IP Router

QUICK START GUIDE
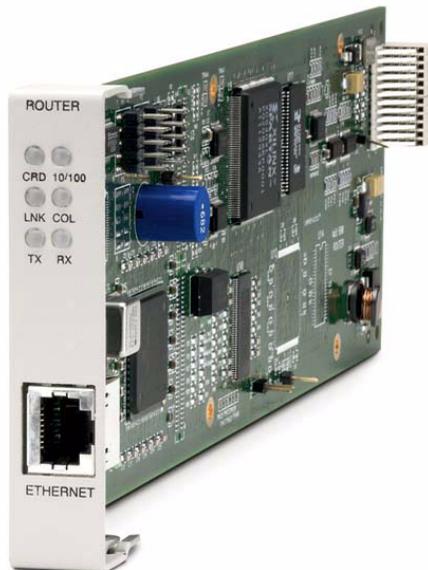
Contact Information:

Carrier Access Corporation
5395 Pearl Parkway
Boulder, CO 80301-2490
Corporate Phone: (800) 495-5455
Fax: (303) 443-5908
www.carrieraccess.com

Customer Support Direct: (800) 786-9929
E-mail: tech-support@carrieraccess.com

Supporting Software Version:

Adit Controller Release 8.0

IP Router Release 1.8

QUICK START GUIDE

In this Guide

- Installation
- Basic Setup
- PPP Internet Connection and Public IP Address Routing
- Frame Relay Internet Connection and Public IP Address Routing
- Internet Connection using PPP, NAT/PAT and Firewall Filters
- Internet Connection using NAT and Static NAT Addresses
- Back-to-Back with PPP
- Back-to-Back with Multi-Link PPP
- Back-to-Back with Frame Relay

Installation

Installation of the router card into the chassis.

- Unit can be on or off
- Router card will work in any slot
- Slide card into slot until fully seated
- Router has completed it's boot cycle when CRD light is solid

The following setups are all executed with CLI

NOTE: Configuration can be done with the following CLI commands or with the Router Menu-Driven Software.

Basic Setup

Command	Description
set {ds0-addr} type data	Confirm DS0 is set to type data. ds0-addr = {slot:port:channel} of DS0 Example: set a:1:1-24 type data
connect {slot:port:trunk} {slot:port:channel}	Cross-connect T1 to router card. Example: connect a:1:1-24 6:1:1 (router in slot 6)
set {router-addr} proxy	Disable/enable router proxy. router-addr = {slot:port}| of router card. Example: set 6:1 disable.
set {slot:port} up	Set Router LAN as In-Service. Example: set 6:1 up
telnet {router_card-addr}	Telnet to Router card. router_card-addr = {slot} location of router card Example: telnet 6 (if earlier than 3.0 release {slot:port} must be used)
Local and Remote Profile Setup	
reinitialize	To enable any configuration changes, the card must be reinitialized.

PPP Internet Connection and Public IP Address Routing

Router in Slot 1

ISP Router that provides the Internet connection.

Command	Description
set clock1 a:1	Set primary master transmit clock source
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename the from "LocalUnit" (default) to "Boulder" (LAN)
rename 1 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set 1:1 ip address 215.168.21.14 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1	Adds a static IP network (route) to the WAN interface
set 1 "wan1" trunk 1	Set the WAN interface named "wan1" to be mapped to trunk 1
reset 1	Reboot the router, to enable all configurations set

Frame Relay Internet Connection and Public IP Address Routing

Router in Slot 1

ISP Router that provides the Internet connection.

Command	Description
set clock1 a:1	Set primary master transmit clock source
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename the from "LocalUnit" (default) to "Boulder" (LAN)
rename 1 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set 1:1 ip address 215.168.21.14 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1	Adds a static IP network (route) to the WAN interface
set 1:1:1 encapsulation fr	Set the encapsulation on trunk 1 to Frame Relay
set 1 lmi annexd	Disable LMI to Annex D
set 1 "wan1" trunk 1	Set the WAN interface named "wan1" to be mapped to trunk 1
set 1 "wan1" dlci 101	Set the DLCI number
reset 1	Reboot the router, to enable all configurations set

Internet Connection using PPP, NAT/PAT and Firewall Filters

Router in Slot 1

ISP Router that provides the Internet connection. Router with NAT/PAT and Firewall Filters.

