User Guide

V^{2}IU 6400-S Converged Network Appliance

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Polycom Inc.
4750 Willow Road
Pleasanton, CA 94588-2708
USA

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1

Introduction

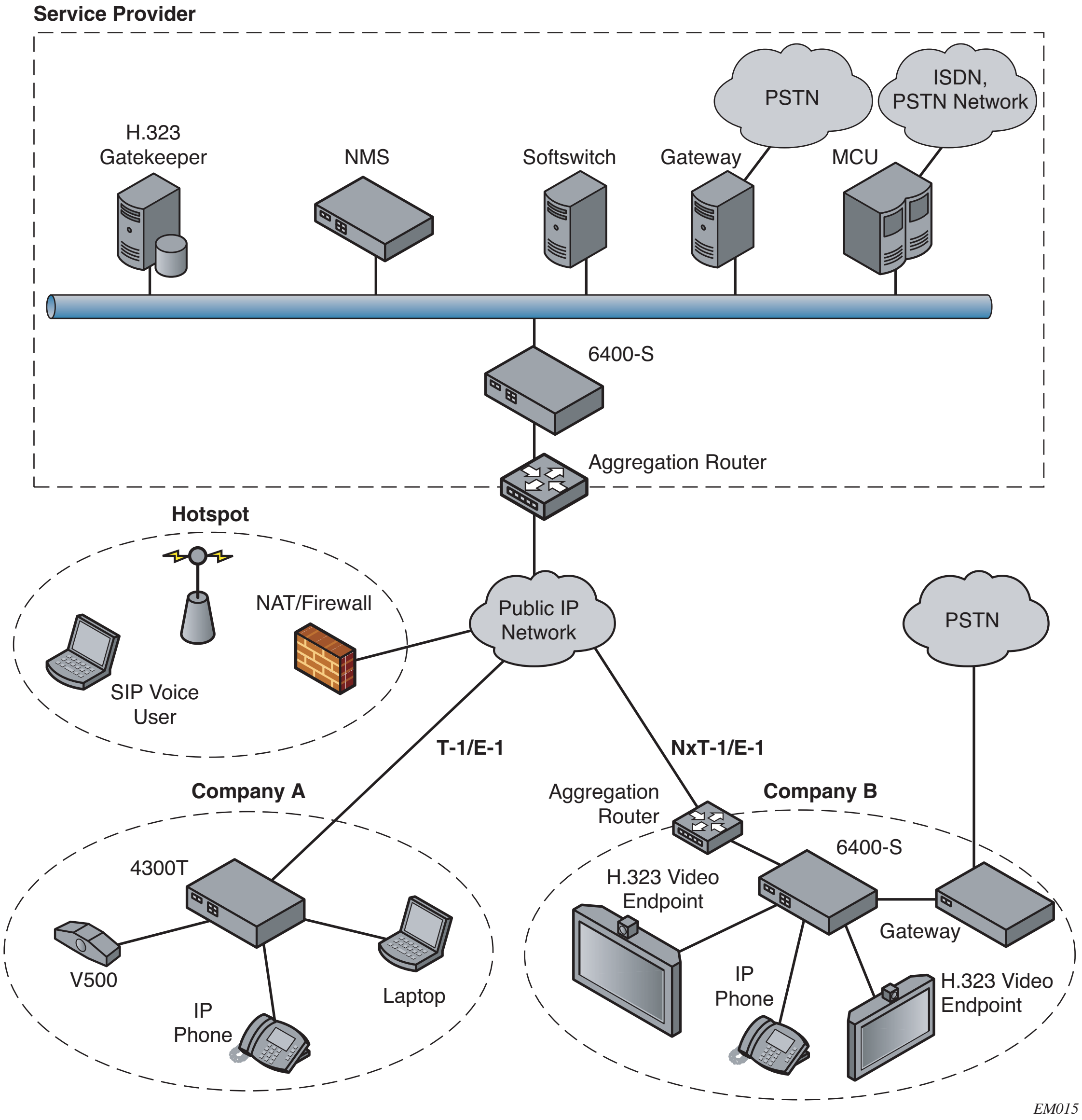
Introducing the V^{2}IU 6400-S Converged Network Appliance

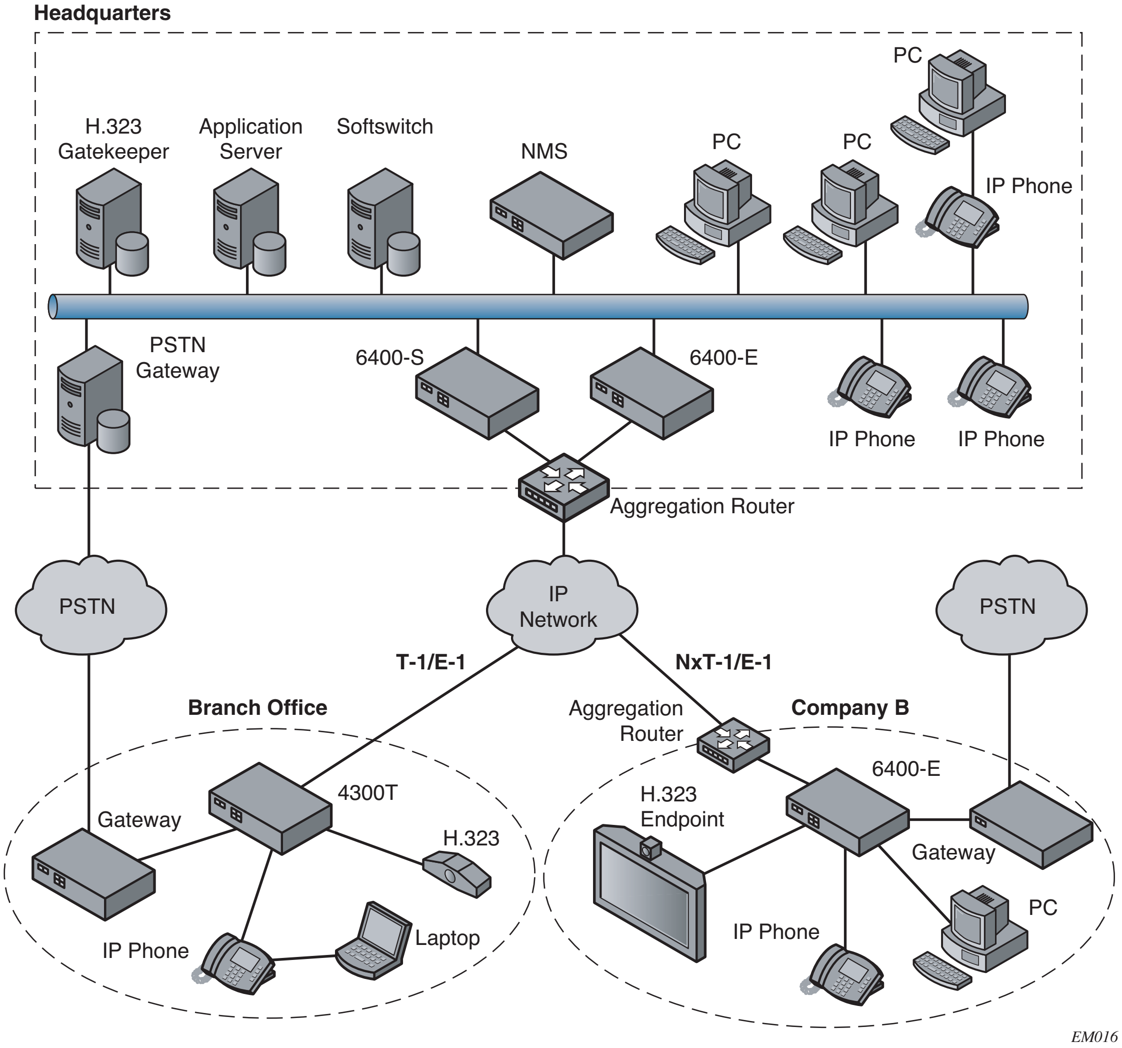
Installed at the edge of the operations center, 6400-S Series converged network appliances secure critical voice, video and data infrastructure components such as VoIP softswitches, video Gatekeepers, gateways and media servers.

This chapter contains the following sections:

- Introducing the V^{2}IU 6400-S Converged Network Appliance
- Features
- Physical Connections and Specifications
- Management Features

The 6400-S Series converged network appliances can be deployed in service provider or enterprise environments as depicted below.





The 6400-S is designed to protect managed VoIP service providers and enterprise customers from network-based attacks. It combines topology hiding, dynamic session admission control and stateful packet inspection to secure critical voice, video and data infrastructure components.This chapter introduces the:

- Functional features
- Hardware features
- Management features

Features

- Resolves firewall traversal problems at the Network Operations Center for VoIP by providing a VoIP application layer gateway (ALG) or voice and video aware firewall that supports SIP, MGCP and H.323
- Resolves firewall traversal problems at customer offices for VoIP by providing NAT-Traversal capability for SIP.
- Supports up to 10,000 concurrent VoIP calls or up to 85 Mbps of H.323 video traffic
- Protects the enterprise LAN using a stateful packet inspection (SPI) firewall for both voice and data traffic
- Performs static IP routing
- Provides integrated test tools to facilitate problem isolation
- Performs TFTP relay for IP phone images
- Uses a simple web based GUI for configuration and management
- Supports logging to external syslog servers and interfaces to network management systems using SNMP

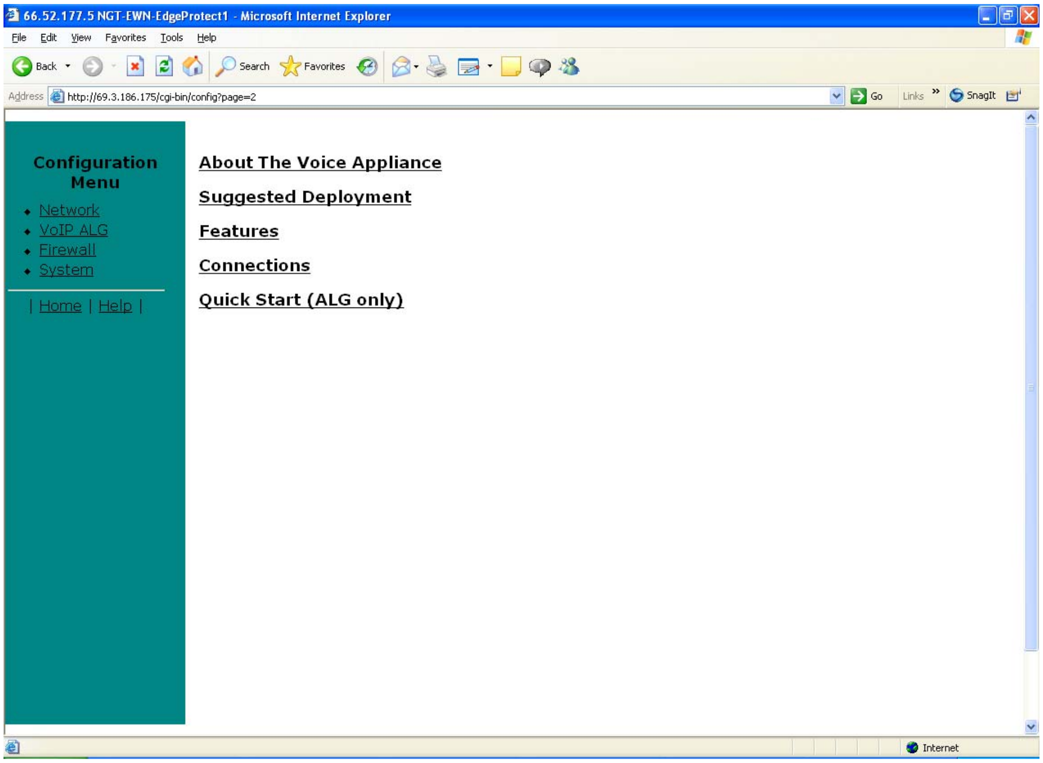
Physical Connections and Specifications

Port	Description
Subscriber (ETH0) Ethernet Port 1	This port is a 10/100 auto sensing port. It is connected through an Ethernet switch to IP phones, IADs or PCs installed on the public network.
Provider (ETH1) Ethernet Port 2	This port is a 10/100 auto sensing port. It is connected to the private network.
Out of Band Management Port 3	This port can be configured to allow out of band management sessions. It is typically connected to a private management network.
Console Port (COM 1)	This port is used to establish a local console session with the EdgeProtect using a VT100 terminal or emulation program. The baud rate is 9600. It is used for debug or local diagnostic purposes only.

Port	Description
Dimensions	Compact 2U design - 3.45"(H) x 17.11"(W) x 20"(D)
Weight	45 lbs (20411 grams)
Power	Dual, redundant 500W AC supplies Dual, redundant 470W DC supplies
Warranty	1 Year

Management Features

The 6400-S is configured and managed through the Configuration Menu, a web-based Graphical User Interface.


66.52.177.5 NGT-EWN-EdgeProtect1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://69.3.186.175/cgi-bin/config?page=2
Go Links SnagIt
Configuration Menu
Network
VoIP ALG
Firewall
System
| Home | Help |
About The Voice Appliance
Suggested Deployment
Features
Connections
Quick Start (ALG only)
Internet

Access the Configuration Menu by entering a URL in a web browser such as Internet Explorer, Netscape, or Firefox.

Using the Configuration Menu, you can set a wide range of network services, including:

- Provider and subscriber settings and related network settings.

- Remote system logging.
- VoIP and subnet routing.
- Firewall
- Administration, maintenance and upgrading.

The following chapters give you detailed processing steps you need to set up the 6400-S.

2

Installing the 6400-S

Physical Installation[1]

Anchor the equipment rack that will contain the 6400.

The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more systems are extended in front of the rack on slides. You must also consider the weight of any other device installed in the rack. A crush hazard exists should the rack tilt forward which could cause serious injury.

If AC power supplies are installed

Mains AC power disconnect

The AC power cord(s) is considered the mains disconnect for the 6400-S and must be readily accessible when installed. If the individual server power cord(s) will not be readily accessible for disconnection then you are responsible for installing an AC power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire rack, not just to the 6400-S. To remove all power, two AC cords must be removed.

Grounding the rack installation

To avoid the potential for an electrical shock hazard, you must include a third wire safety ground conductor with the rack installation. If the 6400-S power cord is plugged into an AC outlet that is part of the rack, then you must provide proper grounding for the rack itself. If the 6400-S power cord is plugged into a wall AC outlet, the safety ground conductor in the power cord provides proper grounding only for the 6400-S. You must provide additional, proper grounding for the rack and other devices installed in it.

[1] Intel® Telco/Industrial Grade Server TIGPR2U Product Guide

Overcurrent protection

The 6400-S is designed for an AC line voltage source with up to 20 amperes of overcurrent protection per cord feed. If the power system for the equipment rack is installed on a branch circuit with more than 20 amperes of protection, you must provide supplemental protection for the 6400-S. The overall current rating of a 6400-S configured with two power supplies is less than 4 amperes.

If DC power supplies are installed:

Connection with a DC source should only be performed by trained service personnel. The 6400-S with DC input is to be installed in a Restricted Access Location in accordance with articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70. The DC source must be electrically isolated by double or reinforced insulation from any hazardous AC source. The DC source must be capable of providing up to 650 Watts of continuous power per feed pair.

Main DC power disconnect:

You are responsible for installing a properly rated DC power disconnect for the 6400-S system. This mains disconnect must be readily accessible, and it must be labeled as controlling power to the 6400-S. The circuit breaker of a centralized DC power system may be used as a disconnect device when easily accessible and should be rated no more than 10 amps.

Grounding the 6400-S

To avoid the potential for an electrical shock hazard, you must reliably connect an earth grounding conductor to the 6400-S. The earth grounding conductor must be a minimum 14AWG connected to the earth ground stud(s) on the rear of the 6400-S. The safety ground conductor should be connected to the chassis stud with a Listed closed two-hole crimp terminal with a maximum width of 0.25 inch. The nuts on the chassis earth ground studs should be installed with a 10 in/lbs torque. The safety ground conductor provides proper grounding only for the 6400-S. You must provide additional, proper grounding for the rack and other devices installed in it.

Overcurrent protection

Overcurrent protection circuit breakers must be provided as part of each host equipment rack and must be incorporated in the field wiring between the DC source and the 6400-S. The branch circuit protection shall be rated minimum 75Vdc, 10 A maximum per feed pair. If the DC power system for the equipment rack is installed with more than 10 amperes of protection, you must provide supplemental protection for the 6400-S. The overall current rating of a 6400-S configured with two power supplies is 8 amperes.

Do not attempt to modify or use an AC power cordset that is not the exact type required. You must use a power cordset that meets the following criteria:

- Rating: For U.S./Canada cords must be UL Listed/CSA Certified type SJT, 18-3 AWG. For outside U.S./Canada cords must be flexible harmonized (<HAR>) or VDE certified cord with 3 x 0.75 mm conductors rated 250 VAC.
- Connector, wall outlet end: Cords must be terminated in grounding-type male plug designed for use in your region. The connector must have certification marks showing certification by an agency acceptable in your region and for U.S. must be Listed and rated 125% of overall current rating of the 6400-S.
- Connector, 6400-S end: The connectors that plug into the AC receptacle on the 6400-S must be an approved IEC 320, sheet C19, type female connector.
- Cord length and flexibility: Cords must be less than 4.5 meters (14.76 feet) long. CAUTION Temperature: The temperature in which the 6400-S operates when installed in an equipment rack, must not go below 5 °C (41 °F) or rise above 40 °C (104 °F). Extreme fluctuations in temperature can cause a variety of problems in your 6400-S.
- Ventilation: The equipment rack must provide sufficient airflow to the front of the 6400-S to maintain proper cooling. The rack must also include ventilation sufficient to exhaust a maximum of 1023 BTU's per hour for the 6400-S. The rack selected and the ventilation provided must be suitable to the environment in which the 6400-S will be used.

Power Supplies[1]

The power supply cage shown is accessed from the rear of the chassis. The power supply cage supports up to two hot-swap power supplies (either AC input or DC input) in a (1+1) redundant configuration. Only the DC input version is NEBS certified. The combined output power to the 6400-S system is 470 Watts per DC supply and 500 Watts per AC supply.

DC Power Supply Interface Requirements

The DC power source may produce hazardous voltage levels exceeding -60 VDC and high energy levels above 240VA that may cause electric shock or burns. All DC input connections should be made only by a qualified service person to prevent injury. All wiring terminals connected to the DC input terminal block must be fully insulated with no exposed bare metal.

The power supply will operate within all specified limits over the input voltage range outlined as follows:

[1] Intel® Telco/Industrial Grade Server TIGPR2U Product Guide

Voltage

- Minimum tolerance = -38VDC
- Nominal rating = -48 to -60VDC
- Maximum tolerance = -75VDS
- Maximum input current = 17.0 Amps

The power supply will power-off if the DC input is less than -34 VDC.

DC Power Supply LED Indicators

Power Supply condition	Power Supply LED
No DC power to all PSUs	Off
No DC power to this PSU only	Amber
DC present/Only Standby Outputs On	Blink Green
Power supply DC outputs ON and OK	Green
Current limit	Amber
Power supply failure	Amber

AC Power Supply Interface Requirements

The AC power supply operates within the following limits:

- AC line voltage = Auto-ranging for either 100-127 VAC or 200-240 VAC
- AC line frequency = 50/60 Hz
- AC input current = 4 Amp at 100-127 VAC, 2 Amp at 200-240 VAC

AC Power Supply LED Indicators

Power Supply condition	Power Supply LED
No AC power to all PSUs	Off
No AC power to this PSU only	Amber
DC present/Only Standby Outputs On	Blink Green
Power supply DC outputs ON and OK	Green
Power supply in Alert Condition	Blink Amber
Power supply failure	Amber

3

Configuring the V^{2}IU 6400-S

Configure the 6400-S using a web browser such as Internet Explorer or Netscape Navigator. The 6400-S is shipped with a pre-configured IP address for its Subscriber (Port 1) interface.

This chapter gives you the information you need to get started. It contains the following sections:

- Connecting to the 6400-S
- Logging In and Out of the 6400-S
- Navigating Through the Configuration Pages
- Read-only User
- Getting Help

Connecting to the 6400-S

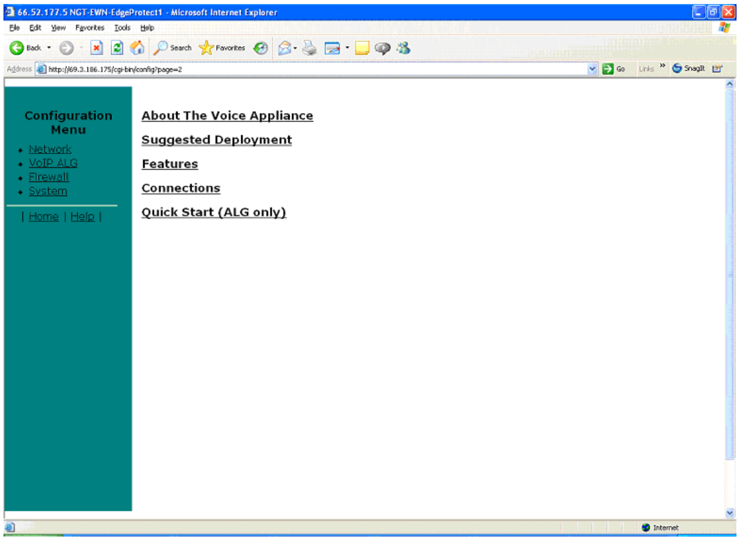
You need to connect to the 6400-S before you can configure it to work with your network. Connect using the supplied preset IP address and subnet mask. You are also supplied with a default user ID and password.

To connect to the 6400-S:

1. Connect a PC using an IP address of 192.168.1.2 and subnet mask of 255.255.255.0 to Port 1 of the 6400-S.
2. Launch a web browser on the PC and enter the URL string: 192.168.1.1.

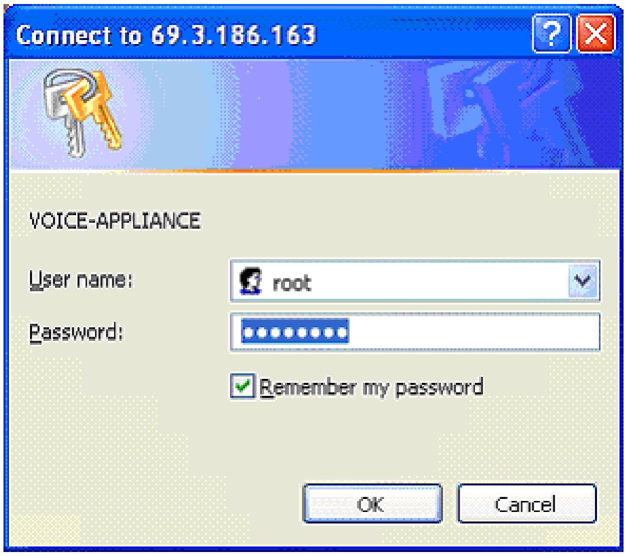
3. Press Return.

   The Main Configuration Menu appears.



66.52.177.5 NGT-EWN-EdgeProtect1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://69.3.186.175/cgi-bin/config?page=2
Go Links SnagIt
Configuration Menu
Network
VoIP ALG
Firewall
System
| Home | Help |
About The Voice Appliance
Suggested Deployment
Features
Connections
Quick Start (ALG only)
Internet

4. To log in, select Network from the navigation bar.
5. In the Connect to pop-up enter the following default information:



Connect to 69.3.186.163

VOICE-APPLIANCE

User name: root

Password: ●●●●●●●●●

☑ Remember my password

   – For username: root
   – For password: default

Caution To maintain your network security, be sure to change the default username and password as described under Changing the Administration Password on page 7-1.

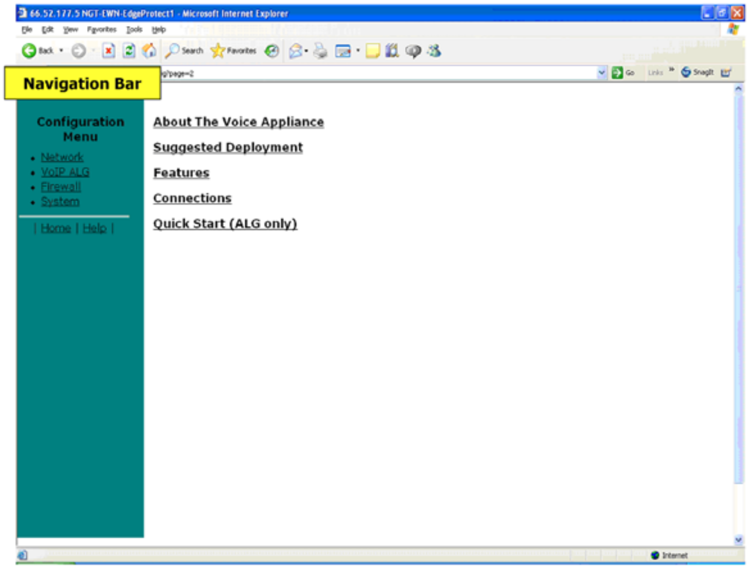
6. Continue to configure the system using the information provided in subsequent chapters of this guide.

Logging In and Out of the 6400-S

You are prompted to log in every time you point a new browser session to the Configuration URL.
To log out, simply close your browser.

Navigating Through the Configuration Pages

Navigate through the configuration pages from the navigation bar.



