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# BROADCOM NETLINK<sup>®</sup>/NETXTREME<sup>®</sup> 57XX USER GUIDE

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# Functionality and Features: Broadcom NetLink<sup>®</sup>/NetXtreme<sup>®</sup> 57XX User Guide

- [Functionality and Features](#)
- [Supported Operating Systems](#)
- [Network Link and Activity Indication](#)

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## FUNCTIONALITY AND FEATURES

### FUNCTIONAL DESCRIPTION

Broadcom NetXtreme<sup>®</sup> Gigabit Ethernet adapters connect a PCI Express<sup>™</sup> compliant computer to a Gigabit Ethernet network. The network adapter incorporate a technology that transfers data at a maximum rate of 1 gigabit per second—10 times the rate of Fast Ethernet adapters.

### FEATURES

The following is a list of the Broadcom network adapter features for all supported operating systems. For features specific to your NetLink/NetXtreme network adapter, see [Table 1](#).

- Gigabit Ethernet (IEEE Std 802.3-1999)
- Logical Link Control (IEEE Std 802.2)
- Flow Control (IEEE Std 802.3x)
- Standard Ethernet frame size (1518 bytes)
- Layer-2 Priority Encoding (IEEE 802.1p)
- High-speed on-chip RISC processor
- Adaptive interrupt frequency
- Up to four classes of service (CoS)
- Up to four send rings and receive rings
- Integrated 96 KB frame buffer memory
- GMI/MII management interface
- Statistics for SNMP MIB II, Ethernet-like MIB, and Ethernet MIB (IEEE Std 802.3z, Clause 30)
- Four unique MAC unicast addresses
- Support for multicast addresses via 128 bits hashing hardware function
- Serial EEPROM or serial NVRAM flash memory
- Supports PXE 2.1 specification (Linux Red Hat PXE Server, Windows Server 2003, Intel APITEST, DOS UNDI)
- JTAG support
- PCI Power Management Interface (v1.1)
- PCI Express<sup>™</sup> v1.0A, x1 or greater

- ACPI and Wake on LAN support
- 64-bit BAR support
- EM64T processor support
- 3.3 V/1.8 V CMOS with 5V tolerant I/Os
- Self boot
- Receive Side Scaling (RSS)

Table 1: Feature vs. Network Adapter Family

Feature	NetLink	NetXtreme
<b>Base Drivers</b>		
Flow Control	X	X
Jumbo Frames	—	X
PCI Hot Plug	X <sup>b</sup>	X
Unattended Install	X	X
Auto-Negotiate	X	X
802.1p (priority encoding)	X	X
Wake on LAN (WOL)	X	X
LSO IPv4	X	X
LSO IPv6 <sup>a</sup>	X	X
UDP/IP Checksum Offload IPv4 (tx and rx)	X	X
UDP/IP Checksum Offload IPv6 (tx only) <sup>a</sup>	X	X
TCP/IP Checksum Offload IPv4 (tx and rx)	X	X
TCP/IP Checksum Offload IPv6 (tx only) <sup>a</sup>	X	X
IPsec Task Offload	—	X
TPM 1.1b	—	X <sup>c</sup>
TPM 1.2	—	X
<b>Broadcom Advanced Control Suite (BACS)</b>		
Power Management	—	X
Vital Sign	—	X
Diagnostics	X	X
Cable Diagnostic	—	X
Selective Teaming	—	X
Teaming Configuration	—	X
Teaming Statistics	—	X
Statistics	—	X
Network Test	—	X
<b>Broadcom Advanced Server Program (BASP)</b>		
SLB	—	X
Generic Trunking	—	X
Link Aggregation	—	X
Failover	—	X
LSO	—	X
Probe Packets	—	X
VLANs	—	X
<b>Miscellaneous</b>		
Clockrun	—	X
Receive Side Scaling (RSS)	—	X
Self Boot	X	X

*Table 1: Feature vs. Network Adapter Family*

<b>Feature</b>	<b>NetLink</b>	<b>NetXtreme</b>
Alert Standard Format (ASF) 1.0	—	X
Alert Standard Format (ASF) 2.0	—	X
TruManage™	—	X
UMP	—	X
IPMI Passthrough	—	X

a. Not on all NetLink and NetXtreme network adapters.

b. Not on all NetLink network adapters.

c. Not on all NetXtreme network adapters.

## Power Management

Wake on LAN (Magic Packet, Wake Up Frame, specific pattern) is supported at 10/100 Mbps operation only.



**Note:** Adapter speed connection when the system is down waiting for a wake-up signal is either 10 Mbps or 100 Mbps, but can return to 1000 Mbps when the system is up and running if connected to a 1000 Mbps capable switch. Systems intending to use Wake on LAN (WOL) should be connected to a switch capable of both 1000 and 10/100 Mbps speeds.

## Adaptive Interrupt Frequency

The adapter driver intelligently adjusts host interrupt frequency based on traffic conditions, to increase overall application throughput. When traffic is light, the adapter driver interrupts the host for each received packet, minimizing latency. When traffic is heavy, the adapter issues one host interrupt for multiple, back-to-back incoming packets, preserving host CPU cycles.

## Dual DMA Channels

The PCI interface on Broadcom NetXtreme Gigabit Ethernet adapters contains two independent DMA channels for simultaneous read and write operations.

## 32-Bit or 64-Bit PCI Bus Master

Compliant with PCI Local Bus Rev 2.3, the PCI interface on Broadcom NetXtreme Gigabit Ethernet adapters is compatible with both 32-bit and 64-bit PCI buses. As a bus master, the adapter requests access to the PCI bus, instead of waiting to be polled.

## ASIC with Embedded RISC Processor

The core control for Broadcom NetXtreme Gigabit Ethernet adapters resides in a tightly integrated, high-performance ASIC. The ASIC includes a RISC processor. This provides the flexibility to add new features to the card and adapt it to future network requirements through software downloads. This also enables the adapter drivers to exploit the built-in host offload functions on the adapter as host operating systems are enhanced to take advantage of these functions.



## Broadcom Advanced Control Suite

Broadcom Advanced Control Suite (BACS) is an integrated utility that provides useful information about each network adapter that is installed in your system. The BACS utility also enables you to perform detailed tests, diagnostics, and analysis on each adapter, as well as to modify property values and view traffic statistics for each adapter. See [“Using Broadcom Advanced Control Suite”](#) for detailed information and instructions.

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## SUPPORTED OPERATING SYSTEMS

Broadcom NetXtreme Gigabit Ethernet adapters have software support for the following operating systems:

- Microsoft® Windows® XP Family
- Microsoft® Windows® Vista™ Family
- Microsoft® Windows® 7 Family
- Microsoft® Windows® 8 Family
- Linux® (32-bit and 64-bit extended)
- MS-DOS®
- NetWare®

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## NETWORK LINK AND ACTIVITY INDICATION

The state of the network link and activity is indicated by the port LEDs adjacent to the RJ-45 connector, as described in [Table 2](#). Broadcom Advanced Control Suite also provides information about the status of the network link and activity (see “Vital Sign”).

**Table 2: Network Link and Activity Indicated by the Port LEDs**

<b>Port LED</b>	<b>LED Appearance</b>	<b>Network State</b>
Link LED	Off	No link (cable disconnected)
	Continuously illuminated	Link
Activity LED	Off	No network activity
	Illuminated and blinking	Network activity





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# Teaming: Broadcom NetLink®/NetXtreme® 57XX User Guide

- [Broadcom Advanced Server Program Overview](#)
- [Load Balancing and Fault Tolerance](#)

## BROADCOM ADVANCED SERVER PROGRAM OVERVIEW

Adapter teaming allows you to group any available network adapters together to function as a team, the benefit of which enables membership to VLANs on different subnets. You also can add virtual LANs (VLANs) to a team, which enables you to add multiple virtual adapters that are on different subnets. The benefit of adding VLANs to a team, is that each virtual adapter can belong to multiple subnets. With a VLAN, you can couple the functionality of load balancing for the load balance members, and with the capability of employing a failover adapter.

Broadcom Advanced Server Program (BASP) is the Broadcom teaming software for Windows Server 2003, Windows 8, Windows 7, Vista, Windows XP, and NetWare operating systems. For Windows operating systems, BASP runs within the BACS utility. For NetWare operating systems, teams are configured by loading BASP with all the necessary frames for the team (see “Configuring Teaming”).



**Note:** BASP is not supported on all Broadcom network adapters.

BASP supports four types of load balancing teams:

- Smart Load Balancing™ and Failover
- Link Aggregation (802.3ad)
- Generic Trunking (FEC/GEC)/802.3ad-Draft Static
- SLB (Auto-Fallback Disable)



**Note:** Enabling Windows Server 2003 built-in bridging is not advisable when you are using teaming software.

## LOAD BALANCING AND FAULT TOLERANCE

Teaming provides traffic load balancing and fault tolerance (redundant adapter operation in the event that a network connection fails). When multiple adapters are installed in the same system, they can be grouped into teams, creating a virtual adapter.

A team can consist of one to eight network interfaces, and each interface can be designated as a primary interface or a standby interface (standby interfaces can be used only in a Smart Load Balancing™ and Failover (SLB) or SLB (Auto-Fallback Disabled) type of team, and only one standby interface can be designated per SLB team). If traffic is not identified on any of the adapter team member connections due to failure of the adapter, cable, switch port, or switch (where the teamed adapters are attached to separate switches), the load distribution is reevaluated and reassigned among the remaining team



members. In the event that all of the primary adapters are down, the hot standby adapter becomes active. Existing sessions are maintained and there is no impact on the user.

## Types of Teams

The available types of teams for the supported operating systems are shown in the following table:

**Table 1: Types of Teams**

<b>Operating System</b>	<b>Available Types of Teams</b>
Windows Server 2003 Windows 8 Windows 7 Windows XP Windows Vista	Smart Load Balancing and Failover Link Aggregation (802.3ad) Generic Trunking (FEC/GEC)/802.3ad-Draft Static SLB (Auto-Fallback Disable)
Linux	Team adapters using the bonding kernel module and a channel bonding interface: Information on channel bonding can be found at <a href="http://www.redhat.com/docs/manuals/enterprise/RHEL-3-Manual/ref-guide/s1-modules-ethernet.html">http://www.redhat.com/docs/manuals/enterprise/RHEL-3-Manual/ref-guide/s1-modules-ethernet.html</a> .
NetWare	Smart Load Balancing Link Aggregation (802.3ad) Generic Trunking

## Smart Load Balancing™ and Failover

Smart Load Balancing™ and Failover is the Broadcom implementation of load balancing based on IP flow. This feature supports balancing IP traffic across multiple adapters (team members) in a bidirectional manner. This type of team provides automatic fault detection and dynamic failover to other team member or to a hot standby member. This is done independently of layer 3 protocol (IP, IPX, NetBEUI); rather, it works with existing layer 2 and layer 3 switches. No switch configuration (such as trunk, link aggregation) is necessary for this type of team to work.



### Notes:

- If you do not enable LiveLink™ when configuring teams, disabling Spanning Tree Protocol (STP) at the switch is recommended. This minimizes the downtime due to spanning tree loop determination when failing over. LiveLink mitigates such issues.
- IPX balances only on the transmit side of the team; other protocols are limited to the primary adapter.
- If a team member is linked at 1000 Mbit/s and another team member is linked at 100 Mbit/s, most of the traffic is handled by the 1000 Mbit/s team member.

## Link Aggregation (802.3ad)

This mode supports link aggregation and conforms to the IEEE 802.3ad (LACP) specification. Configuration software allows you to dynamically configure which adapters you want to participate in a given team. If the link partner is not correctly configured for 802.3ad link configuration, errors are detected and noted. With this mode, all adapters in the team are configured to receive packets for the same MAC address. The outbound load-balancing scheme is determined by our BASP driver. The team link partner determines the load-balancing scheme for inbound packets. In this mode, at least one of the link partners must be in active mode.

## Generic Trunking (FEC/GEC)/802.3ad-Draft Static

The Generic Trunking (FEC/GEC)/802.3ad-Draft Static type of team is very similar to the Link Aggregation (802.3ad) type of team in that all adapters in the team need to be configured to receive packets for the same MAC address. The Generic Trunking (FEC/GEC)/802.3ad-Draft Static type of team, however, does not provide LACP or marker protocol support. This type of team supports a variety of environments in which the adapter link partners are statically configured to support a proprietary trunking mechanism. For instance, this type of team could be used to support Lucent's OpenTrunk or Cisco's Fast EtherChannel (FEC). Basically, this type of team is a light version of the Link Aggregation (802.3ad) type of team. This approach is much simpler, in that there is not a formalized link aggregation control protocol (LACP). As with the other types of teams, the creation of teams and the allocation of physical adapters to various teams is done statically through user configuration software.

The Generic Trunking (FEC/GEC/802.3ad-Draft Static) type of team supports load balancing and failover for both outbound and inbound traffic.

## SLB (Auto-Fallback Disable)

The SLB (Auto-Fallback Disable) type of team is identical to the Smart Load Balance and Fail Over type of team, with the following exception—when the standby member is active, if a primary member comes back on line, the team continues using the standby member, rather than switching back to the primary member.