Command	Description
set clock1 a:1	Set primary master transmit clock source
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename the from "LocalUnit" (default) to "Boulder" (LAN)
rename 1 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set 1:1 ip address 192.168.21.14 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
set 1 "wan1" nat enable	Set the WAN interface named "wan1" enable NAT mapping
set 1 "wan1" nat address 216.174.44.2 1	Set the WAN interface named "wan1" NAT address
add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1	Adds a static IP network (route) to the WAN interface
add 1 "wan1" firewall 1 pass incoming log telnet 192.168.21.14/32 xxx.xxx.xxx.xxx/32	Adds a Firewall rule to the WAN. Where xxx.xxx.xxx.xxx is the host's IP address at the far end that will be able to ping or telnet to the router. 0.0.0.0/0 will allow any other host at the far end to ping and/or telnet to the router.

Command	Description
`add 1 "wan1" firewall 2 pass inout nolog ping 192.168.21.14/32 xxx.xxx.xxx.xxx/32`	Adds a Firewall rule to the WAN. Where xxx.xxx.xxx.xxx is the host's IP address at the far end that will be able to ping or telnet to the router. 0.0.0.0/0 will allow any other host at the far end to ping and/or telnet to the router.
`add 1 "wan1" firewall 3 pass inout nolog ping 0.0.0.0/0 0.0.0.0/0`	Adds a Firewall rule to the WAN.
`add 1 "wan1" firewall 4 pass inout nolog tcp 1-65535 0.0.0.0/0 0.0.0.0/0`	Adds a Firewall rule to the WAN.
`add 1 "wan1" firewall 5 pass inout nolog udp 1-65535 0.0.0.0/0 0.0.0.0/0`	Adds a Firewall rule to the WAN.
`set 1 "wan1" trunk 1`	Set the WAN interface named "wan1" to be mapped to trunk 1
`reset 1`	Reboot the router, to enable all configurations set

Internet Connection using NAT and Static NAT Addresses

Router in Slot 1

 ISP Router that provides the Internet connection. Router with NAT and Static NAT addresses.

Command	Description
set clock1 a:1	Set primary master transmit clock source
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename the from "LocalUnit" (default) to "Boulder" (LAN)
rename 1 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set ethernet ip address 192.168.21.15 255.255.255.0	Set the Ethernet IP address and Subnet Mask, for the
set 1:1 ip address 192.168.21.14 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
set 1 "wan1" nat enable	Set the WAN interface named "wan1" enable NAT mapping
set 1 "wan1" nat address 216.174.44.2 1	Set the WAN interface named "wan1" NAT address
add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1	Adds a static IP network (route) to the WAN interface
add 1 "wan1" static nat address 192.168.21.14 216.174.44.232	Add static NAT bi-directional mapping to wan1

Command	Description
`add 1 "wan1" static nat address 192.168.21.15 216.174.44.233`	Add static NAT bi-directional mapping to wan1
`add 1 "wan1" static nat address 192.168.21.16 216.174.44.234`	Add static NAT bi-directional mapping to wan1
`add 1 "wan1" static nat address 192.168.21.17 216.174.44.235`	Add static NAT bi-directional mapping to wan1
`set 1:1:1 encapsulation fr`	Set the encapsulation on trunk 1 to Frame Relay
`set 1 lmi annexd`	Disable LMI Annex D
`set 1 "wan1" trunk 1`	Set the WAN interface named "wan1" to be mapped to trunk 1
`set 1 "wan1" dlci 101`	Set the DLCI number
`reset 1`	Reboot the router, to enable all configurations set

216.174.44.232 is the static NAT address assigned to the router.

216.174.44.233 is the static NAT address assigned to the controller.

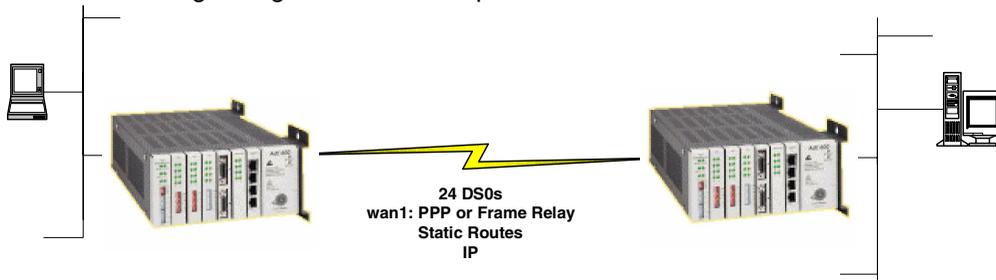216.174.44.234 is the static NAT address for a server*.

