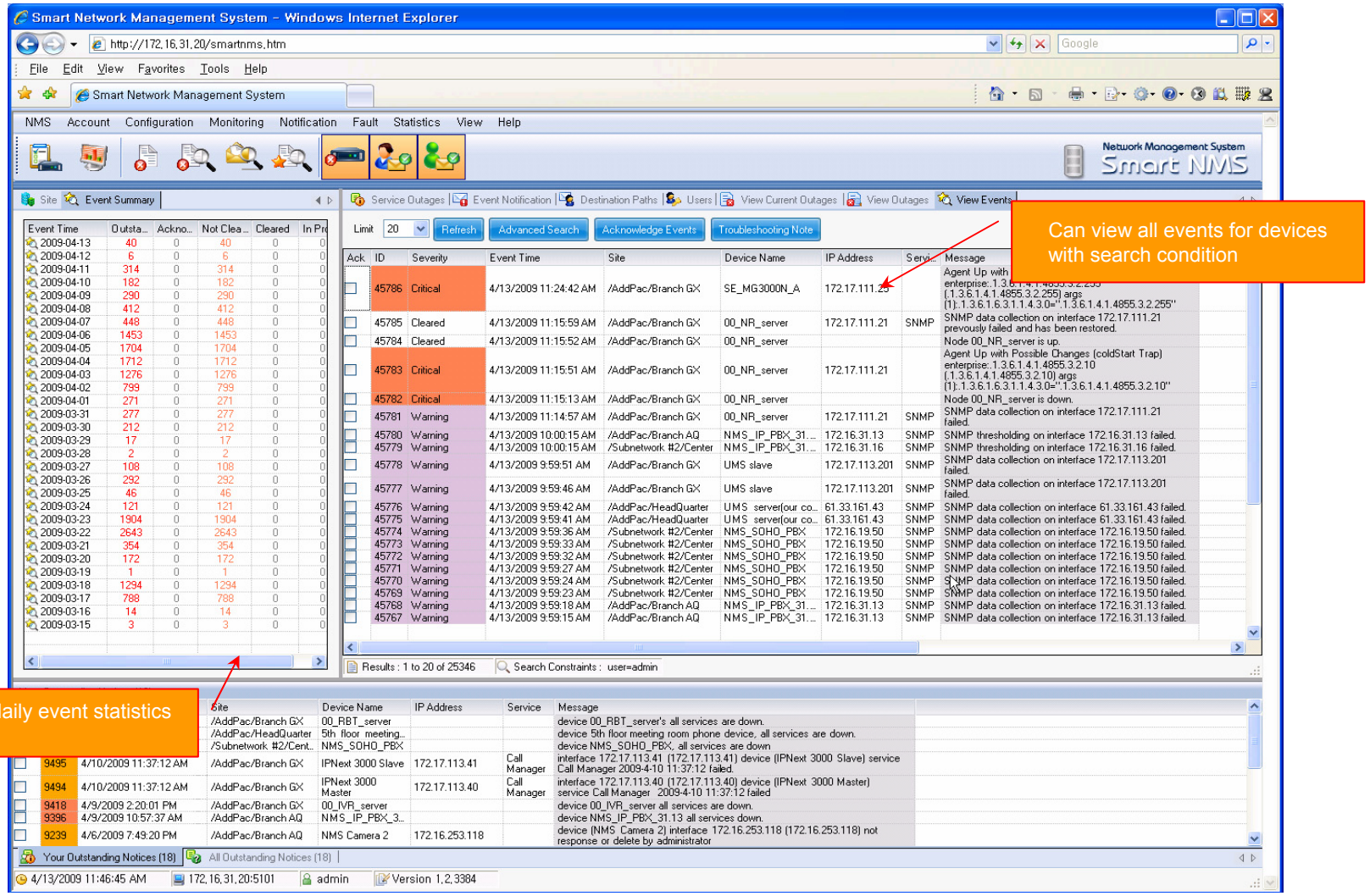
# Device Fault History Management



# Current Device Fault (Outage)



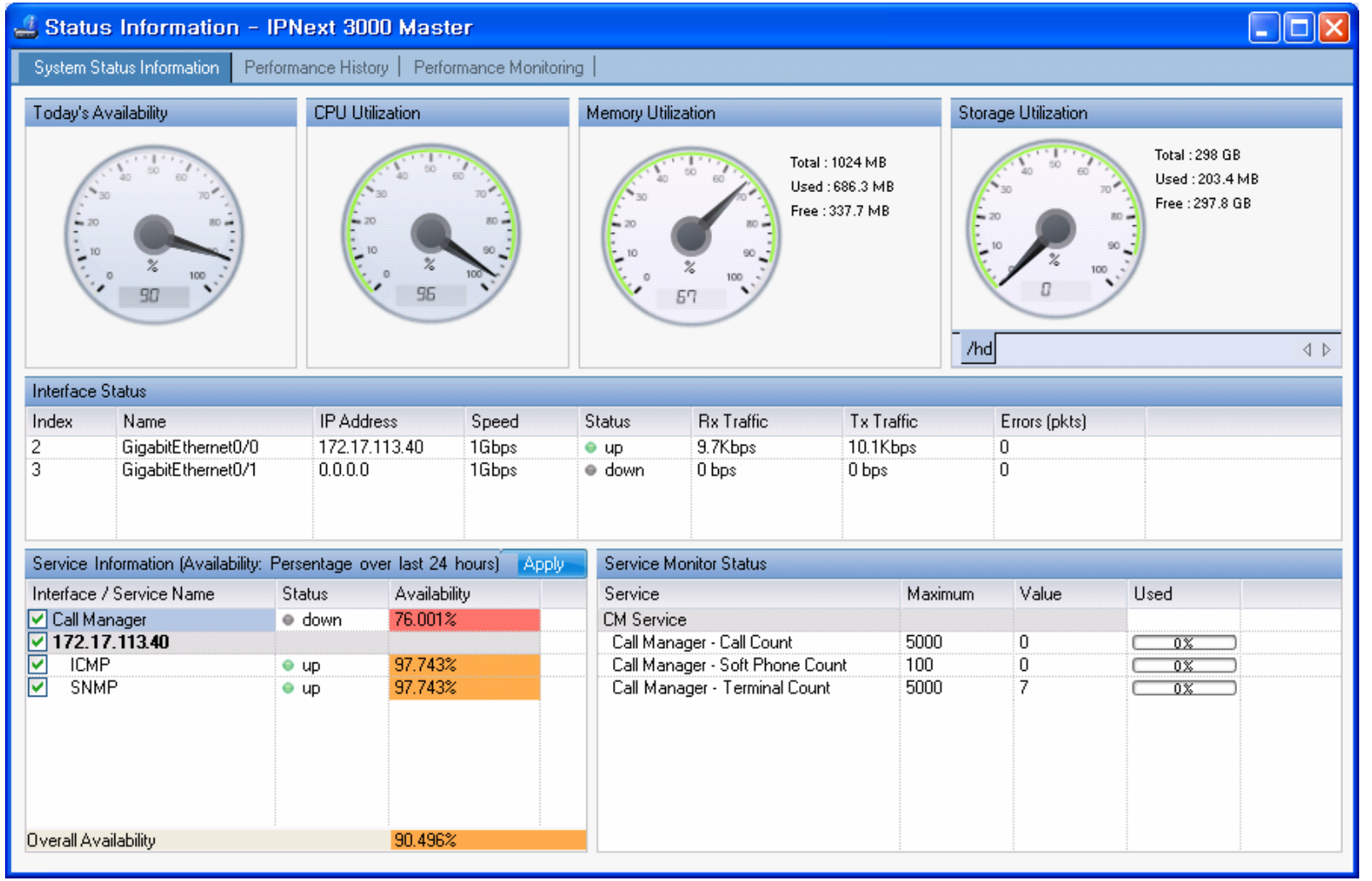
# Device Event History



# Device Status Information

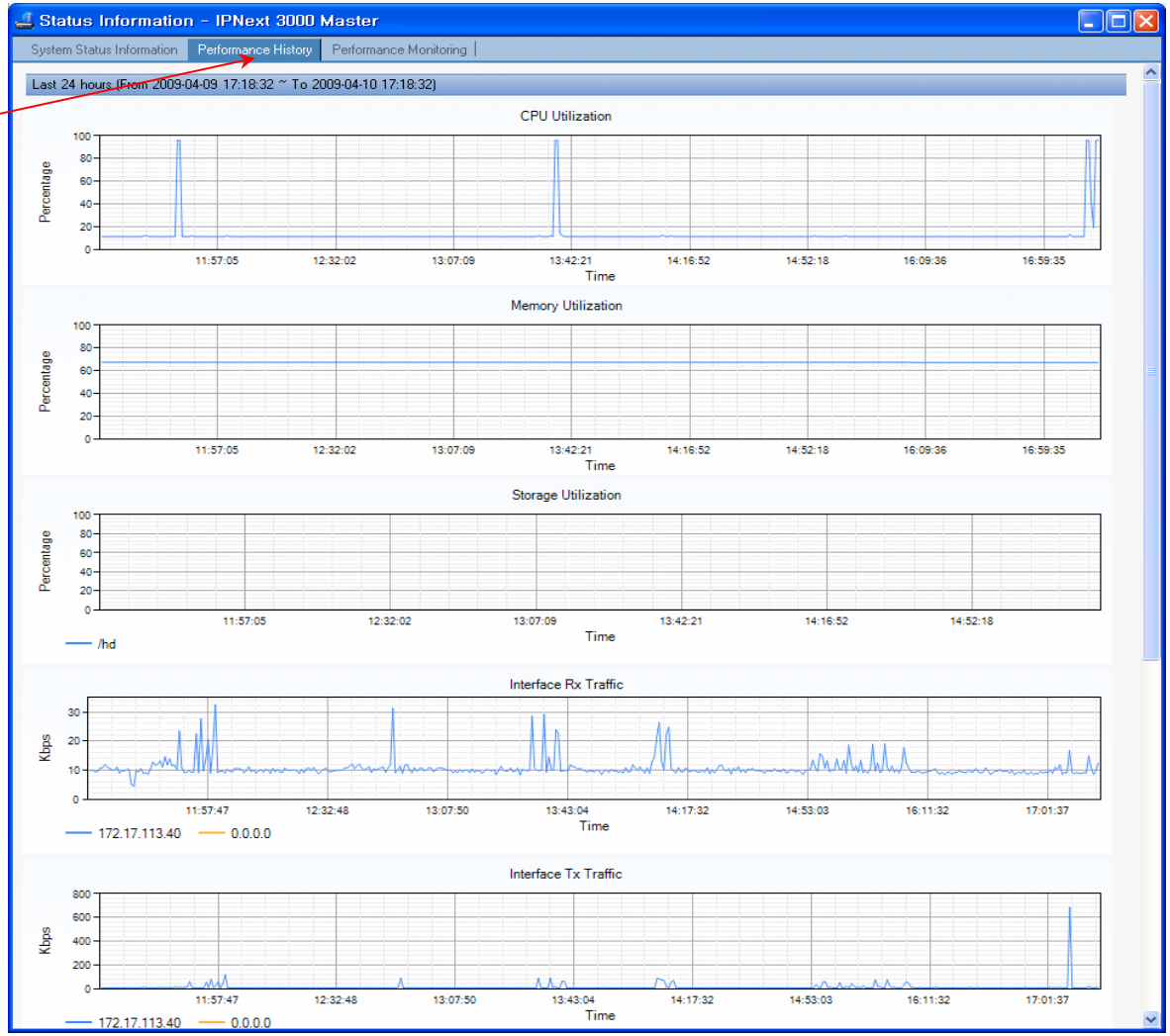
- System Performance Information (CPU, HDD, Memory,…)
- Provide device current service status (up/down)
- Provide device main status (max value vs current value)
- Display Graph Series with System Performance Information
- Monitor Main Status Flow with System Monitoring View

