

Dell™ PowerEdge™ Systems

# Installing Broadcom NetXtreme Drivers and TOE

## Notes, Notices, and Cautions



**NOTE:** A NOTE indicates important information that helps you make better use of your computer.



**NOTICE:** A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.



**CAUTION:** A CAUTION indicates a potential for property damage, personal injury, or death.

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This document provides important information about installing Broadcom NetXtreme and NetXtreme II drivers and also describes known limitations of the driver set under various conditions. For further information about the Broadcom drivers, see the **ReadMeFirst.txt** file on the driver CD or in the downloadable Broadcom driver package.

This document also provides information about installing and enabling the TCP/IP Offload Engine (TOE) feature on your system and provides important information about using TOE. For more information on TOE, see the Dell™ TCP/IP Offload Engine (TOE) white paper available on [support.dell.com](http://support.dell.com).

## Installing the Broadcom Drivers in Microsoft® Windows®

To install the Broadcom driver package (NetXtreme version 8.3 or later and NetXtreme II version 2.6 or later), run the **setup.exe** file that is provided by Dell with the driver package. The Broadcom installer installs all of the available package features by default.

- On the *Broadcom Driver Installation CD* that shipped with your system, the **setup.exe** file is located in the **Driver\_Management\_Apps\_Installer** directory under the directory of the version of Microsoft Windows you are using.
- In Dell Server Assistant, the Broadcom driver package and **setup.exe** file are located on the Service Mode CD.
- If you have downloaded the driver package from [support.dell.com](http://support.dell.com), uncompress the downloaded file and locate the **setup.exe** file in the extracted file directory.

Using the **setup.exe** file is the preferred method for installing the drivers on a local system. However, if you need to install the drivers using the Windows Plug and Play method, you can extract the drivers from the installer file by running `setup.exe /a` and specifying a directory for the extracted files.

## Requirements for TOE

The following hardware and software components are required to use TOE on your TOE-capable system:

- Broadcom NetXtreme II 5708-based networking device, drivers, and control suite software.
- Microsoft Windows Server™ 2003 operating system family (32-bit or 64-bit) updated to Service Pack 1 or later.
- Microsoft Windows Server 2003 Scalable Networking Pack (SNP) hotfix. (For more information on the SNP hotfix, see Knowledge Base Article 912222 available on the Microsoft support web site.)

Dell offers TOE-capable Broadcom 5708-based networking devices as integrated LAN-on-Motherboard (LOM) and as an add-in PCIe adapter. The 5708-based LOM network devices on some PowerEdge™ systems also require a license-enabling hardware key; see your system documentation for the location and proper installation of this hardware key on your system board.

The following Dell systems have integrated 5708-based LOMs (enabled by a hardware key) and also support an add-in 5708-based network controller as an expansion card:

- PowerEdge 2900
- PowerEdge 2950
- PowerEdge 1950
- PowerEdge 1900
- PowerEdge 1955 (add-in card support is provided via a daughter card that provides two additional 5708 network connections)

The following Dell systems support the 5708-based network controller as a PCIe (x4 lanes) expansion card:

- PowerEdge 2800
- PowerEdge 2850
- PowerEdge 1850
- PowerEdge 1800
- PowerEdge 850
- PowerEdge 830
- PowerEdge 6800
- PowerEdge 6850

## Installing and Enabling TOE

If the Microsoft Windows operating system was installed on your system using the Dell OpenManage™ Server Assistant, you only need to update the operating system and drivers with the files necessary to support TOE. To update your system, insert the *TOE Update Installation CD* and double-click the icon on the Windows desktop entitled **install-TOE-Update.vbs** to start the update script. Follow the on-screen instructions to install the SNP hotfix and the Broadcom tools to support TOE.

If the **install-TOE-Update.vbs** script is not available on your system, you must install the Broadcom driver package and the Microsoft SNP hotfix in separate steps. If you have not already done so, install the Broadcom driver package by running the **setup.exe** file included in the Broadcom driver package. See "Installing the Broadcom Drivers in Microsoft Windows" earlier in this document for more information.



**NOTE:** Features of the driver package can be deselected, but you must install the Broadcom Advanced Control Suite (BACS) as you will need this application to configure and control TOE offload settings.

The SNP hotfix is provided on the *TOE Update Installation CD*; you can also download the hotfix from the Microsoft support web site. Begin the installation by double-clicking the hotfix executable file and following the on-screen instructions.

TOE is enabled by default once all the required components are installed. To disable TOE or change the settings, use the Broadcom BACS software. For information on using BACS, see the *Broadcom NetXtreme II User's Guide* available on the Dell Documentation CD, the Broadcom Driver CD, or from [support.dell.com](http://support.dell.com).