If any primary adapter assigned to a team is disabled, the team functions as a Smart Load Balancing and Failover type of team in which auto-fallback occurs.

All primary interfaces in a team participate in load-balancing operations by sending and receiving a portion of the total traffic. Standby interfaces take over in the event that all primary interfaces have lost their links.

Failover teaming provides redundant adapter operation (fault tolerance) in the event that a network connection fails. If the primary adapter in a team is disconnected because of failure of the adapter, cable, or switch port, the secondary team member becomes active, redirecting both inbound and outbound traffic originally assigned to the primary adapter. Sessions will be maintained, causing no impact to the user.

## Limitations of Smart Load Balance and Fail Over/SLB (Auto-Fallback Disable) Types of Teams

Smart Load Balancing™ (SLB) is a protocol-specific scheme. The level of support for IP, IPX, and NetBEUI protocols is listed below.

**Table 2: Smart Load Balancing**

Operating System	Failover/Fallback—All Broadcom			Failover/Fallback—Multivendor		
	IP	IPX	NetBEUI	IP	IPX	NetBEUI
Windows Server 2003	Y	Y	N/S	Y	N	N/S
Windows XP	Y	Y	Y	Y	N	N
NetWare 5.1/6.5	Y	Y	N/S	Y	N	N/S
Red Hat Linux 3 and 4	Y	N/S	N/S	Y	N/S	N/S
	Load Balance—All Broadcom			Load Balance—Multivendor		
	IP	IPX	NetBEUI	IP	IPX	NetBEUI
Windows Server 2003	Y	Y	N/S	Y	N	N/S
Windows XP	Y	Y	Y	Y	N	N

**Table 2: Smart Load Balancing**

<b>Operating System</b>	<b>Failover/Fallback—All Broadcom</b>			<b>Failover/Fallback—Multivendor</b>		
NetWare 5.1/6.5	Y	Y	N/S	Y	Y	N/S
Red Hat Linux 3 and 4	Y	N/S	N/S	Y	N/S	N/S

**Legend:** Y = yes  
 N = no  
 N/S = not supported

Drivers for third-party network adapters must be Netware Event Service Layer (NESL) compliant for NetWare to be fault-tolerant and load-balanced in a multivendor team.

The Smart Load Balancing type of team works with all Ethernet switches without having to configure the switch ports to any special trunking mode. Only IP traffic is load-balanced in both inbound and outbound directions. IPX traffic is load-balanced in the outbound direction only. Other protocol packets are sent and received through one primary interface only. Failover for non-IP traffic is supported only for Broadcom network adapters. The Generic Trunking type of team requires the Ethernet switch to support some form of port trunking mode (for example, Cisco's Gigabit EtherChannel or other switch vendor's Link Aggregation mode). The Generic Trunking type of team is protocol-independent, and all traffic should be load-balanced and fault-tolerant.



**Note:** If you do not enable LiveLink™ when configuring teams, disabling Spanning Tree Protocol (STP) at the switch is recommended. This minimizes the downtime due to the spanning tree loop determination when failing over. LiveLink mitigates such issues.

## LiveLink™ Functionality

LiveLink™ functionality is a feature of BASP that is available only for the Smart Load Balancing™ and Failover type of teaming. The purpose of LiveLink is to detect link loss beyond the switch and to route traffic only through team members that have a live link. This function is accomplished through the teaming software. The teaming software periodically probes (issues a link packet from each team member) one or more specified target network device(s). The probe target(s) responds when it receives the link packet. If a team member does not detect a response within a specified amount of time after a specified number of retries, the teaming software discontinues passing traffic through that team member. Later, if that team member begins to detect a response from a probe target, this indicates that the link has been restored, and the teaming software automatically resumes passing traffic through that team member. LiveLink works only with TCP/IP.

LiveLink™ functionality is supported in both 32-bit and 64-bit Windows operating systems, but is not supported in NetWare systems. See the Channel Bonding documentation for similar functionality in Linux Channel Bonding (see <http://www.redhat.com/docs/manuals/enterprise/RHEL-3-Manual/ref-guide/s1-modules-ethernet.html>).

## Teaming and Large Send Offload/Checksum Offload Support

Large Send Offload (LSO) and Checksum Offload are automatically enabled for a team only if LSO and Checksum Offload are supported and configured on all members of a team.

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# Virtual LANs: Broadcom NetLink®/NetXtreme® 57XX User Guide

- [VLAN Overview](#)
- [Adding VLANs to Teams](#)

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## VLAN OVERVIEW

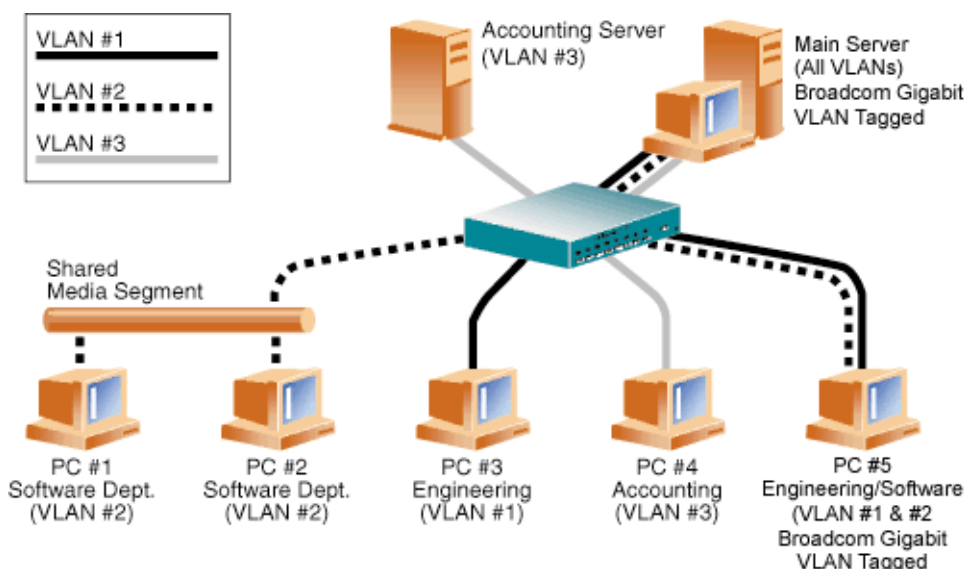
Virtual LANs (VLANs) allow you to split your physical LAN into logical parts, to create logical segmentation of workgroups, and to enforce security policies for each logical segment. Each defined VLAN behaves as its own separate network with its traffic and broadcasts isolated from the others, increasing bandwidth efficiency within each logical group. Up to 64 VLANs (63 tagged and 1 untagged) can be defined for each Broadcom adapter on your system, depending on the amount of memory available in your system.



**Note:** VLANs are not supported on all Broadcom network adapters.

VLANs can be added to a team to allow multiple VLANs with different VLAN IDs. A virtual adapter is created for each VLAN added.

Although VLANs are commonly used to create individual broadcast domains and/or separate IP subnets, it is sometimes useful for a server to have a presence on more than one VLAN simultaneously. Broadcom adapters support multiple VLANs on a per-port or per-team basis, allowing very flexible network configurations.



**Figure 1: Example of Systems Supporting Multiple VLANs with Tagging**

Figure 1 above shows an example network that uses VLANs. In this example network, the physical LAN consists of a switch, two systems, and five clients. The LAN is logically organized into three different VLANs, each representing a different IP subnet. The features of this network are described in [Table 1](#):

**Table 1: Example VLAN Network Topology**

<b>Component</b>	<b>Description</b>
VLAN #1	An IP subnet consisting of the Main System, PC #3, and PC #5. This subnet represents an engineering group.
VLAN #2	Includes the Main System, PCs #1 and #2 via shared media segment, and PC #5. This VLAN is a software development group.
VLAN #3	Includes the Main System, the Accounting System and PC #4. This VLAN is an accounting group.
Main System	A high-use system that needs to be accessed from all VLANs and IP subnets. The Main System has a Broadcom adapter installed. All three IP subnets are accessed via the single physical adapter interface. The system is attached to one of the switch ports, which is configured for VLANs #1, #2, and #3. Both the adapter and the connected switch port have tagging turned on. Because of the tagging VLAN capabilities of both devices, the system is able to communicate on all three IP subnets in this network, but continues to maintain broadcast separation between all of them.
Accounting System	Available to VLAN #3 only. The Accounting System is isolated from all traffic on VLANs #1 and #2. The switch port connected to the system has tagging turned off.
PCs #1 and #2	Attached to a shared media hub that is then connected to the switch. PCs #1 and #2 belong to VLAN #2 only, and are logically in the same IP subnet as the Main System and PC #5. The switch port connected to this segment has tagging turned off.
PC #3	A member of VLAN #1, PC #3 can communicate only with the Main System and PC #5. Tagging is not enabled on PC #3 switch port.

*Table 1: Example VLAN Network Topology*

<i>Component</i>	<i>Description</i>
PC #4	A member of VLAN #3, PC #4 can only communicate with the systems. Tagging is not enabled on PC #4 switch port.
PC #5	A member of both VLANs #1 and #2, PC #5 has an Broadcom adapter installed. It is connected to switch port #10. Both the adapter and the switch port are configured for VLANs #1 and #2 and have tagging enabled.



**Note:** VLAN tagging is only required to be enabled on switch ports that create trunk links to other switches, or on ports connected to tag-capable end-stations, such as systems or workstations with Broadcom adapters.

## ADDING VLANS TO TEAMS

Each team supports up to 64 VLANs (63 tagged and 1 untagged). Note that Broadcom adapters can be part of a team with VLANs. With multiple VLANs on an adapter, a server with a single adapter can have a logical presence on multiple IP subnets. With multiple VLANs in a team, a system can have a logical presence on multiple IP subnets and benefit from load balancing and failover. For instructions on adding a VLAN to a team, see [Adding VLANs to Teams](#) for Windows operating systems.



**Note:** Adapters that are members of a failover team can also be configured to support VLANs.





# Windows Driver Software: Broadcom NetLink®/NetXtreme® 57XX User Guide

- [Installing the Driver Software](#)
- [Updating the Driver Software](#)
- [Removing the Driver Software](#)
- [Viewing or Changing the Properties of the Controller](#)
- [Setting Power Management Options](#)

## INSTALLING THE DRIVER SOFTWARE



### Notes:

- These instructions are based on the assumption that your Broadcom NetXtreme Gigabit Ethernet Controller was not factory installed. If your adapter was installed at the factory, the driver software has been installed for you.
- For Vista systems, the driver software has been installed for you. To ensure your machine has the latest driver, see [Updating the Driver Software](#).

When Windows first starts after a hardware device (such as a Broadcom NetXtreme 57XX Gigabit Ethernet Controller) has been installed, or after the existing device driver has been removed, the operating system automatically detects the hardware and prompts you to install the driver software for that device.

Both a graphical interactive installation mode (see [Using the Driver Installer](#)) and a command-line silent mode for unattended installation (see [Using Silent Installation](#)) are available.



### Notes:

- Before installing the driver software, verify that the Windows operating system has been upgraded to the latest version with the latest service pack applied.
- A network device driver must be installed before the Broadcom NetXtreme 57XX Gigabit Ethernet Controller can be used with your Windows operating system. Drivers are located on the installation CD as well as the Broadcom website at [http://www.broadcom.com/support/ethernet\\_nic/downloaddrivers.php](http://www.broadcom.com/support/ethernet_nic/downloaddrivers.php).

## Using the Driver Installer

1. When the **Found New Hardware Wizard** appears, click **Cancel**.
2. Insert the installation CD into the CD or DVD drive.
3. On the installation CD, open the folder containing the driver installer program (Setup.exe), and then double-click Setup.exe to launch the InstallShield® Wizard.



**Note:** If you have a standard account on a Vista system, you will receive the User Account Control dialog box. Verify



the presented information and select **Continue**.

4. Click **Next** to continue.
5. After you review the license agreement, **click I accept the terms in the license agreement**, and then click **Next** to continue.
6. Click **Install**.
7. Click **Finish** to close the wizard.

## Using Silent Installation

For silent installation, run commands at the command prompt.



### Notes:

- All commands are case sensitive.
- The Command Prompt must be "Run as Administrator" when using "msiexec" for "silent" install/uninstall(s).
- For more detailed instructions and information about unattended installs, refer to the Silent.txt file in the Tools\DrvInst\ia32 folder.

### To perform a silent install from within the installer source folder

Type the following:

```
setup /s /v/qn
```

or

```
msiexec /i "BDrvInst.msi" /qn
```

### To perform a silent upgrade from within the installer source folder

Type the following:

```
setup /s /v/qn
```

### To perform a silent uninstall from within the installer source folder

Type the following:

```
msiexec /x "BDrvInst.msi" /qn
```

### To perform a silent uninstall from any folder

Type the following:

```
msiexec /x "{B7F54262-AB66-44B3-88BF-9FC69941B643}" /qn
```

### To perform a silent reinstall of the same installer

Type the following:

```
setup /s /v"/qn REINSTALL=ALL"
```

### To perform a GUI reinstall of the same installer

Type the following:

```
setup /V"REINSTALL=ALL"
```

### Using the Found New Hardware Wizard

These instructions are based on the assumption that you are using Windows XP Service Pack 2.

