

4500 Series Converged Networking Router

Quick Start Guide



This guide helps you to install and connect to the 4500 Series Converged Networking Router. You may then use the online help files to configure the 4500 to meet the specific needs of your environment.

This guide also provides an example of a typical 4500 Series deployment that can be used as a guideline for your installation.

Before you begin you must have:

- A computer with a web browser (Microsoft Internet Explorer or Netscape Navigator)
- At least 1 ethernet cable
- The following information supplied by your VoIP service provider
 - IP address of the WAN interface
 - T1 frame format
 - Layer 2 protocol (PPP, Frame Relay/DLCIs or HDLC)
 - IP address of the Softswitch

Step 1 – connect all of the cables

- Connect an ethernet cable between LAN port 4 on the 4500 and your computer's ethernet port.
- Connect a cable between the T1/E1 WAN port on the 4500 and the T1 demarcation unit provided by your service provider. Alternatively, connect an ethernet cable between the WAN ethernet port on the 4500 and a WAN router or broadband modem.

CAUTION: To reduce the risk of fire, use only 26 AWG or larger wire (e.g. 24, 22, 20, etc.) to connect the T1 port on your unit to an RJ-45 jack.

- Plug one end of the power adapter into an AC outlet and the other end into the power receptacle on the 4500.

Step 2 – connect to your 4500

The 4500 is shipped with a pre-configured IP address on its LAN port of 192.168.1.1.

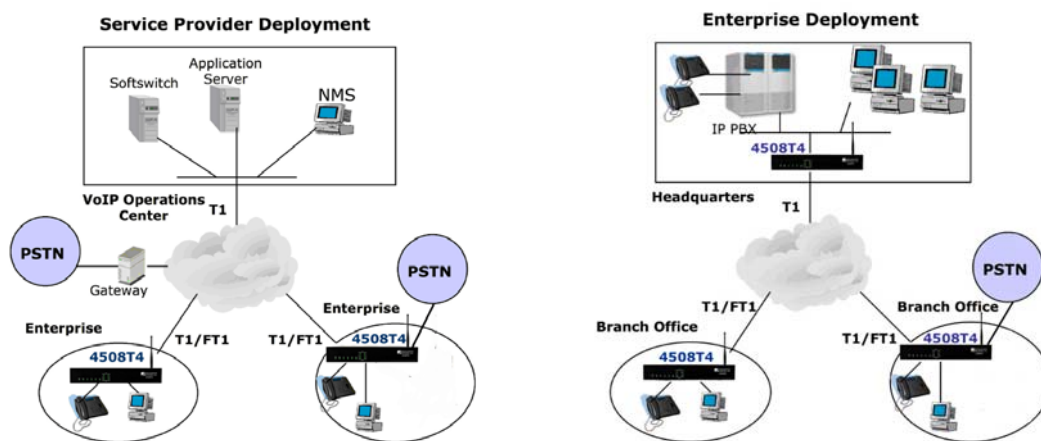
To connect to the 4500, do the following:

- Configure your PC's ethernet adapter to use an IP address of 192.168.1.2 and a subnet mask of 255.255.255.0. (If using a LAN switch then the switch must support 100Mbps full duplex).
- Launch a web browser on the PC and enter the URL 192.168.1.1.
- Press Return. The initial 4500 main configuration menu appears.
- Login by typing "root" for username and "default" for password
- Select the Network link and configure the LAN and WAN ports and the rest of the device using the information in step 3 as a guideline.

Step 3 – plan your configuration

Suggested Deployment

A typical 4500 installation uses the integrated CSU/DSU in the 4500 to terminate a T1 WAN connection. The LAN ports of the 4500 are then used for connection to PCs, servers, IP phones or other layer 2 ethernet switches. The diagrams below show typical deployments for both service provider and enterprise applications.



In these examples a single public IP address on the WAN is used to proxy for all of the IP phones and to route to multiple PC's installed on the LAN.

The 4500 provides the following services:

- WAN/LAN IP routing
- NAT/PAT translation for IP phones and PC's. This allows a single public IP address to be used on the WAN link to represent all of the private IP addresses assigned to the LAN IP phones and PC's.
- A "VoIP" aware firewall. A full layer 7 gateway for voice traffic *and* a stateful packet inspection firewall for data traffic.
- Traffic shaping and priority queuing to guarantee the quality of VoIP traffic. These mechanisms protect voice and data traffic from contending for the same network resources to guarantee low latency and the highest call quality possible for VoIP traffic. At the same time they ensure the best utilization of WAN bandwidth by enabling data traffic to burst up to full line rate in the absence of voice calls. Precedence is given to traffic for the range of addresses reserved for the IP phones.
- Call Admission Control (CAC). CAC uses a deterministic algorithm to decide when there are insufficient network resources available to adequately support new calls and then return the equivalent of a "fast busy" to new call requests.