The choices are:

Menu	Description
Network	Through the *Network* page, you can configure a wide range of multimedia network services. These services can be enabled or disabled depending on the functionality required for a network configuration. The device's network settings include configuring the Subscriber and Provider interfaces, DNS and Default Gateway.
VoIP ALG	Using the *VoIP ALG* page, you can configure the connectivity and management for Subscriber and Provider voice and video over IP devices.
Firewall	Through the *Firewall* page, you can configure the 6400-S to act as a firewall for voice, video and data traffic.
System	Through the *System* menu you have access to a variety of configuration operations and status information.

Read-only User

This feature works by creating a new user with read-only access to the system. All information is displayed in a non-changeable form. Information changed in entry boxes cannot be submitted. In fact, most **Submit** and **OK** buttons are not visible.

Note: You must have administrator privileges and log in as an administrator to change read-only user.

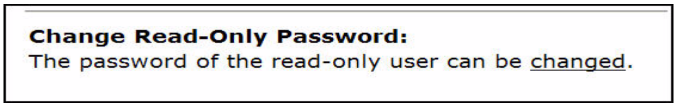
Enabling a Read-only User

To enable a read-only user, use the following steps:

1. Using the configuration graphical user interface, from the Configuration Menu on the left-hand side, click **Network**.

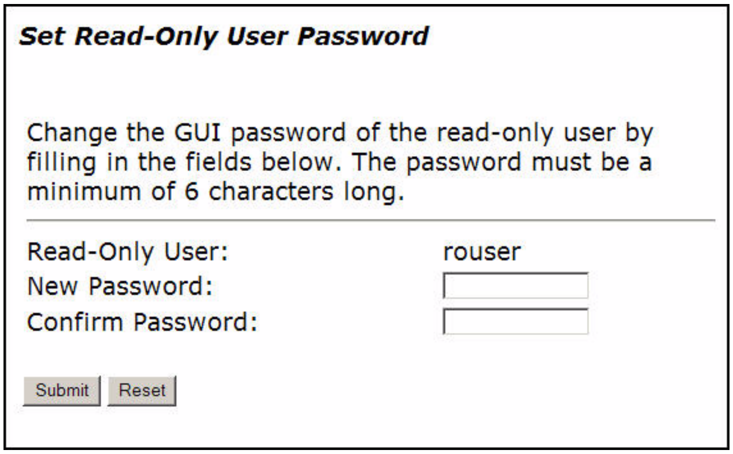
   Note: You must have administrator access and log in as an administrator to change read-only user.

2. Scroll down to the area of the screen shown below.



Change Read-Only Password:
The password of the read-only user can be changed.

3. Click changed. The following window screen appears:



Set Read-Only User Password

Change the GUI password of the read-only user by filling in the fields below. The password must be a minimum of 6 characters long.

Read-Only User: rouser

New Password:

Confirm Password:

Note: All open web browsers must be closed when you change between administrative user “root” and read-only “rouser.”

4. Enter a new password. The password must be a minimum of six characters long.
4. Re-enter the new password to confirm it.
5. Click **Submit.**

Now when you access the system using this user name (rouser) and password, all fields are read-only.

Getting Help

You can get help from several sources in the Configuration Menu.

- By pressing Help in the navigation bar.
- Following the link in Info at the top of the various Configuration pages.
- From the links on the Configuration Menu home page.

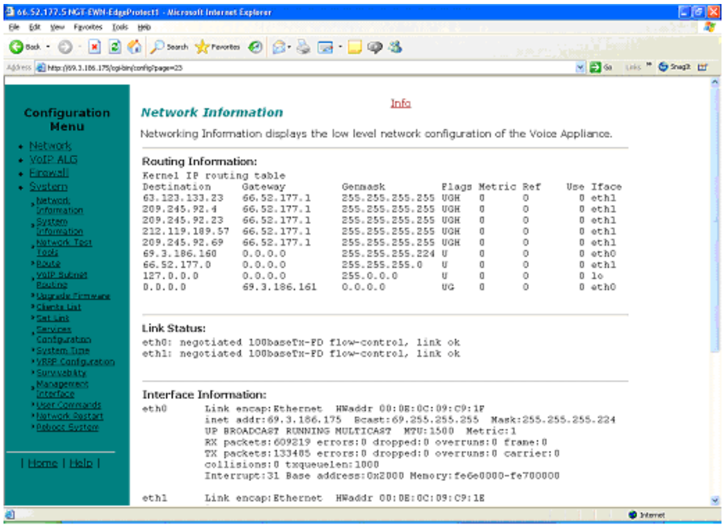
Getting information about the network

You can view a variety of information about the network from Network Information in the System menu. Networking Information displays the low-level IP network and interface configuration of the 6400-S.

To view network information:

1. In the navigation bar, select System.

2. In the System menu, select Network Information.



Network Information

Networking Information displays the low level network configuration of the Voice Appliance.

Routing Information:

```
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
63.123.133.23   66.52.177.1     255.255.255.255 UGH   0      0        0 eth1
209.245.92.4    66.52.177.1     255.255.255.255 UGH   0      0        0 eth1
209.245.92.23   66.52.177.1     255.255.255.255 UGH   0      0        0 eth1
212.119.189.57  66.52.177.1     255.255.255.255 UGH   0      0        0 eth1
209.245.92.69   66.52.177.1     255.255.255.255 UGH   0      0        0 eth1
69.3.186.160    0.0.0.0         255.255.255.224 U     0      0        0 eth0
66.52.177.0     0.0.0.0         255.255.255.0   U     0      0        0 eth1
127.0.0.0       0.0.0.0         255.0.0.0       U     0      0        0 lo
0.0.0.0         69.3.186.161    0.0.0.0         UG    0      0        0 eth0
```

Link Status:

```
eth0: negotiated 100baseTx-FD flow-control, link ok
eth1: negotiated 100baseTx-FD flow-control, link ok
```

Interface Information:

```
eth0      Link encap:Ethernet  HWaddr 00:0E:0C:09:C9:1F
          inet addr:69.3.186.175  Bcast:69.255.255.255  Mask:255.255.255.224
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:609219 errors:0 dropped:0 overruns:0 frame:0
          TX packets:133485 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          Interrupt:31 Base address:0x2000 Memory:fe6e0000-fe700000

eth1      Link encap:Ethernet  HWaddr 00:0E:0C:09:C9:1E
```

3. Scroll through the Network Information page to view:
   - Routing information
   - Link status
   - Interface information

Routing Information

The system routing table contains the static routes for the hosts and networks that are on the Provider side of the 6400-S. When the provider and subscriber settings have been fully configured, there must be at least four routing lines displaying:

- The private subnet associated with the Provider interface.
- The immediate subnet associated with the Subscriber interface.
- The loopback interface.
- The network's default gateway, this must be the next-hop-router on the Subscriber side of the 6400-S.

The order of the lines may vary depending on the subnet masks. Additional lines may be displayed depending on the contents of the Route and VoIP Subnet Routing pages. Each of the entries on these pages will cause an additional entry in the routing table.

Link Status

Link Status displays the status of the Ethernet connections. Ethernet auto negotiation is often unreliable, especially between different vendors or old and new networking equipment. Failure of auto negotiation is generally not a cause for concern. However, if the negotiated rates change intermittently, or the link is down or there is no link, the link rate may need to be set manually on the Set Link Rate page. Intermittent data and voice outages may be caused by auto negotiation “flutter”. Setting the link rate manually is recommended and ensures that the device at the far end of the connection will not renegotiate rates during VoIP operation.

Interface Information

The specific status and configuration information for the system interfaces is displayed in the Interface Information section. The MAC address of interface eth0 is needed to retrieve the VoIP ALG License Key if the license information is lost.

The interface statistics can point to areas of congestion in the network. If the errors statistic increase during normal operation of the device, it may be an indication of excessive congestion on the network interface. If the congestion is not corrected, the quality of voice calls will be affected. The topology of the network attached to the network interface with the errors should be examined and modified to better segment and isolate network traffic. See Link Status on page 3-6.

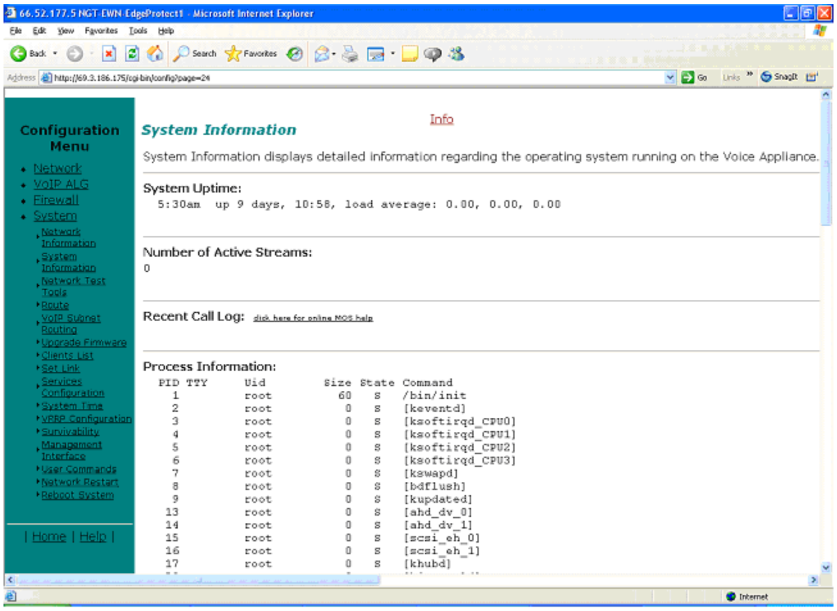
Getting information about the system

You can view a variety of information about the network from System Information in the System menu. System Information displays detailed information regarding the operating system running on the 6400-S. Customer support may ask you to examine or forward this information when troubleshooting problems with the 6400-S.

To view system information:

1. In the navigation bar, select System.

2. In the System menu, select System Information.



System Information

System Information displays detailed information regarding the operating system running on the Voice Appliance.

System Uptime:

```
  5:30am  up 9 days, 10:58, load average: 0.00, 0.00, 0.00
```

Number of Active Streams:

```
0
```

Recent Call Log: click here for online MOS help

Process Information:

```
  PID TTY      Uid         Size State Command
    1          root          60   S   /bin/init
    2          root           0   S   [keventd]
    3          root           0   S   [ksoftirqd_CPU0]
    4          root           0   S   [ksoftirqd_CPU1]
    5          root           0   S   [ksoftirqd_CPU2]
    6          root           0   S   [ksoftirqd_CPU3]
    7          root           0   S   [kswapd]
    8          root           0   S   [bdflush]
    9          root           0   S   [kupdated]
   13          root           0   S   [ahd_dv_0]
   14          root           0   S   [ahd_dv_1]
   15          root           0   S   [scsi_eh_0]
   16          root           0   S   [scsi_eh_1]
   17          root           0   S   [khubd]
```

3. Scroll through the System Information page to view:
   - System uptime
   - Number of active streams
   - Recent call log
   - Process information
   - Memory usage
   - System logging messages

System uptime

System Uptime displays the current time, the amount of time elapsed since the last system reboot, and the system load averages for the past one, five, and 15 minutes. Uptime can help identify when a power outage may have interrupted service. Load averages greater than two indicate excessive system loading and could indicate over provisioning of the VoIP ALG feature.

Number of active streams

The number of active streams indicates how many calls are transiting the 6400-S (crossing from Subscriber to Provider interfaces) OR being hair-pinned by the 6400-S as part of its NAT-Traversal facility. Calls that are in progress and between two devices on one side of the 6400-S are not counted in this number.

Recent Call Log

The Recent Call Log displays quality information about calls that are in progress or have recently completed. If a call falls below the configured MOS Threshold, a system log message is created. The MOS score for a call is always displayed when the call is completed. Detailed statistics for the call are reported in the Advanced MOS syslog message.

Process Information

Process Information displays detailed process table information that may be of use to technical support.

Memory Usage

Memory Usage displays detailed memory allocation information that may be of use to technical support.

System Logging Messages

System Logging Messages displays information logged during system boot and normal operation. Logging messages may indicate unauthorized attempts to access the 6400-S, process restart messages, and excess resource utilization messages.

4

Configuring Network Settings

You can configure the 6400-S for:

- Configuring Subscriber Interface Settings
- Configuring Provider Interface Settings
- Subinterfaces
- ToS Byte Setting
- Setting the Ethernet Link Rate
- Configuring the Network

Optionally, you can:

- Enabling remote system logging.
- Configure a different interface for managing the 6400-S. See 7, for details.
- Configure additional administrative operations, such as changing the password and setting the system date and time are available. See 7, for details about these, and other operations.

Before Starting, collect the following information:

- An IP address for the 6400-S.
- An IP address for the gateway.
- The preferred and secondary IP address for the DNS server.

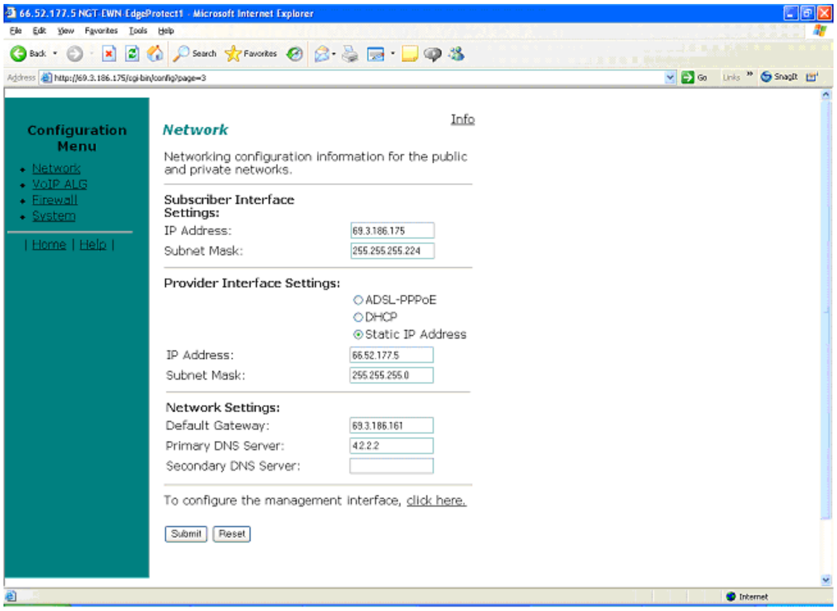
The 6400-S is shipped with the preset subscriber (Port 1) IP address of: 192.168.1.1, and the default subnet mask: 255.255.255.0 so you can access and configure the 6400-S.

Configuring Subscriber Interface Settings

The subscriber interface defines the interface between the 6400-S and your customers’ endpoints or the public network.

To configure subscriber interface settings:

1. In the navigation bar, select Network.


66.52.177.5 NGT-EWN-EdgeProtect1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://69.3.186.175/cgi-bin/config?page=3
Go Links SnagIt
Configuration Menu
Network
VoIP ALG
Firewall
System
| Home | Help |
Info
Submit
Reset
Internet

Network

Networking configuration information for the public and private networks.

Subscriber Interface Settings:

IP Address: 69.3.186.175
Subnet Mask: 255.255.255.224

Provider Interface Settings:

○ ADSL-PPPoE
○ DHCP
● Static IP Address

IP Address: 66.52.177.5
Subnet Mask: 255.255.255.0

Network Settings:

Default Gateway: 69.3.186.161
Primary DNS Server: 4.2.2.2
Secondary DNS Server:

To configure the management interface, click here.

2. In Subscriber Interface Settings, highlight and replace the default IP Address and Subnet Mask.
3. If you are configuring network settings, see the instructions in “Configuring the Network” on page 4-9.
4. If you want to configure a management interface that is different than the default, complete all of the configuration tasks, then see “Configuring a Management Interface” on page 7-9.
5. Press Submit.

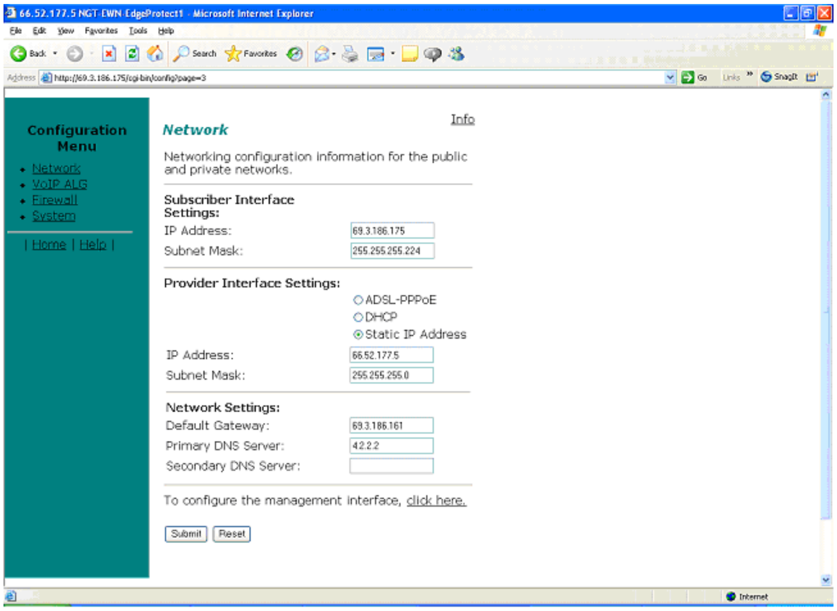
Note After submitting the new configurations, you need to reconnect to the 6400-S using the new IP address and subnet mask before you can continue with the configuration.

Configuring Provider Interface Settings

The provider interface defines the interface between the 6400-S and internal voice, video and data devices. This interface is generally connected to the private network.

To configure provider interface settings:

1. In the navigation bar, select Network


66.52.177.5 NGT-EWN-EdgeProtect1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://69.3.186.175/cgi-bin/config?page=3
Go Links SnagIt
Configuration Menu
Network
VoIP ALG
Firewall
System
| Home | Help |
Info
Internet

Network

Networking configuration information for the public and private networks.

Subscriber Interface Settings:

IP Address: 69.3.186.175

Subnet Mask: 255.255.255.224

Provider Interface Settings:

○ ADSL-PPPoE

○ DHCP

● Static IP Address

IP Address: 66.52.177.5

Subnet Mask: 255.255.255.0

Network Settings:

Default Gateway: 69.3.186.161

Primary DNS Server: 4.2.2.2

Secondary DNS Server:

To configure the management interface, click here.

Submit Reset

2. In Provider Interface Settings, select Static IP Address (the most common configuration), or DHCP if a DHCP server assigns the 6400-S internal address.
3. Enter an IP Address.
4. Enter a Subnet Mask.
5. If you are configuring network settings, see the instructions in "Configuring the Network" on page 4-9.
6. If you want to configure a management interface that is different than the default, complete all of the configuration tasks, then see "Configuring a Management Interface" on page 7-9.
7. Press Submit.

Subinterfaces

The Subinterfaces feature allows a system administrator to assign additional IP addresses to interfaces. These are sometimes referred to as aliases or loopback interfaces. An additional address may be assigned to the system’s WAN interface to support, for example, another management IP address.

How Subinterfaces Works

A common use for subinterfaces is forwarding a public subnet. A subinterface may be created to support a subnet forwarded through the Polycom V^{2}IU 6400-S. When forwarding a subnet through the Polycom V^{2}IU 6400-S, it is necessary to assign an address for this subnet to the system to act as the subnet's gateway. To configure forwarding rules, use the **Forwarding Rules** submenu under the **Firewall** configuration link.

When applied to the WAN/Provider interface, these addresses are protected by the same firewall policy that is applied to the WAN/Provider address. Several other features in the system automatically create Subinterfaces. VRRP (if supported) and Static NAT automatically create Subinterfaces.

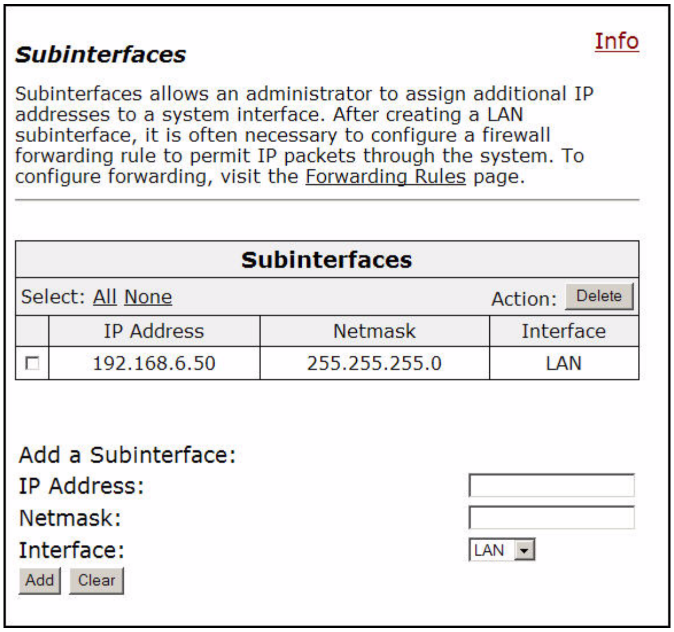
When viewing the Network Information page, Subinterfaces are designated in the Interface Information section with the device name and number, separated by a colon (for example, eth0:100).

Configuring Subinterfaces

To configure subinterfaces, use the following steps:

1. Using the configuration graphical user interface, from the Configuration Menu on the left-hand side, click **Network**.

2. Click **Subinterfaces**. The window shown below opens.



Subinterfaces

Subinterfaces allows an administrator to assign additional IP addresses to a system interface. After creating a LAN subinterface, it is often necessary to configure a firewall forwarding rule to permit IP packets through the system. To configure forwarding, visit the Forwarding Rules page.

Subinterfaces

Select: All None Action: Delete

	IP Address	Netmask	Interface
□	192.168.6.50	255.255.255.0	LAN

Add a Subinterface:

IP Address:

Netmask:

Interface: LAN

3. On this screen, complete the following information:

- **IP Address** is the address to be assigned to the subinterface.
- **Netmask** is the network mask to use for the address. If several addresses are applied to an interface and these addresses are in a common network, they must use a common subnet. The system does not support supernetting.
- **Interface** is the port where the subinterfaces will be configured.

4. When you have finished entering this information, click **Add**. The following popup appears:
5. Click **OK**. The new subinterfaces entry appears on the Subinterfaces window in the list area.

ToS Byte Setting

Since the Internet itself has no direct knowledge of how to optimize the path for a particular application or user, the IP protocol provides a limited facility for upper layer protocols to convey hints to the Internet Layer about how the trade-offs should be made for the particular packet. This facility is the “Type of Service” or ToS facility.

ToS settings allow the service provider to prioritize time sensitive traffic, such as voice plus video to ensure minimized packet loss and delay through their network. When providing end-to-end QOS, it is important that the voice plus video traffic be placed in the correct queues to deliver a higher QOS than regular traffic. Regular traffic, that is not time sensitive, can be delayed with little or no indication to the user, while the slightest delay in voice plus video can cause auditable differences. The ToS byte setting helps prioritize traffic going to the WAN so a provider can prioritize the traffic correctly in its network.

Although the ToS facility has been a part of the IP specification since the beginning, it has been little used in the past. However, the Internet host specification now mandates that hosts use the ToS facility. Additionally, routing protocols (including OSPF and Integrated IS-IS) have been developed which can compute routes separately for each type of service. These new routing protocols make it practical for routers to consider the requested type of service when making routing decisions.

How the ToS Byte Setting Works

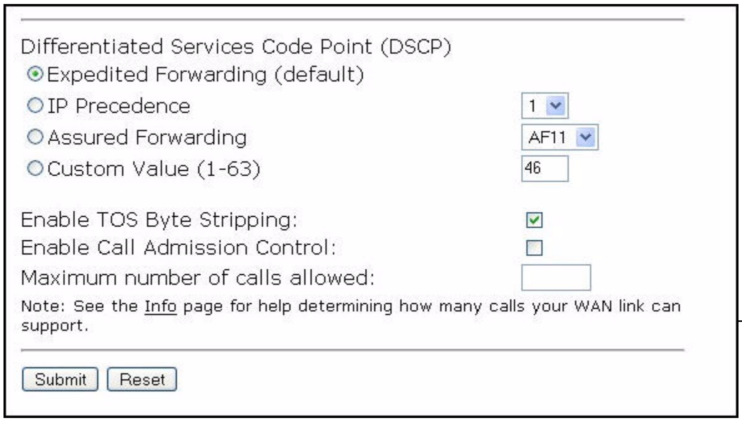
For all RTP traffic (voice and video), the Polycom V^{2}IU 6400-S marks the ToS byte in the IP header as "High Priority," and strips (set to 0) the ToS byte for all other traffic. Unchecking the "Enable ToS Byte Stripping" option means that the ToS byte will not be stripped from non-RTP traffic, but will remain unchanged.

Note: For most situations, you should leave this setting as it is. Only change it if your provider indicates that you should do so.

Viewing or Changing the ToS Byte Setting

To view or change the ToS byte setting, use the following steps:

1. Using the configuration graphical user interface, from the Configuration Menu on the left-hand side, click **Traffic Shaper**.
2. Scroll down the area of the screen shown below.



Differentiated Services Code Point (DSCP)

- ● Expedited Forwarding (default)
- ○ IP Precedence 1
- ○ Assured Forwarding AF11
- ○ Custom Value (1-63) 46

Enable TOS Byte Stripping: ☑

Enable Call Admission Control: □

Maximum number of calls allowed:

Note: See the Info page for help determining how many calls your WAN link can support.