1. When the **Found New Hardware Wizard** opens, click **No**, not this time, and then click **Next**.
2. Click **Install from a list or specific location (Advanced)**, and then click **Next**.
3. Click **Include this location in the search**, browse to the folder on the installation CD where the drivers for Windows XP are located, and then click **Next**.
4. Click **Finish** to close the wizard.

## UPDATING THE DRIVER SOFTWARE

### To update the driver software

You must have administrative rights to update the driver software. If you have a standard account on Windows Vista, you will receive the User Account Control dialog box. Verify the presented information and select **Continue**.

1. Start Windows and log on.
2. In Control Panel, click **System** to view **System Properties**.
3. Click the **Hardware** tab, and then click **Device Manager**.
4. Right-click the name of the Broadcom NetXtreme 57XX Gigabit Ethernet Controller and click **Update Driver**.
5. Click **Include this location in the search**, browse to the folder on the installation CD where the drivers are located, and then click **Next**.
6. Click **Finish** to close the wizard.

## REMOVING THE DRIVER SOFTWARE

You must have administrative rights to update the driver software. If you have a standard account on Windows Vista, you will receive the User Account Control dialog box. Verify the presented information and select **Continue**.

1. In **Control Panel**, double-click **Add or Remove Programs**.
2. Click **Broadcom Gigabit Integrated Controller**, and then click **Remove**.
3. Click **Yes** to remove the drivers.
4. Click **OK**.



**Note:** You can also remove the device drivers by running the InstallShield installer again and clicking **Remove**.

## VIEWING OR CHANGING THE PROPERTIES OF THE CONTROLLER

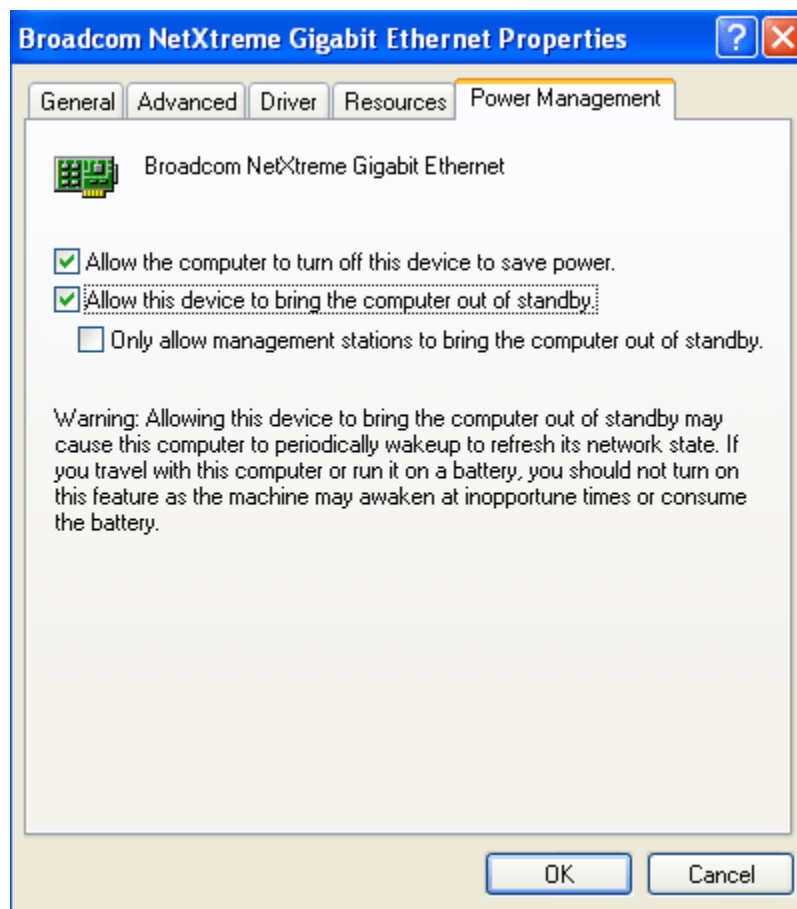
### To view or change the properties of the Broadcom NetXtreme 57XX Gigabit Ethernet Controller

1. In **Control Panel**, click (or double-click) **Broadcom Control Suite**.
2. Click the **Advanced** tab.

3. See [Setting Adapter Properties](#) for a detailed description of the available properties as well as for instructions for viewing and changing the value of a particular property.

## SETTING POWER MANAGEMENT OPTIONS

You can set Power Management options to allow the operating system to turn off the adapter to save power or to allow the adapter to wake up the system. If the device is busy doing something (servicing a call, for example) however, the operating system will not shut down the device. The operating system attempts to shut down every possible device only when the system attempts to go into hibernation. To have the adapter stay on at all times, do not click the **Allow the computer to turn off the device to save power** check box.



### Notes:

- The Power Management tab is available only for systems that support power management.
- To enable Wake on LAN (WOL) when the system is on standby, select the **Allow the device to bring the computer out of standby** check box.
- If you select **Only allow management stations to bring the computer out of standby**, the system can be brought out of standby *only by Magic Packet*, regardless of the settings in **Wake Up Capabilities**.

# NDIS2 Driver Software: Broadcom NetLink®/ NetXtreme® 57XX User Guide

- [Preinstallation Requirements](#)
- [Installing the NDIS2 Driver Software for Use on MS-DOS Platforms](#)
- [Configuring the NDIS2 Driver Software](#)

## PREINSTALLATION REQUIREMENTS

Before you can successfully install the NDIS2 driver software, the Broadcom NetXtreme Gigabit Ethernet adapter must be physically installed in the system. Networking software that is appropriate to the operating system (such as Microsoft LAN Manager 2.2 for MS-DOS) must already be running on your system.

## INSTALLING THE NDIS2 DRIVER SOFTWARE FOR USE ON MS-DOS PLATFORMS

The NDIS2 driver software can be run from an MS-DOS startup disk using Microsoft Network Client 3.0 or from the hard disk using Microsoft LAN Manager 2.2.

### Creating a Startup Disk to Run Microsoft Network Client

To perform this installation you must have the following items:

- Windows NT Server 4.0 CD-ROM
- A blank MS-DOS system disk (3.5" high-density floppy disk)
- Access to the Broadcom NDIS2 driver file (B57.dos). This file is located on the installation CD.



#### Notes:

- **Windows NT Server 4.0 users.** When running **Setup for Microsoft Network Client v3.0 for MS-DOS**, click any network card from the list (**NE2000 Compatible**, for example) to create the startup disk.
- After creating the startup disk, follow the instructions in [Modifying the Startup Disk](#).

### To create a startup disk

1. Create a folder called NCADMIN in the root of the C drive.
2. Copy the NCADMIN.CN\_, NCADMIN.EX\_, and NCADMIN.HL\_ files from the I386 folder on the Windows NT Server 4.0 CD-ROM.
3. Open a command prompt window and change the directory to C:\NCADMIN.
4. Type `expand -r ncadmin.*` and press ENTER.
5. Close the command prompt window by typing `exit` and then pressing ENTER.
6. Start Windows Explorer.
7. Open the NCADMIN folder and double-click **ncadmin.exe**.
8. Follow the on-screen instructions to make the network startup disk (choose **NE2000 Compatible** from the list of adapters).

## Modifying the Startup Disk

To modify the startup disk

1. Edit A:\Net\Protocol.ini with Notepad or a similar text editor.
  - a. Change DriverName=\$ to DriverName=B57\$.
  - b. Remove all other parameter entries under the [MS\$NE2CLONE] or equivalent section such as IOBASE=0x300 or INTERRUPT=3, and so on.

Example: Protocol.ini file for IP

```
[network.setup]
version=0x3110
netcard=ms$ne2clone,1,MS$NE2CLONE,1
transport=tcpip,TCPIP
lana0=ms$ne2clone,1,tcpip
[MS$NE2CLONE]
DriverName=B57$
[protman]
DriverName=PROTMAN$
PRIORITY=MS$NDISHLP
[tcpip]
NBSessions=6
DefaultGateway=0
SubNetMask=255 0 0 0
IPAddress=192 168 0 1
DisabledDHCP=0
DriverName=TCPIP$
BINDINGS=MS$NE2CLONE
LANABASE=0
```

Example: Protocol.ini file for IPX

```
[network.setup]
version=0x3110
netcard=ms$ne2clone,1,MS$NE2CLONE,1
transport=ms$ndishlp,MS$NDISHLP
transport=ms$nwlink,MS$NWLINK
lana0=ms$ne2clone,1,ms$nwlink
lana1=ms$ne2clone,1,ms$ndishlp
[MS$NE2CLONE]
DriverName=B57$
[protman]
DriverName=PROTMAN$
PRIORITY=MS$NDISHLP
[MS$NDISHLP]
DriverName=ndishlp$
BINDINGS=ms$ne2clone
[ms$nwlink]
DriverName=nwlink$
FRAME=Ethernet_802.2
BINDINGS=MS$NE2CLONE
LANABASE=0
```

Example: Protocol.ini file for NetBEUI

```
[network.setup]
version=0x3110
netcard=ms$ne2clone,1,MS$NE2CLONE,1
transport=ms$ndishlp,MS$NDISHLP
```

```
transport=ms$netbeui,MS$NETBEUI
lana0=ms$ne2clone,1,ms$ndishlp
lana1=ms$ne2clone,1,ms$netbeui
[MS$NE2CLONE]
DriverName=B57$
[protman]
DriverName=PROTMAN$
PRIORITY=MS$NDISHLP
[MS$NDISHLP]
DriverName=ndishlp$
BINDINGS=MS$NE2CLONE
[MS$NETBEUI]
DriverName=netbeui$
SESSIONS=10
NCBS=12
BINDINGS=MS$NE2CLONE
LANABASE=0
```

2. Edit A:\Net\System.ini.

- a. Change netcard= to netcard=b57.dos.
- b. Check for references to C:\NET and change C:\NET to A:\NET if necessary.

Example: System.ini file

```
[network]
sizeworkbuf=1498
filesharing=no
printsharing=no
autologon=yes
computername=MYPC
lanroot=A:\NET
username=USER1
workgroup=WORKGROUP
reconnect=yes
dospophotkey=N
lmlogon=0
logondomain=
preferredredir=basic
autostart=basic
maxconnections=8
[network drivers]
netcard=B57.dos
transport=ndishlp.sys,*netbeui
devdir=A:\NET
LoadRMDrivers=yes
```

3. Copy **B57.dos** to **A:\Net**.

4. Create the appropriate Autoexec.bat file in drive A for the chosen protocol as shown below.

For TCP/IP

```
path=a:\net
a:\net\net initialize
a:\net\netbind.com
a:\net\umb.com
a:\net\tcptsr.exe
a:\net\tinyrhc.exe
a:\net\nmtsr.exe
a:\net\emsbfr.exe
```

```
a:\net\net start basic
net use z: \\SERVERNAME\SHARENAME
```

#### For IPX

```
SET PATH=A:\NET
A:\NET\net initialize
A:\NET\nwlink
A:\NET\NET START BASIC
net use z: \\SERVERNAME\SHARENAME
```

#### For NetBEUI

```
SET PATH=A:\NET
A:\NET\NET START BASIC
net use z: \\SERVERNAME\SHARENAME
```

5. Create a Config.sys file on the startup disk in drive A as shown below.

```
files=30
device=a:\net\ifshlp.sys
lastdrive=z
```

## Installing the DOS NDIS2 Driver Software on the Hard Disk

### To install the DOS NDIS2 Driver Software on the hard disk

1. Verify that the system has Microsoft LAN Manager 2.2 installed, with a protocol such as NetBEUI configured.
2. Create a folder on your hard disk to store the NDIS 2.01 driver.  
Example: C:\LANMAN
3. Copy the B57.dos file to this folder.
4. Edit the Config.sys file by adding the following lines:  
DEVICE = C:\LANMAN\PROTMAN.DOS  
DEVICE = C:\LANMAN\B57.DOS  
DEVICE = C:\LANMAN\NETBEUI.DOS
5. Edit the Autoexec.bat file by adding the following lines:  
C:\LANMAN\NETBIND.EXE  
C:\LANMAN\NET START WORKSTATION  
C:\LANMAN\NET USE *drive letter*: \\*server name*\*resource name*
6. Edit the Protocol.ini file (located in C:\LANMAN) to configure the driver to bind with NetBEUI or any other protocols.  
Example:

```
PROTOCOL MANAGER]
DriverName = PROTMAN$
NETBEUI_XIF]
DriverName = netbeui$
BINDINGS = B57
B57]
DriverName = "B57$"
```

7. Restart the computer to complete the installation.



**Note:** The driver loads during system configuration and displays the Broadcom banner, controller name, MAC address, IRQ number, detected line speed, and the controller BusNum and DevNum. If the driver fails to load, an *initialization fail* message is displayed.