# Device Status Information

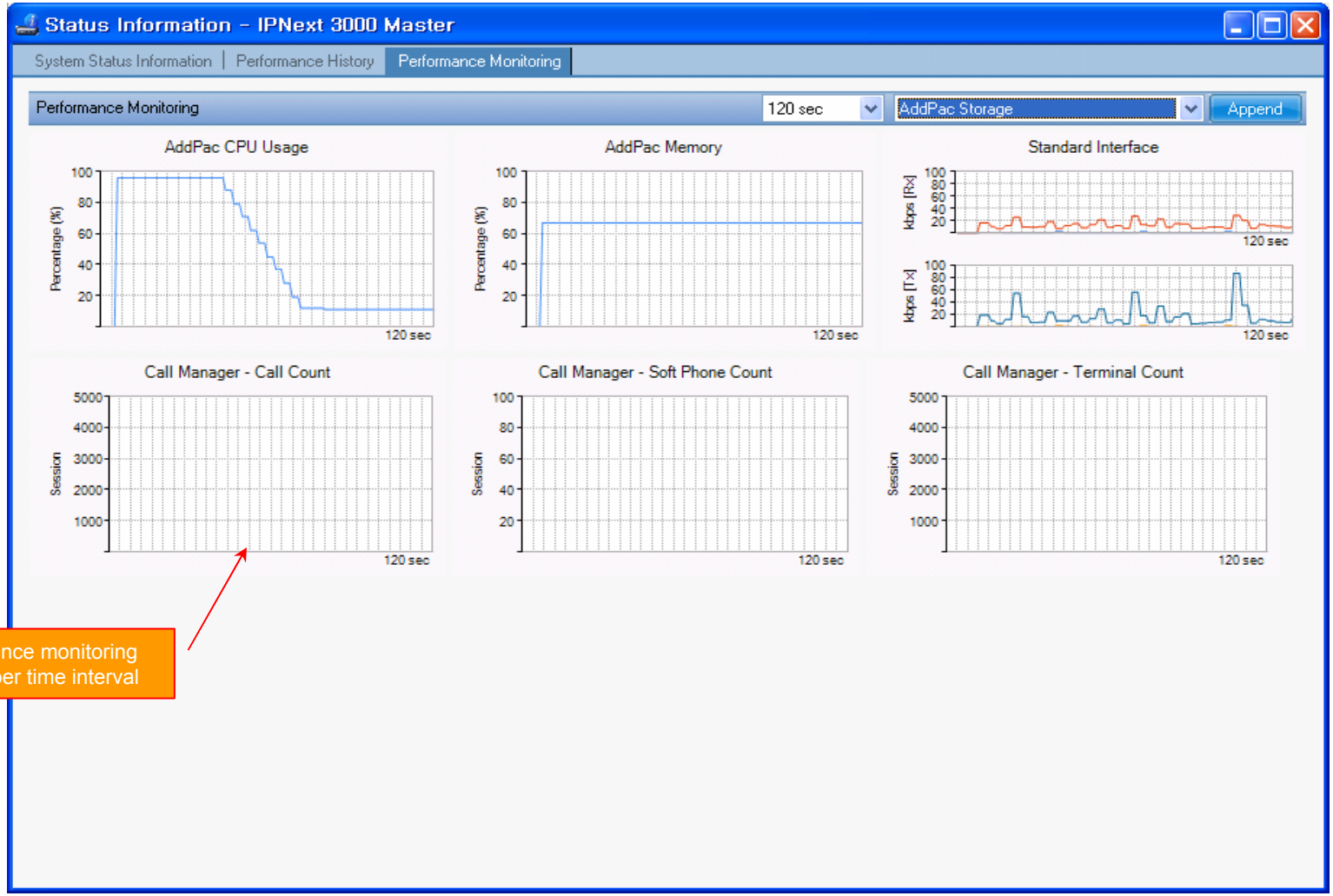


# Device Status Information

performance analysis graph for last 24 hours



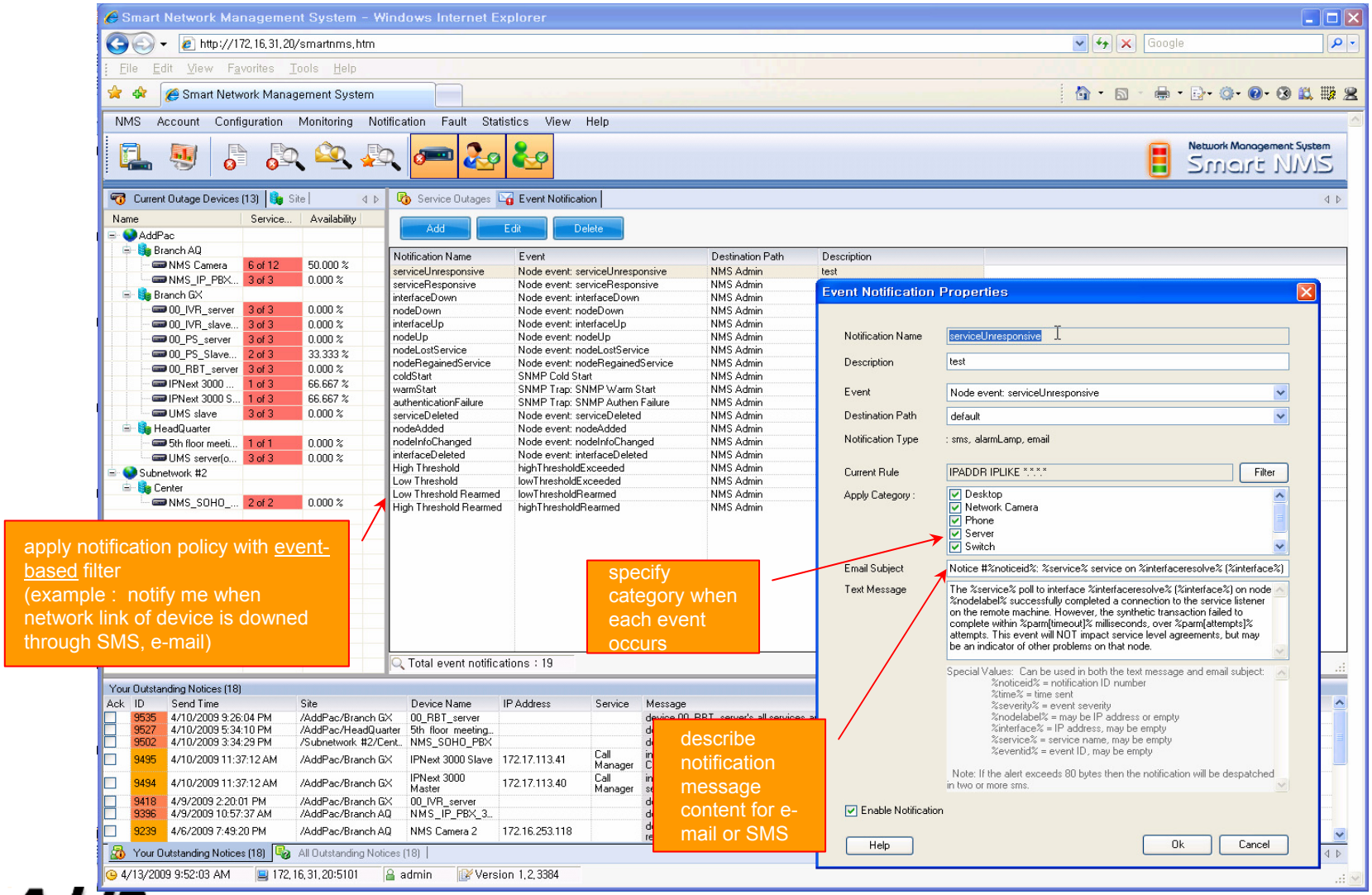
