TABrouter ™

Standalone IP Router For Headless PC

Revision 2.1

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TABrouter™ *Installation and Configuration Guide*
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Chapter 1 Installation

CMOS Configuration

In order for the TABrouter™ to operate on a headless PC the CMOS must first be configured properly. This phase requires the temporary connection of a keyboard and video monitor to edit the CMOS configuration. Verify the following settings.

COM 1 Port

Make sure that COM1 is enabled and set to IO base address of 0x2f8. This is used as the console port for the TABrouter™.

Plug-n-Play

Disable the plug-n-play functionality. If there is a selection for PnP Operating System then select the non-PnP OS.

Keep Booting On Error

Select to keep on booting even if error is encountered. Otherwise the boot sequence will abort when no keyboard or video controller is detected.

Boot From Floppy A

For the boot sequence, select floppy drive A.

Creating Boot Floppy

For Windows systems, use the rawrite.exe utility included with the TABrouter™ distribution to copy the disk image to the floppy.

```
rawrite diskV20
```

For UNIX systems, use the dd utility to copy the disk image to floppy.

```
dd if=diskV20 of=/dev/fd0 bs=512
```

Booting

1. Connect an ASCII terminal or equivalent emulation program to the COM1 port. When the system boots from the floppy the following will appear.

```
boot.................................

56962+19796+209764
```

```
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Version: 2.0

4MB RAM
Interface 0: EtherExpress PRO/100+ EA=0090.2205.3039
Interface 1: EtherExpress PRO/100+ EA=0090.2205.3143
.......Warning: Invalid configuration...Ignored

Password:
```

2. There is no default password, so just hit <RETURN> to logon. To get online assistance with the commands you may use ***help***, ***help <command>*** or ***<command> ?.*** Assign IP addresses to the ethernet interfaces using the ***ifconfig*** command.

   ```
   ifconfig 0 192.168.100.5
   ifconfig 1 192.168.200.5
   ```

   The default subnet mask will be determined from the IP address given. The default MTU is 1500, and the default mode is AUTO NEGOTIATE.

3. Enter routes.

   ```
   route add <ip> mask=<mask> gw=<gw>
   ```

Chapter 2 Command Descriptions

The following tables list the meanings of various command parameters along with a command summary.

Command	Alias	Description
arp		ARP table manipulation
help	?	Display command list
host	ho	Set host name
ifconfig	ifc	Configure interface
ifstat	ifs	Display interface statistics
ipstat	ips	Display IP statistics
logout	exit	Exit system
passwd	pw	Set password
ping		Ping host
register		Software registration
rip		RIP control
route	r	Display routing tables
rtik		Display RTIK information
save		Save configuration
syslog		Syslog control
traceroute	tr	Traceroute

Variable	Definition
<fac.lvl>	Syslog facility and level (0 ≤ fac ≤ 23 & 0 ≤ lvl ≤ 7)
<ifc>	Interface number (0, 1, 2, 3)
<ip>	IP address in dotted decimal notation. 192.168.100.2
<mask>	Subnet mask in dotted decimal notation. 255.255.255.0
<metric>	Network distance in hops (1 ≤ metric ≤ 15)
<n>	Decimal integer value
<netid>	Network identifier in dotted decimal notation. 192.168.1.0

arp

```
arp [flush] [timeout=<n>]
```

Displays the ARP cache and timeout value in minutes. ARP entries are removed from the cache after the timeout period has expired. The timeout value can range from 1 to 15 with the default value being 10 minutes.

```
arp flush
```

causes the ARP cached to be flushed, and

```
arp timeout=7
```

sets the timeout value to 7 minutes.

help

`help [command]`

Displays the list of available commands. With no argument, all commands are displayed with a brief description. An argument can be specified which is the name of a command in which case the specific syntax for that command will be displayed.

host

`host [hostname]`

Display or change the current host name. With no argument, the current system host name is displayed. Specifying an argument changes the host name to the argument string.

ifconfig

`ifconfig [<ifc> <ip> [mask=<ip>][mtu=<n>][auto][half|full][10|100]]`

Display or change the interface configuration. With no arguments, the current interface configuration is displayed. The minimum interface configuration requires at least two arguments which is the interface number and the IP address. By default, the subnet mask will be calculated based on the IP address. The MTU defaults to 1500 and the link speed defaults to auto-negotiate.

ifstat

`ifstat [<ifc> [reset]]`

Display the interface statistics. Also shows the ethernet (MAC) address, the current MTU size, the current LINK status and the current operating mode if set for auto negotiate. In addition, the following statistics are displayed. Counters can be cleared by specifying the reset argument.

`RxFrames`	Ethernet frames received
`TxFrames`	Ethernet frames transmitted
`Octets`	Total number of octets
`UcastPkts`	Packets with unicast address
`NUcastPkts`	Packets with non-unicast address
`Discards`	Packets discarded due to buffer overflow condition
`Errors`	Packets containing errors
`UnknownProtos`	Packets discarded because of unknown or unsupported protocols.

ipstat

```
ipstat [<ifc> [reset]]
```

Display the IP statistics. The IP address and subnet mask are displayed along with the following statistical counters. Counters can be reset by specifying the reset argument.