3. For most situations, you should leave this setting as it is. Only change it if your provider indicates that you should do so. If your provider indicates that you need to change the ToS byte setting, that provider should also provide the other parameters required on this screen.
4. If you have changed the values, click **Submit** to activate the new settings.

Setting the Ethernet Link Rate

Ethernet autonegotiation is often unreliable, especially between different vendors or old and new networking equipment. Failure of autonegotiation is generally not a cause for concern. However, if the negotiated rates change intermittently or the link is reported as no link or down, the link rate may need to be set manually. An interface that "flutters" because of the autonegotiation setting, may cause intermittent voice and data outages.

Note

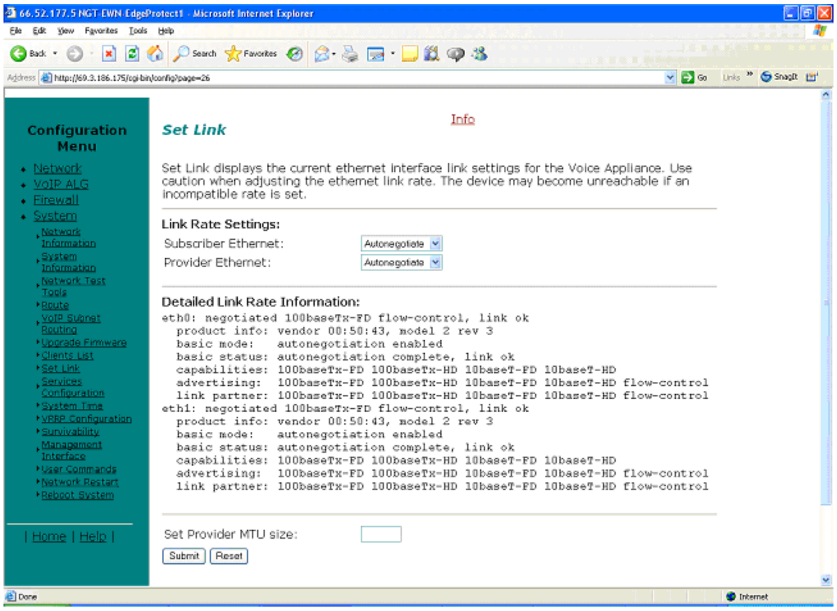
> The vast majority of Ethernet networking devices including the 6400-S use "autonegotiate" as a default setting. Chances are that you will not have to set the Ethernet link rate. Please use caution if manually configuring the link rate, as a speed or duplex mismatch will result in a loss of connectivity.

If needed, configure the rate of the physical Ethernet port on the 6400-S. The default setting for the Ethernet port is autonegotiate, and it applies to both the link speed and duplex with locally attached devices.
The link rate of an interface can be assigned to a desired rate. A network administrator may want to set the rate manually if autonegotiation fails to select a rate consistently or if it selects a rate that is slower than the maximum rate supported by both interfaces.

To set the link rate:

1. In the navigation bar, select System.

2. In the System menu, select Set Link.



Set Link

Set Link displays the current ethernet interface link settings for the Voice Appliance. Use caution when adjusting the ethemet link rate. The device may become unreachable if an incompatible rate is set.

Link Rate Settings:

Subscriber Ethernet: Autonegotiate

Provider Ethernet: Autonegotiate

Detailed Link Rate Information:

```
eth0: negotiated 100baseTx-FD flow-control, link ok
  product info: vendor 00:50:43, model 2 rev 3
  basic mode:   autonegotiation enabled
  basic status: autonegotiation complete, link ok
  capabilities: 100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD
  advertising:  100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD flow-control
  link partner: 100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD flow-control
eth1: negotiated 100baseTx-FD flow-control, link ok
  product info: vendor 00:50:43, model 2 rev 3
  basic mode:   autonegotiation enabled
  basic status: autonegotiation complete, link ok
  capabilities: 100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD
  advertising:  100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD flow-control
  link partner: 100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD flow-control
```

Set Provider MTU size:

Submit Reset

3. Select Subscriber Ethernet or Provider Ethernet.

4. Select the appropriate link rate for your Ethernet network (Note: If you set either 6400-S interfaces to 100FD, be sure you set the device at the other end of the line to 100FD also.):

Setting	Description
10baseT-HD	10Mbits per second using half duplex transmission
10baseT-FD	10Mbits per second using full duplex transmission
100baseT-HD	100Mbits per second using half duplex transmission
100baseT-FD	100Mbits per second using full duplex transmission
Autonegotiate	The 6400-S autonegotiates link rate and duplex with the directly attached device.

5. Press Submit.

Configuring the Network

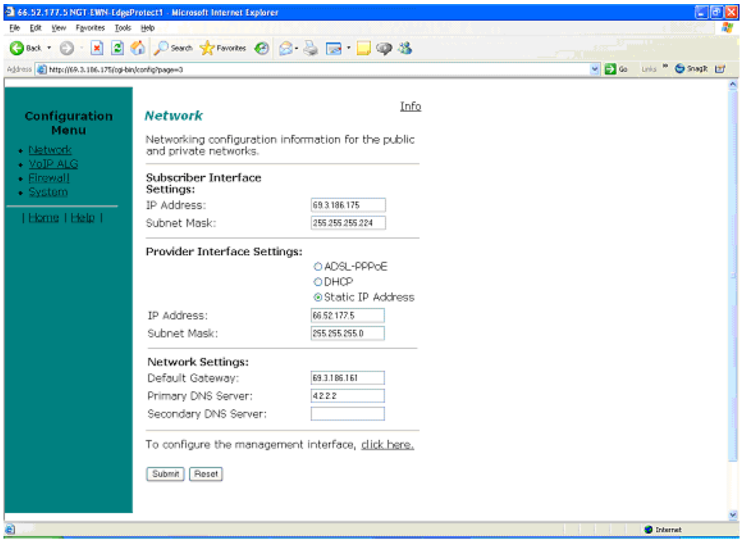
Use network settings to configure the default gateway address, and the primary and secondary DNS servers.

Packets destined for IP addresses not known to the 6400-S are forwarded to the Default Gateway for handling. For the 6400-S the Default Gateway MUST be the next hop router attached to Port 1 (the Subscriber interface).

The primary DNS server is used by the 6400-S to resolve domain names to IP addresses. The secondary DNS server is used in the event the primary DNS server is unreachable.

To configure network settings:

1. In the Network page, move to the Network Settings section.


66.52.177.5 NGT-EWN-EdgeProtect1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://69.3.186.175/cgi-bin/config?page=3
Go Links SnagIt
Configuration Menu
Network
VoIP ALG
Firewall
System
| Home | Help |
Info
Submit
Reset
Internet

Network

Networking configuration information for the public and private networks.

Subscriber Interface Settings:

IP Address: 69.3.186.175

Subnet Mask: 255.255.255.224

Provider Interface Settings:

○ ADSL-PPPoE
○ DHCP
● Static IP Address

IP Address: 66.52.177.5

Subnet Mask: 255.255.255.0

Network Settings:

Default Gateway: 69.3.186.161

Primary DNS Server: 4.2.2.2

Secondary DNS Server:

To configure the management interface, click here.

2. Enter an IP address for the Default Gateway

   This must be the next-hop-router connected to Port 1, the Subscriber side interface

3. Enter the Primary DNS Server.

4. Enter the Secondary DNS Server.

5. Press Submit.

4

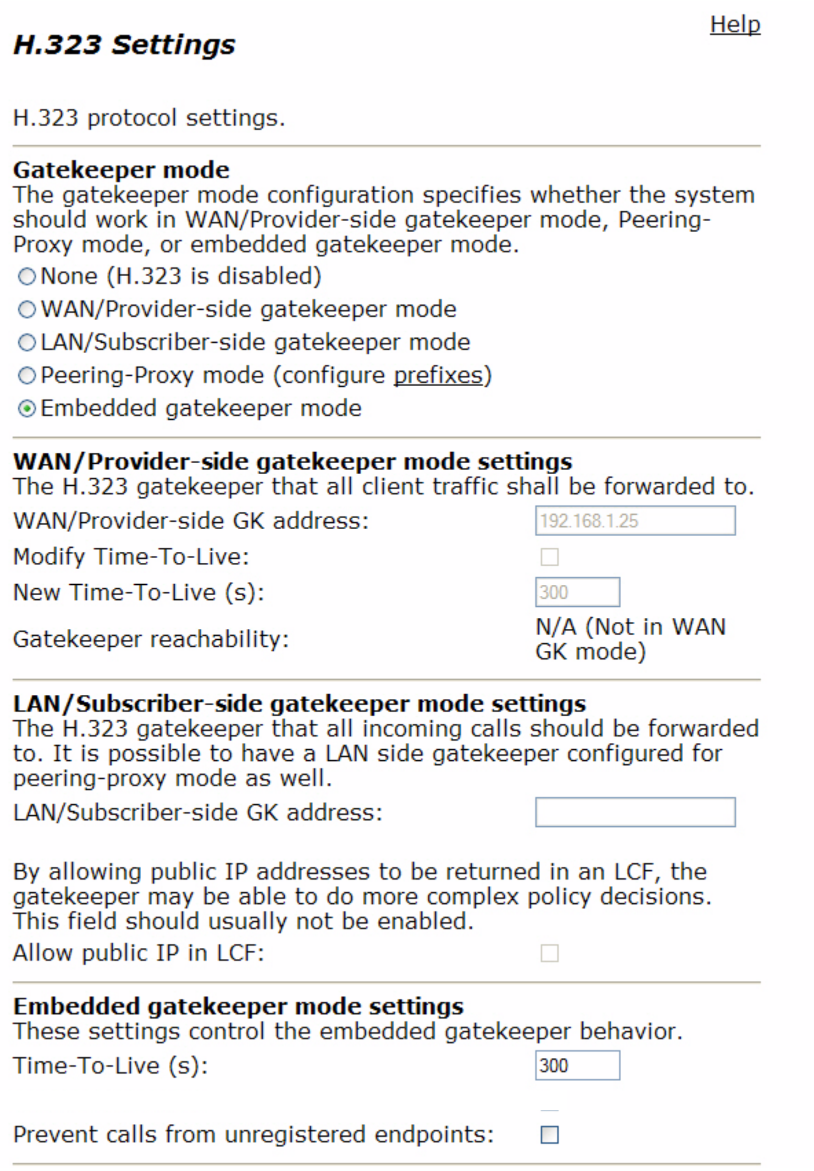
Configuring for Video

This chapter describes how to configure the Polycom V^{2}IU 6400-S to support video:

- H.323 Configuration
- Forwarding Rules
- Peering Proxy
- Clients List Lock
- H.323 Activity Monitor
- H.460 Operation Mode

H.323 Configuration

To access the H.323 Settings page, select **VoIP ALG > H.323** in the Configuration Menu.



H.323 Settings

H.323 protocol settings.

Gatekeeper mode
The gatekeeper mode configuration specifies whether the system should work in WAN/Provider-side gatekeeper mode, Peering-Proxy mode, or embedded gatekeeper mode.

○ None (H.323 is disabled)
○ WAN/Provider-side gatekeeper mode
○ LAN/Subscriber-side gatekeeper mode
○ Peering-Proxy mode (configure prefixes)
● Embedded gatekeeper mode

WAN/Provider-side gatekeeper mode settings
The H.323 gatekeeper that all client traffic shall be forwarded to.

WAN/Provider-side GK address:	192.168.1.25
Modify Time-To-Live:	□
New Time-To-Live (s):	300
Gatekeeper reachability:	N/A (Not in WAN GK mode)

LAN/Subscriber-side gatekeeper mode settings
The H.323 gatekeeper that all incoming calls should be forwarded to. It is possible to have a LAN side gatekeeper configured for peering-proxy mode as well.

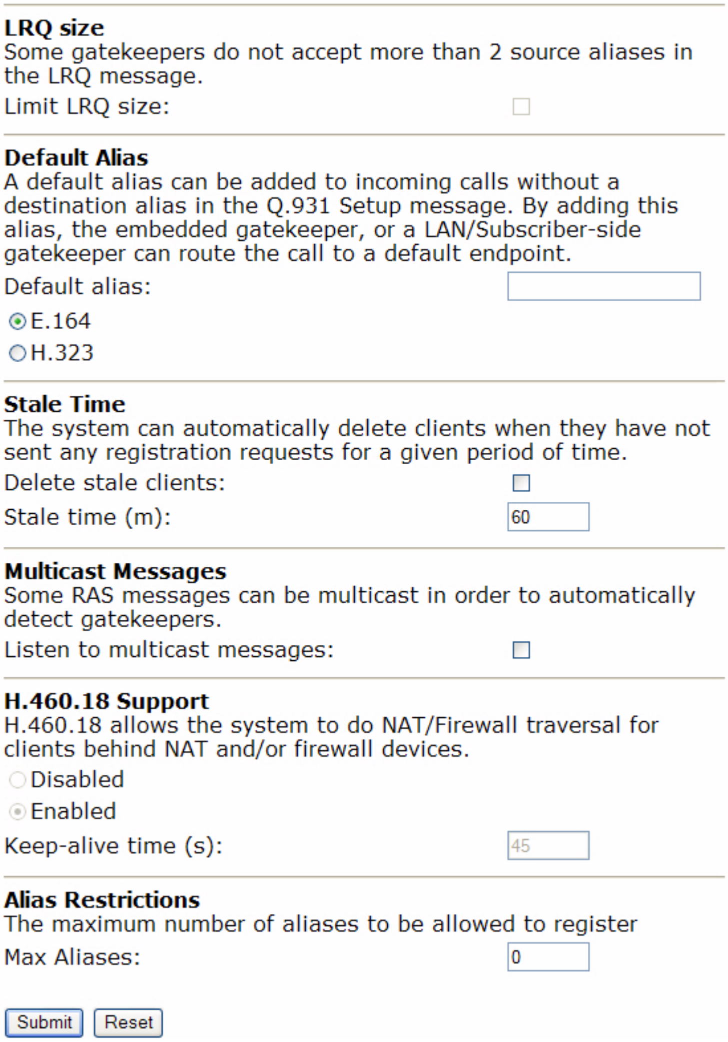
LAN/Subscriber-side GK address:

By allowing public IP addresses to be returned in an LCF, the gatekeeper may be able to do more complex policy decisions. This field should usually not be enabled.

Allow public IP in LCF: □

Embedded gatekeeper mode settings
These settings control the embedded gatekeeper behavior.

Time-To-Live (s):	300
Prevent calls from unregistered endpoints:	□



LRQ size
Some gatekeepers do not accept more than 2 source aliases in the LRQ message.
Limit LRQ size: □

Default Alias
A default alias can be added to incoming calls without a destination alias in the Q.931 Setup message. By adding this alias, the embedded gatekeeper, or a LAN/Subscriber-side gatekeeper can route the call to a default endpoint.
Default alias:
● E.164
○ H.323

Stale Time
The system can automatically delete clients when they have not sent any registration requests for a given period of time.
Delete stale clients: □
Stale time (m): 60

Multicast Messages
Some RAS messages can be multicast in order to automatically detect gatekeepers.
Listen to multicast messages: □

H.460.18 Support
H.460.18 allows the system to do NAT/Firewall traversal for clients behind NAT and/or firewall devices.
○ Disabled
● Enabled
Keep-alive time (s): 45

Alias Restrictions
The maximum number of aliases to be allowed to register
Max Aliases: 0

The H.323 Settings page has the following areas:

- Gatekeeper Mode
- WAN/Provider-side gatekeeper mode settings
- LAN/Subscriber-side gatekeeper mode settings
- Embedded gatekeeper mode settings
- LRQ Size
- Default Alias
- Stale Time
- Multicast Messages

- H.460.18 Support
- Alias Restrictions

In the Gatekeeper mode area, select one of the following modes:

Item	Description
None	H.323 is disabled.
WAN/Provider-side gatekeeper mode	Specifies that the system will forward all client RAS messages to the gatekeeper. If this is selected, you must configure the settings in the WAN/Provider-side gatekeeper mode settings area.
LAN/Subscriber-side gatekeeper mode	Specifies that the system will act as a gatekeeper. If this option is selected, you must configure the settings in the LAN/Subscriber-side gatekeeper mode settings area.
Peering-Proxy mode	Allows calls to be forwarded to other endpoints based on the information sent from the endpoints. All the information about routing the call must be sent as part of the request or prefixes must be configured.
Embedded gatekeeper mode	Provides gatekeeper functions and accepts endpoint registrations. If this option is selected, you must configure the settings in the Embedded gatekeeper mode settings area.

If WAN/Provider-Side Gatekeeper mode is selected, you must configure the following parameters:

Item	Description
WAN/Provider-side GK address	Specifies the IP address of the gatekeeper
Modify Time-To-Live	Allows you to override the value for time-to-live returned by the gatekeeper before forwarding the response to the endpoint.
New Time-To-Live	Specifies how long an endpoint's registration should be valid.

If LAN/Subscriber-Side Gatekeeper mode is selected, you must configure the following parameters:

Item	Description
LAN/Subscriber-side GK address	Enter the IP address of the gatekeeper.
Allow public IP in LCF	Select the checkbox if the gatekeeper has been deployed with multiple outbound proxies and must decide which proxy to use based on the IP address returned in the LCF. This is an advanced configuration option and should usually not be selected.

If Embedded Gatekeeper is selected, you must configure the following parameters:

Item	Description
Time-to-Live(s)	Enter a time in seconds. This setting controls how long an endpoint's registration should be valid. At the end of this period the endpoint sends another registration request.
Prevent calls from unregistered endpoints:	Blocks unregistered LAN-side endpoints from making calls through the device.

In the LRQ Size area, you can limit the number of source aliases in a forwarded LRQ message to a maximum of two to allow interoperability with gatekeepers that cannot handle more than two source aliases.

In the Default Alias area, you can specify a default alias to be added to incoming calls without a destination message in the Q.931 Setup message. This alias allows the embedded gatekeeper or a LAN/Subscriber-side gatekeeper to route the call to a default endpoint. Enter a default alias and select one of the following types:

- E.164
- H.323

In the Stale Time area, you can arrange to delete clients that have not sent any registration requests for the specified interval. This area includes the following configurable parameters:

Item	Description
Delete stale clients	Select this checkbox to enable the stale timer feature.
Stale time (m)	Specify the length of the interval in minutes.

Some RAS messages can be multicast in order to automatically detect gatekeepers. In the Multicast Messages area, you can enable listening to multicast messages. This area includes the following configurable parameter:

Item	Description
Listen to multicast messages	Select this checkbox to enable listening to multicast messages.

In the H.460.18 Support area, you can configure H.460.18 support. This allows the system to do NAT/Firewall traversal for clients behind NAT or firewall devices. This area includes the following configurable parameters:

Item	Description
Disabled	Disables H.460.18 support.
Enabled	Enables H.460.18 support.
Keep-alive time(s)	Specifies the keep-alive time if H.460.18 support is enabled.

In the Alias Restrictions area, you can set a limit on the number of aliases that are allowed to register with the system. If this number is exceeded when a client tries to register, the registration is rejected. This area includes the following parameter:

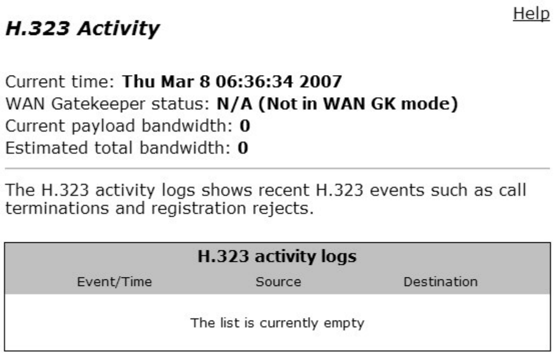
Item	Description
Max Aliases	Enter the maximum number of allowed aliases. If the value is set to 0, the maximum is not enforced.

The H.323 Settings page includes the following two buttons:

Item	Description
Submit	Applies the settings configured on this page.
Reset	Clears all fields and selections and allows you to enter new information.

H.323 Activity

To access the H.323 Activity page, select **VoIP ALG > H.323 Activity** in the Configuration Menu.



H.323 Activity

Current time: **Thu Mar 8 06:36:34 2007**
WAN Gatekeeper status: **N/A (Not in WAN GK mode)**
Current payload bandwidth: **0**
Estimated total bandwidth: **0**

The H.323 activity logs shows recent H.323 events such as call terminations and registration rejects.

H.323 activity logs

Event/Time	Source	Destination
	The list is currently empty	

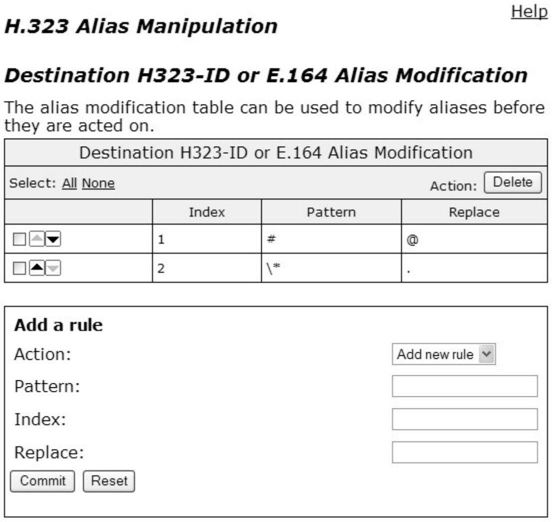
The H.323 Activity page is a read-only page that shows the following information:

- Current time
- WAN Gatekeeper status
- Current payload bandwidth
- Estimated total bandwidth
- Activity log of recent H.323 events

H.323 Alias Manipulation

Alias manipulation is performed immediately when a message (such as an ARQ, LRQ or a Setup) is received. Any matching pattern is replaced with the specified string, allowing you to replace characters or strings that are hard or impossible to dial on certain endpoints. Normal call look-up is performed following alias manipulation.

To access the H.323 Alias Manipulation page, select **VoIP ALG > H.323 >Alias Manipulation** in the Configuration Menu.



Help

H.323 Alias Manipulation

Destination H323-ID or E.164 Alias Modification

The alias modification table can be used to modify aliases before they are acted on.

Destination H323-ID or E.164 Alias Modification

Select: All None — Action: Delete

	Index	Pattern	Replace
□ ▲ ▼	1	#	@
□ ▲ ▼	2	*	.

Add a rule

Action:	Add new rule
Pattern:	
Index:	
Replace:	

Commit Reset

This page includes the following areas:

Item	Description
Destination H323-ID or E.164 Alias Modification table	Lists alias manipulation rules. Rules are executed in the order in which they are listed. Use the arrows to move entries up and down, or use the Index field to specify where a new or edited rule falls in the list.
Add a rule	Allows you to add new prefixes to the Prefix Routing and Gatekeeping Neighboring table.

Item	Description
Action	Indicates whether the rule is to be added or edited.
Pattern	Specifies the pattern to be matched. See <l_link>“Regular Expressions” on page 11 for details on valid patterns.
Index	Determines the order in which the rule is scanned in the Destination H323-ID or E.164 Alias Modification table. To add a rule between two rules with consecutive indexes (n and m), use the higher index (m).
Replace	Specifies the string that will replace the matched pattern.

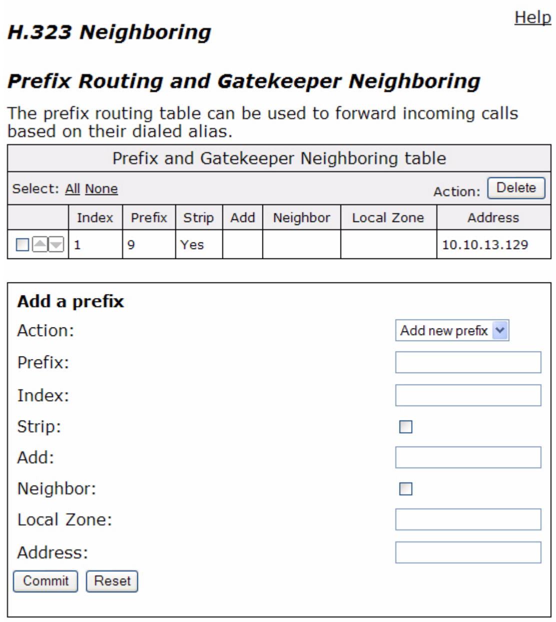
The H.323 Alias Manipulation page includes the following buttons:

Item	Description
Commit	Applies the settings configured on this page.
Reset	Clears all fields and selections and allows you to enter new information.

H.323 Neighboring

Neighboring and prefix routing can be used to route calls based on a matching prefix in the destination alias of the call. The call decision is made following alias manipulation and acts on the modified string, similar to other call lookup processes such as registered client look-up. Each prefix is associated with a domain name or IP address that is used in the event that the prefix matches.

To access the H.323 Neighboring page (formerly the Prefix Routing page), select **VoIP ALG > H.323 > Neighboring** in the Configuration Menu.



H.323 Neighboring

Prefix Routing and Gatekeeper Neighboring

The prefix routing table can be used to forward incoming calls based on their dialed alias.

Prefix and Gatekeeper Neighboring table

	Index	Prefix	Strip	Add	Neighbor	Local Zone	Address
□ ▲ ▼	1	9	Yes				10.10.13.129

Add a prefix

Action: Add new prefix

Prefix:

Index:

Strip: □

Add:

Neighbor: □

Local Zone:

Address:

This page includes the following areas:

Item	Description
Prefix Routing and Gatekeeper Neighboring table	Lists rules for forwarding incoming calls based on their dialed alias. Rules are executed in the order in which they are listed. Use the arrows to move entries up and down, or use the Index field to specify where a new or edited rule falls in the list.
Add a prefix	Allows you to add new prefixes to the Prefix Routing and Gatekeeper Neighboring table.

