

Support for Internet Ethernet access within JNOS

Design objective

Enables a PC running JNOS to serve as a outbound gateway, receiving email traffic (locally generated emails, or SMTP email from other PCs running IP over AX.25 on amateur radio frequencies) and send SMTP emails to other email servers on the Internet. This assumes that the PC is a residential PC with connectivity to the Internet via a cable modem or DSL (Digital Subscriber Line) broadband connection.

This design requires the PC to be running in native MS-DOS mode. MS-DOS V3.0 and above, Windows 95, 98 and ME support that. It cannot run in the DOS compatibility box mode of Windows 2000, XP, etc.

Assumptions about the PC

- Use the same Ethernet adapter as your regular PC RJ45 8-pin modular jack.
- Assumes the Ethernet adapter is compatible with DOS packet drivers. This example assumes the Intel PRO/100 Ethernet adapter.
- For this example, it assumes you have an ISP broadband connection.
- For this example, it assumes you've been assigned AMPR.ORG IP address **44.100.200.250**, assigned to a 1200 baud AX.25 VHF radio network.
- For this example, it assumes you have a neighboring gateway station (one port facing the Internet with an IP address of 44.99.1.2, and one port facing a 1200 baud AX.25 VHF network with AMPR.ORG IP address 44.100.200.1), and other 44.100.200.x AMPR.ORG stations are reachable via the 1200 baud AX.25 VHF network.

Assumptions about Internet Access

- A broadband ISP connection via cable modem or DSL
- Internet Service Provider implements DHCP for assigning IP addresses to the subscriber.
- You (the ISP subscriber) use a wired firewall or wireless access point which translates DHCP IP address on the ISP side to a fixed internal LAN network of 192.168.1.XXX. Assumes you use a Linksys router. (Note that a 192.168.1.XXX address implies a Linksys device. Other equipment vendors use a 192.168.y.xxx subnet addressing scheme, where y is from 2 to 254. Adjust the IP assignment in the examples accordingly.)

- Select a static IP address for the Ethernet port on your PC in the 192.168.1 subnet, other than 192.168.100 to 192.168.1.150. These are the dynamic IP addresses that the Linksys router will hand out to PCs. The IP address used in this example, facing the Internet, is **192.168.1.253**.
- Your wireless access point/router has a gateway port **192.168.1.1**, where IP traffic is gatewayed from your local home PC LAN through that IP address to get to the Internet. This is used when specifying JNOS Ethernet port eth0 (in these examples) to gateway traffic to through to the Internet.
- The ISP provides a dynamically assigned DNS (Domain Name Service) IP address.
- IP Ports needed are:
 - UDP 53 Domain Name Service
 - TCP 25 SMTP (Simple Mail Transfer Protocol)
 - TCP 3600 Convers (if convers link is used)
 - TCP 3601 Convers (if convers xlink is used)
 - TCP 20 Optional FTP data
 - TCP 21 Optional FTP command
 - TCP 23 Optional Telnet

Primers on Packet Drivers for MS-DOS

<http://www.dendarii.co.uk/FAQs/dos-net.html>

<http://fd-doc.sourceforge.net/wiki/index.php?n=FdDocEn.DOSNetworking>

<http://lazybrowndog.net/freedos>

http://www.crynwr.com/packet_driver.html

<http://www.crynwr.com/drivers/>

Interface Design

- If needed, download and configure packet drivers into the PC configuration.

Software Downloads

<http://www.crynwr.com> Select the Intel100Mbps packet driver downloads, and save file e100b11b.zip. Save the file, unzip it, and extract the packet driver <>.

C:\CONFIG.SYS

- Dos=umb,high
-

C:\AUTOEXEC.BAT

-

JNOS AUTOEXEC.NOS

AUTOEXEC.NOS File Entry	Comment
# INTERFACE DESCRIPTIONS #===== ifconfig eth0 description "Ethernet to the Internet"	Comments in the AUTOEXEC.NOS file start with the pound sign (#). The descriptions show with the port names when someone issues a P command

AUTOEXEC.NOS File Entry	Comment
attach packet 0x60 eth0 4096 1500 192.168.1.253 192.168.1.1	<p>Define the Ethernet port eth0. It assumes the packet driver is loaded as a TSR (Terminate and Stay Resident) driver, with the hardware IRQ, I/O address and software IRQ (0x60) supplied in config.sys or autoexec.bat.</p> <p>The software interrupt for the Ethernet driver is 0x60 (a common software interrupt number). The maxqueue size is 4096. The MTU (Message Transfer Unit) size is 1500 characters. The IP address of the port in this example, facing the Internet, is 192.168.1.253. This IP address is a made-up address in the same subnet as your wireless access point unit. It should be unique within the subnet for your wireless access point. The specified IP address 192.168.1.1 is by this interface to gateway to the Internet.</p>
convers interface eth0 on	Sets up a conference call interface on eth0.
convers host yourname	Sets up "yourname" as the hostname for this conference system

AUTOEXEC.NOS File Entry	Comment
convers mycall yourcallsign	Sets up “yourcallsign” as an AX.25 callsign that will immediately connect incoming connections to the conference system.
convers t4 1800	Sets the idle conference timeout timer at 1800 seconds (30 minutes).
convers maxwait 1200	Specifies 1200 seconds as the upper limit for the time this JNOS system will wait to reestablish a disconnected convers link that originated at this system.
convers setinfo yes	
convers link 206.97.195.20	Specifies the IP address (ex: 206.97.195.20) to link with and form a conference system.
route add 44.48.30.100/32 eth0	Example: Specifies the route to IP address 44.48.30.100 is through the Ethernet port eth0.
route add 44.106.62.10/32 asy0	Example: Specifies the route to IP address 44.48.30.100 is through the port asy0.
route add 44.100.200/24 asy0	Example: Adds an IP route for all 44.100.200.x subnet hosts (the AMPR.ORG hosts in the 44.100.200 subnet) through port asy0.

AUTOEXEC.NOS File Entry	Comment
route add 44/8 eth0	Adds an IP route for all 44.x.x.x hosts (AMPR.ORG) through port eth0.
route add default eth0	Defaults all other IP traffic through port eth0.
# Trace all configured interfaces	
trace eth0 0000	Turns off trace messages on port eth0.
trace eth0 0111	Turns on trace messages (display ascii characters, non-ascii characters display as periods) on port eth0, for input and output messages.