

Network Adapters

AT-2711FX

AT-2712FX

AT-2812FX

AT-2912T

AT-2916SX

AT-2931SX

AT-2972SX

Linux User's Guide

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Contents

Preface	5
Safety Symbols Used in this Document	6
Where to Find Web-based Guides	7
Contacting Allied Telesis	8
Online Support	8
Email and Telephone Support	8
Returning Products	8
For Sales or Corporate Information	8
Warranty	8
Management Software Updates	8
Chapter 1: Enabling LINUX	9
Introduction	10
Limitations	10
Packaging	10
Installing the LINUX TG3 File	11
Installing the Source RPM Package	11
Building the Driver from the Source TAR File	12
Driver Settings	13
Driver Default Settings	14
Unloading and Removing the Driver	16
Driver Messages	17

Preface

This guide contains instructions on how to configure the following Allied Telesis adapters using the Linux driver software:

- ❑ AT-2711FX
- ❑ AT-2712FX
- ❑ AT-2812FX
- ❑ AT-2912T
- ❑ AT-2916SX
- ❑ AT-2931SX
- ❑ AT-2972SX



The Preface contains the following sections:

- ❑ “Safety Symbols Used in this Document” on page 6
- ❑ “Where to Find Web-based Guides” on page 7
- ❑ “Contacting Allied Telesis” on page 8
- ❑ “Management Software Updates” on page 8

Safety Symbols Used in this Document

This document uses the safety symbols defined in Table 1.

Table 1. Safety Symbols

Symbol	Meaning	Description
	Caution	Performing or omitting a specific action may result in equipment damage or loss of data.
	Warning	Performing or omitting a specific action may result in electrical shock.

Where to Find Web-based Guides

The installation and user guides for all Allied Telesis products are available in portable document format (PDF) on our web site at **www.alliedtelesis.com**. You can view the documents online or download them onto a local workstation or server.

Contacting Allied Telesis

This section provides Allied Telesis contact information for technical support as well as sales or corporate information.

Online Support

You can request technical support online by accessing the Allied Telesis Knowledge Base: **www.alliedtelesis.com/support/kb.aspx**. You can use the Knowledge Base to submit questions to our technical support staff and review answers to previously asked questions.

Email and Telephone Support

For Technical Support via email or telephone, refer to the Support section of the Allied Telesis web site: **www.alliedtelesis.com/support**.

Returning Products

Products for return or repair must first be assigned a return materials authorization (RMA) number. A product sent to Allied Telesis without an RMA number will be returned to the sender at the sender's expense. For instructions on how to obtain an RMA number, go to the Support section on our web site at **www.alliedtelesis.com/support/rma.aspx**.

For Sales or Corporate Information

You can contact Allied Telesis for sales or corporate information through our web site at **<http://www.alliedtelesis.com/purchase>**.

Warranty

Go to **www.alliedtelesis.com/warranty** for the specific terms and conditions of the warranty and for warranty registration for the Allied Telesis adapters discussed in this manual.

Management Software Updates

New releases of management software for our managed products are available from either of the following Internet sites:

- ☐ Allied Telesis web site: **www.alliedtelesis.com**
- ☐ Allied Telesis FTP server: **<ftp://ftp.alliedtelesis.com>**

If you prefer to download new software from the Allied Telesis FTP server from your workstation's command prompt, you will need FTP client software and you must log in to the server. Enter "anonymous" for the user name and your email address for the password.

Chapter 1

Enabling LINUX

This chapter describes how to enable the LINUX System on the Allied Telesis adapters. This chapter contains the following sections:

- ❑ “Introduction” on page 10
- ❑ “Installing the LINUX TG3 File” on page 11
- ❑ “Unloading and Removing the Driver” on page 16
- ❑ “Driver Messages” on page 17

Introduction

This chapter describes the tg3 Linux driver for the Broadcom NetXtreme-based Allied Telesis PCI/PCI-X/PCI Express Ethernet Network Controllers.

The most recent driver is included in the latest 2.6 Linux kernel. Generally, you do not need to download the driver if you are using the latest 2.6 upstream kernel from www.kernel.org or one of the latest vendor kernels from Red Hat, SuSE, or other vendors. However, you can download the Linux driver as a source package from www.broadcom.com and then select Downloads & Support, Ethernet NICS, Download Drivers, and NetXtreme I Desktop/Mobile.