Item	Description
Action	Indicates whether the rule is to be added or edited.
Prefix	Specifies the prefix pattern to be matched against the dialing string. See <l_link>“Regular Expressions” on page 11 for details on valid patterns.
Index	Determines the order in which the rule is scanned in the Prefix and Gatekeeper Neighboring table. To add a rule between two rules with consecutive indexes (n and m), use the higher index (m).
Strip	Indicates whether the matching prefix is stripped from the dialing string.
Add	Specifies a string to be prepended to the dialing string.
Neighbor	Determines whether a location request (LRQ) is sent when this prefix matches. • If enabled, the prefix becomes a neighboring statement. • If disabled, the incoming Q.931 Setup is forwarded to the given address without a preceding LRQ. This field is used for interoperability with other gatekeepers that may not accept a Setup without a preceding LRQ.
Local Zone	Provides compatibility with remote gatekeepers that are configured to accept LRQs only from sources that match its configured remote zone. If a gatekeeper is configured to accept requests only from a known source, enter the zone in this field.
Address	Specifies the IP address or domain name of the device to which the call is to be forwarded.

The H.323 Neighboring page includes the following buttons:

Item	Description
Commit	Applies the settings configured on this page.
Reset	Clears all fields and selections and allows you to enter new information.

Regular Expressions

Alias manipulation patterns and prefixes use regular expressions to match a string in the destination alias. A regular expression can be a string of literal characters to match or a set of special expressions.

Alias manipulation patterns can match a sub-string at any location and number of times within the alias. Prefixes are always searched from the left of the alias and cannot match a middle part or the end of the alias.

Regular expressions are listed in <l_link>Table 1 and <l_link>Table 2 lists some example expressions.

Table 1 Regular Expressions

Symbol	Description
.	Matches any single character.
[]	Matches any single character listed between the []. For example, [abc], [123]. If the characters are separated by a -, all characters between the two are matching, e.g. [a-z], [0-9]
()	Matches the literal string given, e.g. (abc)
|	Matches the block on either side of the |, e.g. a|b.
?	Matches 0 or 1 of the preceding block.
*	Matches 0 or more of the preceding block.
+	Matches 1 or more of the preceding block.
\	Escapes the special meaning of the next character.
{a}	Matches exactly 'a' numbers of the preceding block.
{a,}	Matches 'a' or more of the preceding block.
{a,b}	Matches between 'a' and 'b' (inclusive) of the preceding block.

Table 2 Example Regular Expressions

Expression	Description
100	Matches the string 100.
(555)?123	Matches 555123 or 123.
(408|555)	Matches 408 or 555.
555[0-9]{3}	Matches 555 followed by exactly 3 digits.
#	Matches the character '#'.
*	Matches the character '*'. Note that '*' by itself is a regular expression and must therefore be escaped with a '\' to match the character itself.

Forwarding Rules

Forwarding Rules allows a system administrator to forward data traffic for a subnet from one interface to another, overriding the Firewall's default drop rules.

Allowing a subnet to be forwarded is commonly used when servers with public addresses are placed behind the system. Configuring the network in this way allows the system to manage and prioritize bandwidth, sharing it between the VoIP services and the servers.

How Forwarding Rules Works

When forwarding, one address from the forwarded range of addresses must be assigned to the rule's output interface. The Polycom V^{2}IU 6400-S uses this address to act as a gateway router for the subnet. The address may be assigned using the Subinterfaces page.

Note: The subnet and forwarded addresses are not protected by the firewall.

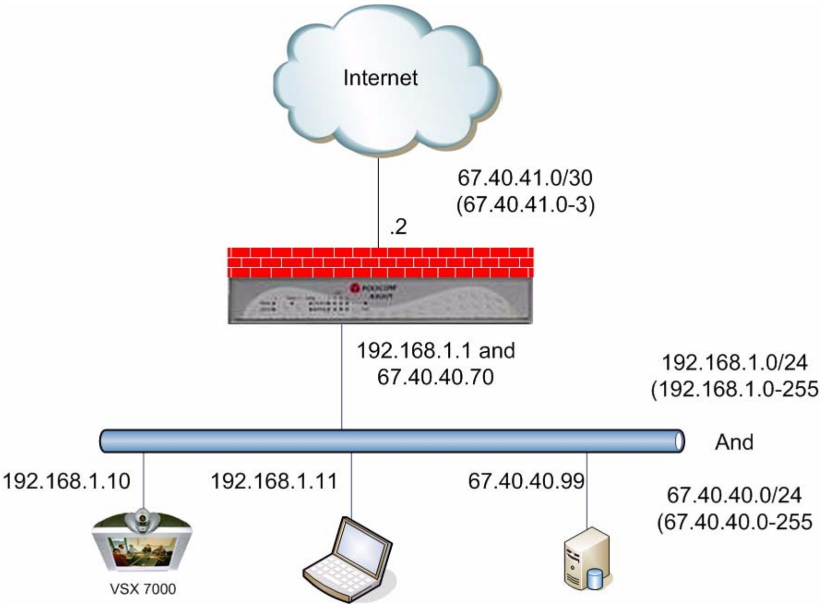
A similar method for forwarding traffic is provided by Proxy ARP. Proxy ARP is used to "bridge" addresses within a single subnet range from one interface to another. Often this is used to bridge and forward a public address to the protected side of the system without having to subnet the public address range. Proxy ARP does not require an additional gateway address on the system for the subnet, but does not allow port and protocol filtering for forwarded data.

Example

In this example:

- The ISP has supplied two separate subnets to the customer:
  - A small one (2 hosts) for the WAN link
  - A large one (254 hosts) for a bank of servers
- 67.40.41.2 is the WAN IP address for the Polycom V^{2}IU 6400-S
- NAT is a private IP range of 192.168.1.xxx using the WAN address for PCs and Phones
- On the LAN side of the Polycom V^{2}IU 6400-S are the following:
  - Private IP subnet (192.168.1.xxx)
  - Public IP subnet (67.40.40.xxx)

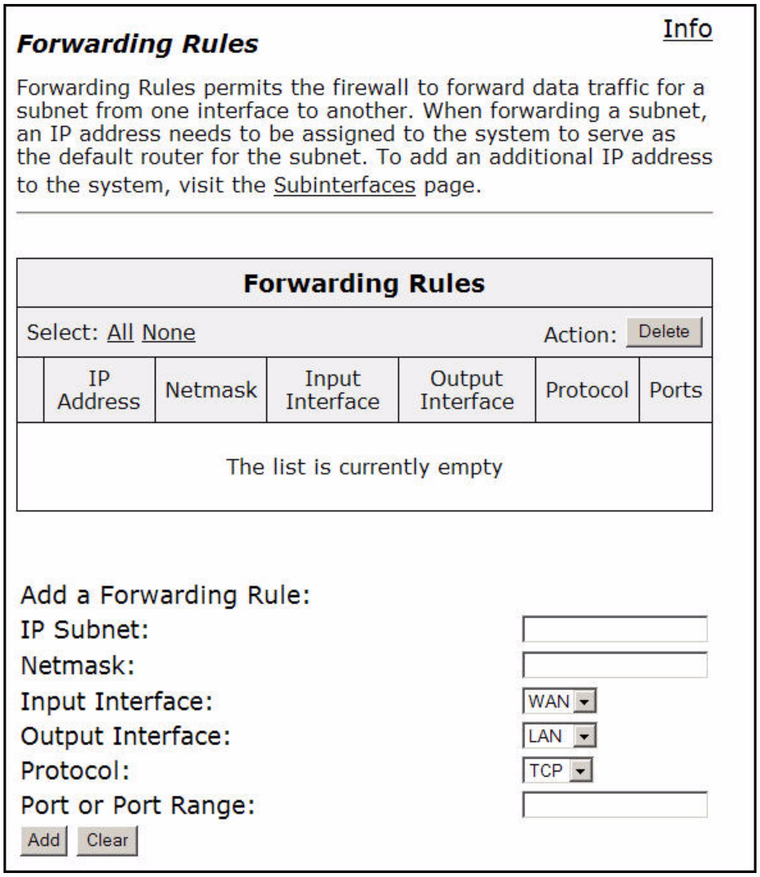
This is shown below.



Configuring Forwarding Rules

To configure address forwarding rules, use the following steps:

1. Using the configuration graphical user interface, from the Configuration Menu on the left-hand side, click **Firewall**.
2. Click **Forwarding Rules**. The window shown below opens.



Forwarding Rules

Info

Forwarding Rules permits the firewall to forward data traffic for a subnet from one interface to another. When forwarding a subnet, an IP address needs to be assigned to the system to serve as the default router for the subnet. To add an additional IP address to the system, visit the Subinterfaces page.

Forwarding Rules

Select: All None Action: Delete

	IP Address	Netmask	Input Interface	Output Interface	Protocol	Ports
The list is currently empty						

Add a Forwarding Rule:

IP Subnet:	
Netmask:	
Input Interface:	WAN
Output Interface:	LAN
Protocol:	TCP
Port or Port Range:	

3. On this screen, complete the following information:

- **IP Subnet:** The subnet to be forward through the firewall from the Input Interface to the Output Interface.
- **Netmask:** The network mask to apply to the IP Subnet to create the range of IP addresses that are forwarded through the firewall.
- **Input Interface:** The interface where data is received that is destined for the forwarded subnet (destination address(es)).
- **Output Interface:** The interface where data is received that is sent from the forwarded subnet (source address(es)).
- **Protocol:** The following protocols are used:
  - UDP: for the specified network, allows the specified UDP port or port range to pass through the system
  - TCP: for the specified network, allows the specified TCP port or port range to pass through the system

  - Any: for the specified network, allows all ports and protocols through the system. No ports are required because not all protocols support the concept of ports.

- Port or Port Range: The port number or port range allowed through the system when UDP or TCP are selected. A port range is specified by separating the starting and ending ports with a colon ':' (for example, 22:80). The ports parameter is not supported when you select **Any** protocol because not all protocols support the concept of ports.

4. When you have finished entering this information, click **Add**.
5. Click **OK**. The new forwarding entry appears on the Forwarding Rules window in the list area.

Peering Proxy

H.323 prefixes can be used to route calls based on a matching prefix in the destination alias of the call. Each prefix is associated with a domain name or IP address to send the call to in case the prefix matches.

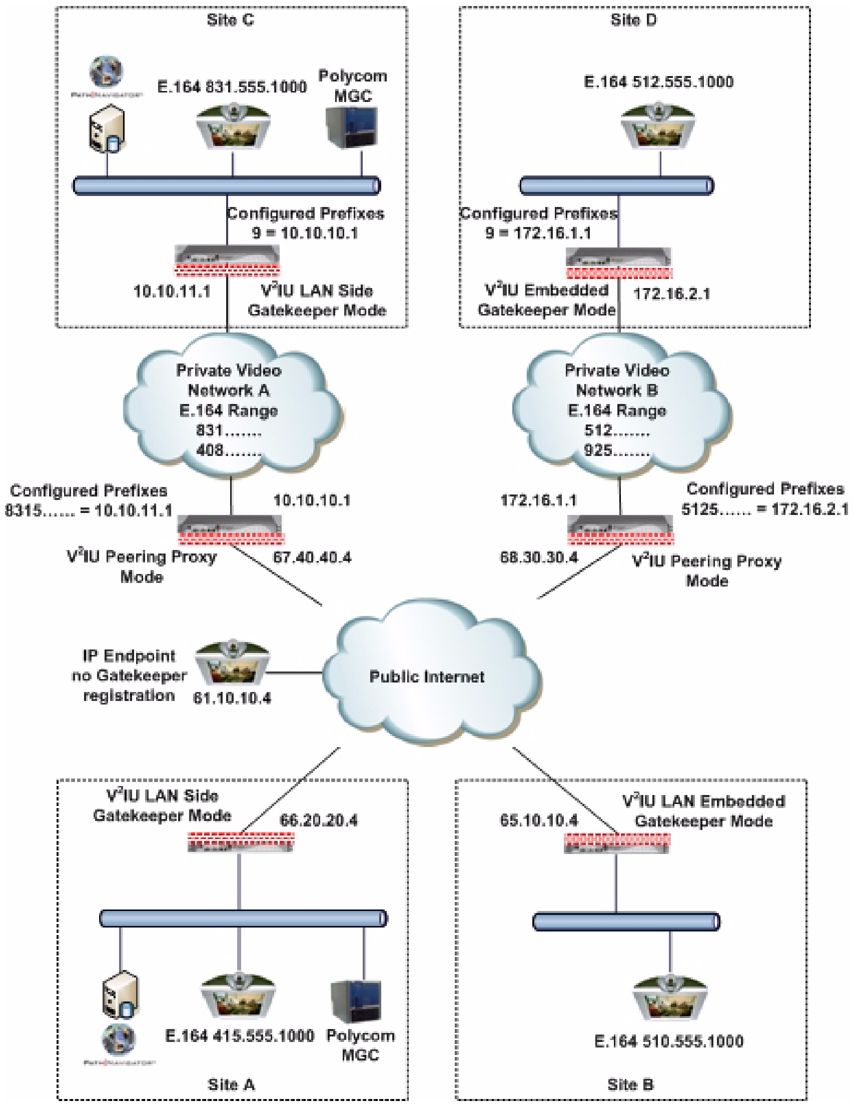
The prefixes are searched in order, that is, the first prefix is tried first, and then the next one on the list until the system finds a matching prefix. This means that if there are multiple matching prefixes, the first one is used.

How Peering Proxy Works

The Polycom V^{2}IU 6400-S supports the concept of an H.323 Peering Proxy. This function provides advanced security layers or peering points within the network where a security layer is needed. Peering Proxy allows network providers to add internetworking connections between their “trusted” network and an unknown network. This topology hides their trusted network and the Stateful packet inspection Firewall provides the policies to ensure security. You can add Peering Proxies in series with one another to push the core H.323 networking infrastructure to meet individual security requirements.

The illustration below shows a sample diagram with dial plan and call flow examples. It is a snapshot of how the Peering Proxy can be deployed. Peering Proxy however, is not limited to this specific scenario, so contact your Polycom representative to discuss specific network requirements for full Peering Proxy support.

Note: A minimum configuration for Peering Proxy would be for inbound only prefixes, since there may be many endpoints to statically route calls to. There might also be a master gatekeeper to which all endpoints are registered. In this case, you would only need 1 prefix pointing to the master gatekeeper and let that gatekeeper signal the other endpoints directly.



In the example above, the Polycom V^{2}IU 6400-S Peering Proxy is installed in “Private Video Network A and B,” a peering point into this network. This network could have additional peering points to allow topology spreading of network resources. However, this example shows only a single point. Peering

Proxy provides an access point into this network and is responsible for the E.164 dial plan using NANP (North American Numbering Plans or NPAs). The NPAs in this case are 831 and 408.

Dial plan integrity is required to insure proper routing of prefix's. This means that if users are to dial into your network, they could be required to enter a “Prefix” on their V^{2}IU with a corresponding destination IP. If the user was to dial another user NOT destined to your network with the same beginning prefix, the prefix configured on this V^{2}IU would create a prefix match and the call would route incorrectly. The call routes to the destination defined in the prefix and not to the intended endpoint. The example shows “Private Video Network A's Peering Proxy” with an inbound prefix defined as 8315…… Any inbound call that matches 8315 with any 6 digits creates a prefix match and sends the call to 10.10.11.1. Refer to “Regular Expressions” in the Info button on the GUI interface for information on all the methods for defining prefixes.

Private Video Network A is one example of a V^{2}IU configured in “LAN Side Gatekeeper” mode with an ANNEX O dial method to dial “Off Net.” Internal “On Net” endpoints registered to the LAN Side Gatekeeper will dial E.164 only. This allows any location to place calls to any location with an ANNEX O dial plan, that is, E.164@WAN_IP or other V^{2}IU's deployed on the network. In this example a Peering Proxy has been deployed to allow dialing ingress and egress to the Public Internet. At each V^{2}IU location required to egress, the Public Internet requires a “Prefix” to be configured. This allows that location's endpoint to dial “Off Net” to the Public Internet. This prefix can be configured to any digit and may be part of the externally dialed E.164 in the E.164@WAN_IP, that is, to reach site A by dialing 4155551000@66.20.20.4 where the prefix is defined as 415* or 415……. In this example, a “9” was chosen. The prefix is then mapped to the LAN interface of the Peering Proxy 10.10.11.1. The dial string is now 94155551000@66.20.20.4 and a strip rule for the prefix is applied. This is needed to route the call at the destination correctly. If the Site C V^{2}IU does not strip the “9”, the destination V^{2}IU fails the call with a “No Registered Client” message (call failures can be viewed under the “H323 Activity” page in the GUI), since the “9” becomes part of the E.164. If you choose a prefix that matches the destination E.164, set Site C's V^{2}IU to NOT strip matching prefixes.

NOTE: In this illustration E.164@WAN_IP was used as an example. Peering Proxy and all V^{2}IU's support user@host ANNEX O dialing methods, for example 123@1.1.1.1 or abc@1.1.1.1 or abc@abc.com with a DNS SRV record configured to point to an A record for the WAN IP of the V^{2}IU.

The following sections demonstrate the Dial Plan for ingress and egress calls to Private Video Network A as shown in the illustration.

Outbound from Site C to Site A

Site C dials an endpoint located at Site A: 94155551000@66.20.20.4. The PathNavigator receives the call and generates a Q.931setup to the V^{2}IU for that subnet. The V^{2}IU processes the Q.931 setup from the calling endpoint. The V^{2}IU looks for a prefix match. In this case, the “9” creates a match. The “Strip Matching Prefix” rule is applied, the “9” is stripped, and the call is routed to the Peering Proxy IP 10.10.10.1. The Peering Proxy applies the same rule set, in this case, NO matching prefix is found and ANNEX O dialing is applied. The call is now routed to Site A's V^{2}IU. The call is forwarded to the LAN Side PathNavigator where the registered client with the E.164 of 4155551000 is located and the call is gatekeeper routed to the called endpoint.

Inbound from Site A to Site C

Site A dials: 8315551000@67.40.40.4. (The destination IP is the Peering Proxy WAN IP address.) The Peering Proxy is configured with prefix 8315……and is mapped to the WAN IP of the V^{2}IU 10.10.11.1. As explained earlier, the prefix could be 831* or 83, and so on, depending upon dial plan requirements. The PathNavigator receives the Q.931setup from the endpoint and forwards the call to the V^{2}IU for that subnet. The V^{2}IU receives the Q.931 setup from the calling endpoint. The V^{2}IU looks for a prefix match, finds NO matching prefix, and ANNEX O dialing is applied. The call is now routed to the Peering Proxy IP 67.40.40.4. The Peering Proxy receives the Q.931 setup and looks for a prefix match, in this case “8315” creates a match. The Peering Proxy now changes the destination IP to 10.10.11.1 and routes the call to Site C's V^{2}IU. The Q.931 setup is forwarded to the LAN Side PathNavigator where the registered client with the E.164 of 8315551000 is located, and the call is gatekeeper routed to the called endpoint.

Outbound from Site C to Site D

Site C dials an endpoint located at Site D: 95125551000@68.30.30.4. The PathNavigator receives the call and generates a Q.931 setup to the V^{2}IU for that subnet. The V^{2}IU processes the Q.931 setup from the calling endpoint. The V^{2}IU looks for a prefix match, in this case the “9” creates a match. The “Strip Matching Prefix” rule is applied, the “9” is striped, and the call is routed to the Peering Proxy IP 10.10.10.1. The Peering Proxy applies the same rule set, in this case NO matching prefix is found, and ANNEX O dialing is applied. The call is now routed to the Peering Proxy for “Private Video Network B” IP 68.30.30.4. The Peering Proxy receives the Q.931 and looks for a prefix match. In this case, “5125” creates a match. The Peering Proxy now changes the destination IP to 172.16.2.1 and routes the call to Site D's V^{2}IU. The V^{2}IU is configured for Embedded Gatekeeper Mode. In this mode, the endpoint is directly registered and an E.164 registered client match is made. The call is then routed to the called endpoint.

Outbound from Site D to Site B

Site D dials an endpoint located at Site B: 95105551000@65.10.10.4. The V^{2}IU Embedded Gatekeeper is configured with a prefix of “9” to point to Peering Proxy 172.16.1.1. The V^{2}IU looks for a prefix match. In this case, the “9” creates a match. The “Strip Matching Prefix” rule is applied, the “9” is striped, and the call is routed to Peering Proxy IP 172.16.1.1. The Peering Proxy applies the same rule set. In this case NO matching prefix is found and ANNEX O dialing is applied. The call is now routed to Site B. The V^{2}IU is configured for

Embedded Gatekeeper Mode. In this mode, the endpoint is directly registered, an E.164 registered client match is made, and the call is routed to the called endpoint.

Outbound from Site C to Public IP Endpoint

Site C dials the public endpoint: 9@61.10.10.4. The PathNavigator receives the call and generates a Q.931 setup to the V^2IU for that subnet. The V^2IU receives the Call setup from the calling endpoint, and the V^2IU looks for a prefix match. In this case, the “9” creates a match. The “Strip Matching Prefix” rule is applied, the “9” is striped, and the call is routed to the Peering Proxy IP 10.10.10.1. The Peering Proxy applies the same rule set, in this case NO matching prefix is found, and direct IP dialing is applied.

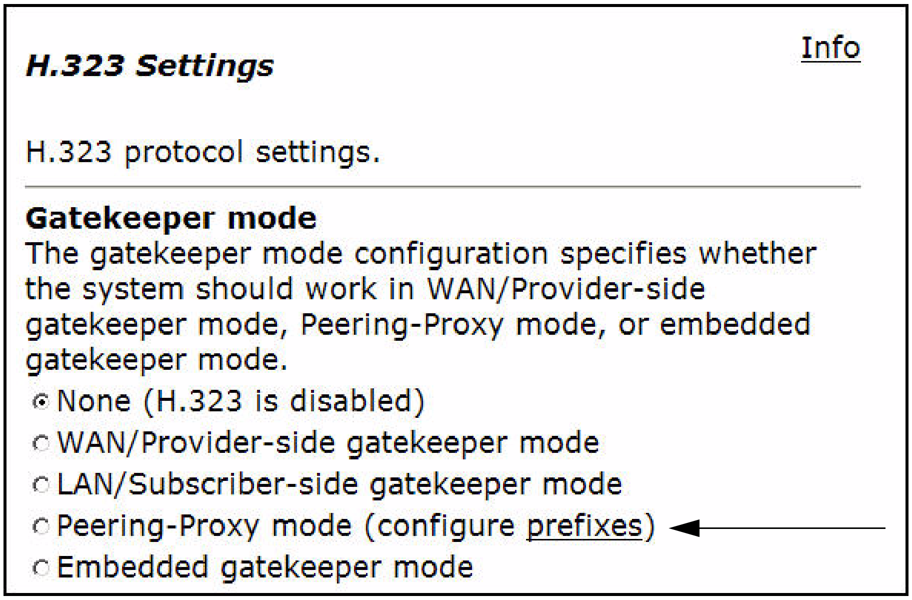
Inbound from Public IP Endpoint to Site C

Public IP endpoint is NOT registered to a gatekeeper and must dial an IP+EXT to reach Site C's endpoint,. In this case, the IP address is 67.40.40.4 and EXT 8315551000. The Peering Proxy receives the call and looks for a prefix match. In this case “8315” creates a match. The Peering Proxy now changes the destination IP to 10.10.11.1 and routes the call to Site C's V^2IU. The Q.931 setup is forwarded to the LAN Side PathNavigator where the registered client with the E.164 of 8315551000 is located, and the call is gatekeeper routed to the called endpoint.

Configuring Peering Proxy

To configure peering proxy, use the following steps:

1. Using the configuration graphical user interface, from the Configuration Menu on the left-hand side, click **VoIP ALG**.
2. Click **H.323**. The window shown below opens.



H.323 Settings

H.323 protocol settings.

Gatekeeper mode

The gatekeeper mode configuration specifies whether the system should work in WAN/Provider-side gatekeeper mode, Peering-Proxy mode, or embedded gatekeeper mode.

● None (H.323 is disabled)

○ WAN/Provider-side gatekeeper mode

○ LAN/Subscriber-side gatekeeper mode

○ Peering-Proxy mode (configure prefixes)

○ Embedded gatekeeper mode

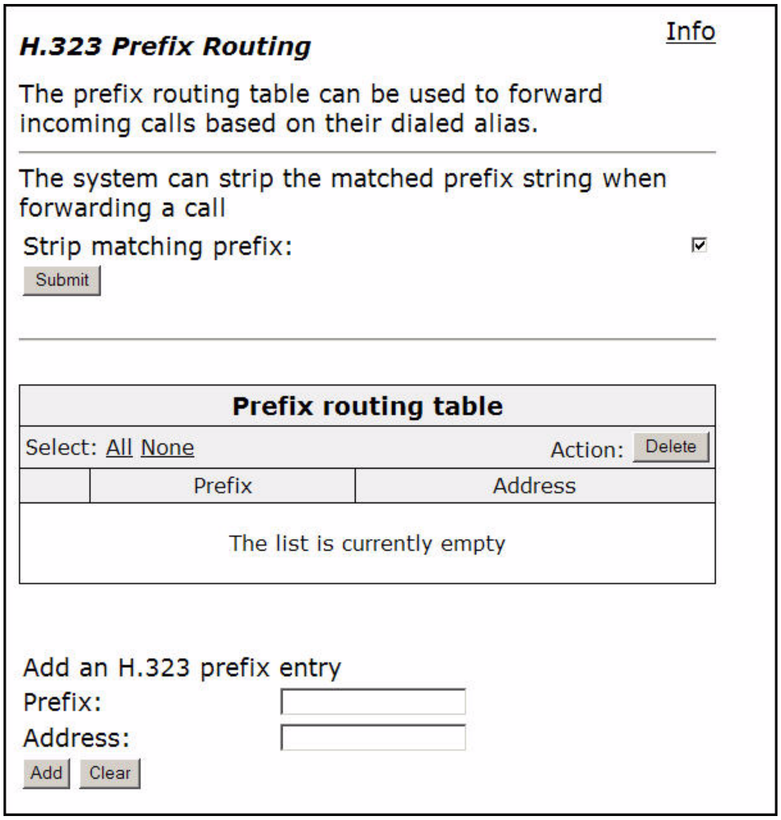
3. On this screen, check “Peering-Proxy mode”.
4. **Scroll** to the bottom of the window and click **Submit.**

Adding an H.323 Prefix Entry

You can add prefixes by entering the prefix string and the target address.