216.174.44.235 is the static NAT address for a host*.

*In the private network that can be reached from the outside world.

There can be up to 16 static NAT addresses, therefore the actual range can be 216.174.44.232 to 216.174.44.247. Only 4 were used in this example.

Back-to-Back with PPP

The following configuration will set up two Adit 600 Routers back-to-back with PPP.

24 DS0s
wan1: PPP or Frame Relay
Static Routes
IP

Boulder Router in Slot 1

Command	Description
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
rename 1 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set 1:1 ip address 1.1.1.1 255.255.255.0	Set the Ethernet IP address, in the conventional IP address format. (Router LAN)
set 1:1 phy auto	Set the Physical Specifications to auto-negotiate
add 1 "wan1" static ip network 2.2.2.0 255.255.255.0 1	Adds a static IP network (route) to the WAN interface
set 1 "wan1" trunk 1	Set the WAN interface named "wan1" to be mapped to trunk 1
reset 1	Reboot the router, to enable all configurations set

Denver Router in Slot 1

Command	Description
`set 1 default`	Set Router to default settings
`disconnect a:1`	Disconnect all connections to the T1 on the Controller (slot a)
`disconnect 1`	Disconnect all connections to the router in slot 1
`set clock1 a:1`	Set primary master transmit clock source
`set a:1:all type data`	Set the T1-1 of the Controller, Type to Data
`connect a:1:all 1:1:1`	Connect all of T1-1 to the Router that is in slot 1
`rename 1 "LocalUnit" "Denver"`	Rename the from "LocalUnit" (default) to "Denver" (LAN)
`rename 1 "RemoteUnit" "wan1"`	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
`set 1:1 ip address 2.2.2.1 255.255.255.0`	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
`set 1:1 phy auto`	Set the Physical Specifications to auto-negotiate
`add 1 "wan1" static ip network 1.1.1.0 255.255.255.0 1`	Adds a static IP network (route) to the WAN interface
`set 1 "wan1" trunk 1`	Set the WAN interface named "wan1" to be mapped to trunk 1
`reset 1`	Reboot the router, to enable all configurations set

Back-to-Back with Multi-Link PPP

The following configuration will set up two Adit 600 Routers back-to-back with Multi-Link PPP.
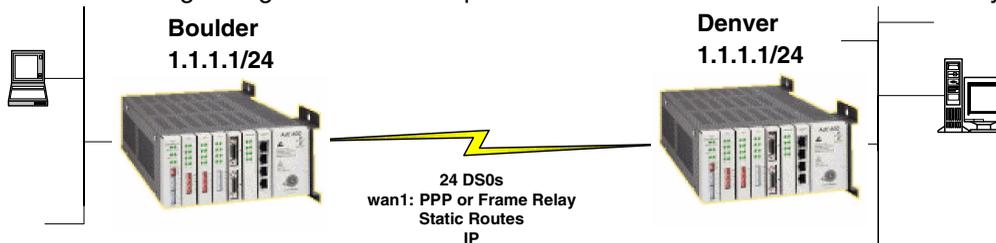
Boulder Router in Slot 1

Command	Description
`set 1 default`	Set Router to default settings
`disconnect a:1`	Disconnect all connections to the T1 on the Controller (slot a)
`disconnect 1`	Disconnect all connections to the router in slot 1
`set a:1:all type data`	Set the T1-1 of the Controller, Type to Data
`connect a:1:all 1:1:1`	Connect all of T1-1 to the Router that is in slot 1
`connect a:2:all 1:1:2`	Connect all of T1-1 to the Router that is in slot 1
`rename 1 "LocalUnit" "Boulder"`	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
`rename 1 "LocalUnit" "Boulder"`	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
`set 1:1:1-2 multilink group 1`	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
`rename 1 "RemoteUnit" "wan1"`	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
`set 1:1 ip address 1.1.1.1 255.255.255.0`	Set the Ethernet IP address, in the conventional IP address format. (Router LAN)
`add 1 "wan1" static ip network 2.2.2.0 255.255.255.0 1`	Adds a static IP network (route) to the WAN interface
`set 1 "wan1" trunk multilink group 1`	Set the WAN interface named "wan1" to be mapped to trunk multilink group 1
`reset 1`	Reboot the router, to enable all configurations set