---

## CONFIGURING THE NDIS2 DRIVER SOFTWARE

The NDIS2 driver software can be configured by adding specific optional keywords to the Protocol.ini file. If multiple (or multiport) Broadcom NetXtreme Gigabit Ethernet adapters are installed in a system, the NDIS2 driver software loads by default on the adapter/port that has a good link. If 2 or more adapters have a good link, the NDIS2 driver software loads on the adapter having the latest Device ID. If 2 or more adapters that have a good link have the same Device ID, the NDIS2 driver software loads on the adapter that is located in the slot having the lowest bus number.

NOTE: On MS-DOS platforms, it is not recommended to load the NDIS2 driver software on more than 1 adapter; the required NDIS2 protocol manager that supports multiple binds is not available in the MS-DOS environment.

If it is necessary to have the NDIS2 driver load on certain adapters in a certain order, the BusNum, DevNum, and FuncNum keywords can be used. Do not use these keywords unless you know how to configure PCI devices.

The **BusNum** keyword value, which represents the PCI bus number in which the adapter is located, is a decimal number ranging from 0 to 255.

The FuncNum keyword value, which represents the function (port) number of a multiport adapter, is a decimal number, with 0 representing the first port, and 1 representing the second port.

The DevNum keyword value, which represents the assigned device number, is a decimal number ranging from 0 to 31.

NOTE: At the end of the NDIS2 driver software installation process, note the BusNum and DevNum values that are displayed. Alternatively, use Broadcom Advanced Control Suite to view the bus number, function (port) number, and device number assigned to each adapter (Windows users only).

Example BusNum, DevNum, and FuncNum keyword entries for loading the NDIS2 driver on multiple adapters in a certain order are shown below:

```
[B57]
DRIVERNAME = B57$
BUSNUM = 3
DEVNUM = 10
[B57_2]
DRIVERNAME = B572$
BUSNUM 3
DEVNUM 11
[B57_3]
DRIVERNAME = B573$
BUSNUM 3
DEVNUM 12
[B57_4]
DRIVERNAME = B574$
BUSNUM 3
DEVNUM 13
```

The LineSpeed keyword is used to force the speed of the network connection. The LineSpeed keyword requires a decimal number and of either 10, 100, or 1000. Technically, a line speed of 1000 Mbit/s cannot be forced and can be achieved only through auto-negotiation. For the sake of simplicity, the driver performs auto-negotiation when the line speed is set to a value of 1000. Forced 1000 Mbit/s speed is not needed for copper links; auto-negotiation is the proper supported configuration under the IEEE Ethernet specification.

The Duplex keyword is used to force the duplex mode of the adapter. The Duplex keyword requires a text string of either HALF or FULL. When the Duplex keyword is used, the LineSpeed keyword must also be used. If neither keyword is used, the network adapter defaults to auto-negotiation mode.

The NodeAddress keyword specifies the network address used by the adapter. If a multicast address or a broadcast address is specified, the adapter uses the default MAC address.

The FixChecksumOff keyword turns off the driver workaround for the TCP/IP stack to recognize the ones complement version of the checksum.

Example entries for the LineSpeed, Duplex, and NodeAddress keywords are shown below:

```
[B57]
DRIVERNAME = B57$
BUSNUM = 3
DEVNUM = 10
PORTNUM = 0
LINESPEED = 100
DUPLEX = FULL
NODEADDRESS = 10010203040501
```

---

# ODI Driver Software: Broadcom NetLink®/ NetXtreme® 57XX User Guide

- [Installing the Driver Software](#)
- [Configuring the Driver Software](#)

The Open Data-Link Interface (ODI) driver software allows LAN drivers to work together irrespective of differences between the hardware and/or the protocol stacks of communicating computers. An intervening layer, called the link support layer (LSL), is responsible for routing different packet types between LAN drivers and protocol stacks.

## INSTALLING THE DRIVER SOFTWARE

Installing the ODI driver software involves the following steps:

1. Verifying that the MS-DOS operating system files are installed on your system hard disk or are available on a removable storage device.
2. Installing the ODI driver software in the MS-DOS environment.
3. If necessary, reconfiguring the driver software after installation.

### Preinstallation Requirements

Verify that the Broadcom NetXtreme Gigabit Ethernet adapter driver software has been installed on your system. If it has not, install it (see [Installing the Driver Software](#)). Otherwise, you cannot use a Broadcom NetXtreme Gigabit Ethernet adapter in the MS-DOS environment.



**Note:** To successfully install the adapter driver for MS-DOS, the adapter must be installed before you install the adapter driver.

### Installing the Novell NetWare Client32 Driver for MS-DOS

1. Extract the dw271.zip file to a temporary directory on the hard disk.
2. Double-click the dw271e.exe file.
3. Type y and then press ENTER when you are prompted for a response.
4. Restart your system in MS-DOS mode.
5. Change to the directory where the extracted files are located.
6. Type install, and then press ENTER.
7. Read the agreement, and then press ENTER to accept the agreement.
8. Using the UP ARROW or DOWN ARROW key as necessary, highlight **Novell Client for DOS (required)**, and then press **F10** to save and continue.
9. Highlight **32-bit LAN Drivers**, and then press **F10** to save and continue.
10. Insert the floppy disk containing the Broadcom 32-bit LAN driver files into the floppy disk drive.
11. Highlight **USER SPECIFIED 32-BIT DRIVER**, and then press ENTER.
12. Press ENTER.

13. Highlight **NetXtreme Gigabit Ethernet Driver**, and then press ENTER.
14. Press ENTER.
15. Select **Receive Buffers**, type **32** for the value, and then press **F10** to save and continue.



**Note:** Do not change the default settings for any of the other items in the **Installation Configuration Summary**.

16. Press **F10** to save and continue. The B57.LAN and B57.Ldi files are copied to the directory.
17. Restart the system to complete the install.
18. As the files are being loaded, the system attempts to attach to a Netware system using the frame types specified in Net.cfg. If the connection is successful, a dialog box is displayed. Change to drive F and log on to the NetWare system.



**Note:** The driver loads during system configuration, and the Broadcom banner, the adapter name, the MAC address, the IRQ number, the detected line speed, and the bus number (BusNum) and device number (DevNum) of the adapter are displayed. If the driver fails to load, an initialization fail message appears.

### Installing the Novell NetWare ODI Client16 Driver for MS-DOS

1. Extract each of the 6 vlm121\_\*.exe files to a temporary common directory on the hard disk.
2. Type y and then press ENTER each time you are prompted for a response.
3. Restart your system in MS-DOS mode.
4. Change to the directory where the extracted files are located.
5. Type install, and then press ENTER.
6. Using the UP ARROW or DOWN ARROW key as necessary, highlight **Highlight here and press <Enter>** to see the list below item 5, and then press ENTER.
7. Do not change the default settings for items 1 through 4. Insert the floppy disk containing the Broadcom ODI 16-bit driver files into the floppy disk drive.
8. Highlight **Other Drivers**, and then press ENTER.
9. Press ENTER.
10. Highlight **Broadcom Ethernet DOS ODI**, and then press ENTER.
11. Highlight **Frame Type**, and then press ENTER.
12. Highlight **Ethernet 802.2**, and then press ENTER.
13. Press F10 to save and continue.
14. Highlight **Highlight here and press <Enter>** to install, and then press ENTER.
15. The B57.com and B57.ins files are copied to the directory.
16. Restart the system to complete the install.
17. As the files are being loaded, the system attempts to attach to a Netware system using the frame types specified in Net.cfg. If the connection is successful, a dialog box is displayed.
18. Change to drive F and log on to the NetWare system.



**Note:** The driver loads during system configuration, and the Broadcom banner, the adapter name, the MAC address, the IRQ number, the detected line speed, and the bus number (BusNum) and device number (DevNum) assigned to the adapter are displayed. If the driver fails to load, an *initialization fail* message is displayed.

---

## CONFIGURING THE DRIVER SOFTWARE

The ODI driver software can be configured by adding specific optional keywords to the Net.cfg file.

If multiple (or multiport) Broadcom NetXtreme Gigabit Ethernet adapters are installed in a system, the ODI driver software loads by default on the adapter/port that has a good link. If 2 or more adapters have a good link, the ODI driver software loads on the adapter having the latest Device ID. If 2 or more adapters that have a good link have the same Device ID, the ODI driver software loads on the adapter that is located in the slot having the lowest bus number. If it is necessary to have the ODI driver load on certain adapters in a certain order, the **BusNum**, **DevNum**, and **FuncNum** keywords can be used. Do not use these keywords unless you know how to configure PCI devices.

The **BusNum** keyword value, which represents the PCI bus number in which the adapter is located, is a hexadecimal number ranging from 0 to 255.

The **FuncNum** keyword value, which represents the function (port) number of a multiport adapter, is a hexadecimal number with 0 representing the first port and 1 representing the second port.

The **DevNum** keyword value, which represents the assigned device number, is a hexadecimal number ranging from 0 to 31.



### Notes:

- At the end of the ODI driver software installation process, note the BusNum and DevNum values that are displayed. Alternatively, use Broadcom Advanced Control Suite to view the bus number, function (port) number, and device number assigned to each adapter (Windows users only).
- The values for the BusNum, DevNum, and FuncNum keywords are displayed in hexadecimal notation when the driver loads on the adapter.

For example, **BusNum**, **DevNum**, and **FuncNum** keyword entries for loading the ODI driver on multiple adapters in a certain order are shown below:

```
PROTOCOL <protocol name>
BIND B57
BIND B57
LINK DRIVER B57
BUSNUM 1
DEVNUM 9
FRAME <frame #1 name>
LINK DRIVER B57
BUSNUM 1
DEVNUM A
FRAME <frame #2 name>
```

The LineSpeed keyword is used to force the speed of the network connection. The LineSpeed keyword requires a decimal number and of either 10, 100, or 1000. Technically, a line speed of 1000 Mbit/s cannot be forced and can be achieved only through auto-negotiation. For the sake of simplicity, the driver performs auto-negotiation when the line speed is set to a value of 1000. Forced 1000 Mbit/s speed is not needed for copper links; auto-negotiation is the proper supported configuration under the IEEE Ethernet specification.

The Duplex keyword is used to force the duplex mode of the adapter. The Duplex keyword requires a text string of either HALF or FULL. When the Duplex keyword is used, the LineSpeed keyword must also be used. If neither keyword is used, the network adapter defaults to auto-negotiation mode.

Example keyword entries for the **LineSpeed**, and **Duplex** keywords are shown below:

```
LINK DRIVER B57  
LINESPEED 100  
DUPLEX FULL
```



---

# Broadcom Boot Agent Driver Software: Broadcom NetLink<sup>®</sup>/NetXtreme<sup>®</sup> 57XX User Guide

- [Overview](#)
- [Setting Up MBA in a Client Environment](#)
- [Setting Up MBA in a System Environment](#)

## OVERVIEW

Broadcom NetXtreme Gigabit Ethernet adapters support Preboot Execution Environment (PXE), Remote Program Load (RPL), and Bootstrap Protocol (BootP). Multi-Boot Agent (MBA) is a software module that allows your networked system to boot with the images provided by remote systems across the network. The Broadcom MBA driver complies with the PXE 2.1 specification and is released with both monolithic and split binary images. This provides flexibility to users in different environments where the motherboard may or may not have built-in base code.

The MBA module operates in a client/system environment. A network consists of one or more boot systems that provide boot images to multiple systems through the network. The Broadcom implementation of the MBA module has been tested successfully in the following environments:

**Linux<sup>®</sup> Red Hat<sup>®</sup> PXE Server.** Broadcom PXE clients are able to remotely boot and use network resources (NFS mount, and so forth) and to perform Linux installations. In the case of a remote boot, the Linux universal driver binds seamlessly with the Broadcom Universal Network Driver Interface (UNDI) and provides a network interface in the Linux remotely-booted client environment.

**Microsoft<sup>®</sup> Windows Server 2003.** Using Windows Remote Installation Services (RIS), Broadcom PXE clients are able to perform remote installations from the network.

**Intel<sup>®</sup> APITEST.** The Broadcom PXE driver passes all API compliance test suites.

**MS-DOS UNDI.** The MS-DOS Universal Network Driver Interface (UNDI) seamlessly binds with the Broadcom UNDI to provide a network device driver interface specification (NDIS2) interface to the upper layer protocol stack. This allows systems to connect to network resources in an MS-DOS environment.

## SETTING UP MBA IN A CLIENT ENVIRONMENT

Use the following procedure for add-in NICs. For LOMs, refer to your computer's system guide.

Setting up MBA in a client environment involves the following steps:

1. Enabling the MBA driver.
2. Configuring the MBA driver.
3. Setting up the BIOS for the boot order.

### Enabling the MBA Driver

To enable or disable the MBA driver:

1. Insert an MS-DOS 6.22 bootable floppy disk containing the B57udiag.exe file in the floppy disk drive and power up your system.