To add an H.323 prefix entry, use the following steps:

1. Using the configuration graphical user interface, from the Configuration Menu on the right-hand side, click **VoIP ALG**.
2. Click **H.323 Prefixes**. The window shown below opens.



H.323 Prefix Routing

The prefix routing table can be used to forward incoming calls based on their dialed alias.

The system can strip the matched prefix string when forwarding a call

Strip matching prefix: ☑

Prefix routing table

Select: All None — Action: Delete

	Prefix	Address
	The list is currently empty	

Add an H.323 prefix entry

Prefix:

Address:

The prefix routing table shows all currently configured prefixes. The prefixes are searched in the order they are entered. Each prefix can be moved up or down in the list. You can select and delete prefixes.

3. To strip a matching prefix, select the checkbox and click **Submit.**

   If you enable this, all matching prefixes are stripped from the destination alias before the call is forwarded.

4. To add an entry, enter the prefix and the address.

   The prefix string can be a regular expression as described above. The target address can be a domain name or an IP address.

5. Click **Add**. The new entry appears in the table.

Clients List Lock

Client List lockdown allows you to prevent new clients from registering. This is done as follows:

- Creating a client, as follows:

- Manually entering all clients that are allowed to use the system
- Running the system without the Client List lockdown feature until all desired clients have registered

- Enabling this feature.

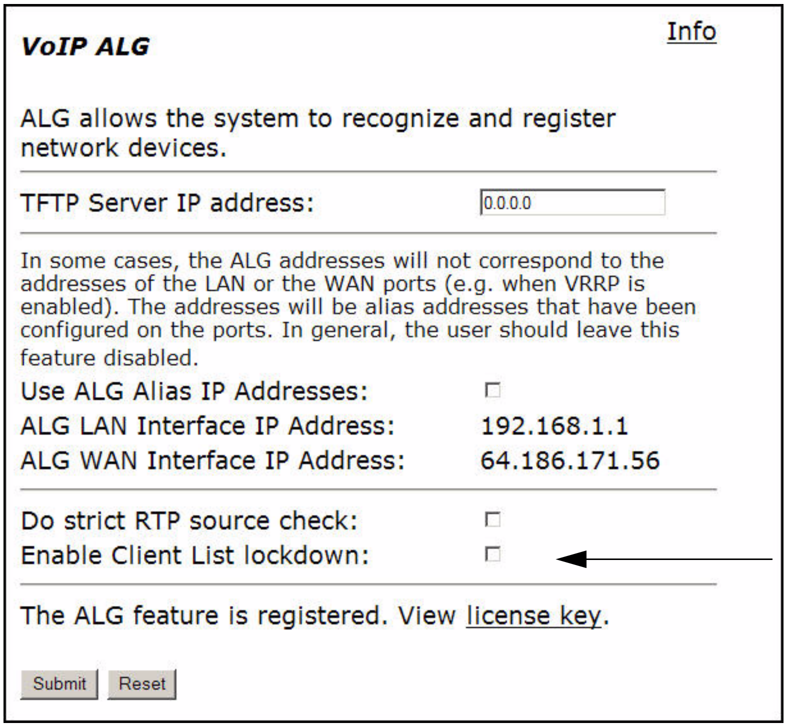
This feature is useful for lists involved with 911 usage.

When this feature is in effect, any message from an unauthorized SIP client will be rejected with a “403 Forbidden” response. MGCP messages will be discarded.

Enabling the Clients List Lock

To configure clients list lock, use the following steps:

6. Using the configuration graphical user interface, from the Configuration Menu on the left-hand side, click **VoIP ALG**. The following window appears.



VoIP ALG

ALG allows the system to recognize and register network devices.

TFTP Server IP address: 0.0.0.0

In some cases, the ALG addresses will not correspond to the addresses of the LAN or the WAN ports (e.g. when VRRP is enabled). The addresses will be alias addresses that have been configured on the ports. In general, the user should leave this feature disabled.

Use ALG Alias IP Addresses: □

ALG LAN Interface IP Address: 192.168.1.1

ALG WAN Interface IP Address: 64.186.171.56

Do strict RTP source check: □

Enable Client List lockdown: □

The ALG feature is registered. View license key.

3. On this screen, check “Enable Client List lockdown”.

4. Scroll to the bottom of the window and click **Submit.**

H.323 Activity Monitor

The H.323 Activity Monitor shows any recent H.323 events that may be of interest to the administrator of the system. The information appears in three columns:

- Event/Time
- Source
- Destination

Following this information are a number of lines with event specific information such as call-id, duration, call-status, and so on.

Abnormal events have their event specific information listed in red.

Type of Events

The events that may currently be listed in the activity monitor are as follows:

- **Bandwidth change** - the endpoint requested a change of the bandwidth used for its call, only sent if the bandwidth management is enabled.
- **Call Setup** – Only sent if the call was 'successfully' established. A call is successfully established if the H.245 media negotiation connection was established.
- **Call Termination** – Sent when a call terminates. You can have a call termination event without a call setup event, for example, a failed call that doesn't reach the H.245 established state will not cause a call setup event, but only a call termination event.
- **Registration Reject** – Sent when a registration was rejected. This includes the authority that rejected the registration (our side or the gatekeeper (only in WAN GK mode) as well as a text reason for the rejection.
- **Gatekeeper reachability changed** (only in WAN GK mode). Gatekeeper status toggled from reachable to unreachable or vice versa.
- **Location Request** – Received a location request from a neighboring gatekeeper.
- **Location Confirm** – Sent, or forwarded, a location confirm to a previous request.
- **Location Reject** - Sent, or forwarded, a location reject to a previous request.

Call Status

The call status shows the last state of the call at the time of the event. Each call progresses through a number of states when being established. If a call fails, the call-status in the call termination event can help trouble-shoot the cause of the call failure. For example, if the call fails at the "Caller/Callee admission request received" state, there may be a problem communicating with the gatekeeper, whereas if the call fails at the "Attempting to establish outgoing Q.931 TCP connection" state, the remote endpoint may not be reachable. The following are call status messages:

- **"Caller admission request received"**

Received an admission request from the source endpoint and forwarded it to the gatekeeper.

- **"Caller admission response received"**

Received an admission response (either confirm or reject) from the gatekeeper and forwarded it to the source endpoint.

- **"Incoming Q.931 TCP connection established"**

Received an incoming Q.931 TCP connection from the source.

- **"Attempting to establish outgoing Q.931 TCP connection"**
Successfully resolved the destination of the call and attempting to establish an outgoing Q.931 TCP connection to the destination.

- **"Q.931 signaling received and forwarded"**
Both Q.931 TCP connections have been successfully established and Q.931 signaling has been received and forwarded.

- **"Callee admission request received"**
Received an admission request from the destination endpoint and forwarded it to the gatekeeper.

- **"Callee admission response received"**
Received an admission response (either confirm or reject) from the gatekeeper and forwarded it to the destination endpoint.

- **"Incoming H.245 TCP connection established"**
Received an incoming H.245 TCP connection from the source.

- **"Attempting to establish outgoing H.245 TCP connection"**
Attempting to establish an outgoing H.245 TCP connection to the destination.

- **"H.245 signaling received and forwarded"**
Both H.245 TCP connections have been successfully established and H.245 signaling has been received and forwarded. At this point, the call is considered established, even though no media channels have been opened up yet.

- **"Outgoing media channel established"**
An outgoing media channel (from the LAN/subscriber side to the WAN/provider side) has been opened.

- **"Incoming media channel established"**
An incoming media channel (from the WAN/provider side to the LAN/subscriber side) has been opened.

- **"Bidirectional media channels established"**
Media channels have been opened in both directions. This is a normal call where media is being sent in both directions.

Call Termination

The call termination cause may also give some information about why the call terminated or failed to be established.

- **"Out of system resources"**

The call could not be completed because the system was out of system resources.

- **"Client owning the call has been deleted"**

The call could not be completed because the client that made this call was deleted during the call setup.

- **"Connection to destination could not be established"**

A TCP connection to the destination could not be established.

- **"Connection refused by destination"**

The call could not be completed because the destination refused the incoming TCP connection.

- **"No route to destination"**

A TCP connection to the destination could not be established because the destination could not be reached. This could happen if there is no route to the destination or, if the destination is on the same subnet, the destination does not answer to ARP requests.

- **"Connection to destination timed out"**

The TCP connection attempt to the destination timed out before it could be established.

- **"Call ended by source"**

The call was gracefully terminated by H.323 signaling from the source. This usually indicates that the endpoint intended to terminate the call.

- **"Call ended by destination"**

The call was gracefully terminated by H.323 signaling from the destination. This usually indicates that the endpoint intended to terminate the call.

- **"Connection terminated by source"**

The call was terminated because the source terminated the TCP connection without prior call termination signaling.

- **"Connection terminated by destination"**

The call was terminated because the destination terminated the TCP connection without prior call termination signaling.

- **"No admission confirm received"**

The call could not be established because the admission response was not received from the gatekeeper.

- **"Cannot resolve destination"**

The call could not be established because the destination could not be resolved.

- **"At maximum bandwidth usage"**

The call could not be established because the system already is at the maximum allowed bandwidth.

- **"Received admission reject"**
The call was terminated because an admission reject was received from the gatekeeper.

- **"Received disengage request"**
The call was terminated because the endpoint requested to tear down the call.

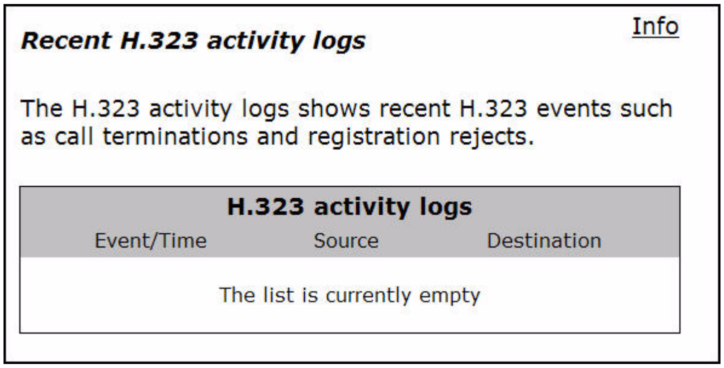
- **"Received invalid data"**
The call could not be established because the system received invalid data on the signaling channel.

- **"Cannot find client"**
The call could not be established because the called client could not be found.

Viewing the H.323 Activity Monitor

To configure the H.323 Activity Monitor, use the following steps:

5. Using the configuration graphical user interface, from the Configuration Menu on the left-hand side, click **VoIP**.
6. Click **H.323 Activity**. The window shown below opens.



Recent H.323 activity logs

Info

The H.323 activity logs shows recent H.323 events such as call terminations and registration rejects.

H.323 activity logs		
Event/Time	Source	Destination
The list is currently empty		

2. On this screen, the event list contains three columns:
   - The Event/Time field - shows the type of event and the time that it occurred.
   - The Source field - shows the source of the event as an IP address and an alias (when available).
   - The Destination field - shows the destination of the event as an IP address and an alias (when available).

H.460 Operation Mode

This feature allows the Polycom V²IU 6400-S to do NAT/Firewall traversal for clients behind NAT or firewall devices.

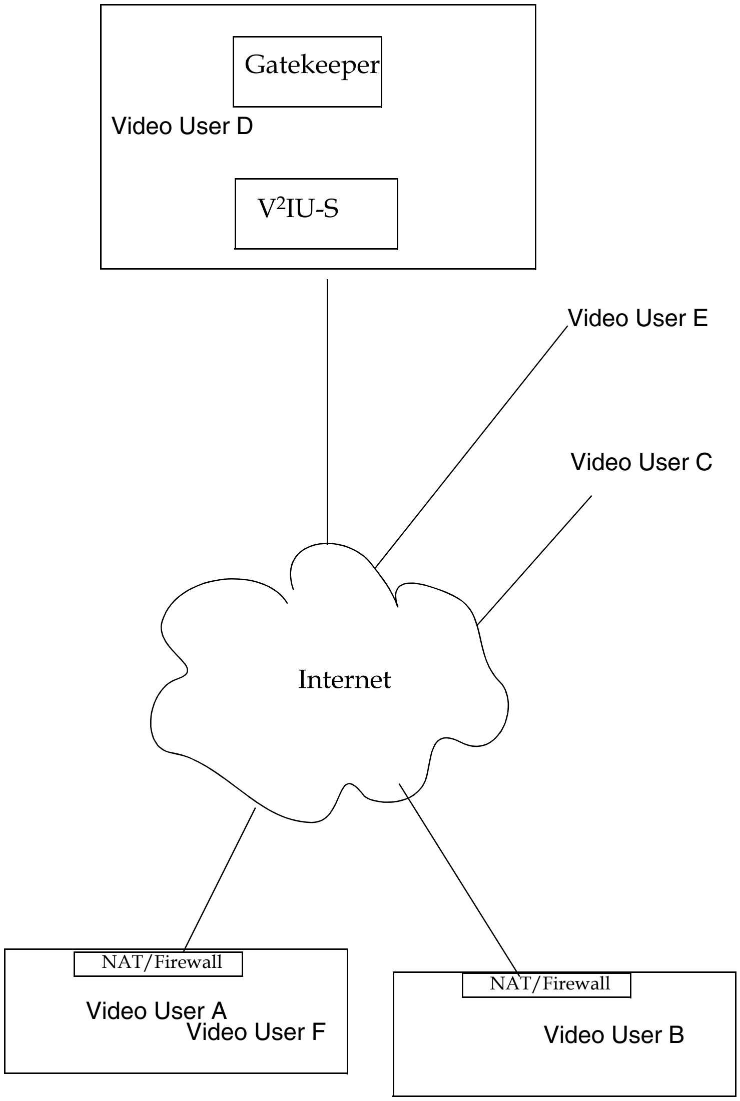
The endpoint must always signal H.460.18 capability for this feature to be enabled.

Note: For this to be fully functional, it must be enabled with H.460 capability on both ends.

How H.460 Operation Mode Works

H.460.18 is an extension to H.323 for traversing NAT/Firewalls when communicating between H.323 devices. Typically a NAT/Firewall will block any incoming connection attempts from a public-side host to a private-side host.

The figure below shows a basic configuration of video users with both firewall and non-firewall connections.



H.323 requires many connections in order to establish a call, for example, Q.931 and H.245 TCP connections and multiple RTP UDP streams. H.460.18 allows an H.323 device to traverse a NAT/Firewall by having the private-side endpoint initiate all TCP connections and UDP streams to the outside H.323 device.

Note: When NAT/Firewall connections are configured**,** H.323 Fixup software must be turned off.

In the previous figure, the following communication between video users is available:

- User D communicates to Users A, B, C, E, and F.

The connection between User D and User A is hairpinned. This means that the connection is 768 kilobits per second (kbps) or 2 times 384 kbps, the typical bandwidth for a H.323 call.

- User E can communicate directly with User C (Shortest Path Media) because no firewalls are involved.
- User A communicates with User C or User E through the V^{2}IU because a firewall is involved.
- User D communicates with User A and User B through the V^{2}IU.
- User A communicates with User F and User A through the V^{2}IU.

Normally, as long as outbound traffic is allowed, no additional ports have to be opened on the NAT/Firewall for H.460.18 to work.

If outbound traffic is restricted, the following port ranges must be opened.

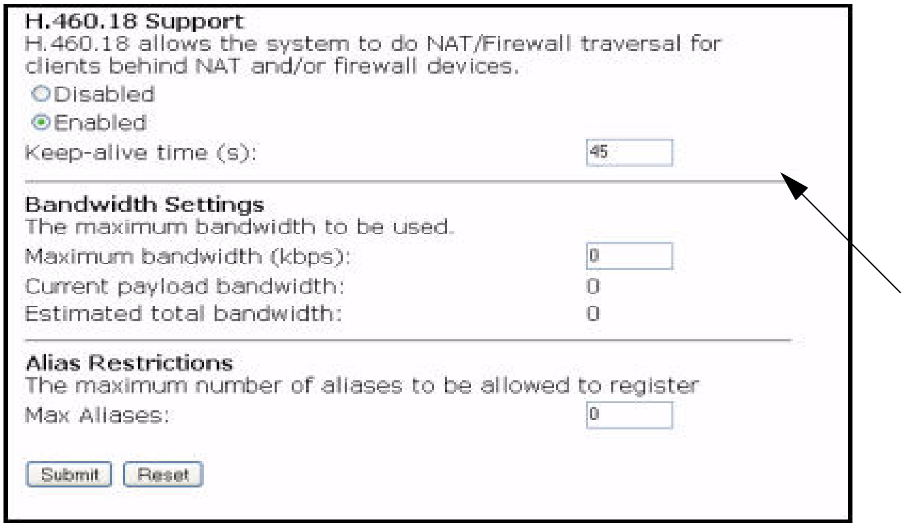
RAS	UDP	1719
Q.931	TCP	1720
H.245	TCP	14085:15084
RTP	UDP	16386:17286 (4200/4300) 16386:25386 (5300) 16386:34386 (6400)

Configuring the H.460 Operation Mode

To configure the H.460 Operation Mode, use the following steps:

1. Using the configuration graphical user interface, from the Configuration Menu on the left-hand side, click **VoIP ALG**.
2. Click **H.323**.

3. Scroll down until the following part of the window appears.



H.460.18 Support

H.460.18 allows the system to do NAT/Firewall traversal for clients behind NAT and/or firewall devices.

○ Disabled

● Enabled

Keep-alive time (s): 45

Bandwidth Settings

The maximum bandwidth to be used.

Maximum bandwidth (kbps): 0

Current payload bandwidth: 0

Estimated total bandwidth: 0

Alias Restrictions

The maximum number of aliases to be allowed to register

Max Aliases: 0

4. On this screen, use the following options:

   – Disabled – disabled (The system will not use H.460.18 even though the endpoint is capable of it.)

   – Always enabled – The system always turns H.460.18 on if the endpoint signals capability.

   – The keep-alive time is the interval between keep-alive messages (used to keep the firewall open) that the endpoint should use. The default is 30s.

5. When you have entered your selections, click **Submit.**

5

Configuring VoIP

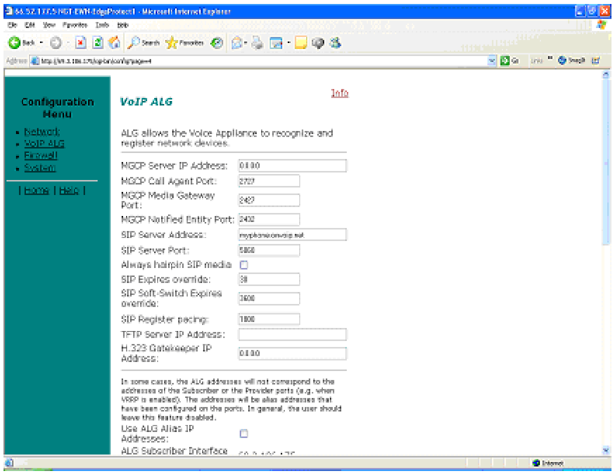
An application-layer gateway provides basic proxy features for voice and video over IP traffic. Serving as an ALG proxy, the 6400-S provides Network Address Translation (NAT) services for the protected softswitch, gatekeeper or other media devices. It maps multiple devices on the subscriber interface (public) to a single IP address on the provider interface (private). The ALG must first recognize and register a public network based device before it presents traffic from the IP telephone, video endpoint or data device through its provider port.

The 6400-S contains an MGCP, SIP, and H.323 call-control proxy ALG. VoIP phones, video endponts and client adapters have to be configured to point to the 6400-S as the call-control server, proxy, gatekeeper or gateway (depending on protocol). The 6400-S then forward this traffic onto the actual call-control server or gatekeeper.

For corporate customers with high-end routers and firewalls, the 6400-S can be configured as a VoIP Application Layer Gateway only. This allows all of the normal data traffic to continue to be handled by the existing network devices, and only voice or traffic to be handled by the 6400-S. For this configuration, the 6400-S Subscriber Ethernet port is connected to the internet. The 6400-S Provider Ethernet port is connected to a port on the local Ethernet switch.

To configure VoIP ALG:

1. In the navigation bar, select VoIP ALG.



Configuration Menu

- Network
- VoIP ALG
- Firewall
- System

| Home | Help |

Info

VoIP ALG

ALG allows the Voice Appliance to recognize and register network devices.

MGCP Server IP Address: 0.0.0.0
MGCP Call Agent Port: 2727
MGCP Media Gateway Port: 2427
MGCP Notified Entity Port: 2432
SIP Server Address: myphone.onvoip.net
SIP Server Port: 5060
Always hairpin SIP media □
SIP Expires override: 30
SIP Soft-Switch Expires override: 3600
SIP Register pacing: 1800
TFTP Server IP Address:
H.323 Gatekeeper IP Address: 0.0.0.0

In some cases, the ALG addresses will not correspond to the addresses of the Subscriber or the Provider ports (e.g. when VRRP is enabled). The addresses will be alias addresses that have been configured on the ports. In general, the user should leave this feature disabled.

Use ALG Alias IP Addresses: □
ALG Subscriber Interface

2. On the VoIP ALG page, enter information as follows:

Field	Description
MGCP Server IP Address	If a MGCP ALG is needed, enter the IP address for the MGCP Server as provided. This address should be reached via the Provider side Ethernet port. The MGCP server provides media gateway control protocol service to IP phones, client adapters and gateways.
MGCP Call Agent Port	The Call Agent port specifies the port number that the Call Agent (soft-switch) listens to for messages from the phones. (Default is 2727)
MGCP Media Gateway Port	The Media Gateway port specifies the port number the Media Gateway (phones) listens to for messages from the soft-switch. (Default is 2427)
MGCP Notified Entity Port	The Notified Entity port specifies the port number that the soft-switch uses for notifications from the phones, e.g. hook up, hook down, digits. (Default is 2432)

Field	Description
SIP Server Address	The SIP server provides session-initialization protocol service to IP phones, client adapters and gateways. If a SIP ALG is needed, enter the address (either an IP or URL) for the SIP Server. This address should be reached via the Provider side Ethernet port.
SIP Server Port	If a SIP ALG is needed, enter a port for the SIP Server Port.
Always hairpin SIP media	Normally set to False. If set to True, then SIP phone-to-phone calls made on the Subscriber side of the 6400-S will always have their RTP traffic flow to and back from the EP's subscriber interface.
SIP Expires override	The SIP Expires override field specifies the number of seconds a registration should be valid. The 6400-S uses this value to re-write the expires value returned from the soft-switch before forwarding it to the IP phone. This value is used to force the IP phone to register at the configured interval And helps to maintain NAT bindings in network based firewalls when the 6400-S is performing NAT/firewall traversal.
SIP Soft-Switch Expires override	The SIP Soft-Switch expires override field specifies the number of seconds that should be used when forwarding registration messages to the soft-switch on behalf of the IP phones. This should be higher than the rate pacing value, otherwise, the soft-switch may consider the phone's registration to have expired. If this field is not set, the phone's value is forwarded unchanged.

Field	Description
SIP Register pacing	If the SIP Expires override field is set to a lower value, the number of registration messages may overload the soft-switch. In order to prevent this, you can set the SIP Register pacing field to the number of seconds to wait before forwarding a register message from one phone to the soft-switch. Any register messages received before this time will be locally answered by the 6400-S. For example, you may set the expires value to 60 and the pacing value to 1800 to have the phone register to the 6400-S every minute, but only let a register message through to the soft-switch every 30 minutes.
TFTP Server IP Address	Enter the IP address for the TFTP Server.
This allows the 6400-S to forward (proxy) TFTP requests from devices on the Subscriber side to a TFTP server on the Provider side.	
H232 Gatekeeper IP Address	If an H.323 ALG is needed, enter the address (either an IP or URL) for the H.323 Gatekeeper. This address should be reached via the Provider side Ethernet port.
Use ALG Alias IP Addresses	Not used
ALG Subscriber Interface	Not Used.
Automatic MCCP Re-registration	Automatic MGCP Re-registration is used to re-register MGCP endpoints every time the network or system restarts. Enable this feature to automatically synchronize the softswitch and phones immediately after a restart. The default is Enabled.
MGCP Re-registration Rate(s)	The MGCP Re-registration Rate is used to set the number of MGCP RSIP messages to send per second to the Media Gateway Controller when re-registration is needed. If the MGCP Re-registration Rate needs to be changed, enter a value between 1 and 5. Generally, this value does not need to be modified. The default value is 5 msg/second.