The tg3 driver from the Broadcom package is almost identical to the tg3 driver in the latest 2.6 upstream Linux kernel. It does include some additional kernel-compatible code to allow it to compile on older 2.6 and some 2.4 kernels. The version number is similar but generally has a one-letter suffix, for example 3.55b, to distinguish it from the in-kernel tg3 driver.

Limitations

The current version of the driver has been tested on the 2.4x kernels starting from 2.4.24 and all 2.6.x kernels.



Caution

The driver may not compile on kernels older than version 2.4.24.

Testing is concentrated on i386 and x86_64 CPU architectures. Only limited testing has been done on some other architectures such as PowerPC and SPARC64.

On some kernels, you may need to make minor changes to some source files and the Makefile.

Packaging

To replace an older previously installed or in-kernel tg3 driver, follow the instructions in "Installing the LINUX TG3 File" on page 11.

The driver package from www.broadcom.com is released in two packaging formats: source RPM and compressed tar formats. The file names for the two packages are tg3<version>.src.rpm and tgs<version>.tar.gz respectively. Identical source files to build the driver are included in both packages.

Installing the LINUX TG3 File

There are two procedures to install the Linux TG3 file:

- ❑ “Installing the Source RPM Package” on page 11
- ❑ “Building the Driver from the Source TAR File” on page 12

Installing the Source RPM Package

Here are general guidelines for installing the driver:

1. Install the source RPM package by enter the following command:

```
rpm -ivh tg3<version>.src.rpm
```

2. Change directory to the RPM path and build the binary driver for your kernel. Enter one of the following commands:

```
cd /usr/src/{redhat, openLinux, turbo, packages, rpm..}
```

or

```
rpmbuild -bb SPECS/tg3.spec (for RPM version 4.x.x)
```

Note

The RPM path is different for specific Linux distributions.

3. By default, the driver is compiled for the running kernel. To build the driver for a kernel different from the running kernel, specify the kernel by defining it in KVER. If this is not necessary, skip to step 4. Enter the following command:

```
rpmbuild -bb SPECS/tg3.spec --define "KVER <kernel_version>
```

where <kernel_version> in the form of 2.x.y-z is the version number of another kernel that is installed on the system.

4. To install the newly-built package (driver and man page), enter the following command:

```
rpm -ivh RPMS/<arch>/tg3-<version>.<arch>.rpm
```

where <arch> is the architecture of the machine such as i386. For example:

```
rpm -ivh RPMS/i386/tg3-<version>.i386.rpm
```

Note

The force option may be needed on some Linux distributions if conflicts are reported.

Depending on the kernel, the driver is installed in one of the following directories:

2.4.x kernels:

```
/lib/modules/<kernel_version>/kernel/drivers/net/  
tg3.o
```

2.6.x kernels:

```
/lib/modules/<kernel_version>/kernel/drivers/net/  
tg3.ko
```

5. To load the driver, enter one of the following commands:

```
insmod tg3.o
```

or

```
insmod tg3.ko (on 2.6 kernels)
```

or

```
modprobe tg3
```

To configure the network protocol and address, refer to the Linux version-specific documentation.

Building the Driver from the Source TAR File

To build the LINUX driver from the source TAR file, use the following procedure:

1. Create a directory, called tg3 - version, and extract the TAR files to the directory. Enter the following command:

```
tar xvzf tg3-version.tar.gz
```

2. Build the driver tg3.o or tg3.ko as a loadable module for the running kernel. Enter the following commands:

```
cd src  
make
```

3. The driver is compiled for the running kernel by default. To build the driver for a kernel different from the one running, specify the kernel by defining it in KVER. If this is not necessary, skip to step 4.

Enter the following command:

```
make KVER=<kernel_version>
```

where <kernel_version> in the form of 2.x.y-z is the version of another kernel that is installed on the system.

4. Test the driver by loading it. Enter the following commands:

```
insmod tg3.o
```

or

```
insmod tg3.ko (on 2.6 kernels)
```

or

```
modprobe tg3
```

5. Install the driver by entering the following command:

```
make install
```

See “Installing the Source RPM Package” on page 11 for the location of the installed driver.

To configure the network protocol and address, refer to the Linux version-specific documentation.

Driver Settings

It is important to configure the speed and duplex settings for the following adapters:

- ☐ AT-2711FX
- ☐ AT-2712FX
- ☐ AT-2812FX

By default, the Linux driver is configured for autonegotiation which is not supported with an 100 FX operation. Driver settings can be queried and changed using the ethtool utility. Download the latest ethtool from the following web site:

<http://sourceforge.net/projects/gkernel>

See Table 2 on page 14 for examples that describe how to use the ethtool utility. In addition, see the ethtool man page for more information.