## Windows Remote Installation Services and Unattended Installation

Dell has provided a specialized driver to enable complete Remote Installation Services (RIS), PXE, and ADS installation of all the drivers and applications in the Broadcom driver package. To use the RIS driver, browse the *Broadcom Driver Installation CD* and locate the directory for your operating system. Copy the RIS driver and **.inf** file located in the directory to the **i386** image directory on your RIS server and then restart the RIS services. The RIS driver and **.inf** file are also available in the Windows driver package, which can be downloaded from [support.dell.com](http://support.dell.com).

To install the Broadcom driver package with ADS, you must copy the RIS driver and **.inf** files into one or more locations of the ADS image file to properly set up the remote installation. See the ADS documentation for instructions on where to place the driver files in ADS.

Once the driver files have been copied into the server image, you can proceed to install the Broadcom driver package using remote services. The recommended method for installing the drivers with remote services is first to extract the drivers from the installer file by running **setup.exe /a** and then set up the remote installer answer file to install the drivers using the Windows Plug and Play wizard. Installing the drivers as a separate step ensures that all required drivers are installed to support the Broadcom network controllers.

The remainder of the Broadcom driver package, which includes the management software, Broadcom Advanced Control Suite (BACS), is installed after the remote service installs the operating system. The Broadcom **setup.exe** installer file can be set up to run from the post-installation portion of the unattended answer file. For more information on how to use the unattended answer file, see the *Microsoft Windows Corporate Deployment Tools User's Guide*. For information about unattended installation options specific to the Broadcom driver package, see the **silent.txt** file located on the *Broadcom Driver Installation CD* in the same directory as the **setup.exe** file. Additional information on adding a network adapter to a RIS installation is available in Microsoft Knowledge Base article 315279.



**NOTE:** Network configuration parameters cannot be set in the unattended answer file using the **PCI Bus/Device/Function** field. You must use the **MAC** address field to specify the interface to receive the network settings.

To further customize your RIS installation to assign IP addresses and other network settings, you can use WMI scripts in the post-installation phase of the unattended answer file.

Microsoft also provides the program **netset.exe** in the Windows 2000 Server Resource Kit. **Netset.exe** uses the unattended answer file to apply network settings specified in the answer file to network connections that failed to properly receive those settings during installation. For more information on **netset.exe**, see the Microsoft Windows 2000 Server Resource Kit, or see the Microsoft Knowledge Base article 268781.

## Firewalls and TOE

Installing or activating firewall applications disables TOE for all TOE-enabled NICs in a system. A firewall application must examine all incoming packets and frames to implement its protection mechanisms. This firewall function is incompatible with the packet-offload operation of TOE.

## Windows Network Bridging, VPN, and Routing With TOE

If you enable certain networking components in Windows like VPN, bridging, or routing services, the Windows operating system also enables IP NAT and IPSEC Policy Agent by default. TOE will not function with these services and disabling these services is not enough to re-enable TOE. You must turn off IP NAT and IPSEC Policy Agent before TOE will function. Use the following commands at a command prompt to turn off IP NAT and IPSEC Policy Agent.

```
net stop accesspolicy <Enter>
```

```
net stop sharedaccess <Enter>
```

```
net stop ipnat <Enter>
```

## Linux High-Stress Environments Running Multiple NetXtreme II Adapters

In high-stress Linux environments running multiple NetXtreme II NICs, the Broadcom 5708 network connection may run out of receive buffers. The default receive descriptor ring size for a 5708 connection is 100. If network traffic shows excessive dropped packets and connection timeouts, increase the size of the receive description ring using the following command string.

```
ethtool -g ethn rx size
```

where *n* is the number of the Ethernet channel and *size* is the new size of the receive description ring.

The following example changes the receive ring size for eth0 to 400:

```
ethtool -g eth0 rx 400
```

When prompted to verify the change, enter the following command:

```
ethtool -g eth0
```

To make the updated receive descriptor ring setting permanent, do the following:

- For Red Hat® Linux, add the **ethtool** entry to **/etc/rc.d/rc.local**.
- For SUSE® Linux, perform the following procedure:
  - a** Add the following to the interface configuration file in **/etc/sysconfig/network**.

```
POST_UP_SCRIPT=set_ring_size
```

- b** Create a **set\_ring\_size** script file with the following commands and place it in **/etc/sysconfig/network/scripts**.

```
#!/bin/bash
```

```
ethtool -g ethn rx size
```

where *n* is the number of the Ethernet channel and *size* is the new size of the receive description ring.

- c** Make the script executable by running the following command:

```
chmod +x set_ring_size
```