# Device Status Information



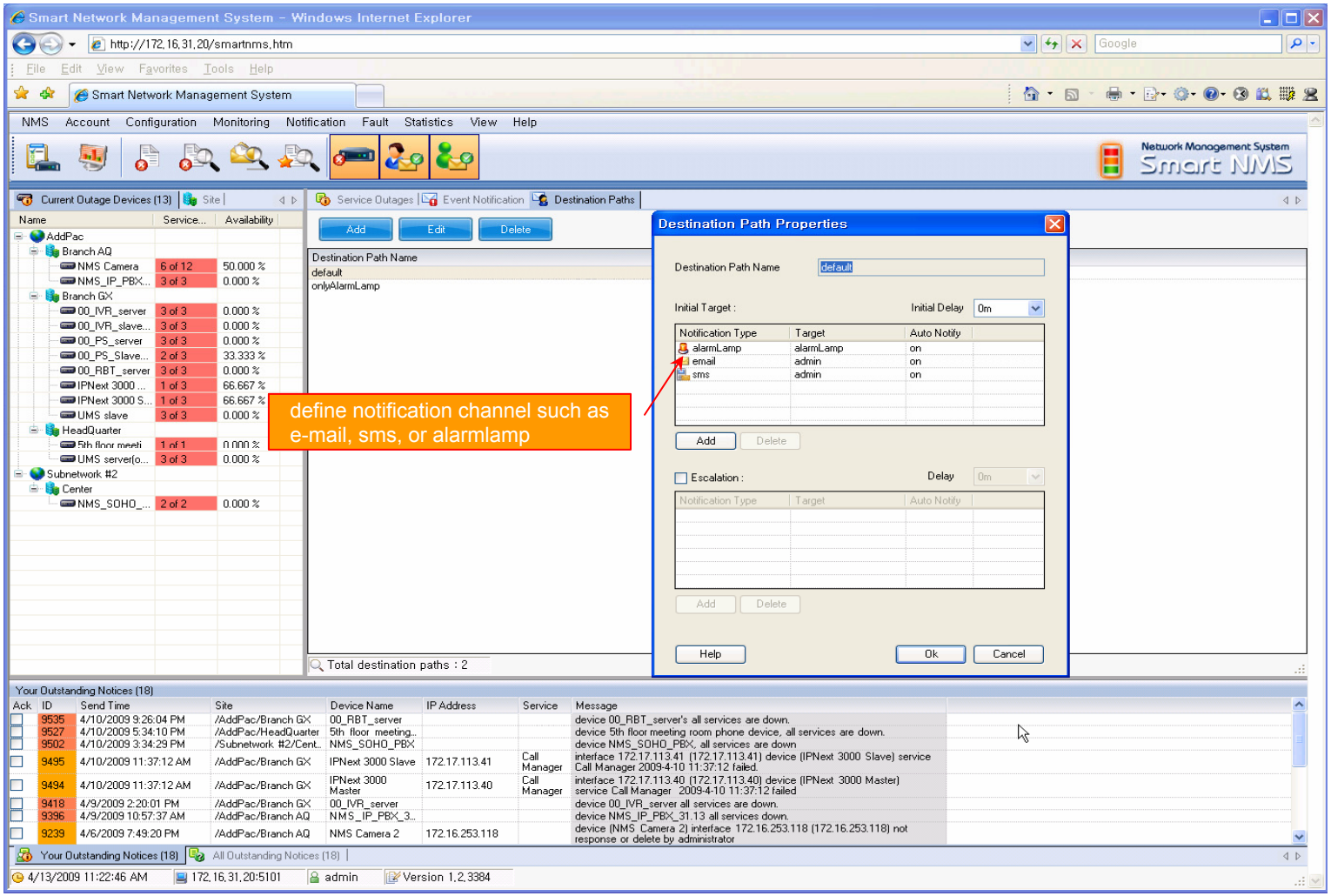
# Notification Management

- 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