Field	Description
Automatic MGCP Audit	The Automatic MGCP Audit flag specifies whether MGCP clients should be automatically audited by sending a message to each client and wait for a response.
Audit Cycle Interval	The Audit Cycle Interval specifies how often these messages should be sent out to the clients. For each cycle, all endpoints are audited so the rate of messages being sent is dependent on the number of clients currently registered.
State Time	The Stale Time value is used to decide when a client is supposed to be deemed stale, or unavailable.
Prevent state re-registration	The Prevent stale re-registration flag can be used to disable the automatic MGCP re-registration feature for stale clients.
Automatic Client Deletion	Automatic Client Deletion will delete clients that have been unavailable for a given period of time.
Deletion Time	Deletion Time specifies the time that a stale client will show a warning icon in the client list.
H 323 Terminal Type	The H.323 TerminalType is used to specify the type of terminal that the 6400-S should use. This value should be set to endpoint.
Maximum bandwidth (kbps)	This value is not used and should be set to 0.
Current payload bandwidth	The total bandwidth in use for H.323 video calls as requested by the H.323 video endpoints.
Estimated total bandwidth	The total bandwidth in use for video calls; generally the current payload bandwidth plus 20% for packet overhead.
H 323 Max Aliases	This value is not used and should be set to 0.

Field	Description
SIP LAN side Gateway	The SIP LAN Side Gateway is used to configure a LAN side SIP gateway to which calls that are not for a registered phone can be sent. The name of the gateway is a locally meaningful name. These two fields must both be filled in, or be empty.
Gateway Name	The name of a subscriber PSTN gateway or a single SIP proxy for multiple PSTN gateways.
Gateway Address	The IP address of a subscriber PSTN gateway or a single SIP proxy for multiple PSTN gateways.

Configuring VoIP subnet routing

In its simplest configuration, the 6400-S acts as a proxy for a soft-switch or H.323 gatekeeper on its immediate Provider subnet. Because these devices reside on the same subnet as the 6400-S, packets proxied by the ALG function do not require additional routing information.

The 6400-S can support a VoIP call-control server or H.323 gatekeeper on it's Provider side but not located immediately on the Provider-side subnet by configuring VoIP Subnet Routes.

Using the VoIP Subnet Routing feature, the 6400-S can be configured to serve these remote devices. Three pieces of information are required for each subnet containing the VoIP call-control server or H.323 gatekeeper:

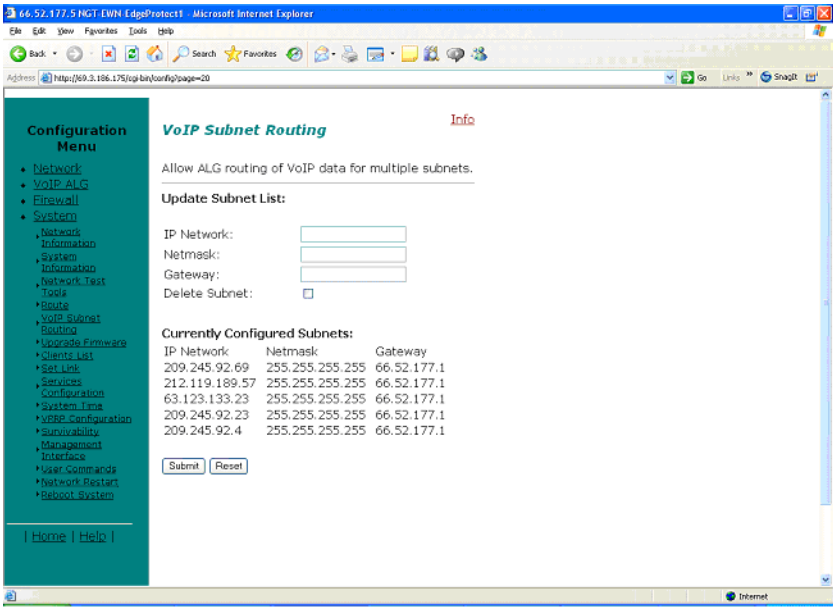
- The IP Network address.
- The Netmask.
- The Gateway.

You can configure up to 20 VoIP subnets.

To configure VoIP subnet routing:

1. In the navigation bar, select System.

2. In the System menu, select VoIP Subnet Routing.



VoIP Subnet Routing

Allow ALG routing of VoIP data for multiple subnets.

Update Subnet List:

IP Network:

Netmask:

Gateway:

Delete Subnet: □

Currently Configured Subnets:

IP Network	Netmask	Gateway
209.245.92.69	255.255.255.255	66.52.177.1
212.119.189.57	255.255.255.255	66.52.177.1
63.123.133.23	255.255.255.255	66.52.177.1
209.245.92.23	255.255.255.255	66.52.177.1
209.245.92.4	255.255.255.255	66.52.177.1

Submit Reset

3. Enter the network address in IP Network, such as 10.10.12.0.

   This is the IP address of the remote subnet containing the voice devices.

4. Enter a subnet mask in Netmask, such as 255.255.255.0

   A subnet mask of the network determines which packets are destined for the 6400-S.

5. Enter and address in Gateway, such as 10.10.10.2.

   This is the IP address of the intermediate router that knows the return path to the remote subnet from the 6400-S.

6. Press Submit.

7. You can configure as many as 20 subnets. Complete steps 3 through 6 for each subnet.

Deleting a VoIP subnet route

To delete a VoIP subnet route:

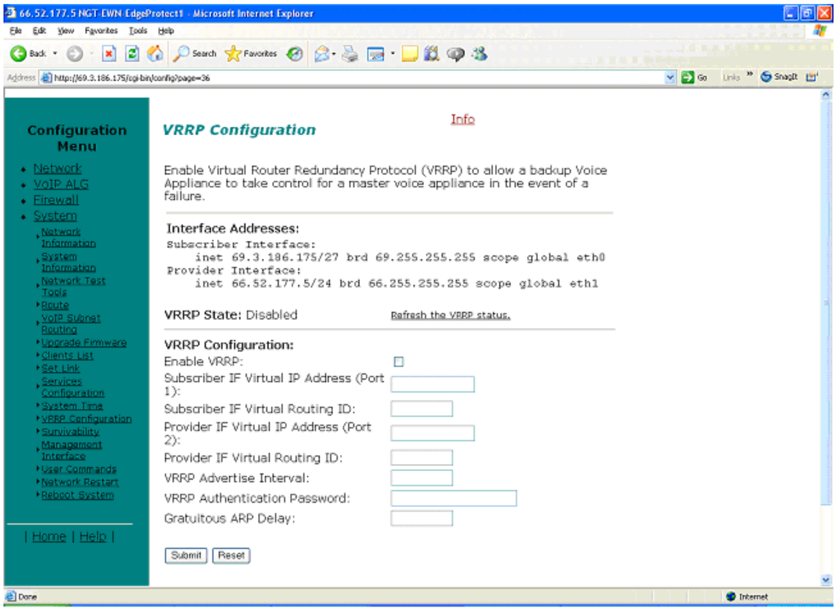
1. In the navigation bar, select System.
2. In the System menu, select VoIP Subnet Route.
3. Enter an IP Network, such as 10.10.10. 0.
4. Check the Delete Subnet box.
5. Press Submit.

Configuring VRRP

The Virtual Router Redundancy Protocol (VRRP) is designed to eliminate the 6400-S as a single point of failure in a network configuration. Two 6400-S devices can be configured to perform as a redundant pair. One 6400-S is the Master, the other is the Backup. If the Master fails because of a network or hardware failure, the Backup takes over for the Master.

To configure VRRP:

1. In the navigation bar, select System.
2. In the System menu, select VRRP Configuration.



VRRP Configuration

Enable Virtual Router Redundancy Protocol (VRRP) to allow a backup Voice Appliance to take control for a master voice appliance in the event of a failure.

Interface Addresses:

```
Subscriber Interface:
    inet 69.3.186.175/27 brd 69.255.255.255 scope global eth0
Provider Interface:
    inet 66.52.177.5/24 brd 66.255.255.255 scope global eth1
```

VRRP State: Disabled

VRRP Configuration:

Enable VRRP: □

Subscriber IF Virtual IP Address (Port 1):

Subscriber IF Virtual Routing ID:

Provider IF Virtual IP Address (Port 2):

Provider IF Virtual Routing ID:

VRRP Advertise Interval:

VRRP Authentication Password:

Gratuitous ARP Delay:

3. To enable VRRP, check the Enable VRRP box.
4. Enter a Subscriber IF Virtual IP Address. The common virtual IP address to be shared on the Port 1 interface.
5. Enter a Subscriber IF Virtual Routing ID. A unique number in the range 1-255 that identifies the router for the Subscriber virtual IP.
6. Enter a Provider IF Virtual IP Address. The common virtual IP address to be shared on the Port 2 interface.
7. Enter a Provider IF Virtual Routing ID. A unique number in the range 1-255 that identifies the router for the Provider virtual IP.
8. Enter the VRRP Advertise Interval. How often (in seconds) that VRRP packets should be sent.
9. Enter the VRRP Authentication Password. Password used to authenticate routers in a VRRP group.

10. Enter the Gratuitous ARP Delay. How long in seconds an 6400-S should wait after a switch over before sending Gratuitous ARPs packets.
11. Press Submit.

6

Configuring the Firewall

This chapter describes how to configure the 6400-S as a firewall. It contains the following sections:

- Configuring the Firewall Basic Settings
- Configuring Advanced Firewall Settings

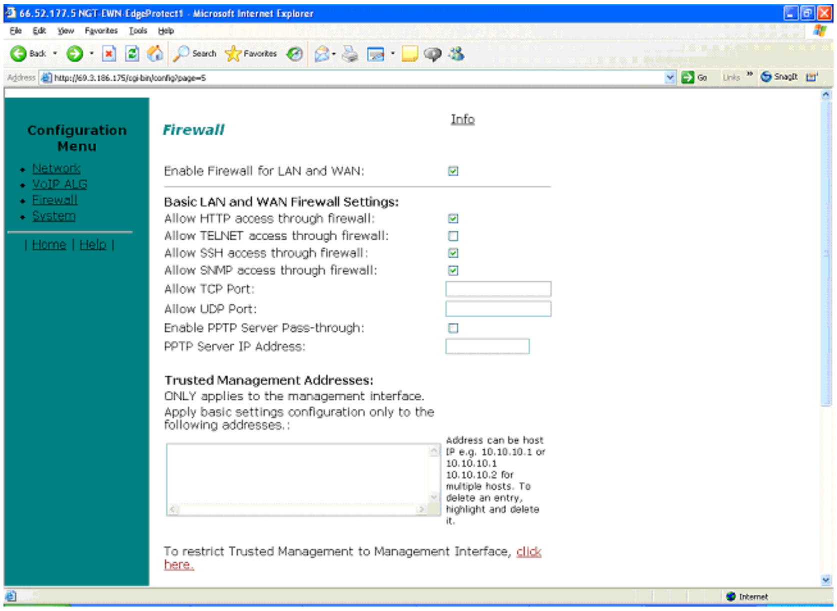
The 6400-S can act as a firewall. A firewall restricts and controls the traffic between networks, typically between a corporate network and the Internet. If an external firewall is used, the firewall features can be set to pass or block traffic depending on whether the 6400-S is placed in series or in parallel with the external firewall.

Configuring the Firewall Basic Settings

The basic settings are under Basic LAN (Subscriber) and WAN (Provider) Firewall Settings on the Firewall configuration page.

To configure basic settings:

1. In the navigation pane, select Firewall.



66.52.177.5 NGT-EWN EdgeProtect1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://69.3.186.175/cgi-bin/config?page=5
Go Links SnagIt
Configuration Menu
Network
VoIP ALG
Firewall
System
| Home | Help |
Info
Internet

Firewall

Enable Firewall for LAN and WAN: ☑

Basic LAN and WAN Firewall Settings:

Allow HTTP access through firewall: ☑

Allow TELNET access through firewall: ☐

Allow SSH access through firewall: ☑

Allow SNMP access through firewall: ☑

Allow TCP Port:

Allow UDP Port:

Enable PPTP Server Pass-through: ☐

PPTP Server IP Address:

Trusted Management Addresses:

ONLY applies to the management interface.
Apply basic settings configuration only to the following addresses.:

Address can be host IP e.g. 10.10.10.1 or 10.10.10.1 10.10.10.2 for multiple hosts. To delete an entry, highlight and delete it.

To restrict Trusted Management to Management Interface, click here.

2. In the section: Basic LAN and WAN Firewall Settings, enable the management services that you want to reach the 6400-S by checking the appropriate box for:

   – Allow HTTP access through firewall

   – Allow TELNET access through firewall

   – Allow SSH access through firewall

   – Allow SNMP access through firewall

3. Configure Allow TCP Port according to the rules in “Basic settings rules” on page 31. This setting allows traffic with the specified TCP port to terminate on the 6400-S.

4. Configure Allow UDP Port according to the rules in Basic settings rules on page 6-3. This setting allows traffic with the specified UDP port to terminate on the 6400-S.

5. Skip Enable PPTP server Pass-through. This setting is not currently used.

6. Enter an IP address in PPTP Server IP Address. This setting is not currently used.

7. To restrict Trusted Management to the Management Interface, see Configuring a Management Interface on page 7-9.

8. Press Submit.

Basic settings rules

Follow these rules when configuring basic settings:

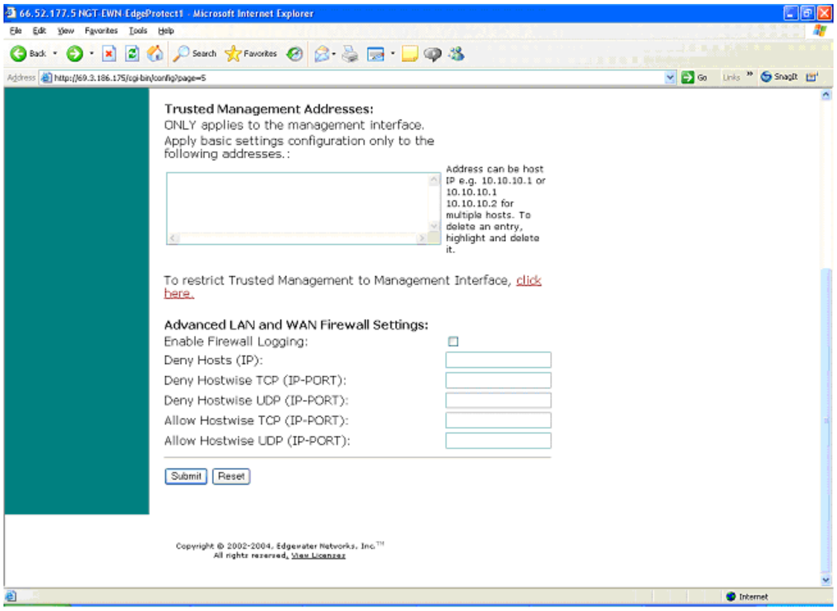
- For Allow TCP Port and Allow UDP Port, valid values are 1 through 65535.
- Separate multiple entries by spaces,
- Indicate a range of values with a colon (:). For example, 25:50 means perform the action on ports 25 through 50

Configuring Advanced Firewall Settings

A comprehensive security policy can be created using advanced settings.

To configure advanced settings:

1. In the navigation pane, select Firewall and scroll to Advanced LAN and WAN Firewall Settings.


66.52.177.5 NGT-EWN-EdgeProtect1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://69.3.186.175/cgi-bin/config?page=5
Go Links SnagIt
Internet

Trusted Management Addresses:
ONLY applies to the management interface.
Apply basic settings configuration only to the following addresses.:

Address can be host IP e.g. 10.10.10.1 or 10.10.10.1 10.10.10.2 for multiple hosts. To delete an entry, highlight and delete it.

To restrict Trusted Management to Management Interface, click here.

Advanced LAN and WAN Firewall Settings:
Enable Firewall Logging: ☐
Deny Hosts (IP):
Deny Hostwise TCP (IP-PORT):
Deny Hostwise UDP (IP-PORT):
Allow Hostwise TCP (IP-PORT):
Allow Hostwise UDP (IP-PORT):

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2. Enable to disable firewall logging. (See Enabling or disabling the firewall on page 6-4.)
3. Configure Deny Hosts (IP) according to the rules in Advanced setting rules on page 6-4. Deny Hosts (IP) denies all traffic with the source IP address matching the specified hosts

4. Configure Deny Hostwise TCP (IP-Port) according to the rules in Advanced setting rules on page 6-4. This setting denies all traffic matching the specified TCP port numbers and the specified source IP addresses
5. Configure Deny Hostwise UDP (IP-Port) according to the rules in Advanced setting rules on page 6-4. This feature denies all traffic matching the specified UDP port numbers and the specified source IP addresses
6. Configure Allow Hostwise TCP (IP-Port) according to the rules in Advanced setting rules on page 6-4. This setting allows all traffic matching the specified TCP port numbers and the specified source IP addresses
7. Configure Allow Hostwise UDP (IP-Port) according to the rules in Advanced setting rules on page 6-4. This setting allows all traffic matching the specified UDP port numbers and the specified source IP addresses
8. Press Submit.

Advanced setting rules

Follow these rules when configuring advanced settings:

- Separate multiple entries with spaces.
- Specify a port using the dash (-), as in 192.168.3.1-23 for Telnet.
- Indicate a range of ports with a colon (:). For example, 192.168.3.1-23:50 means perform the action on ports 25 through 50
- Classful IP addresses are assumed by default. For example: 192.168.3.1 uses a class “c” mask. Specify subnets using the forward slash (/), as in 192.168.3.1/24

Enabling or disabling the firewall

1. To disable the firewall, check or uncheck the Enable Firewall box.
2. Press Submit.

7

Administrative Options

The 6400-S supports a number of additional administrative operations. Using these options you can:

- Changing the Administration Password
- Specifying User Commands
- Managing SIP, MGCP or H.323 Clients
- Restarting the Network
- Rebooting the System
- Using Network Test Tools
- Upgrading the Firmware
- Configuring a Management Interface
- Reconnecting the 6400-S
- Configuring the Trusted Management Addresses
- Setting the Provider MTU Size
- Enabling SNMP
- Setting the System Date and Time
- Creating a Static Route

Changing the Administration Password

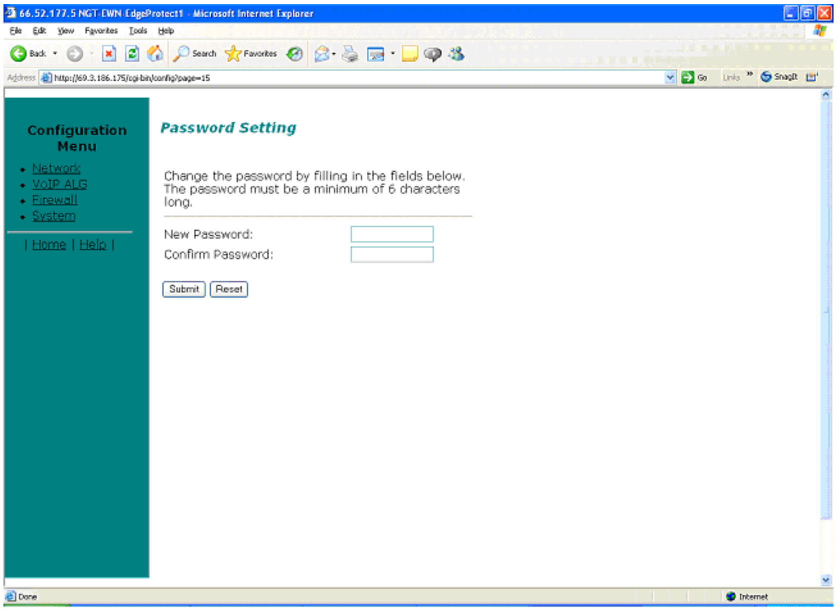
We strongly recommend that you change the default password for the root administrative account.

To change the password:

1. In the navigation bar, select System.

2. On the System page, locate Change Password, and follow this link:

   The password of the device can be changed.


66.52.177.5 NGT-EWN-EdgeProtect1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Search
Favorites
Address http://69.3.186.175/cgi-bin/config?page=15
Go
Links
SnagIt
Configuration Menu
Network
VoIP ALG
Firewall
System
| Home | Help |
Submit
Reset
Done
Internet

Password Setting

Change the password by filling in the fields below. The password must be a minimum of 6 characters long.

New Password:

Confirm Password:

3. Enter the New Password. The new password must be between 6 and 20 characters in length. Any combination of alpha and numeric characters is accepted.
4. Enter the password again in the Confirm Password to ensure that there were no mistakes in the initial entry.
5. Press Submit.

Specifying User Commands

User commands allow you to execute special operations that may be required for your installation, such as creating user specific firewall or routing rules.

Examples:

```
ifconfig eth0:20 192.168.20.10 netmask 255.255.255.0
```

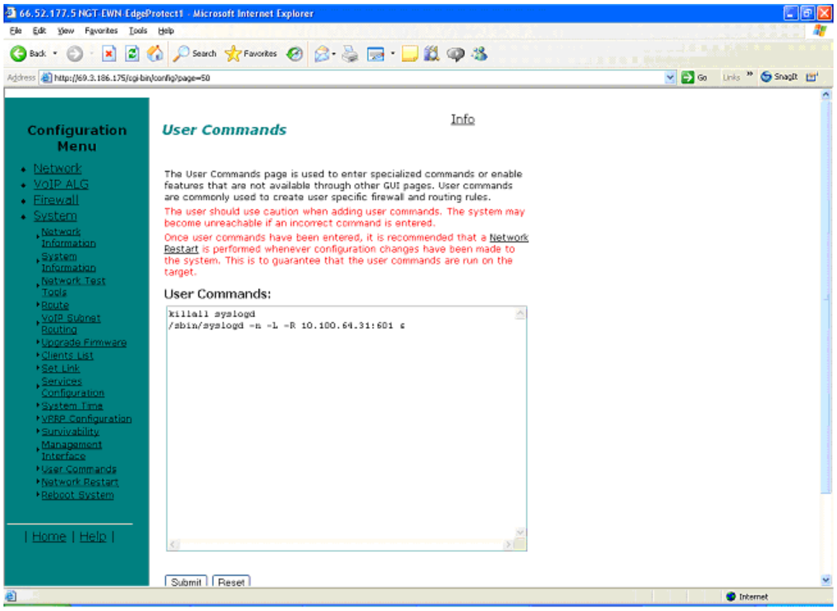
```
iptables -I POSTROUTING -t nat -s 192.168.20.10 -j ACCEPT
```

Caution

> Use caution when adding user commands. The system may become unreachable if an incorrect command is entered.

To enter a user command:

1. Choose User Commands from the System menu on the navigation bar.



User Commands

The User Commands page is used to enter specialized commands or enable features that are not available through other GUI pages. User commands are commonly used to create user specific firewall and routing rules.

The user should use caution when adding user commands. The system may become unreachable if an incorrect command is entered.

Once user commands have been entered, it is recommended that a Network Restart is performed whenever configuration changes have been made to the system. This is to guarantee that the user commands are run on the target.

User Commands:

```
killall syslogd
/sbin/syslogd -n -L -R 10.100.64.31:601 &
```

2. Enter a command in the User Commands: area.
3. Press Submit.
4. Restart the network to guarantee that the user commands are running. See Restarting the Network on page 7-6.

Managing SIP, MGCP or H.323 Clients

You can view and manage information about devices that have registered as clients with the 6400-S. This information is displayed on the Clients List page. You can filter, sort, query, add and delete records.

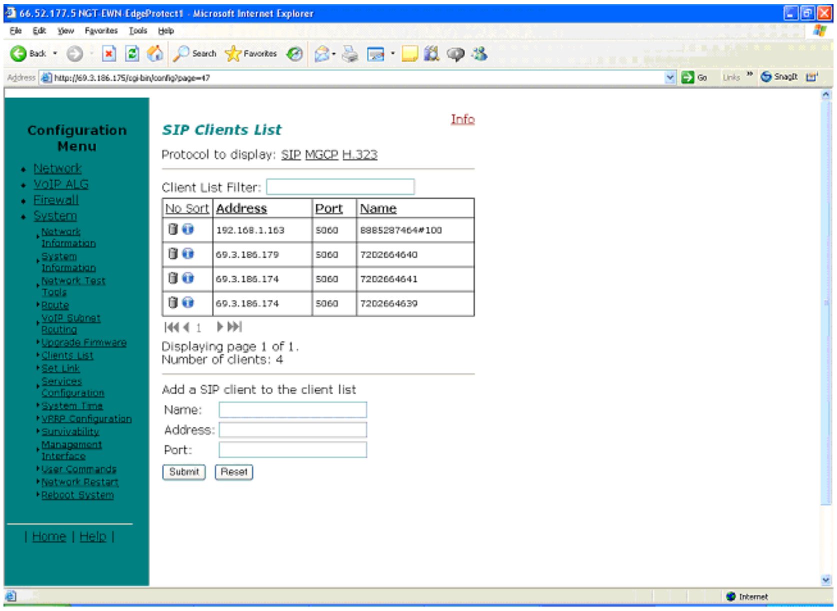
Caution

Currently, MGCP clients can be added and deleted without restarting the 6400-S but changes to SIP or H.323 clients list will automatically restart the 6400-S.

Use caution! All calls that are in progress will be interrupted.