2. Type:  
`drive:\dos\utility`  
 where  
 drive is the drive letter of the CD-ROM drive.
3. Type:  
`b57udiag -mba [ 0-disable | 1-enable ] -c devnum`  
 where  
 devnum is the specific device(s) number (0,1,2,...) to be programmed.

## Configuring the MBA Driver

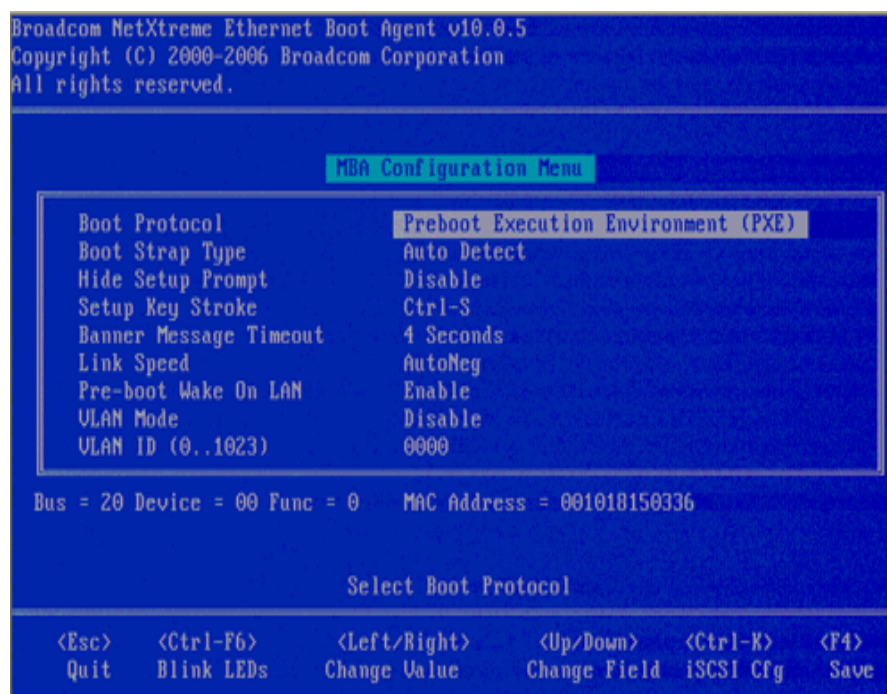


**Note:** You can use the MBA Configuration Menu to configure the MBA driver one adapter at a time as described below, or you can use the Broadcom NetXtreme User Diagnostics MS-DOS based application to simultaneously configure the MBA driver for multiple adapters.

1. Restart your system.
2. Press CTRL+S within 4 seconds after you are prompted to do so.



**Note:** The message prompting you to press CTRL+S is displayed once for each Broadcom NetXtreme Gigabit Ethernet adapter you have in your system. The messages are displayed in the same order as the assigned adapter device number.



3. Use the UP ARROW and DOWN ARROW keys to move to the Boot Protocol menu item. Then use the RIGHT ARROW or LEFT ARROW key to select the boot protocol of choice. The available boot protocols include Preboot Execution Environment (PXE), Remote Program Load (RPL), and Bootstrap Protocol (BOOTP).





**Note:** If you have multiple adapters in your system and you are unsure which adapter you are configuring, press CTRL+F6, which causes the port LEDs on the adapter to start blinking.

4. Use the UP ARROW, DOWN ARROW, LEFT ARROW, and RIGHT ARROW keys to move to and change the values for other menu items, as desired.
5. Press F4 to save your settings.
6. Press ESC when you are finished.

## Setting Up the BIOS

To boot from the network with the MBA, make the MBA enabled adapter the first bootable device under the BIOS. This procedure depends on the system BIOS implementation. Refer to the user manual for the system for instructions.

## SETTING UP MBA IN A SYSTEM ENVIRONMENT

### Linux Red Hat PXE Server

The Red Hat Linux 8.0 (or later) distribution has PXE Server support. It allows users to remotely perform a complete Linux installation over the network. The distribution comes with the boot images boot kernel (vmlinuz) and initial ram disk (initrd), which are located on the Red Hat disk#1:

/images/pxeboot/vmlinuz

/images/pxeboot/initrd.img

Refer to the Red Hat documentation for instructions on how to install PXE Server on Linux.

The Initrd.img file distributed with Red Hat 8.0, however, does not have a Linux network driver for the Broadcom NetXtreme Gigabit Ethernet adapter.

This version requires drivers that are not part of the standard distribution. You can create a driver disk for the Broadcom NetXtreme Gigabit Ethernet adapter using files obtained from the support website. You can create a driver disk for the Broadcom NetXtreme 57XX Gigabit Ethernet Controller from the image distributed with the installation CD. Refer to the Linux Readme.txt file for more information.

A remote boot does not require a standard Linux network driver for the Broadcom NetXtreme Gigabit Ethernet adapter. After the PXE client downloads the Linux kernel and initial ram disk, the Linux universal driver that came with the Linux distribution binds with the UNDI code of the PXE to form a Linux network driver.



**Note:** Refer to the Distrib.txt file on the installation CD for a list of the specific Linux distributions on which the driver has been tested.

### Windows Server 2003/Windows XP

The current version of Windows Server 2003/Windows XP does not include the latest released network driver for the Broadcom NetXtreme Gigabit Ethernet adapter. You can create a driver disk for the adapter using files obtained from the support website. To perform remote installations with PXE, include a network driver for the NetXtreme Gigabit Ethernet adapter as a part of the client installation image on the server. Refer to Microsoft Knowledge Base Article, "How to Add Third-Party OEM Network Adapters to RIS Installations." See also [Troubleshooting](#) for details.

**DOS UNDI/Intel APITEST**

To boot in DOS mode and connect to a network for the DOS environment, download the Intel PXE PDK from the Intel website. This PXE PDK comes with a TFTP/ProxyDHCP/Boot server. The PXE PDK can be downloaded from Intel at [http://downloadcenter.intel.com/detail\\_desc.aspx?agr=Y&DwnldID=6100&ProductID=412](http://downloadcenter.intel.com/detail_desc.aspx?agr=Y&DwnldID=6100&ProductID=412).



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# Linux Driver Software: Broadcom NetLink®/ NetXtreme® 57XX User Guide

- [Limitations](#)
- [Packaging](#)
- [Installing TG3 Driver Software](#)
- [Network Installations](#)
- [Patching PCI Files \(Optional\)](#)
- [Unloading/Removing the TG3 Driver](#)
- [Driver Messages](#)

---

## LIMITATIONS

The current version of the adapter driver has been tested on the latest Red Hat, SuSE, and other Linux distributions for i386, ia64, and x86\_64 CPU architectures using 2.4.x and 2.6.x kernels. The driver has been tested up to kernel version 2.4.33 and 2.6.13. The driver should work on other little endian or big endian CPU architectures, but only very limited testing has been done on some of these machines. The Makefile may have to be modified to include architecture-specific compile switches, and some minor changes in the source files may also be required. On these machines, patching the driver into the kernel is recommended.

---

## PACKAGING

The Linux TG3 driver is released in the following packaging formats (file names):

- Source RPM (tg3-version.src.rpm)
- Supplemental (tg3\_sup-version.tar.gz)
- Compressed tar (tg3-version.tar.gz)

Identical source files to build the driver are included in both RPM and TAR source packages. The tar file contains additional utilities such as patches and driver disk images for network installation.

---

## INSTALLING TG3 DRIVER SOFTWARE

- [Installing the Source RPM Package](#)



- [Building the Driver from the Source TAR File](#)

## INSTALLING THE SOURCE RPM PACKAGE

1. Install the source RPM package.  

```
rpm -ivh tg3-version.src.rpm
```
2. Change the directory to the RPM path and build the binary driver for your kernel (the RPM path is different for different Linux distributions).  

```
cd /usr/src/redhat,OpenLinux,turbo,packages,rpm ...  
rpm -bb SPECS/tg3.spec or rpmbuild -bb SPECS/tg3.spec  
rpmbuild -bb SPECS/tg3.spec (for RPM version 4.x.x)
```



**NOTE:** During your attempt to install a source RPM package, the following message may be displayed:

```
error: cannot create %sourcedir /usr/src/redhat/SOURCE
```

The most likely cause of the error is that the rpm-build package has not been installed. Locate the rpm-build package on the Linux installation media and install it using the following command:

```
rpm -ivh rpm-build-version.i386.rpm
```

Complete the installation of the source RPM.

3. Install the newly-built package (driver and man page).  

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

Depending on the kernel, the driver is installed to one of the following paths:

**2.4.x kernels:**

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

**2.4.x kernels with the tg3 driver patched in:**

`/lib/modules/kernel_version/kernel/drivers/addon/tg3/tg3.o`

**2.6.x kernels:**

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

4. Load the driver.  

```
modprobe tg3
```

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

## BUILDING THE DRIVER FROM THE SOURCE TAR FILE

1. Create a directory (`tg3-version`) and extract the TAR files to the directory.  

```
tar xvzf tg3-version.tgz
```
2. Build the driver `tg3.o` as a loadable module for the running kernel.  

```
cd tg3-version  
make clean  
make; make install
```
3. Test the driver by loading it.  

```
rmmmod tg3  
modprobe tg3
```

No message should be returned if this command runs properly.





**NOTE:** See the RPM instructions above for the location of the installed driver.

4. To configure network protocol and address, refer to the manuals supplied with your operating system.

---

## NETWORK INSTALLATIONS

For network installations through NFS, FTP, or HTTP (using a network boot disk or PXE), a driver disk that contains the tg3 driver may be needed. The driver disk images for the most recent Red Hat versions are included. Boot drivers for other Linux versions can be compiled by modifying the Makefile and the make environment. Further information is available from the Red Hat website, <http://www.redhat.com>.

To create the driver disk, select the appropriate image file (located in `tg3_sup-version.tar.gz`) and type the following:

```
dd if=<version>.dd.img of=/dev/fd0
```

---

## PATCHING PCI FILES (OPTIONAL)

For hardware detection utilities such as Red Hat kudzu to properly identify tg3 supported devices, a number of files containing PCI vendor and device information may need to be updated.

Apply the updates by running the scripts provided in the Supplemental tar file. For example, on Red Hat Enterprise Linux, apply the updates by doing the following:

```
./patch_pcitbl.sh /usr/share/hwdata/pcitable pci.updates /usr/share/hwdata/pcitable.new
```

```
./patch_pciids.sh /usr/share/hwdata/pci.ids pci.updates /usr/share/hwdata/pci.ids.new
```

Next, the old files can be backed up and the new files can be renamed for use.

```
cp /usr/share/hwdata/pci.ids /usr/share/hwdata/old.pci.ids
cp /usr/share/hwdata/pci.ids.new /usr/share/hwdata/pci.ids
```

```
cp /usr/share/hwdata/pcitable /usr/share/hwdata/old.pcitable
cp /usr/share/hwdata/pcitable.new /usr/share/hwdata/pcitable
```



**NOTE:** The paths above are for Red Hat distributions. These paths may be different on other distributions.

---

## UNLOADING/REMOVING THE TG3 DRIVER

- [Unloading/Removing the Driver from an RPM Installation](#)
- [Removing the Driver from a TAR Installation](#)

## UNLOADING/REMOVING THE DRIVER FROM AN RPM INSTALLATION

To unload the driver, use **ifconfig** to bring down all *ethX* interfaces opened by the driver, and then type the following:

```
rmmod tg3
```

If the driver was installed using **rpm**, do the following to remove it:

```
rpm -e tg3-<version>
```

## REMOVING THE DRIVER FROM A TAR INSTALLATION

If the driver was installed using make install from the tar file, the tg3.o driver file has to be manually deleted from the operating system. See [Installing the Source RPM Package](#) for the location of the installed driver.

If there is an interface configuration that is related to the tg3 driver, then bring the interface down first by using **ifconfig ethx down** and then **rmod tg3**.

---

## DRIVER MESSAGES

The following are the most common sample messages that may be logged in the */var/log/messages* file. Use **dmesg -nlevel** to control the level at which messages appear on the console. Most systems are set to level 6 by default.

### Driver Signon

```
tg3.c:version (date)
```

### NIC Detected

```
eth#: Tigon3 [partno (BCM95xxx) rev 4202 PHY (57xx) (PCI Express) 10/100/1000BaseT
Ethernet :00:xx:xx:xx:xx:xx
eth#: RXcsums [1] LinkChg REG [0] MIirq [0] ASF [0] Split [0] Wirespeed [1]TSOcap [1]
eth#: dma_rwctrl [76180000]
ACPI : PCI interrupt 0000:02:02.0 [A] -> GSI 26 (level,low) -> IRQ 233
```

### Flow Control

```
tg3: eth#: Flow control is configured for TX and for RX.
```

### Link Up and Speed Indication

```
tg3: eth#: Link is up at 1000 Mbps, full duplex.
```

### Link Down Indication

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

# Installing Management Applications: Broadcom NetLink®/NetXtreme® 57XX User Guide

- [Installing Broadcom Advanced Control Suite and Related Management Applications](#)
- [Updating Broadcom Advanced Control Suite](#)
- [Removing Broadcom Advanced Control Suite](#)

## INSTALLING BROADCOM ADVANCED CONTROL SUITE AND RELATED MANAGEMENT APPLICATIONS

The Broadcom Advanced Control Suite (BACS) software and related management applications can be installed from the installation CD. Both a graphical interactive installation mode (see [Using the Installer](#)) and a command-line silent mode for unattended installation (see [Using Silent Installation](#)) are available.