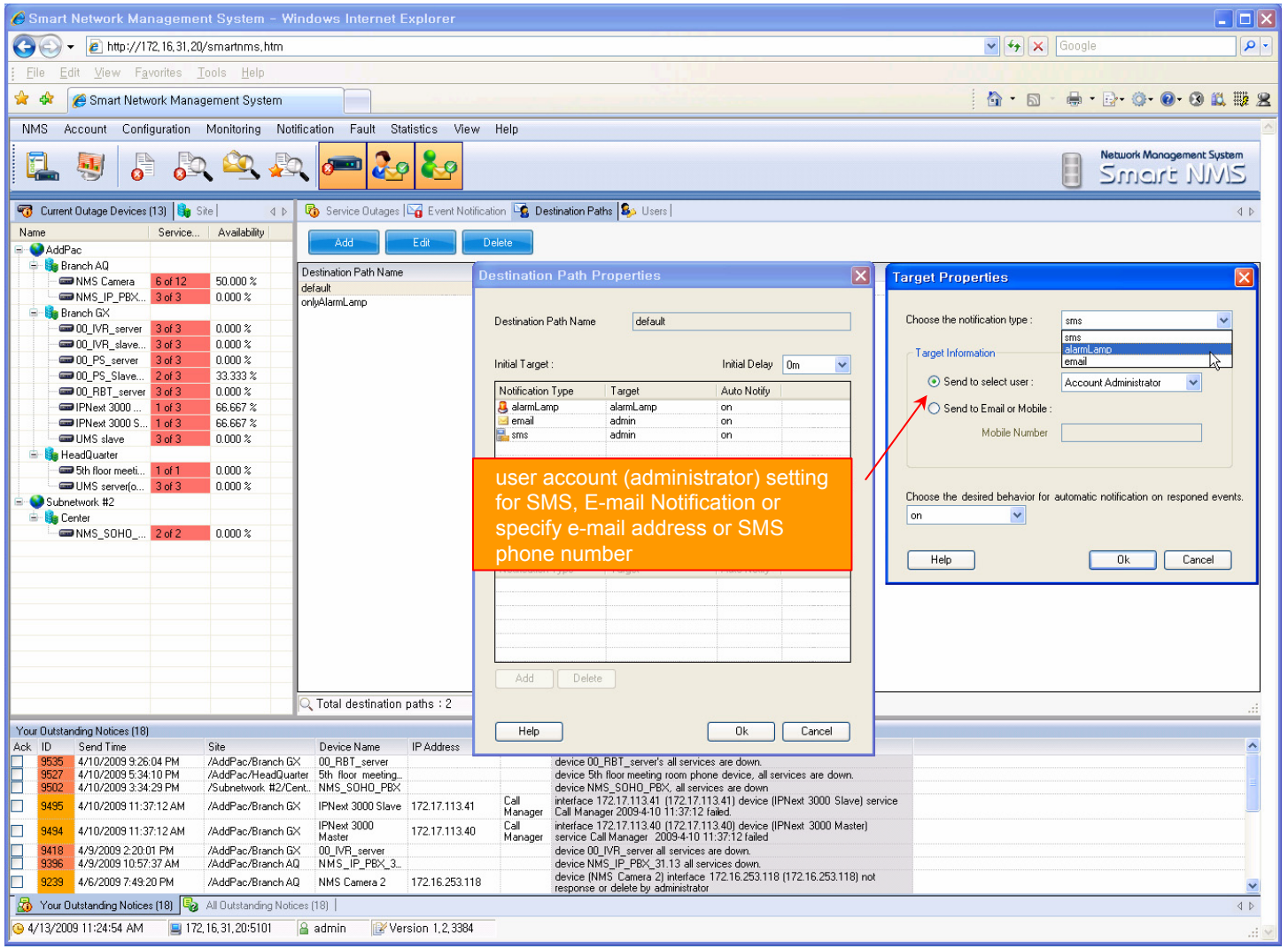
# Event Notification Management



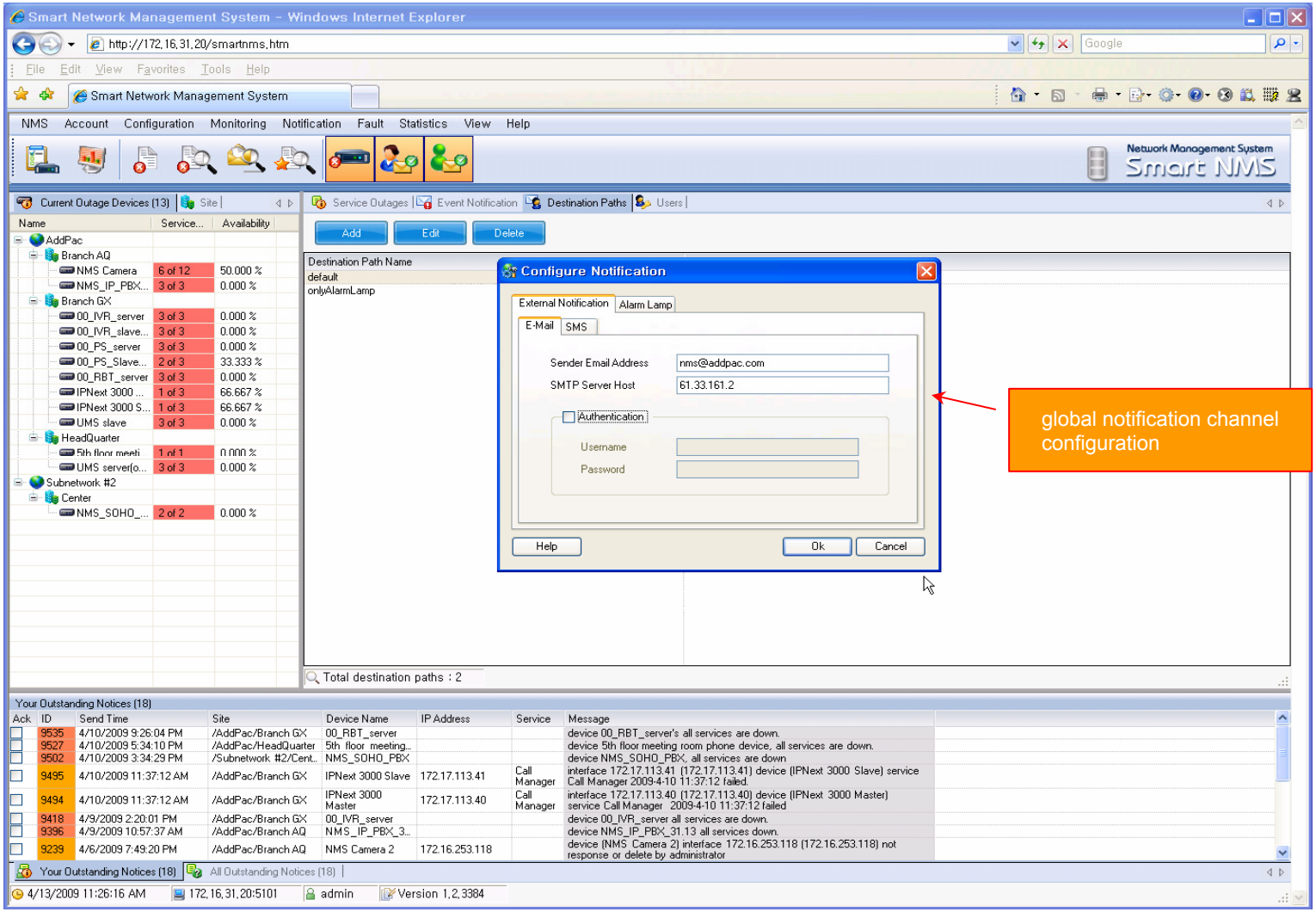
# Event Notification Management