To work with the client list:

1. Choose Clients List from the System menu on the navigation bar.



SIP Clients List

Protocol to display: SIP MGCP H.323

Client List Filter:

No Sort	Address	Port	Name
	192.168.1.163	5060	8885287464#100
	69.3.186.179	5060	7202664640
	69.3.186.174	5060	7202664641
	69.3.186.174	5060	7202664639

Displaying page 1 of 1.
Number of clients: 4

Add a SIP client to the client list

Name:
Address:
Port:

2. Select a protocol from Protocol to display. The SIP client list is the default.
3. Perform an operation according to the instructions in:
   - Filtering the clients list
   - Deleting clients
   - Querying clients
   - Adding clients

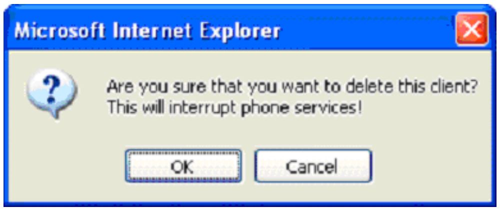
Selecting a client

You can select a single client by entering a client identifier in the Client List Filter field.

Deleting clients

1. To delete a client, click the trashcan in the No Sort column.

2. Press OK to delete the client or Cancel to end the operation.

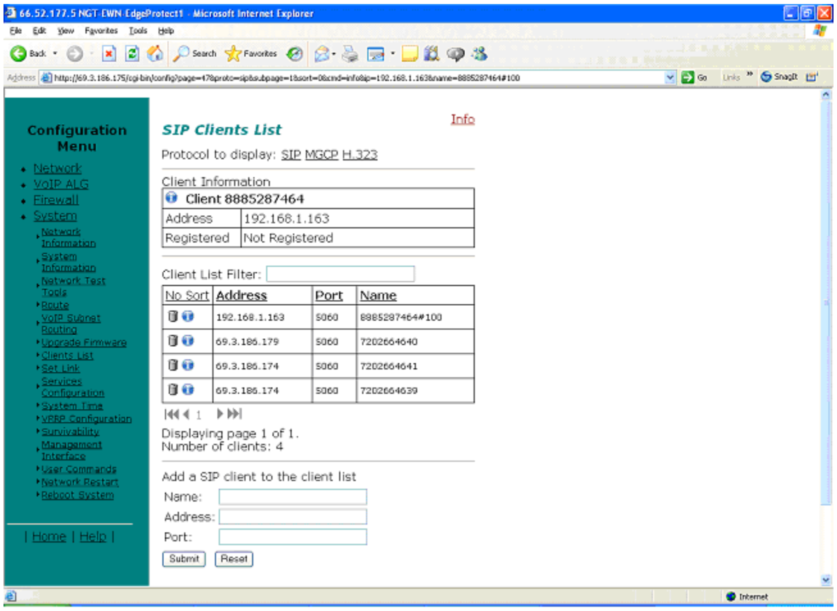


Are you sure that you want to delete this client?
This will interrupt phone services!

Querying clients

To query a client:

1. Click the Information Icon in the No Sort column.



http://69.3.186.175/cgi-bin/config?page=47&proto=sip&subpage=1&sort=0&cmd=info&ip=192.168.1.163&name=8885287464#100

SIP Clients List

Protocol to display: SIP MGCP H.323

Client Information

Client 8885287464	
Address	192.168.1.163
Registered	Not Registered

Client List Filter:

No Sort	Address	Port	Name
	192.168.1.163	5060	8885287464#100
	69.3.186.179	5060	7202664640
	69.3.186.174	5060	7202664641
	69.3.186.174	5060	7202664639

Displaying page 1 of 1.
Number of clients: 4

Add a SIP client to the client list

Name:
Address:
Port:

2. Details about the selected client display at the top of the page.

Adding clients

To add a client:

1. Enter the client Name.

2. Enter an IP Address.

3. Enter a Port.

Press Submit.

Restarting the Network

Use Network Restart to stop and the restart all the networking services that are running on the system. Technical support may request that networking services be restarted during a troubleshooting session.

Restarting network services will interrupt the system for up to a minute. All voice and data sessions currently in progress will be interrupted! Proceed with caution!

To restart the network:

1. In the navigation bar, select System.
2. In the System menu, select Network Restart.
3. In the Network Restart page, press Restart.

Rebooting the System

Rebooting the system stops all networking services and reboots the 6400-S. The operating system and networking services will be loaded from scratch. Reboot is functionally equivalent to power cycling the 6400-S. Technical support may request that the system be rebooted during a troubleshooting session.

Rebooting the system will interrupt services for a few minutes. All voice and data sessions currently in progress will be interrupted! Proceed with caution!

To reboot the system:

1. In the navigation bar, select System.
2. In the System menu, select Reboot system.
3. In the Reboot system page, press Reboot.

Using Network Test Tools

A network administrator may use the test tools on this page to verify connectivity of the 6400-S and trace the path of data throughout the network. You can run a ping test or a traceroute test.

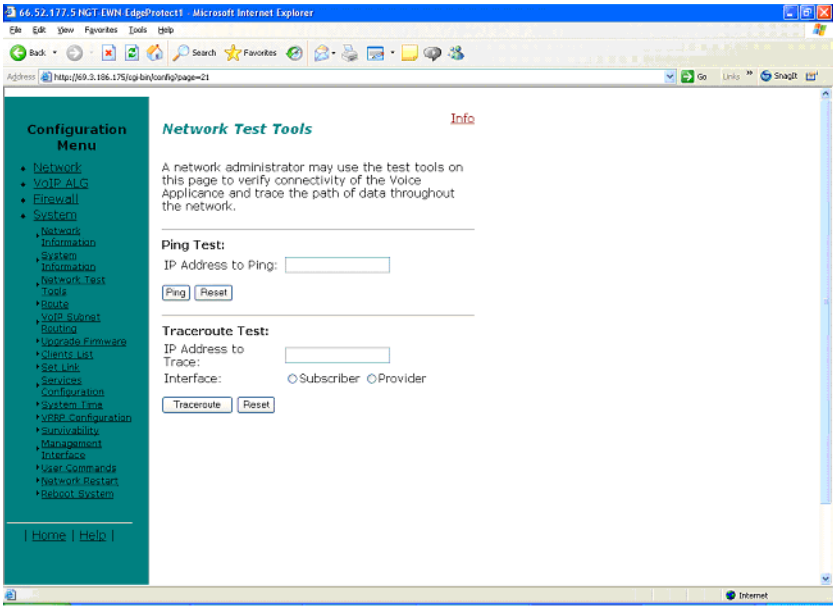
Running a ping test

The Ping Test is the most common test used to verify basic connectivity to a networking device. Successful ping test results indicate that both physical and logical path connections exist between the 6400-S and the test IP address. Successful ping tests do not guarantee that all data message are allowed between the 6400-S and the test IP address.

To run a ping test:

In the navigation bar, select System.

In the System menu, select Network Test Tools.



Network Test Tools

A network administrator may use the test tools on this page to verify connectivity of the Voice Appliance and trace the path of data throughout the network.

Ping Test:

IP Address to Ping:

Ping Reset

Traceroute Test:

IP Address to Trace:

Interface: ○Subscriber ○Provider

Traceroute Reset

1. Enter an IP Address to Ping.
2. Press Ping.

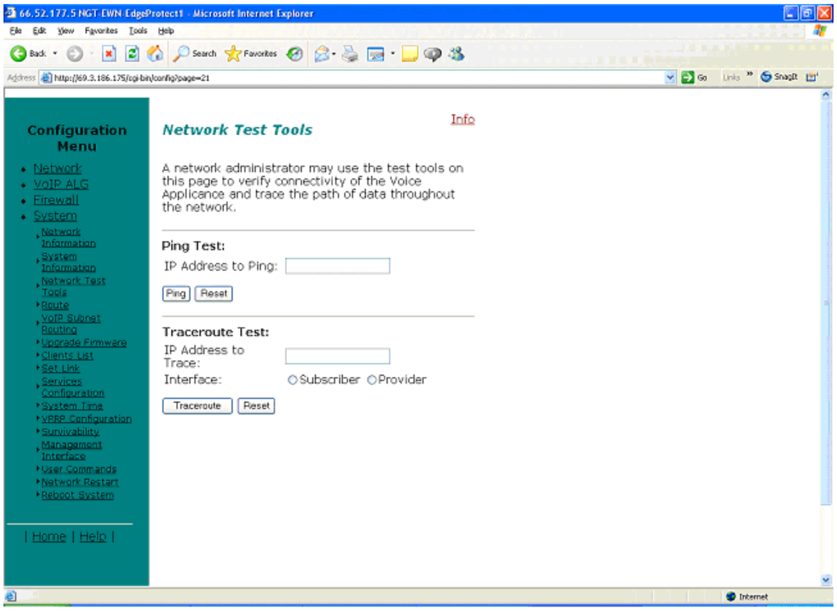
Running a traceroute test

The Traceroute Test is used to track the progress of a packet through the network. The test can be used to verify that data destined for a provider device reaches the remote IP address via the desired path. Similarly, network paths internal to a company can be traced over the subscriber network to verify the local network topology.

To run a traceroute test:

1. In the navigation bar, select System.

2. In the System menu, select Network Test Tools.



66.52.177.5 NGT-EWN-EdgeProtect1 - Microsoft Internet Explorer

Address http://69.3.186.175/cgi-bin/config?page=21

Network Test Tools

A network administrator may use the test tools on this page to verify connectivity of the Voice Applicance and trace the path of data throughout the network.

Ping Test:

IP Address to Ping:

Traceroute Test:

IP Address to Trace:

Interface: ○Subscriber ○Provider

3. Enter an IP Address to Trace

4. Select an Interface.

5. Press Traceroute.

Upgrading the Firmware

Occasionally, new releases of firmware will become available to add new features to the 6400-S. Upgrading the 6400-S is easy. Simply enter the IP address of the upgrade server and press Submit.

Note

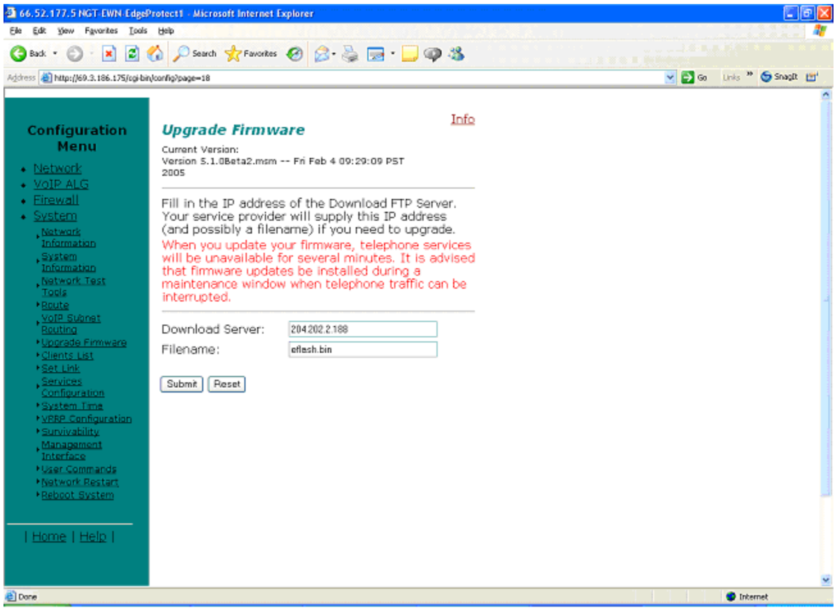
During the upgrade, telephone services are interrupted. For this reason, the upgrade should take place during a maintenance window.

Warning! During the upgrade process, the 6400-S must not be interrupted or powered off. If the upgrade is interrupted, the device may become unusable and need to be returned to the factory.

The upgrade process takes between two and five minutes, depending on how quickly the upgrade package is downloaded. Writing the software to the 6400-S takes about five minutes. Once the upgrade is started, the status of the upgrade is displayed. The progress of the upgrade process can be upgraded by pressing the refresh the upgrade status link.

To upgrade the firmware:

1. In the navigation bar, select System.
2. In the System menu, select Upgrade Firmware.



Upgrade Firmware

Current Version:
Version 5.1.0Beta2.msm -- Fri Feb 4 09:29:09 PST 2005

Fill in the IP address of the Download FTP Server. Your service provider will supply this IP address (and possibly a filename) if you need to upgrade. When you update your firmware, telephone services will be unavailable for several minutes. It is advised that firmware updates be installed during a maintenance window when telephone traffic can be interrupted.

Download Server: 204.202.2.188
Filename: eflash.bin

Submit Reset

3. Enter an Download Server IP address.
4. Enter a Filename.
5. Press Submit.

Configuring a Management Interface

You can configure a specific management interface and restrict management of the system to this interface only. When enabled, connections to management protocols such as HTTP, SSH, SNMP, Telnet will only be allowed through this interface.

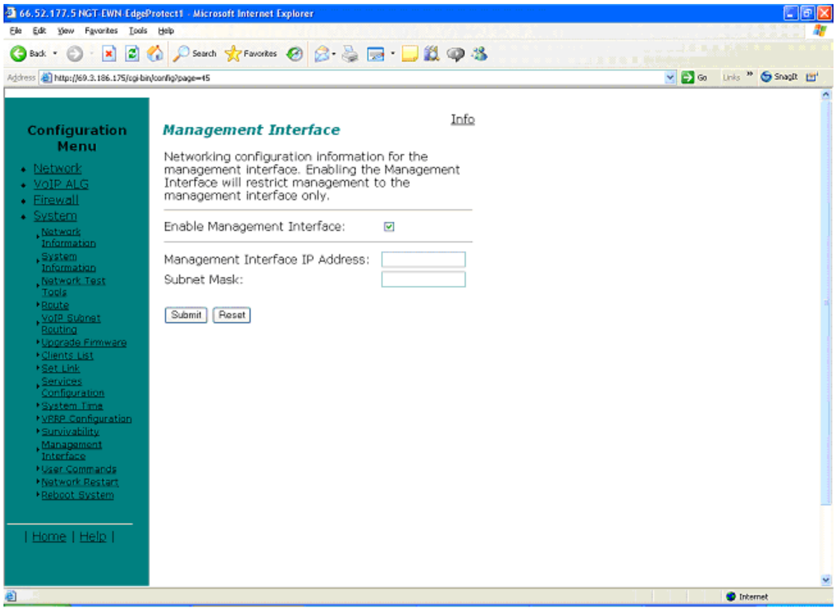
If you configure a management interface, you must also configure trusted management addresses when you configure the firewall.

Configuring the interface

To configure the Management Interface:

1. In the navigation bar, select System.

2. On the System menu, select Management Interface.



Management Interface

Networking configuration information for the management interface. Enabling the Management Interface will restrict management to the management interface only.

Enable Management Interface: ☑

Management Interface IP Address:

Subnet Mask:

3. On the Management Interface page:
4. Check the Enable Management Interface box.
5. Enter a Management Interface IP Address.
6. Enter a Subnet Mask address.
7. Press Submit.

Reconnecting the 6400-S

1. Reconnect the 6400-S to the network by moving the connection from the Provider port (Port 2) to the Optional Out of Band Ethernet Port (Port 3).

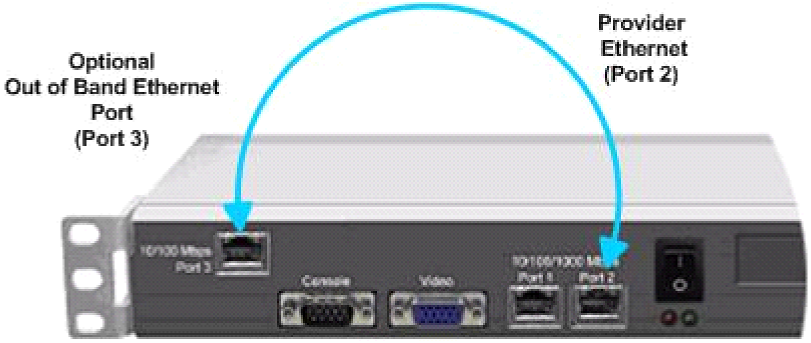


Figure 1. Move the connection from Port 2 to Port 3

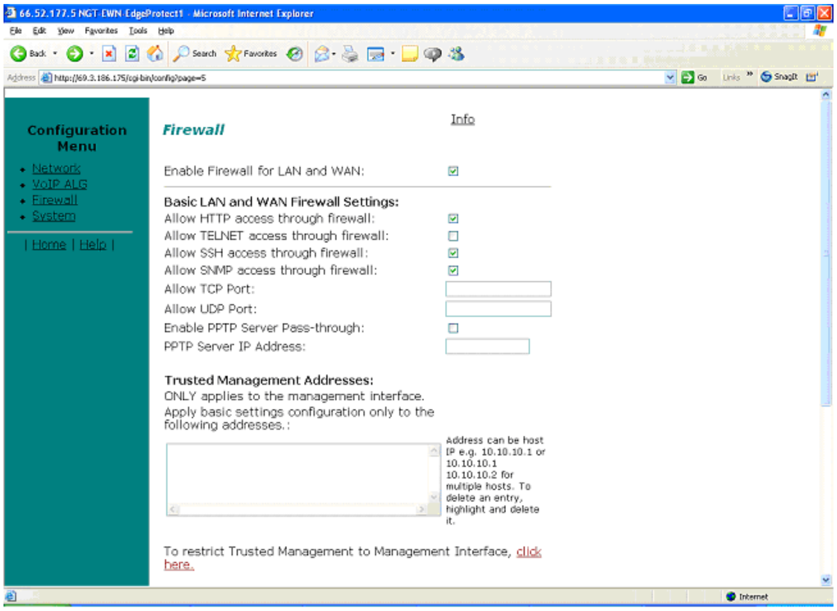
2. Restart the system.

Configuring the Trusted Management Addresses

Trusted management addresses, define a list of trusted management host addresses or network/masks. All other addresses are blocked from accessing the device.

To configure trusted management addresses:

1. In the navigation pane, select Firewall.



66.52.177.5 NGT-EWN-EdgeProtect1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://69.3.186.175/cgi-bin/config?page=5
Go Links SnagIt
Internet

Configuration Menu

- Network
- VoIP ALG
- Firewall
- System

| Home | Help |

Firewall

Info

Enable Firewall for LAN and WAN: ☑

Basic LAN and WAN Firewall Settings:

Allow HTTP access through firewall: ☑
Allow TELNET access through firewall: ☐
Allow SSH access through firewall: ☑
Allow SNMP access through firewall: ☑
Allow TCP Port:
Allow UDP Port:
Enable PPTP Server Pass-through: ☐
PPTP Server IP Address:

Trusted Management Addresses:
ONLY applies to the management interface.
Apply basic settings configuration only to the following addresses.:

Address can be host IP e.g. 10.10.10.1 or 10.10.10.1 10.10.10.2 for multiple hosts. To delete an entry, highlight and delete it.

To restrict Trusted Management to Management Interface, click here.

2. Within the Trusted Management Addresses, enter a list of trusted management host addresses or network/masks. The basic firewall rules will be applied only to those addresses. All other addresses will be blocked from accessing the device.

   If you do not include your management station, or a station to which you have access, you lose access to the 6400-S. You can only reinstate access by connecting to the serial console interface.

3. Press Submit.

Setting the Provider MTU Size

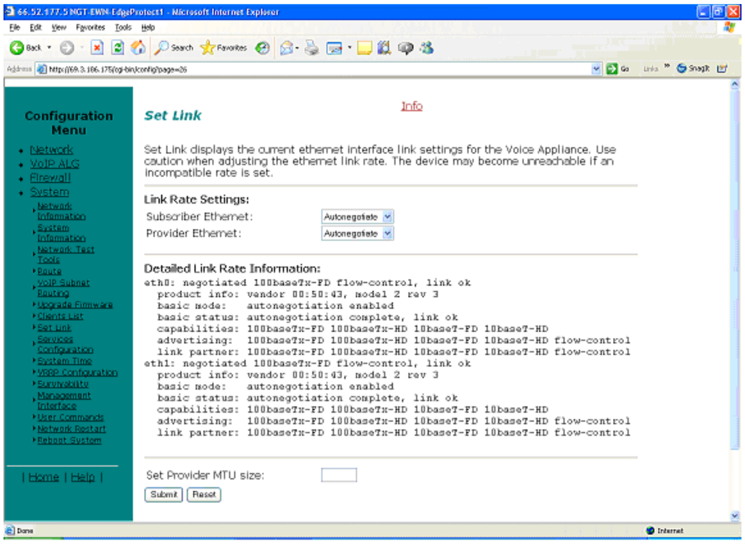
The Provider MTU size may be set to reduce the latency that is introduced when large data packets are sent over a slow link. The default setting is 1500 bytes for static IP addresses. PPPoE links negotiate the value automatically although the value can be overridden using this field. If the Upstream Bandwidth is less than 256 Kbit/s, the MTU size is automatically reduced to 576 bytes.

When the link rate is set manually, ensure that the device at the far end of the connection can communicate at the desired rate. Incompatible rates can cause a loss of communication with the 6400-S!

Caution When manually configuring the MTU size we recommend that you use a setting of 800 bytes or greater. You may experience problems with certain types of VoIP traffic if the MTU size is set below 800 bytes.

To set the Provider MTU size:

1. In the navigation bar, select System.
2. In the System menu, select Set Link.



Set Link

Set Link displays the current ethernet interface link settings for the Voice Appliance. Use caution when adjusting the ethernet link rate. The device may become unreachable if an incompatible rate is set.

Link Rate Settings:

Subscriber Ethernet: Autonegotiate

Provider Ethernet: Autonegotiate

Detailed Link Rate Information:

```
eth0: negotiated 100baseTx-FD flow-control, link ok
  product info: vendor 00:50:43, model 2 rev 3
  basic mode:   autonegotiation enabled
  basic status: autonegotiation complete, link ok
  capabilities: 100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD
  advertising:  100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD flow-control
  link partner: 100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD flow-control
eth1: negotiated 100baseTx-FD flow-control, link ok
  product info: vendor 00:50:43, model 2 rev 3
  basic mode:   autonegotiation enabled
  basic status: autonegotiation complete, link ok
  capabilities: 100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD
  advertising:  100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD flow-control
  link partner: 100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD flow-control
```

Set Provider MTU size:

Submit Reset

3. Enter the Provider MTU size.
4. Press Submit.

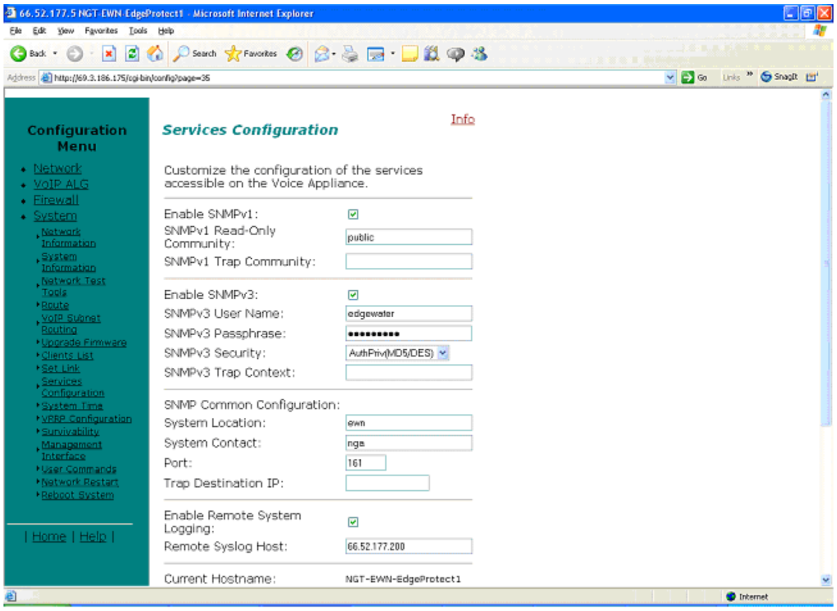
Enabling SNMP

The 6400-S can be managed remotely by an SNMP network management system such as HP Openview. The 6400-S supports SNMPv1 and MIB-II (RFC1213). All MIB-II variables are read only. The MIB variables sysContact and sysLocation are set by the web GUI.

To enable SNMP:

1. In the Navigation bar, select System.

2. In the System menu, select Services Configuration.



Services Configuration

Customize the configuration of the services accessible on the Voice Appliance.

Enable SNMPv1: ☑

SNMPv1 Read-Only Community: public

SNMPv1 Trap Community:

Enable SNMPv3: ☑

SNMPv3 User Name: edgewater

SNMPv3 Passphrase: ••••••••••

SNMPv3 Security: AuthPriv(MD5/DES)

SNMPv3 Trap Context:

SNMP Common Configuration:

System Location: ewn

System Contact: nga

Port: 161

Trap Destination IP:

Enable Remote System Logging: ☑

Remote Syslog Host: 66.52.177.200

Current Hostname: NGT-EWN-EdgeProtect1

3. Enter information as described in the following table.

Field	Description
SNMPv1 Read-Only Community	The community string that the management station uses when accessing read-only objects from the 6400-S. The default is 'public'.
SNMPv1 Trap Community	Trap community string place in trap pdus.
SNMPv3 User Name	If SNMPv3 is enabled, this field defines the SNMPv3 user name for SNMPv3 USM based authentication and VACm access control.
SNMPv3 Passphrase	The SNMPv3 passphrase is optionally used to authenticate the user as well as encrypt the payload based on the SNMPv3 Security setting below. The minimum length of a valid passphrase is 8.