If available, the following are installed when running the installer:

- **Control Suite.** Broadcom Advanced Control Suite (BACS).
- **OOB Mgmt Config.** Installs OOB Management Configuration.
- **BASP.** Installs Broadcom Advanced Server Program.
- **SNMP.** Installs the Simple Network Management Protocol subagent.
- **CIM Provider.** Installs the Common Information Model provider.
- **Management Agent.** Installs Management Agent for remote monitoring.



### Notes:

- Do not install the BACS software until after you have installed the Broadcom NetXtreme Gigabit Ethernet adapter(s).
- Before you begin the installation, close all applications, windows, or dialog boxes.

## USING THE INSTALLER

### To install the management applications

1. Insert the installation CD into the CD or DVD drive.
2. Open the folder on the installation CD that contains the BACS **Setup.exe** file and then double-click **Setup.exe** to open the InstallShield Wizard.



**Note:** If you have a standard account on a Vista system, you will receive the User Account Control dialog box. Verify the presented information and select **Continue**.

3. Click **Next** to continue.
4. After you review the license agreement, click **I accept the terms in the license agreement** and then click **Next** to

continue.

5. Select the features you want installed.



**Note:** Microsoft SNMP Service must be running for the SNMP subagent to function properly.

6. Click **Next**.
7. Click **Install**.
8. Click **Finish** to close the wizard.

## USING SILENT INSTALLATION

To perform a silent installation, see Silent.txt on the installation CD in the BACS directory for your operating system.

---

## UPDATING BROADCOM ADVANCED CONTROL SUITE



**Note:** Before you begin the update, close all applications, windows, or dialog boxes.

Follow the instructions for [Installing Broadcom Advanced Control Suite and Related Management Applications](#).

---

## REMOVING BROADCOM ADVANCED CONTROL SUITE

1. In Control Panel, click **Add or Remove Programs**.
2. Click **Broadcom Advanced Control Suite** and click **Change/Remove**.
3. In InstallShield Wizard, click **Remove**, and then click **Next**.



**Note:** If you have a standard account on a Vista system, you will receive the User Account Control dialog box. Verify the presented information and select **Continue**.

4. Click **OK** to remove the application and all of its features.
5. Click **OK**.
6. Restart your computer.



---

# Using Broadcom Advanced Control Suite 4: Broadcom NetLink<sup>®</sup>/NetXtreme<sup>®</sup> 57XX User Guide

- [Broadcom Advanced Control Suite Overview](#)
- [Starting Broadcom Advanced Control Suite](#)
- [Using Broadcom Advanced Control Suite](#)
- [Configuring Teaming](#)

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## BROADCOM ADVANCED CONTROL SUITE OVERVIEW

Broadcom Advanced Control Suite (BACS) is an integrated utility that provides useful information about each network adapter that is installed in your system. BACS also enables you to perform detailed tests, diagnostics, and analyses on each adapter, as well as to view and modify property values and view traffic statistics for each adapter.

Broadcom Advanced Server Program (BASP), which runs within Broadcom Advanced Control Suite, is used to configure teams for load balancing, fault tolerance, and virtual local area networks (VLANs). BASP functionality is available only on systems that use at least one Broadcom network adapter.

---

## STARTING BROADCOM ADVANCED CONTROL SUITE

In Control Panel, click **Broadcom Control Suite 4**, or click the BACS icon in the taskbar located at the bottom of the Windows desktop.

---

## USING BROADCOM ADVANCED CONTROL SUITE

Start BACS. Click the tab that provides the information of interest or from which to perform a desired test, diagnostic, analysis, or set adapter properties. To create a team, see [Configuring Teaming](#).

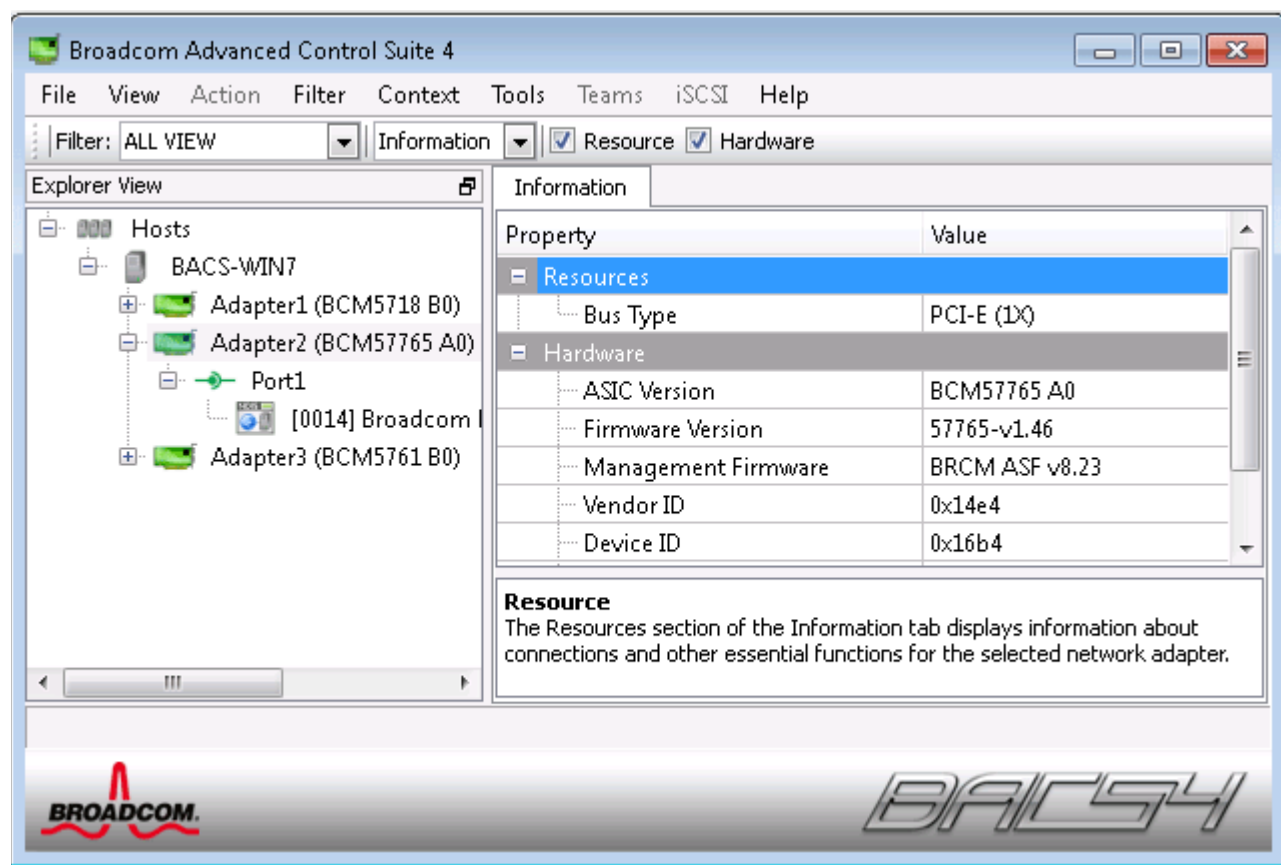
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## BACS INTERFACE

The BACS interface is comprised of the following regions:

- Explorer View pane
- Context View selector
- Context View pane
- Menu bar
- Description pane

By default, the Explorer View pane is docked and pinned on the left side of the main window, the Context View pane on the right, the Context View selector below the menu bar, and the Description pane below the Context View pane. Drag the splitter between any two panes to vary the size of the panes.



## EXPLORER VIEW PANE

You can dock and pin the Explorer View pane on the left side, right side, top, or bottom of the main window.

The Explorer View pane lists the objects that can be viewed, analyzed, tested, or configured by BACS. When an item is selected in the Explorer View pane, the tabs showing the information and options that are available for the item appear in the Context View pane.

The organization of this panel is designed to present the manageable objects in the same hierarchical manner as drivers and its subcomponents. This simplifies the management of various elements of the network interface controller (NIC). The top level of the hierarchy is the Host container, which lists all hosts managed by BACS. Below the hosts are the installed network adapters, with the manageable elements, such as physical port, VBD, and NDIS below the adapters.

The icon next to each device in the Explorer View pane shows its status. An icon next to a device name that appears normal means the device is connected and working.

- **X.** A red “X” that appears on the device’s icon indicates the device is currently not connected to the network.
- **Greyed out.** A device icon that appears greyed out indicates the device is currently disabled.

## CONTEXT VIEW SELECTOR

The Context View selector appears below the menu bar and includes the filter and tab categories. Although you can expand and collapse the categories that appear on tabs in the Context View pane, you can alternatively display a category by selecting the box next to the category name.

### Filter View

In a multiple-host environment using several network adapters, there can be a large number of manageable elements per adapter that can be difficult and cumbersome to view, configure, and manage all elements. Use the filter to select a particular device function. Possible filter views include:

- All
- Team view
- NDIS view
- iSCSI view
- FCoE view
- iSCSI Target view
- FCoE Target view

## CONTEXT VIEW PANE

The Context View pane displays all the parameters that you can view for the object selected in the Explorer View pane. The parameters are grouped by tabs and categories, depending on the parameter type. The available tabs are Information, Configuration, Diagnostics, and Statistics. Because the BACS interface is context-sensitive, only the parameters that apply to the selected object can be viewed or configured in the Context View pane.

## MENU BAR

The following appear on the menu bar, but because the menu items are context-sensitive, not all items will be available at all times:

### File menu

- Team Save As: saves the current team configurations to a file
- Team Restore: restores any saved team configuration from a file

### Action menu

- Remove Host: removes the selected host
- Refresh Host: refreshes the information for the selected host

### View menu

- Explorer View: displays/hides the Explorer View pane
- Tool Bar: displays/hides the tool bar
- Status Bar: displays/hides the status bar
- Broadcom Logo: displays/hides the Broadcom Logo on BACS to optimize the maximum viewable space

### Tools menu

- Options: used for configuring BACS preferences

### Teams

- Create Teams: creates new teams with either the Teaming Wizard or in Advanced mode
- Manage Teams: manages existing teams with either the Teaming Wizard or in Advanced mode

## DESCRIPTION PANE

The Description pane provides information, configuration instructions, and options for the selected parameter in the Context View pane.

## CONFIGURING PREFERENCES

### To enable or disable the BACS tray icon

BACS places an icon in the Windows taskbar when the program is installed. Use the Options window to turn this icon on or off.

1. From the **Tools** menu, select **Options**.
2. Select or clear **Enable BACSTray** (the option is enabled by default).
3. Click **OK**.

### Setting the teaming mode

1. From the **Tools** menu, select **Options**.
2. Select **Expert Mode** if you do not need the assistance of the teaming wizard to create teams; otherwise, select **Wizard Mode**.
3. Click **OK**.

### Setting the Explorer View refresh time

1. From the **Tools** menu, select **Options**.
2. Select **Auto** to set the Explorer View refresh time to 5 seconds. Otherwise, select **Custom** and select a time, in seconds.
3. Click **OK**.

---

## CONNECTING TO A HOST

You can add one or more Windows or Linux hosts to manage from BACS.

### To add a local host

1. From the **Action** menu, click **Add Host**.
2. For both Windows and Linux hosts, do not change the default settings. The **User name** and **Password** are not required while connecting to the local host.
3. Select **Persist** if you want BACS to save the information for this host.
4. Click **Ok**. BACS can now be used to view information and manage the host.

### To add a remote host

1. From the **Action** menu, click **Add Host**.
2. Type the remote host's name or IP address in the **Host** box.
3. Select the protocol from the **Protocol** list. The protocol options for Windows are **WMI**, **WinRM**, or **Try All**. The protocol options for Linux are **CimXML**, **WinRM**, or **Try All**. The **Try All** option forces the GUI client to try all options.
4. Select the **HTTP** scheme, or the **HTTPS** scheme for added security.
5. Type the **Port Number** value you used to configure the host, if it is different than the default value of **5985**.
6. Type the **User name** and **Password**.
7. Select **Persist** if you want BACS to save the information for this host. The host will appear in the Explorer Pane whenever you reopen BACS, and you will not need to enter the host IP address or host name when connecting to the host. For security reasons, you must enter the **User name** and **Password** every time.
8. Click **OK**.