Denver Router in Slot 1

Command	Description
`set 1 default`	Set Router to default settings
`disconnect a:1`	Disconnect all connections to the T1 on the Controller (slot a)
`disconnect 1`	Disconnect all connections to the router in slot 1
`set clock1 a:1`	Set primary master transmit clock source
`set a:1:all type data`	Set the T1-1 of the Controller, Type to Data
`connect a:1:all 1:1:1`	Connect all of T1-1 to the Router that is in slot 1
`connect a:2:all 1:1:2`	Connect all of T1-1 to the Router that is in slot 1
`rename 1 "LocalUnit" "Denver"`	Rename the Adit 600 from "LocalUnit" (default) to "Denver" (LAN)
`set 1:1:1-2 multilink group 1`	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
`rename 1 "RemoteUnit" "wan1"`	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
`set 1:1 ip address 2.2.2.1 255.255.255.0`	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
`add 1 "wan1" static ip network 1.1.1.0 255.255.255.0 1`	Adds a static IP network (route) to the WAN interface
`set 1 "wan1" trunk multilink group 1`	Set the WAN interface named "wan1" to be mapped to trunk multilink group 1
`reset 1`	Reboot the router, to enable all configurations set

Back-to-Back with Frame Relay

The following configuration will set up two Routers back-to-back with Frame Relay.

Boulder Router in Slot 1

Command	Description
`set clock1 internal`	Set primary master transmit clock source
`set 1 default`	Set Router to default settings
`disconnect a:1`	Disconnect all connections to the T1 on the Controller (slot a)
`disconnect 1`	Disconnect all connections to the router in slot 1
`set a:1:all type data`	Set the T1-1 of the Controller, Type to Data
`connect a:1:all 1:1:1`	Connect all of T1-1 to the Router that is in slot 1
`rename 1 "LocalUnit" "Boulder"`	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
`rename 1 "RemoteUnit" "wan1"`	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
`set 1:1 ip address 1.1.1.1 255.255.255.0`	Set the Ethernet IP address, in the conventional IP address format. (Router LAN)
`add 1 "wan1" static ip network 2.2.2.0 255.255.255.0 1`	Adds a static IP network (route) to the WAN interface
`set 1:1:1 encapsulation fr`	Set the encapsulation on trunk 1 to Frame Relay
`set 1 lmi disable`	Disable LMI (Local Management Interface)
`set 1 "wan1" trunk 1`	Set the WAN interface named "wan1" to be mapped to trunk 1
`set 1 "wan1" dlci 101`	Set the DLCI number
`reset 1`	Reboot the router, to enable all configurations set

Denver Router in Slot 3

Command	Description
`set 3 default`	Set Router to default settings
`disconnect a:1`	Disconnect all connections to the T1 on the Controller (slot a)
`disconnect 3`	Disconnect all connections to the router in slot 1
`set clock1 a:1`	Set primary master transmit clock source
`set a:1:all type data`	Set the T1-1 of the Controller, Type to Data
`connect a:1:all 3:1:1`	Connect all of T1-1 to the Router that is in slot 1
`rename 3 "LocalUnit" "Denver"`	Rename the from "LocalUnit" (default) to "Denver" (LAN)
`rename 3 "RemoteUnit" "wan1"`	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
`set 3:1 ip address 2.2.2.1 255.255.255.0`	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
`add 3 "wan1" static ip network 1.1.1.0 255.255.255.0 1`	Adds a static IP network (route) to the WAN interface
`set 3:1:1 encapsulation fr`	Set the encapsulation on trunk 1 to Frame Relay
`set 3 lmi disable`	Disable LMI (Local Management Interface)
`set 3 "wan1" trunk 1`	Set the WAN interface named "wan1" to be mapped to trunk 1
`set 3 "wan1" dlci 101`	Set the DLCI number
`reset 3`	Reboot the router, to enable all configurations set