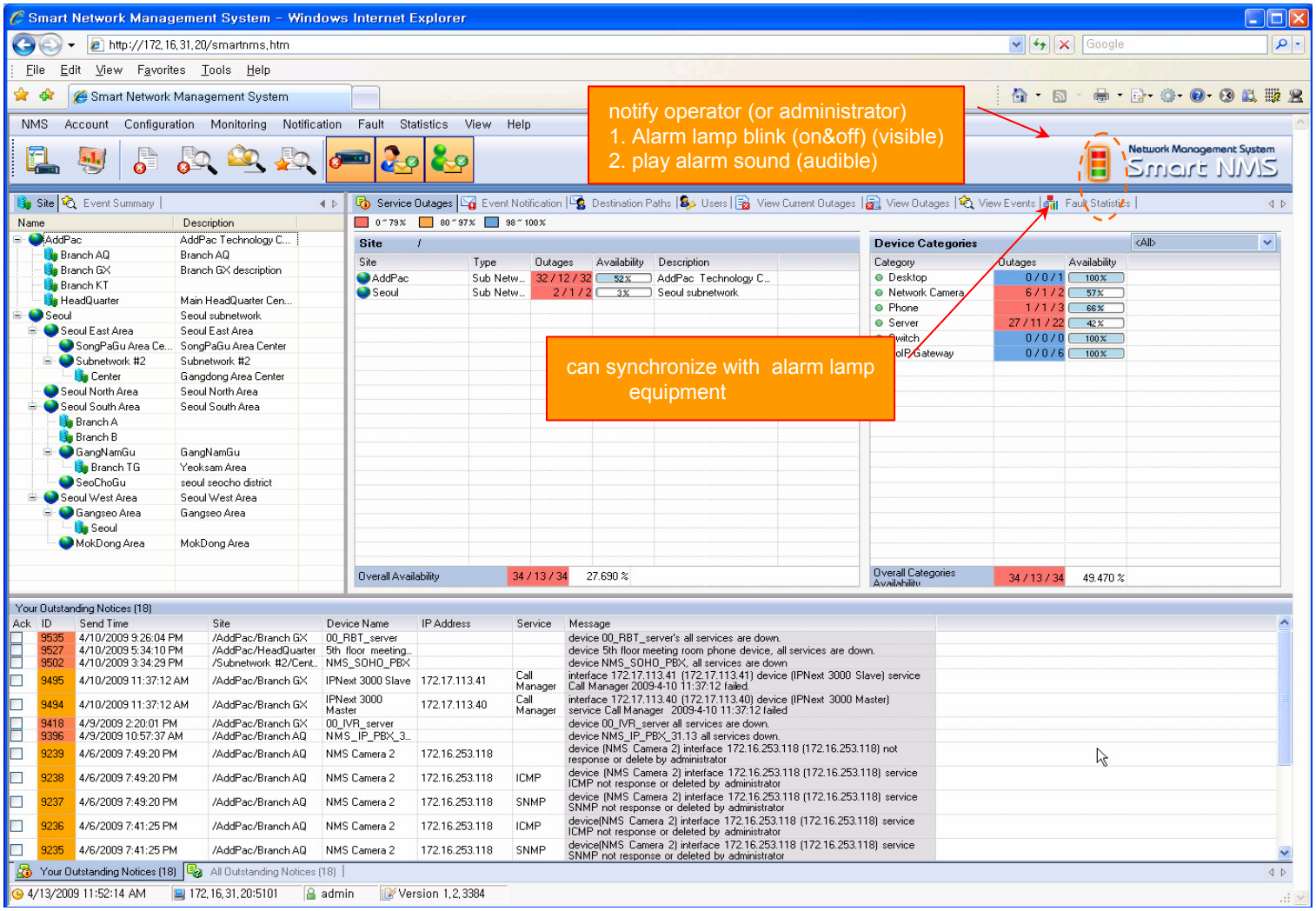
# Event Notification Management



# Configuration



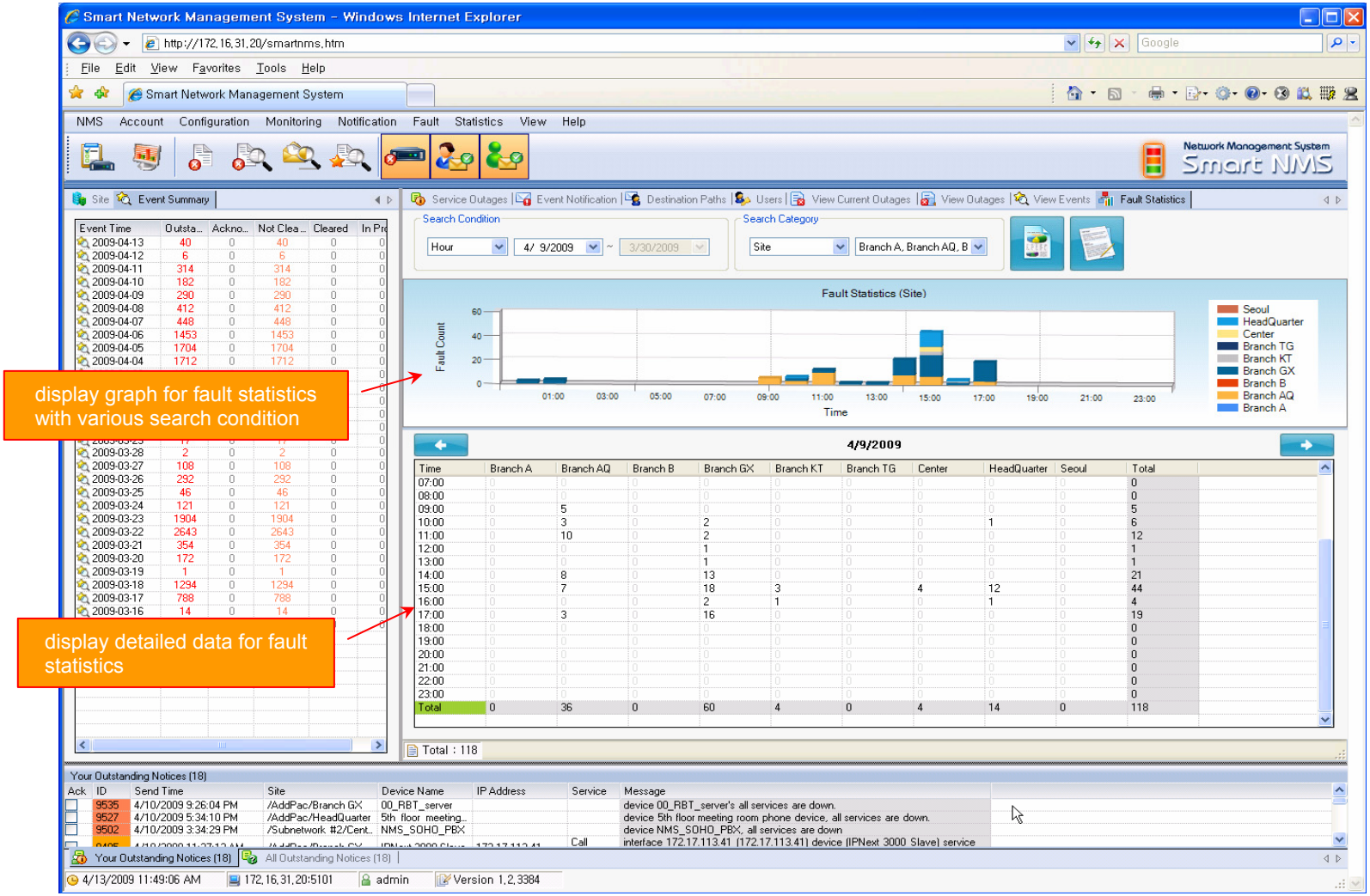
# Audible & Visible Alarm



# Fault Statistics