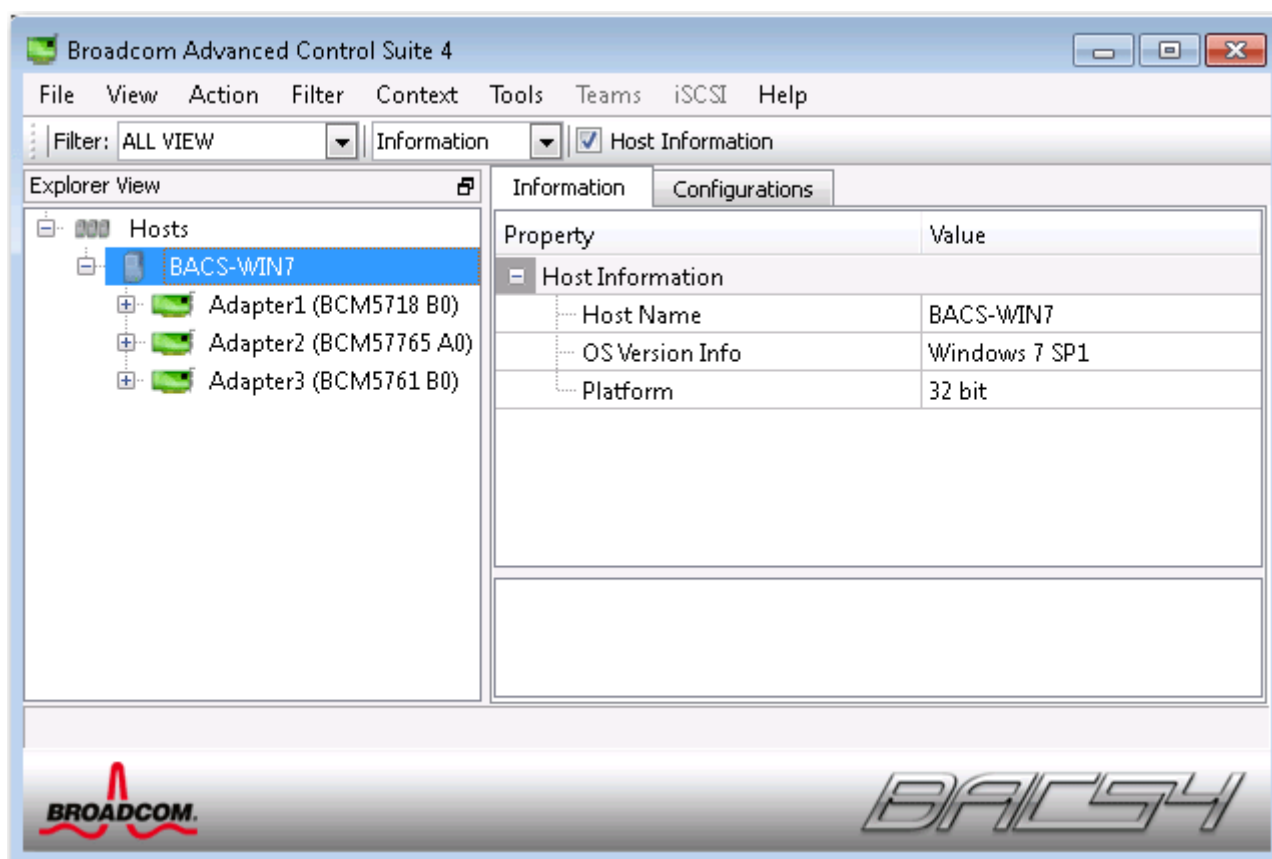
## MANAGING THE HOST

At the host level, you can view host information and configure parameters from the following tabs:

- Information
- Configuration

### To view host information

Select the host in the **Explorer View** pane, and then select the **Information** tab to view host-level information.



### Information Tab: Host Information

**Host Name.** Displays the name of the host.

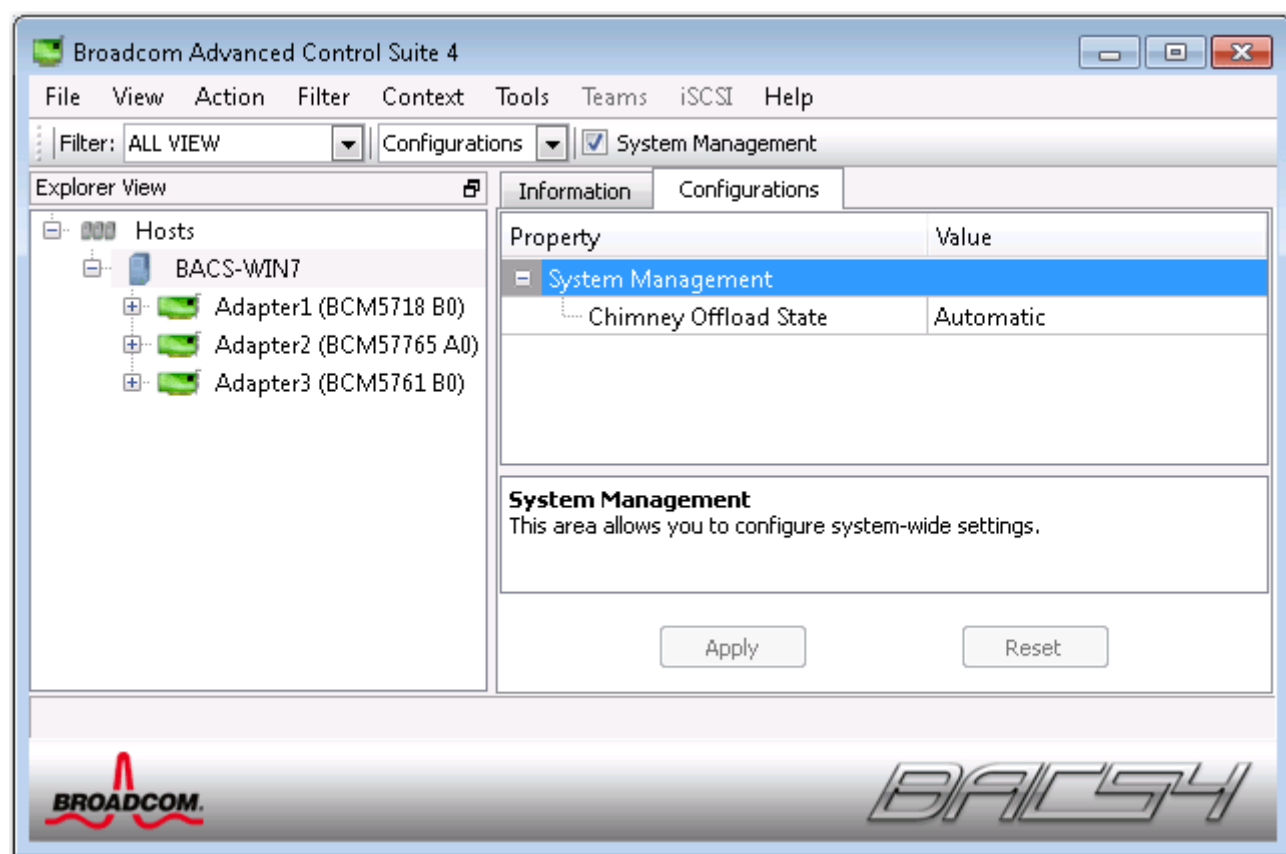
**OS Version Info.** Displays the operating system, including the version.

**Platform.** Displays the hardware architecture platform (for example, 32-bit or 64-bit)

### To configure the host

Select the host in the **Explorer View** pane, and then select the **Configuration** tab to configure host-level parameters.





#### Configuration Tab: System Management

**Chimney Offload State.** Enable or disable chimney offload at the host level, rather than at the device level, and then click **Apply**.

## MANAGING THE NETWORK ADAPTER

The installed network adapters appear one level below the host in the hierarchical tree in the Explorer View pane. At the adapter level, you can view information and configure parameters from the following tabs:

- Information
- Configuration

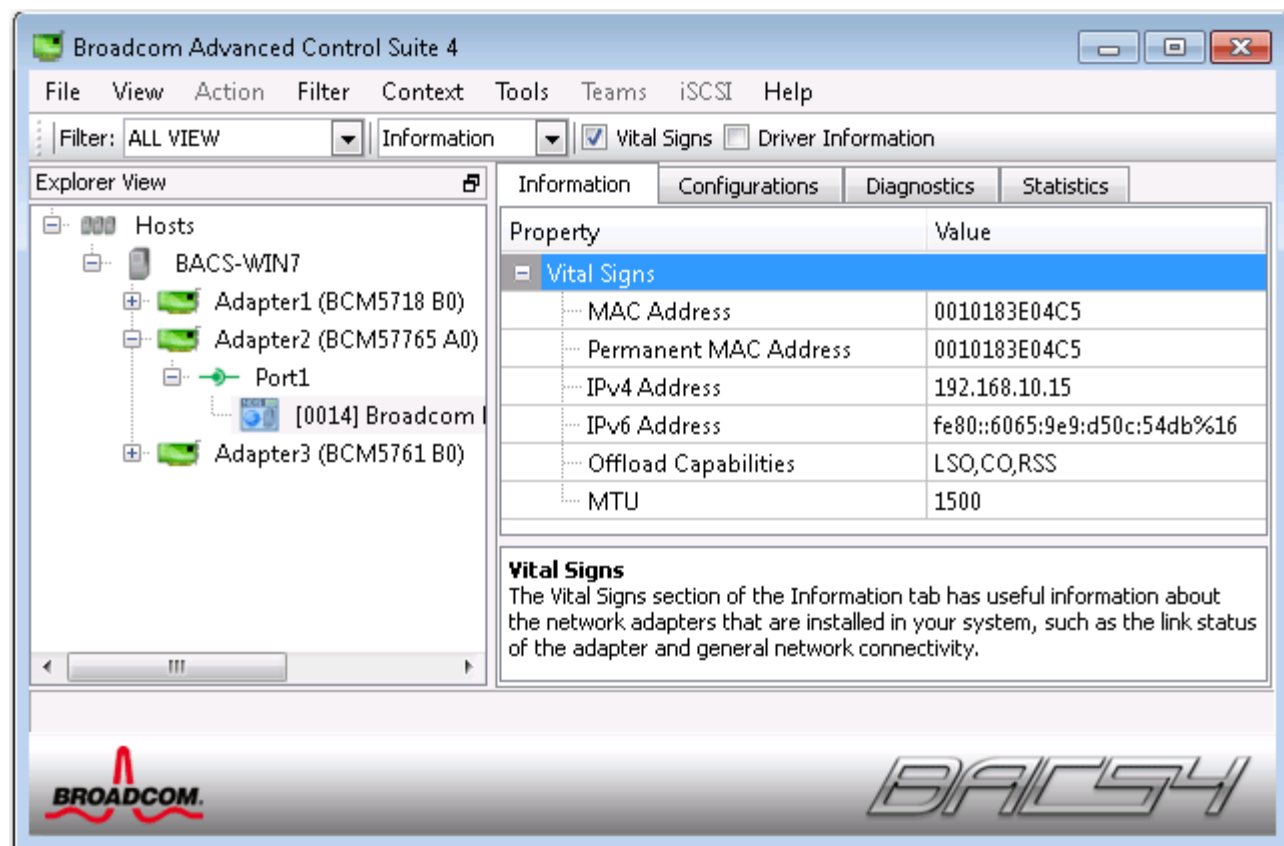
### VIEWING ADAPTER INFORMATION

The **Vital Signs** section of the **Information** tab has useful information about the network adapters that are installed in your system, such as the link status of the adapter and general network connectivity.

Select the network adapter in the **Explorer View** pane, and then select the **Information** tab to view adapter-level information.

**NOTES:**

- Information about Broadcom network adapters may be more comprehensive than information about network adapters made by others.
- Some information may not be available for all Broadcom network adapters.



**MAC Address.** A physical MAC (media access control) address that is assigned to the adapter by the manufacturer. The physical address is never all 0s.

**Permanent MAC Address.** The unique hardware address assigned to the network adapter.

**IP Address.** The network address associated with the adapter. If the IP address is all 0s, the associated driver has not been bound with Internet Protocol (IP).

**Link Status.** The status of the network link.

- **Up.** A link is established.
- **Down.** A link is not established.

**Duplex.** The adapter is operating in the indicated duplex mode.

**Speed (in Mbps).** The link speed of the adapter, in megabits per second.

**Offload Capabilities.** The offload capabilities supported by the adapter.

This information is only available for Broadcom NetXtreme adapters.