`InReceives`	Datagrams received including those with errors.
`InHdrErrors`	Input datagrams discarded due to errors in the IP header.
`InAddrErrors`	Input datagrams discarded because the IP address in the destination field was not valid.
`ForwDatagrams`	Datagrams received for which this entity was not their final IP destination.
`InUnknownProtos`	Datagrams discarded because of and unknown or unsupported protocol.
`InDelivers`	Datagrams successfully delivered to IP user protocols
`ReasmReqds`	IP fragments received that need to be reassembled.
`ReasmOKs`	IP datagrams successfully reassembled
`ReasmFails`	Failures detected by the IP reassembly algorithm
`OutRequests`	IP datagrams requested for transmission
`FragOKs`	IP datagrams that have been successfully fragmented
`FragFails`	IP datagrams discarded because they needed to be fragmented but could not because the don't - fragment flag was set in the IP header.
`FragCreates`	IP datagram fragments generated

logout

```
logout
```

Exit current login session and return to the password prompt.

passwd

```
passwd [old [new]]
```

Change the password. If either the *old* or *new* arguments are missing, you will be prompted for the missing information.

ping

```
ping <ip> [<ifc>]
```

Send ICMP Echo Request message to a host. If an interface is specified, the message will be sent out that interface; otherwise, the message is routed accordingly.

register

```
register [<ifc> <key>]
```

With no arguments, the registration information is displayed for each interface. If the interface and key arguments are given, then the interface is registered. (To obtain registration keys, visit http://brivida.com/router/default.htm or send email to router@brivida.com)

rip

```
rip [active|passive]
```

Display or change the current Routing Information Protocol (RIP v1) participation as either “Passive” or “Active.” In *passive* mode, the ***TABrouter™*** listens to RIP messages and updates its routing tables accordingly. Host routes are ignored. In *active* mode, the ***TABrouter™*** not only listens to RIP messages, but broadcasts a RIP message every 30 seconds advertising each target network with a metric of 1. With no arguments, the command displays the current mode. Use rip active to set active mode or rip passive to set passive mode.

route

```
route [add|change <ip> mask=<mask> gw=<gw> [metric=<metric>]]
route [delete <ip>]
route [flush|flushall]
```

Display or change the routing table. With no arguments, the current routing table is displayed. The TTL column lists the number of seconds remaining for the route is purged. A value of static is a permanent route.

An argument of flush causes all non-static routes to be purged from the route table. An argument of flushall causes the entire route table to be purged including static routes.

The optional parameter metric is used to specify the number of "hops" to the specified network. Typically a value of 1 is used to specify a direct connection and a value of 16 is considered infinity or no connection.

rtik

```
rtik [frame|proc|system]
```

Display information about the system. The argument frame displays the status of the system buffers (or frames). The argument proc displays the

information about the system processes. The argument system displays the current memory size and usage information.

save

```
save
```

Saves the current configuration to floppy disk. When the system boots, it will automatically load the configuration data from the floppy.

syslog

```
syslog [<ip>][<fac.lvl>][console=[on|off]][flush]
```

Displays or changes the syslog configuration information. With no arguments, the host, facility, level and console mode settings are displayed along with the current syslog buffer contents. The host IP address is the host running a syslog daemon. All syslog messages generated are transmitted to UDP port 520 of the syslog host. The default is level 6 (**info**), and the default facility is 10 (**authpriv**). If console=on then all syslog messages are displayed to the console when they occur.

See the Syslog Messaging section for more information about system logging including the facility and level parameters and a list of the syslog messages produced by the ***TABrouter***™.

traceroute

```
traceroute <ip> [<ifc>]
```

Trace the route for an IP packet sent to the specified address.

Chapter 3 Syslog Messaging

Syslog messaging is enabled by setting the syslog host IP address to a valid host that is running the syslog daemon. For more information on configuring the syslog daemon, see the */etc/syslog.conf* file and the UNIX man page on *syslogd*.

The *facility* defines the type of device generating the messages, and the *level* determines which messages are generated. For example, a level of 4 allows only messages less than or equal to 4 to be generated. By default, the ***TABrouter™*** has the syslog *level* set to 6 (info) and the syslog *facility* set to 10 (authpriv).

Syslog Level

The following table lists the 8 possible values for the *level* along with their meaning.

Level	Names	Description
0	panic *or* emerg	System unusable
1	alert	Action to be taken immediately
2	crit	Critical conditions
3	err *or* error	Error conditions
4	warn *or* warning	Warning conditions
5	notice	Normal but significant
6	info	Informational
7	debug	Debug information

Syslog Facility

The following table lists the well-known *facilities* and their meaning.

Facility	Names	Descripton
0	kern	Kernel
1	user	Random user-level messages
2	mail	Mail system
3	daemon	System daemons
4	security or auth	Security/authorization messages
5	syslog	Messages generated internally by syslogd
6	lpr	Line printer subsystem
7	news	Network news subsystem
8	uucp	Uucp subsystem
9	cron	Clock daemon
10	authpriv	Security/authorization (private)
11	ftp	ftp daemon

12-15		Reserved for system use
16-23	Local[0-7]	Reserved for local use

Syslog Messages

The following is a list of the syslog messages generated by the ***TABrouter™.***

Info (6)	Boot Version x.x
Notice (5)	Configuration Saved Invalid Password Entered Logon: Console Logoff: Console ICMP ERROR: type <n> (<*IP*> -> <*IP*>)
Error (3)	Routing Loop Detected <*IP*> <*IP*>

Chapter 4 SNMP

The ***TABrouter™*** acts as a Simple Network Management Protocol (SNMP) agent which provides a mechanism to remotely monitor the unit.

The three MIBs supported by the ***TABrouter™*** are the System (1.3.6.1.2.1.1), the Interface (1.3.6.1.2.1.2) and the IP (1.3.6.1.2.1.4). For security purposes, these MIBs are read-only with the exception of the sysContact, sysName and sysLocation fields within the System MIB which can be written.

Private Enterprise Number

The Private Enterprise Number assigned by the Internet Assigned Numbers Authority (IANA) for BRIVIDA, Inc. is 3436. The sysObjectID for the ***TABrouter™*** is 1.3.6.1.4.1.3436.5.1