The ethtool settings do not persist across reboot or module reload. However, you can place the ethtool commands in a startup script such as /etc/rc.local to preserve the settings across a reboot.

On Red Hat distributions, you can specify “ethtool -s” parameters in the ifcfg-ethx scripts using the ETHTOOL_OPTS keyword. The specified ethtool parameters are set up during ifup. For example, go to the following directory:

```
/etc/sysconfig/network-scripts/ifcfg-eth0
```

Add the following line to the script:

```
ETHTOOL_OPTS="wol g speed 100 duplex half autoneg off"
```

Table 2. Ethtool Utility Examples

Action	Commands
Display current speed, duplex, and link status	ethtool eth0
Change speed, duplex mode, and autonegotiation status to 100Mbps half duplex, and no autonegotiation	ethtool -s eth0 speed 100 duplex half autoneg off
Change speed, duplex mode, and autonegotiation status to 100Mbps full duplex mode, and no autonegotiation	ethtool -s eth0 speed 100 duplex full autoneg off
Display flow control settings	ethtool -a eth0
Turn off flow control	ethtool -A eth0 autoneg off rx off tx off
Display offload settings	ethtool -k eth0
Turn off TCP Segmentation Offload (TSO)	ethtool -K eth0 tso off
Display statistics	ethtool -S eth0
Perform a self-test on an interface that is up and running	ethtool -t eth0

Driver Default Settings

See Table 3 for the default settings of the Linux driver.

Table 3. Linux Driver Settings

Feature	Default Setting
Speed	Autonegotiation with all speeds advertised
Flow control	Autonegotiation with Rx and Tx advertised

Table 3. Linux Driver Settings (Continued)

Feature	Default Setting
MTU	1500 (range 46 - 9000)
Rx Ring Size	200 (range 0 - 511)
Rx Jumbo Ring Size	100 (range 0 - 255)
Tx Ring Size	511 (range (MAX_SKB_FRAGS+1) - 511)
Coalesce Rx usecs	20 (range 0 - 1023)
Coalesce Rx usecs irq	20 (range 0 - 255)
Coalesce Rx frames	5 (range 0 - 1023)
Coalesce Rx frames irq	5 (range 0 - 255)
Coalesce Tx usecs	72 (range 0 - 1023)
Coalesce Tx usecs irq	20 (range 0 - 255)
Coalesce Tx frames	53 (range 0 - 1023)
Coalesce Tx frames irq	5 (range 0 - 255)
Coalesce stats usecs	1000000 (approximately 1 second) Some coalescing parameters are not used or have different defaults on some chips
MSI	Enabled if supported by the chip and passes the interrupt test
TSO	Enabled on newer chips that support TCP segmentation offload in hardware
WoL (Wake on LAN)	Disabled

Unloading and Removing the Driver

To unload the driver, use the `ifconfig` command to bring down all `eth#` interfaces opened by the driver. Then enter the following command:

```
rmmod tg3
```

Note

On all 2.6 kernels, you do not need to bring down the `eth#` interfaces before unloading the driver module.

If the driver was installed using `rpm`, enter the following command to remove it:

```
rpm -e tg3
```

If the driver was installed using the `make install` command from the tar file, you need to manually delete the driver `tg3.o` (or `tg3.ko`) from the system. Refer to “Installing the Source RPM Package” on page 11 for the location of the installed driver.

Driver Messages

The following messages are the most common sample messages that are logged in the `/var/log/messages` file. Use the `dmesg -n<level>` command to control the level at which messages appear on the console. Most systems are set to level 6 by default. To see all messages, set the level higher than 6.

Driver Signon

```
tg3.c:v3.92n (September 29, 2008)
```

NIC Detected

```
eth0: Tigon3 [partno(BCM95704A6) rev 2003 PHY(5704)
(PCIX:100MHz:64-bit)
10/100/1000BaseT Ethernet 00:10:18:04:3f:36
eth0: RXcsms[1] LinkChgREG[0] MIirq[0] ASF[0]
wirespeed[1] TSOcap[1]
eth0: dma_rwctrl[769f4000] dma_mask[64-bit]
```

Link Up and Speed Indication

```
tg3: eth0: Link is up at 1000 Mbps, full duplex.
tg3: eth0: Flow control is on for TX and on for RX.
```

Link Down Indication

```
tg3: eth#: Link is down.
```