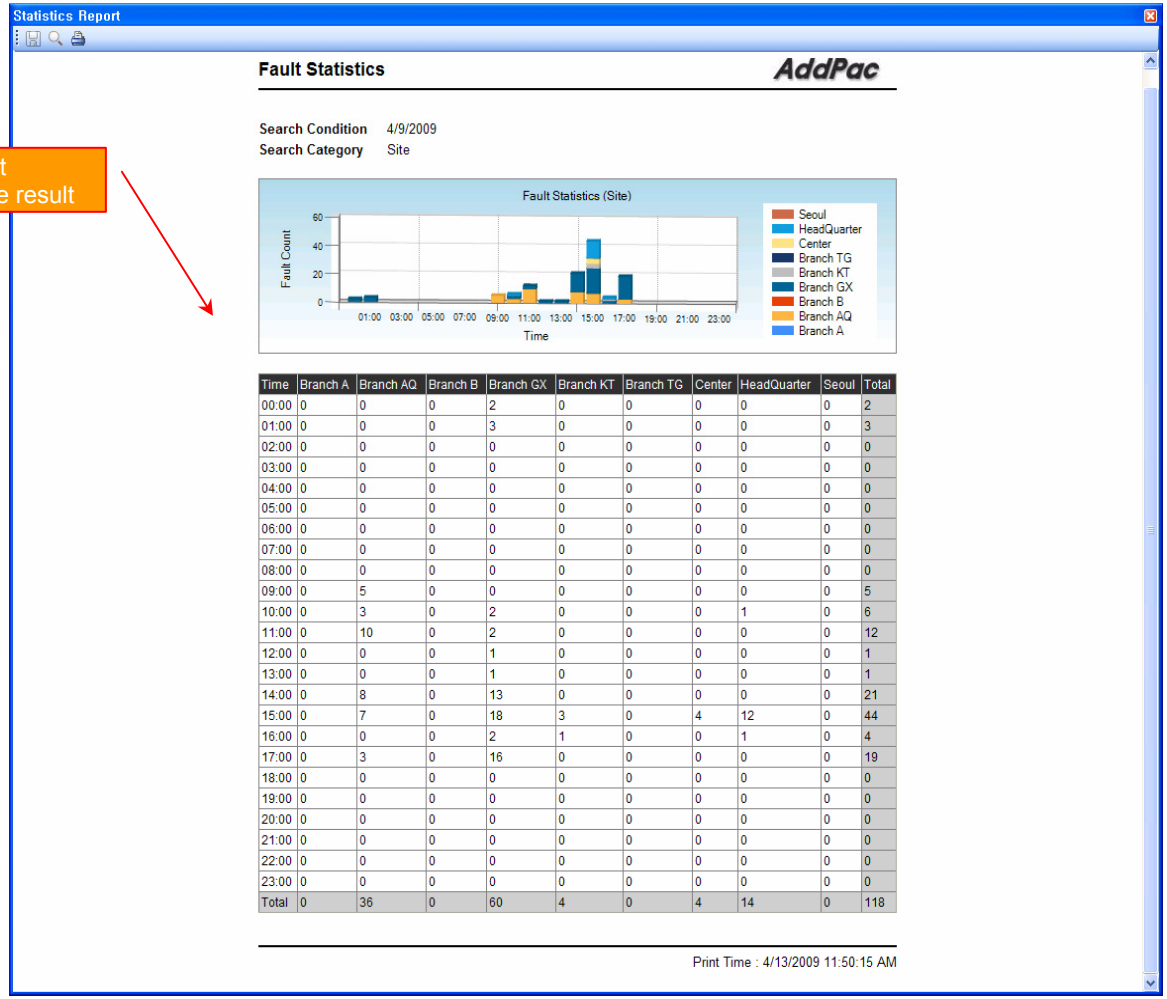
- analyze for a fault event with graph and detailed list data
- Report form generation and print out for statistics result