- DHCP server and FTP/TFTP relay. These features are used to simplify and expedite the IP configuration of phones and PC's. This also includes VoIP signaling gateway information (MGCP).
- Passive call quality monitoring and test tools.
- VoIP survivability is an orderable software option that provides local call switching for SIP clients during a WAN link failure or lost of connectivity to a centralized softswitch or IP PBX. This functionality also includes the ability to make inbound and outbound calls to a local ethernet connected PSTN gateway (SIP).

4500 configuration:

- Firewall enabled
- VoIP ALG enabled
- NAT enabled
- Routing enabled
- Traffic shaping enabled
- DHCP server enabled
- VoIP survivability
- Analog Voice Ports (FXS/FXO)

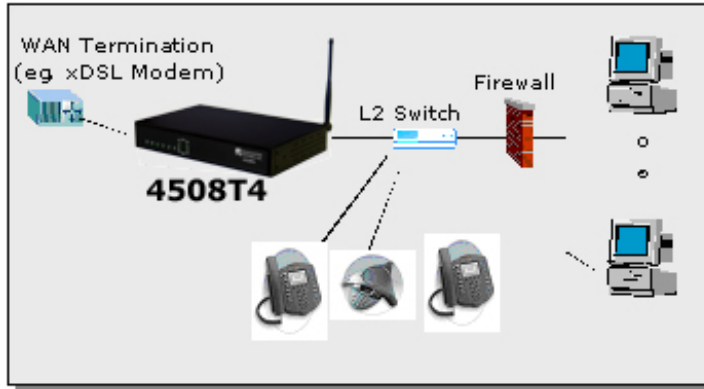
Benefits

- Security of private IP addresses and voice aware firewall
- Traffic shaping prioritizing voice over data traffic.
- Recover bandwidth for data when not used for voice
- Simplified management and administration
- Simplified adds, moves and changes
- Scalability – the single public IP address can continue to be used for new subscribers to the service.
- Increased availability of voice services through VoIP survivability.

Installing The 4500 With Existing Infrastructure

In enterprise networks with existing routers and firewalls, the 4500 can be configured as a VoIP application layer gateway only, which maintains the functions and services of the existing network appliances. It allows all of the existing network devices to continue to handle data traffic, while the 4500 handles voice and video traffic as well as provide VoIP survivability.

In the deployment below, the 4500 is connected to a WAN router or broadband modem using its ethernet WAN port. The enterprise ethernet network is then connected to a LAN port on the 4500. In this example a single public IP address is used to proxy for all of the IP phones and the 4500 routes data traffic to the public side of the firewall.



Although not recommended the 4500 and IP phones can be installed behind an existing enterprise firewall. In this instance the firewall will have to be configured to allow access to and from the 4500 public IP address for the following ports:

Port Type	Firewall Ports to Open
UDP	161 (SNMP) and 162 (SNMPTRAP)
RTP	1056 to 1255
TCP	SSH TCP 22 for remote management & TCP 80 for WAN configuration-downloads
Telnet	23
FTP	TCP 21 for stateful TCP-session control from 4500 to Edgewater FTP server
MGCP	2427, 2429, 2432, and 2727
NTP	123
SIP	5060 and 5075

IP phones normally point to a local NTP server for their time reference. The NTP port 123 needs to be opened if your network does not have an NTP server.

Please Note: Traffic shaping for this configuration is only available if the enterprise data devices are also installed behind the 4500.

4500 Web Based GUI Configurations

The web page configurations for the various 4500 deployments are shown below. The two darker-shaded rows indicate the *minimum* configuration required for each deployment.

4500 GUI Configuration Page	Suggested Deployment	4500 with existing infrastructure	4500, behind an existing firewall
Network	Yes	Yes	Yes
VoIP/ALG	Yes	Yes	Yes

4500 GUI Configuration Page	Suggested Deployment	4500 with existing infrastructure	4500, behind an existing firewall
NAT	Yes	Optional	Yes
Firewall	Yes	Optional, but recommended	Optional, but recommended
DHCP	Yes	Yes (but should be disabled if DHCP server already exists)	Yes (but should be disabled if DHCP server already exists)
Traffic Shaper	Yes	Yes	Optional (depends on network topology)
Traffic Simulator	Only for testing	Only for testing	Only for testing
System	As needed	As needed	As needed

Please visit our website at www.edgewaternetworks.com or contact the Edgewater Technical Assistance Center at 408.351.7255 for additional information or assistance.

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