Field	Description
SNMPv3 Security	The SNMPv3 security level for user authentication and encryption of both synchronous requests as well as asynchronous traps. “None” means neither SNMPv3 authentication or encryption are used. “Auth(MD5)” means authenticating user using MD5 hash algorithm. “AuthPriv(MD5/DES)” means authentication as well as encryption using the DES encryption algorithm. The default value is None.
SNMPv3 Trap Context	The SNMPv3 trap context defaults to nothing but can be set to any string.
System Location	A comment string that can be used to indicate the location of the 6400-S. By default, no value is set.
System Contact	The administrative contact information for the 6400-S. By default, no value is set.
SNMP Port	The port that the 6400-S monitors to read and send SNMP data. The default is 161.

4. Press Submit.

Disabling SNMP

To disable SNMP, select Services Configuration from the System menu and uncheck the SNMP checkboxes.

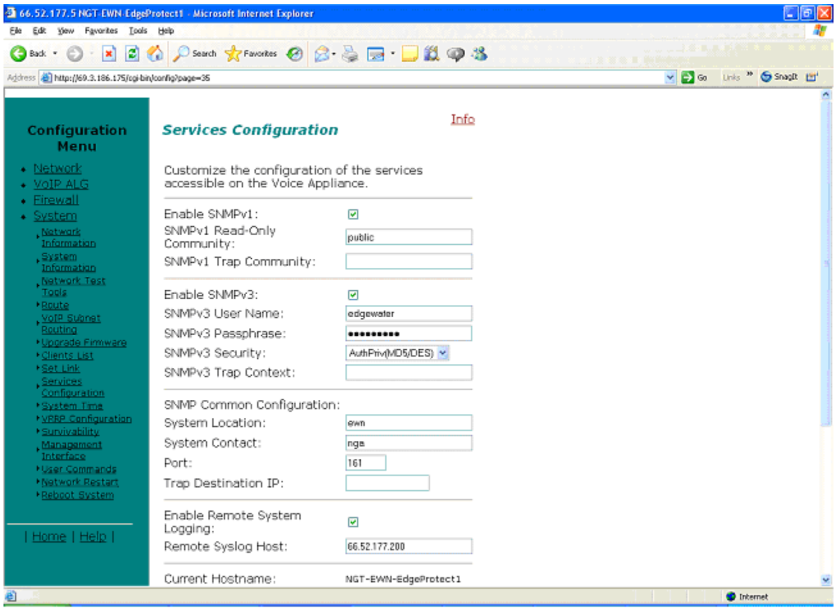
Enabling remote system logging

The 6400-S can be configured to log system messages to an external syslog server.

To enable remote system logging:

1. In the Navigation bar, select System.

2. In the System menu, select Services Configuration.



Services Configuration

Customize the configuration of the services accessible on the Voice Appliance.

Enable SNMPv1: ☑
SNMPv1 Read-Only Community: public
SNMPv1 Trap Community:

Enable SNMPv3: ☑
SNMPv3 User Name: edgewater
SNMPv3 Passphrase: ••••••••••
SNMPv3 Security: AuthPriv(MD5/DES)
SNMPv3 Trap Context:

SNMP Common Configuration:
System Location: ewn
System Contact: nga
Port: 161
Trap Destination IP:

Enable Remote System Logging: ☑
Remote Syslog Host: 66.52.177.200

Current Hostname: NGT-EWN-EdgeProtect1

3. Scroll to Enable Remote System Logging, and check the box.
4. Enter information as described in the following table:

Field	Description
Remote Syslog Host:	The address of the system running a system log server. By default, the system sends to port 514. The system log port can be set by adding a colon and the port number to the end of the address: e.g. ADDRESS[:PORT]
Local Hostname:	Set the hostname for this system. By default, the hostname is the system type.
Enable MOS Scoring:	Enable MOS scoring for media that is passing through the 6400-S. Disabling MOS scoring will improve system performance. By default, MOS scoring is Enabled.
MOS Threshold:	Set the minimum allowable MOS for the system. MOS values below this value will cause system messages to be sent to the system log. By default, the value is 2.5

5. Press Submit.

Disabling remote system logging

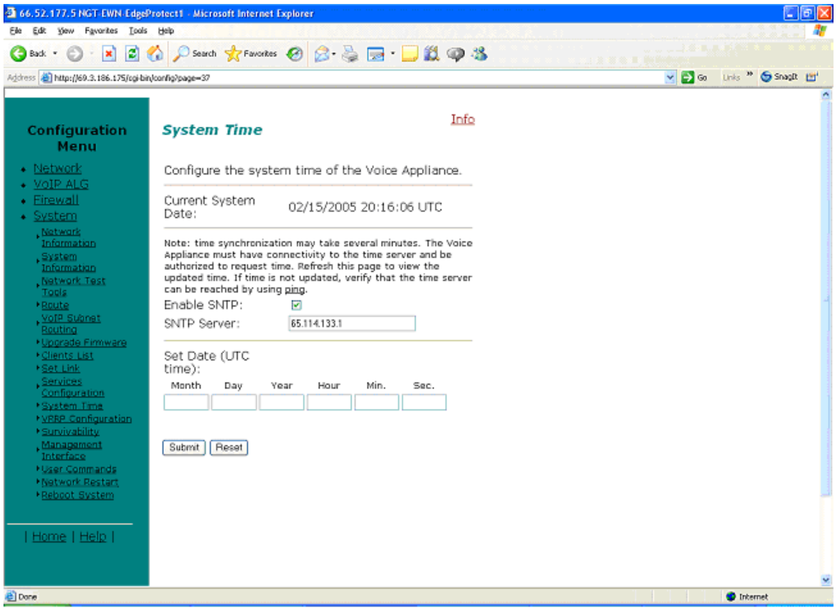
To disable remote system logging, select Services Configuration from the System menu and uncheck Enable Remote System Logging.

Setting the System Date and Time

The System Time page allows the user to set the 6400-S's time or configure it to synchronize with a network time source via Simple Network Time Protocol (SNTP).

To set the system date and time:

1. In the navigation bar, select System.
2. In the System menu, select System Time.



System Time

Configure the system time of the Voice Appliance.

Current System Date: 02/15/2005 20:16:06 UTC

Note: time synchronization may take several minutes. The Voice Appliance must have connectivity to the time server and be authorized to request time. Refresh this page to view the updated time. If time is not updated, verify that the time server can be reached by using ping.

Enable SNTP: ☑

SNTP Server: 65.114.133.1

Set Date (UTC time):

Month	Day	Year	Hour	Min.	Sec.

3. Enable SNTP by checking the box.
4. To synchronize with a SNTP server on the network, enable SNTP and set the address of the SNTP server. The server address can be either an IP address or the DNS name of the SNTP server.
5. To set the date and time, enter information as follows. The date on the device can be set manual using this option. The values are entered in numeric form.

Field	Description
Month	Enter a value from 1 to 12.
Day	Enter a value from 1 to 31.
Year	Enter the current year.
Hour	Enter a value from 0 (Midnight) to 23 (11 pm).
Minute	Enter a value from 0 to 59.
Second	Enter a value from 0 to 59.

6. Press Submit.

Creating a Static Route

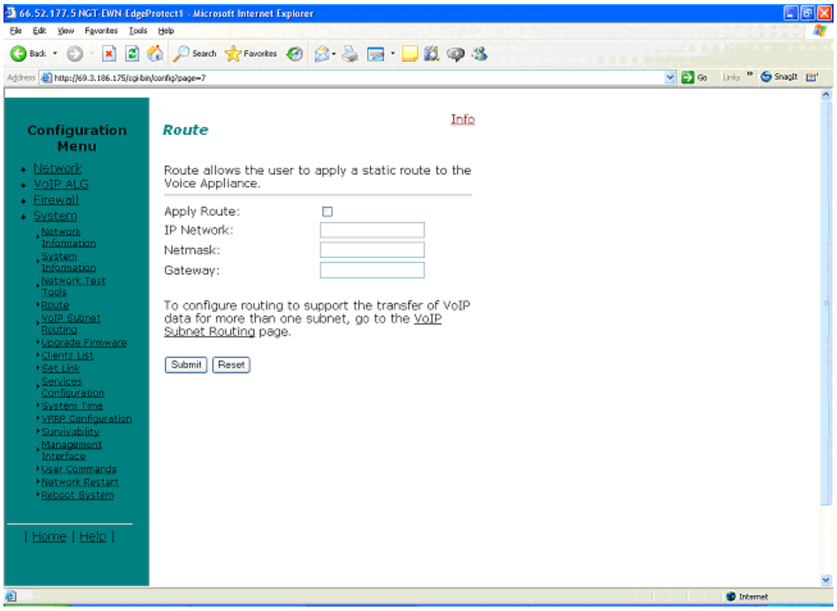
Static routes may be needed to support network applications, such as a web server, that are allowed through the firewall and directed to a specific IP address or subnet.

Use care when configuring static routes! Static routes may prevent the other networking features in the 6400-S from functioning properly.

To configure a static route:

1. In the navigation bar, select System.

2. In the System menu, select Route.



Route

Route allows the user to apply a static route to the Voice Appliance.

Apply Route: □

IP Network:

Netmask:

Gateway:

To configure routing to support the transfer of VoIP data for more than one subnet, go to the VoIP Subnet Routing page.

3. Check the Apply Route box.
4. Enter an IP Network address.
5. Enter a Netmask address.
6. Enter a Gateway address.
7. Press Submit

To delete a static route, uncheck the Apply Route box.

Appendix

Troubleshooting Tips

This section assists you with problems you may encounter while installing the 6400-S.

Trouble accessing the Internet

We recommend connecting a PC either directly or through a switch to the Port 1 of the 6400-S. The default IP address of the 6400-S is 192.168.1.1 so please be sure that the IP address of the PC is on the same network (eg. 192.168.1.2). Once you have connected please verify that the IP configuration information in the Network page is correct. Some other items to try:

- Ping the Port 2 interface of the 6400-S from the attached PC
- Ping the DNS server for your network. Sometimes connectivity problems occur when the domain name being used cannot be mapped to the proper IP address.
- Ping a well known address on the Internet.
- Ping the IP address of the softswitch.

No dial tone

If don't hear a dial tone when off hook:

- Check the configurations on the VoIP ALG page.
- Make sure the ALG registration code is configured.

Checking the ALG registration code

To check the ALG registration code:

1. From the navigation bar, select System.
2. From Registration Status, click License Key.
3. If you do not see a license key, contact Polycom Technical Services.

Telephone doesn't register with the softswitch

If one or more telephones are not registering with the softswitch:

- Check the configurations on the VoIP ALG page.
- Attempt to ping the softswitch.

Checking the configurations on the ALG page

To check configurations on the ALG page:

1. From the navigation bar, select VoIP ALG.
2. …and then what? What would they be looking for and what needs to be corrected?

Pinging the softswitch

To ping the softswitch:

1. From the navigation bar, select System.
2. From the System submenu, select Network Test Tools.
3. In IP Address to Ping, enter the softswitch address.
4. Click Ping.

Regulatory Notices

Important Safeguards
Read and understand the following instructions before using the system: • Close supervision is necessary when the system is used by or near children. Do not leave unattended while in use. • Only use electrical extension cords with a current rating at least equal to that of the system. • Always disconnect the system from power before cleaning and servicing and when not in use. • Do not spray liquids directly onto the system when cleaning. Always apply the liquid first to a static free cloth. • Do not immerse the system in any liquid or place any liquids on it. • Do not disassemble this system. To reduce the risk of shock and to maintain the warranty on the system, a qualified technician must perform service or repair work. • Connect this appliance to a grounded outlet. • Only connect the system to surge protected power outlets. • Keep ventilation openings free of any obstructions. SAVE THESE INSTRUCTIONS.

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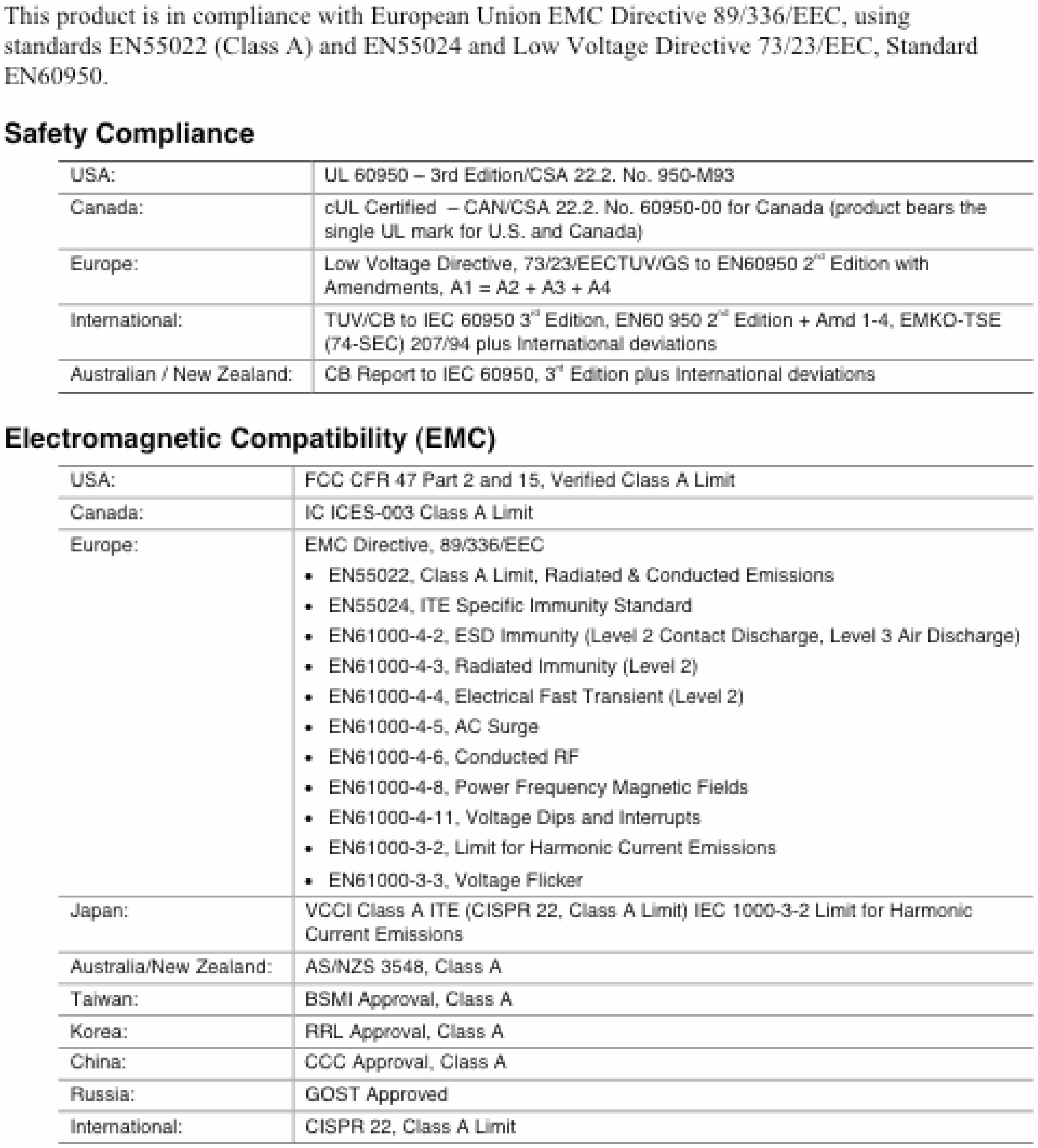


This product is in compliance with European Union EMC Directive 89/336/EEC, using standards EN55022 (Class A) and EN55024 and Low Voltage Directive 73/23/EEC, Standard EN60950.

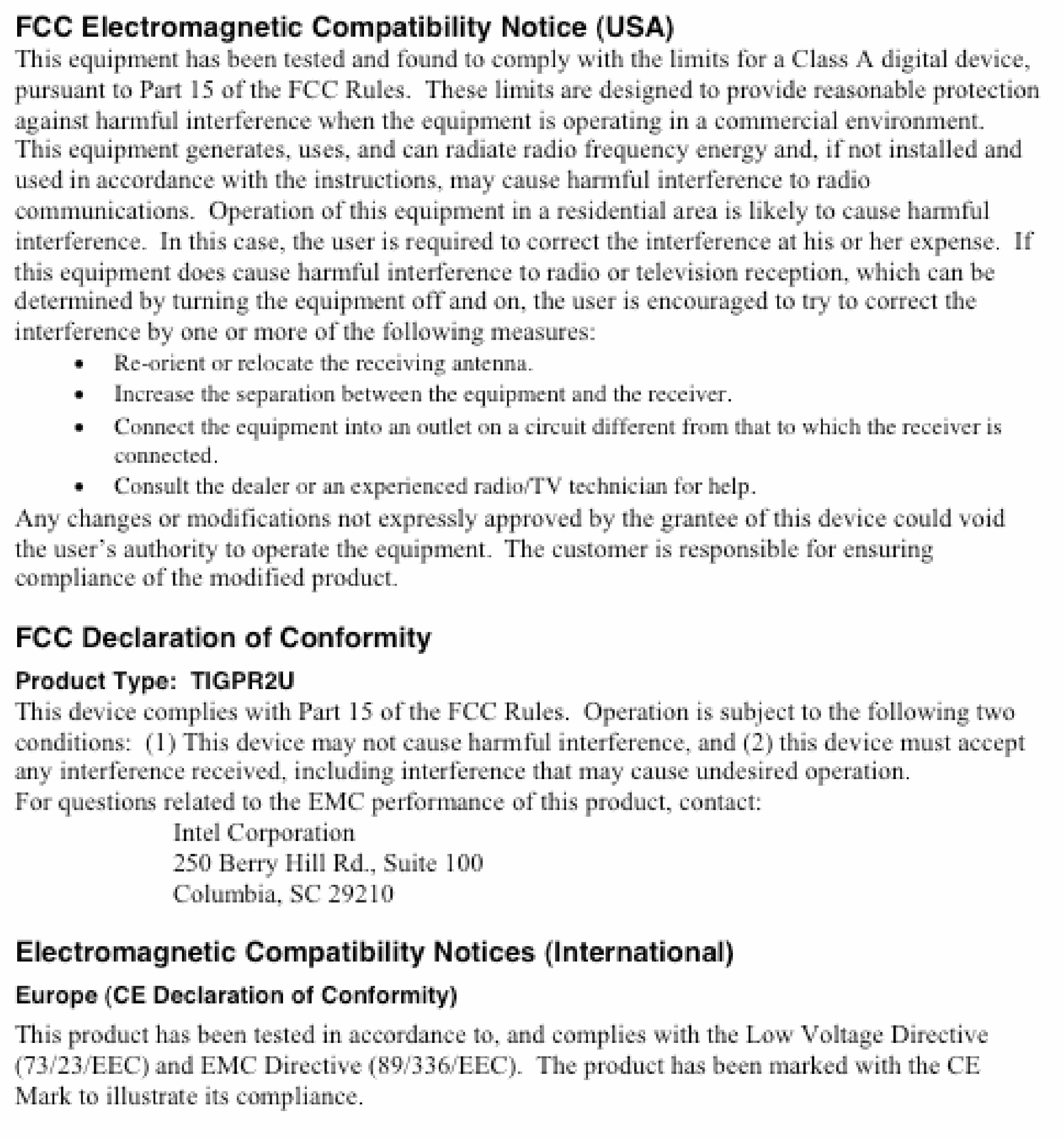
Safety Compliance

USA:	UL 60950 – 3rd Edition/CSA 22.2. No. 950-M93
Canada:	cUL Certified – CAN/CSA 22.2. No. 60950-00 for Canada (product bears the single UL mark for U.S. and Canada)
Europe:	Low Voltage Directive, 73/23/EECTUV/GS to EN60950 2nd Edition with Amendments, A1 = A2 + A3 + A4
International:	TUV/CB to IEC 60950 3rd Edition, EN60 950 2nd Edition + Amd 1-4, EMKO-TSE (74-SEC) 207/94 plus International deviations
Australian / New Zealand:	CB Report to IEC 60950, 3rd Edition plus International deviations

Electromagnetic Compatibility (EMC)

USA:	FCC CFR 47 Part 2 and 15, Verified Class A Limit
Canada:	IC ICES-003 Class A Limit
Europe:	EMC Directive, 89/336/EEC • EN55022, Class A Limit, Radiated & Conducted Emissions • EN55024, ITE Specific Immunity Standard • EN61000-4-2, ESD Immunity (Level 2 Contact Discharge, Level 3 Air Discharge) • EN61000-4-3, Radiated Immunity (Level 2) • EN61000-4-4, Electrical Fast Transient (Level 2) • EN61000-4-5, AC Surge • EN61000-4-6, Conducted RF • EN61000-4-8, Power Frequency Magnetic Fields • EN61000-4-11, Voltage Dips and Interrupts • EN61000-3-2, Limit for Harmonic Current Emissions • EN61000-3-3, Voltage Flicker
Japan:	VCCI Class A ITE (CISPR 22, Class A Limit) IEC 1000-3-2 Limit for Harmonic Current Emissions
Australia/New Zealand:	AS/NZS 3548, Class A
Taiwan:	BSMI Approval, Class A
Korea:	RRL Approval, Class A
China:	CCC Approval, Class A
Russia:	GOST Approved
International:	CISPR 22, Class A Limit

[1] Intel® Telco/Industrial Grade Server TIGPR2U Product Guide



FCC Electromagnetic Compatibility Notice (USA)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operating in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. In this case, the user is required to correct the interference at his or her expense. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

FCC Declaration of Conformity

Product Type: TIGPR2U

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

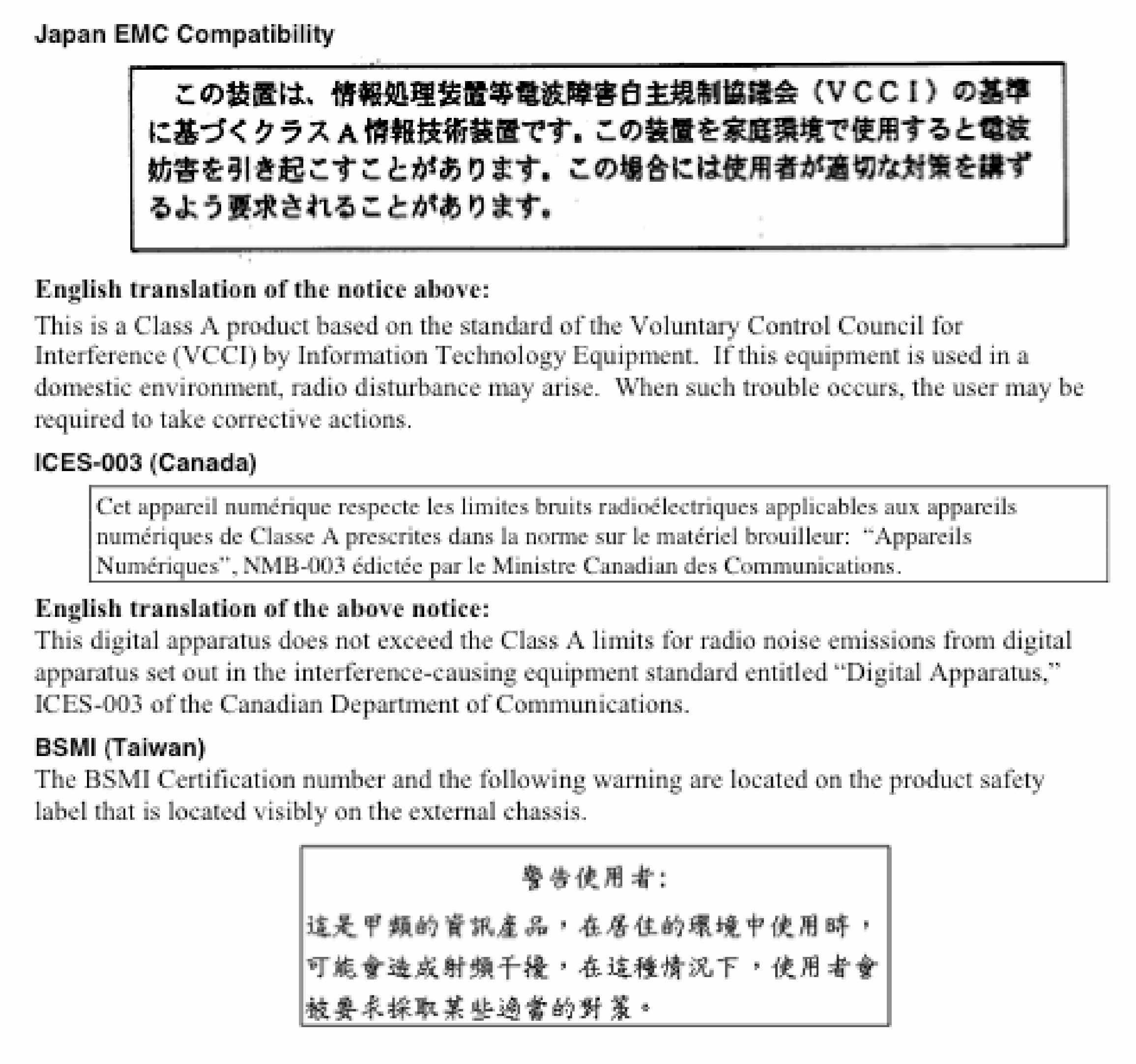
For questions related to the EMC performance of this product, contact:

Intel Corporation
250 Berry Hill Rd., Suite 100
Columbia, SC 29210

Electromagnetic Compatibility Notices (International)

Europe (CE Declaration of Conformity)

This product has been tested in accordance to, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.



Japan EMC Compatibility

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English translation of the notice above:

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) by Information Technology Equipment. If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

ICES-003 (Canada)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadian des Communications.

English translation of the above notice:

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Canadian Department of Communications.

BSMI (Taiwan)

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