# Fault Statistics



# Fault Statistics – Report Generation

report generation for fault statistics and print out the result



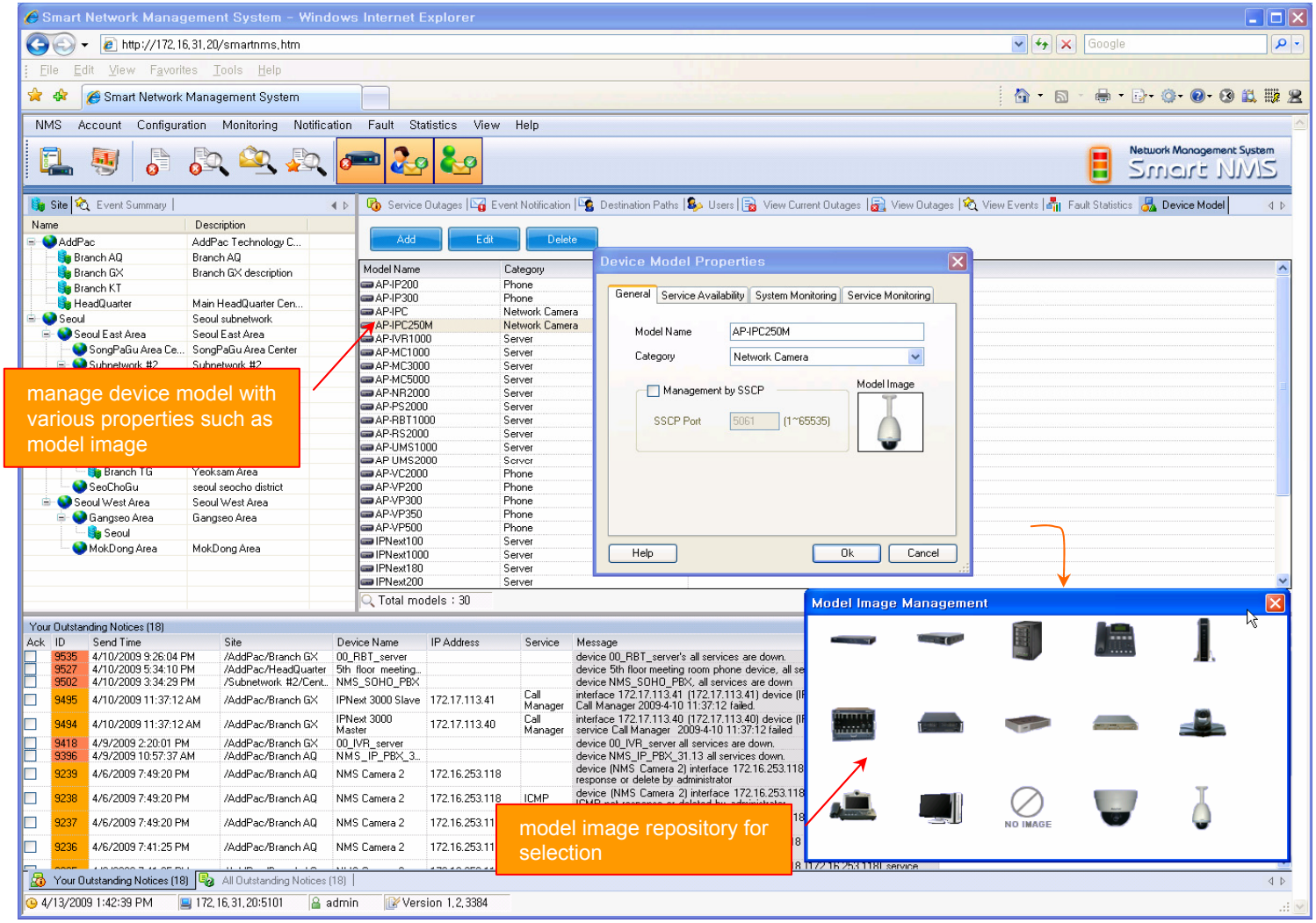

| Time | Branch A | Branch AQ | Branch B | Branch GX | Branch KT | Branch TG | Center | HeadQuarter | Seoul | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 01:00 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 |
| 02:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 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 |
| Total | 0 | 36 | 0 | 60 | 4 | 0 | 4 | 14 | 0 | 118 |

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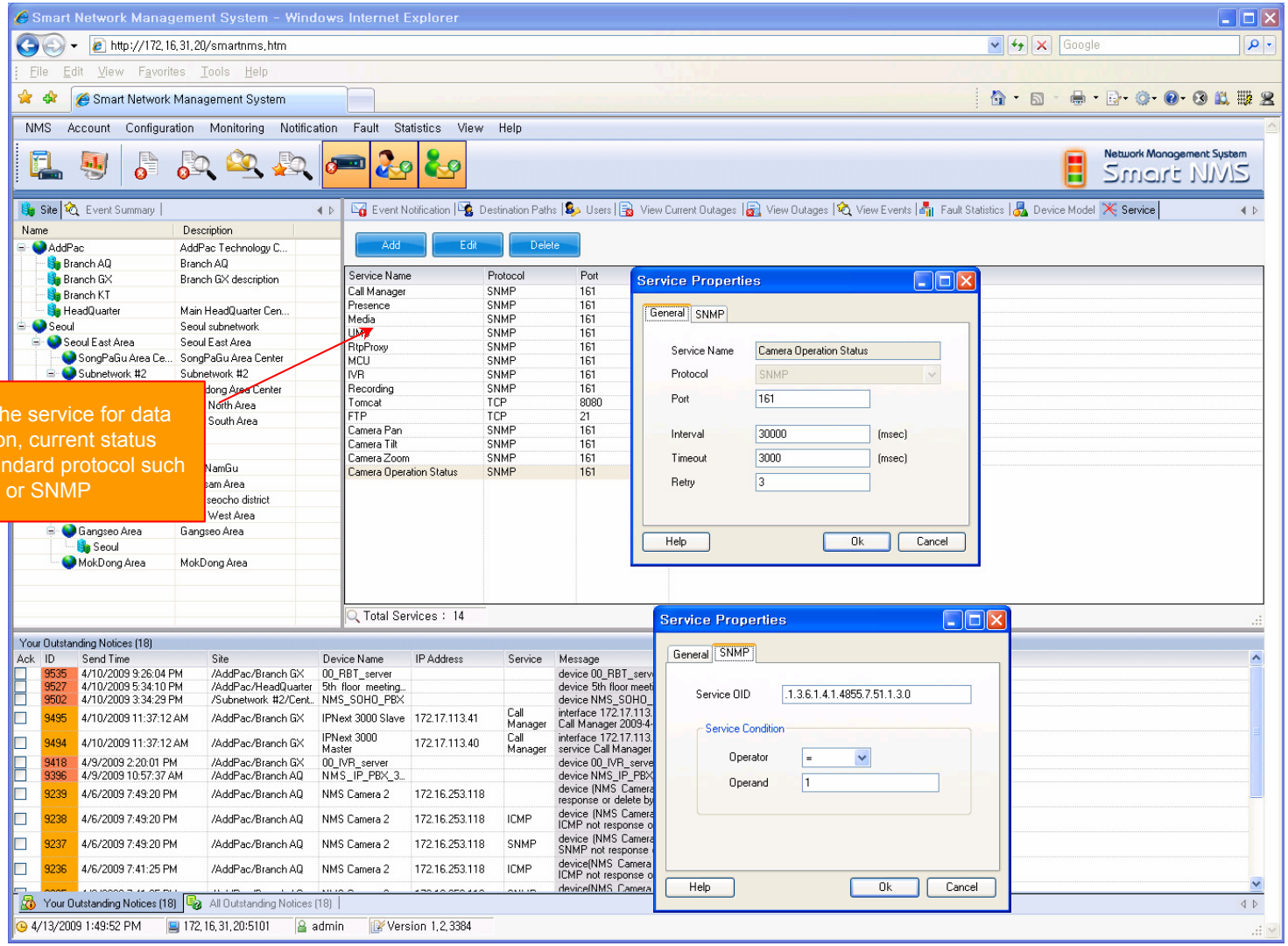
# Model & Service Management

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

# Device Model Management



# Service Definition




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

# Thank you!

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