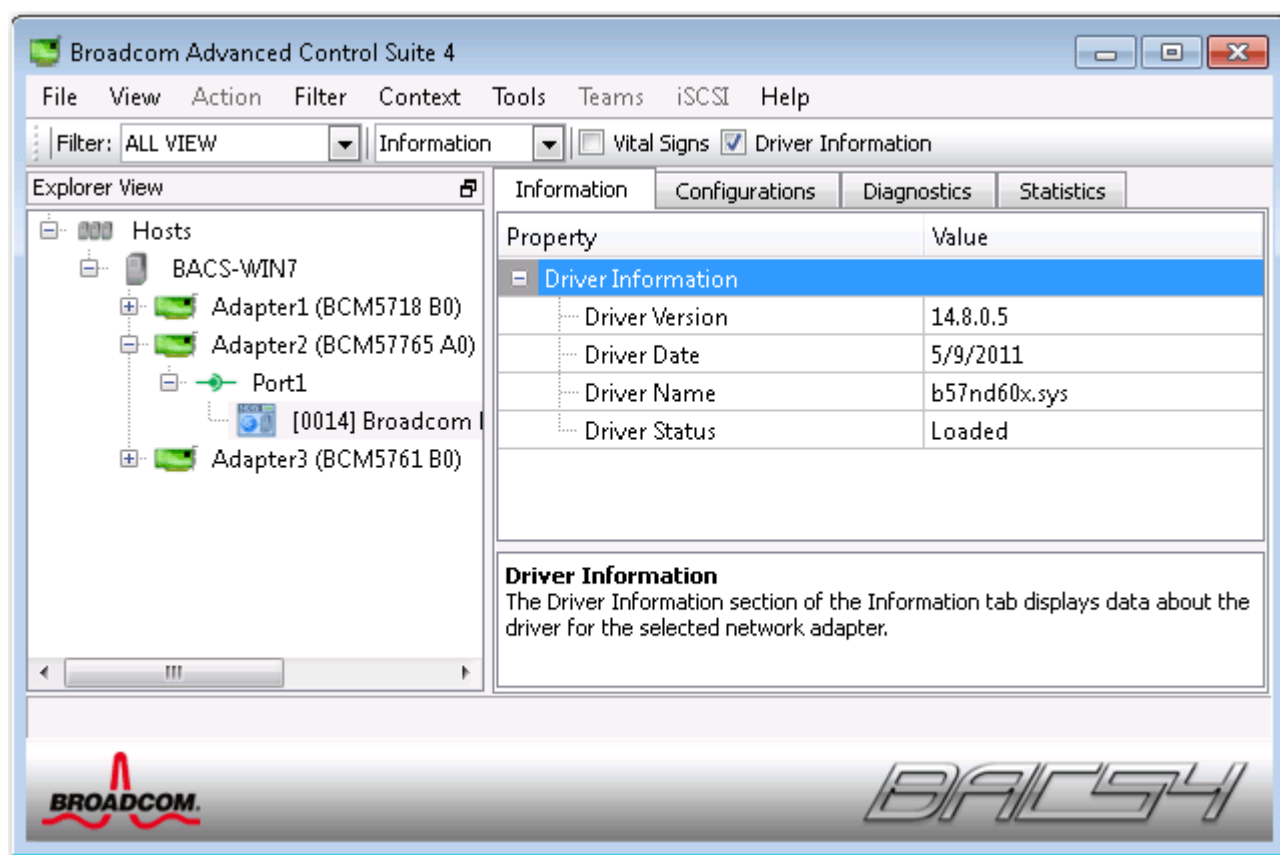
- **LSO.** Large Send Offload (LSO) prevents an upper level protocol such as TCP from breaking a large data packet into a series of smaller packets with headers appended to them.
- **CO.** Checksum Offload (CO) allows the TCP/IP/UDP checksums for send and receive traffic to be calculated by the adapter hardware rather than by the host CPU.

**LiveLink IP Address.** The network address of the LiveLink enabled adapter.

## VIEWING DRIVER INFORMATION

The **Driver Information** section of the **Information** tab displays data about the driver for the selected network adapter.

To view Driver Information for any installed network adapter, click the name of the adapter listed in the Explorer View pane, then click the **Information** tab.



**Driver Status.** The status of the adapter driver.

- **Loaded.** Normal operating mode. The adapter driver has been loaded by Windows and is functioning.
- **Not Loaded.** The driver associated with the adapter has not been loaded by Windows.
- **Information Not Available.** The value is not obtainable from the driver that is associated with the adapter.

**Driver Name.** The file name of the adapter driver.

**Driver Version.** The current version of the adapter driver.

**Driver Date.** The creation date of the adapter driver.

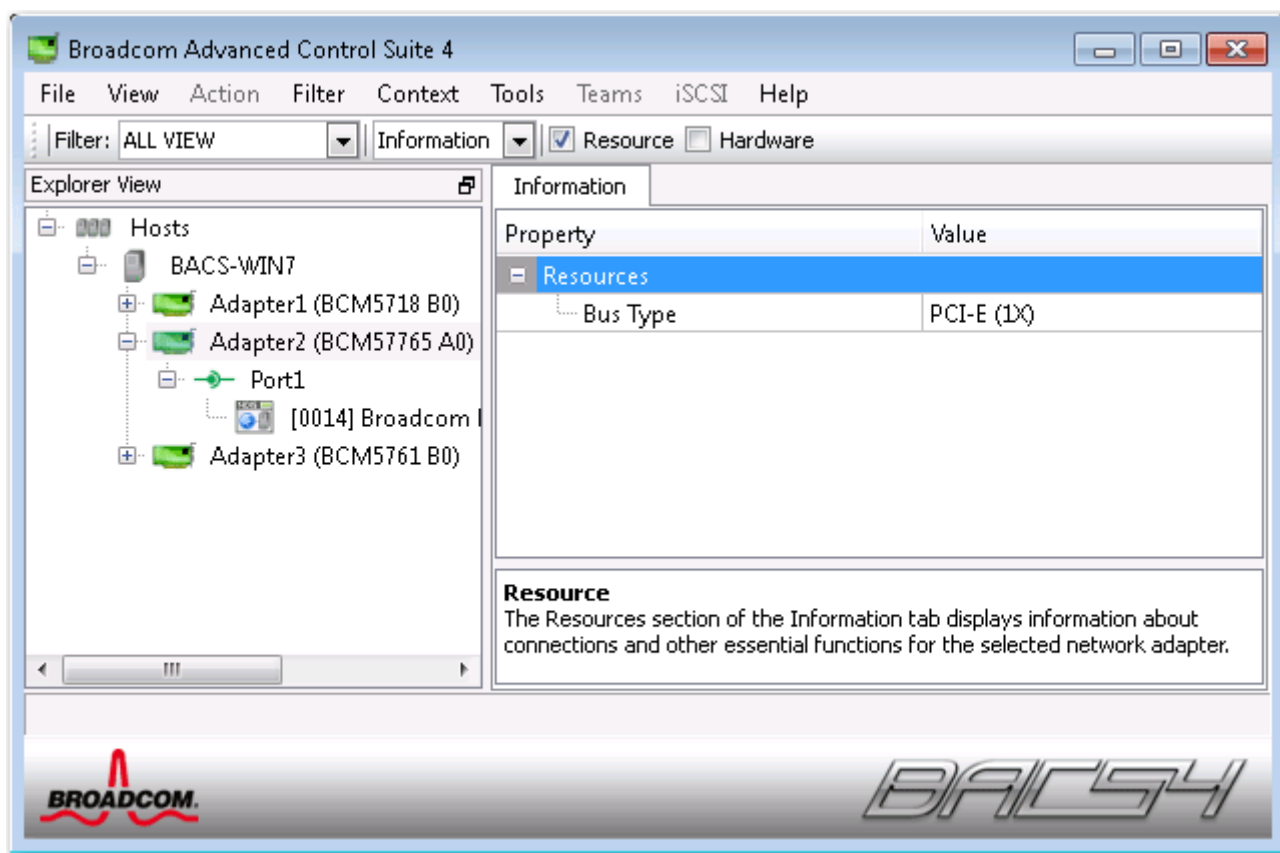
## VIEWING RESOURCE INFORMATION

The **Resources** section of the **Information** tab displays information about connections and other essential functions for the selected network adapter.

To view Resources for any installed network adapter, click the name of the adapter listed in the Explorer View pane, then click the **Information** tab.



**Note:** Some information may not be available for all Broadcom network adapters.



**Bus Type.** The type of input/output (I/O) interconnect used by the adapter.

**Slot No.** The slot number on the system board occupied by the adapter. This item is not available for PCI Express type adapters.

**Bus Speed (MHz).** The bus clock signal frequency used by the adapter. This item is not available for PCI Express type adapters.

**Bus Width (bit).** The number of bits that the bus can transfer at a single time to and from the adapter. This item is not available for PCI Express type adapters.

**Bus No.** Indicates the number of the bus where the adapter is installed.

**Device No.** The number assigned to the adapter by the operating system.

**Function No.** The port number of the adapter. For a single-port adapter, the function number is 0. For a two-port adapter, the function number for the first port is 0, and the function number for the second port is 1.

**Interrupt Request.** The interrupt line number that is associated with the adapter. Valid numbers range from 2 to 25.

**Memory Address.** The memory mapped address that is assigned to the adapter. This value can never be 0.

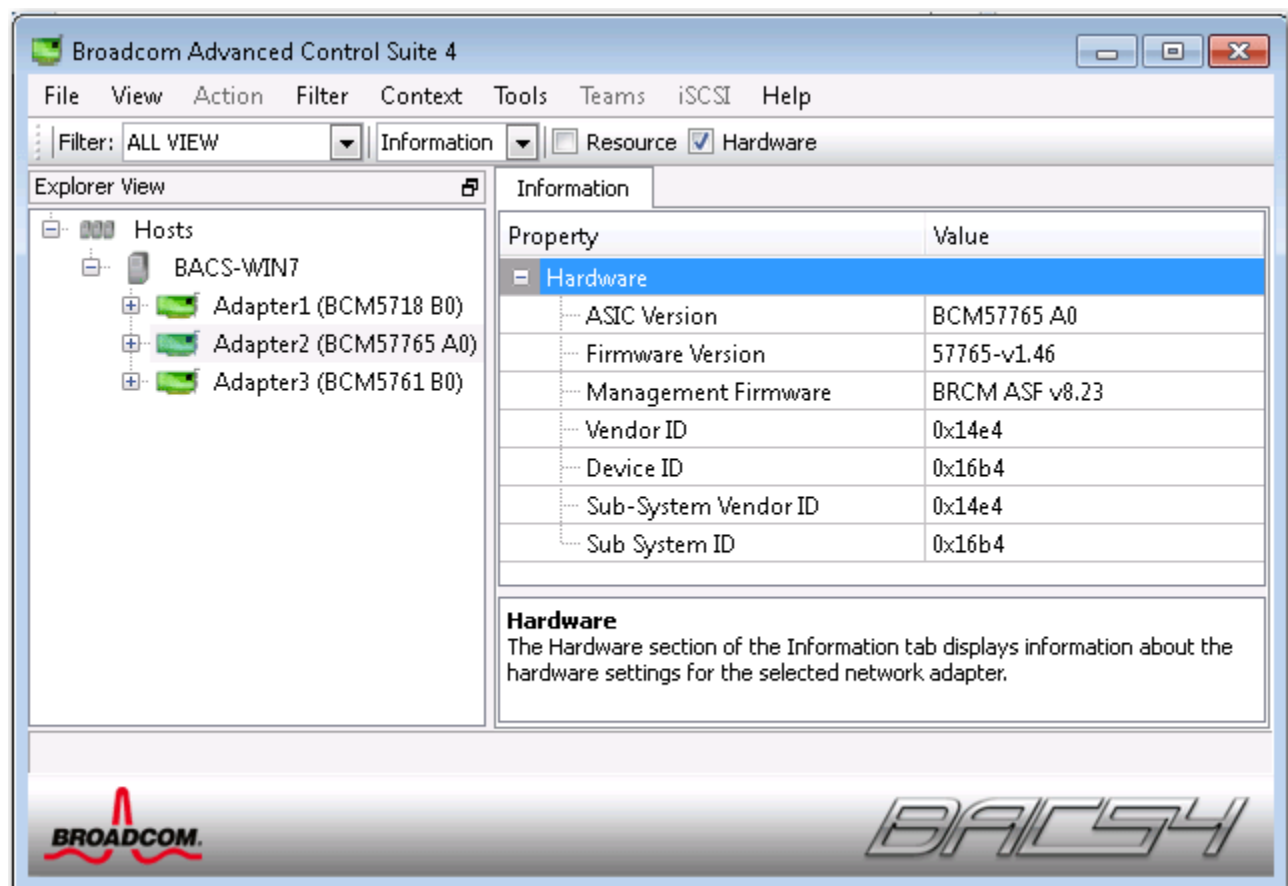
## VIEWING HARDWARE INFORMATION

The Hardware section of the **Information tab** displays information about the hardware settings for the selected network adapter.

To view Hardware for any installed network adapter, click the name of the adapter listed in the Explorer View pane, then click the Information tab.



**Note:** Some information may not be available for all Broadcom network adapters.



**ASIC Version.** The chip version of the Broadcom adapter (this information is not available for adapters made by others).

**Firmware Version.** The firmware version of the Broadcom adapter (this information is not available for adapters made by others). This information is only available for Broadcom NetXtreme adapters.

**Vendor ID.** The vendor ID.

**Device ID.** The adapter ID.

**Subsystem Vendor ID.** The subsystem vendor ID.

**Subsystem ID.** The subsystem ID.

## TESTING THE NETWORK

The **Network Test** option on the **Diagnostics** tab lets you verify IP network connectivity. This test verifies if the driver is installed correctly and tests connectivity to a gateway or other specified IP address on the same subnet. The network test uses TCP/IP to send ICMP packets to remote systems, then waits for a response.

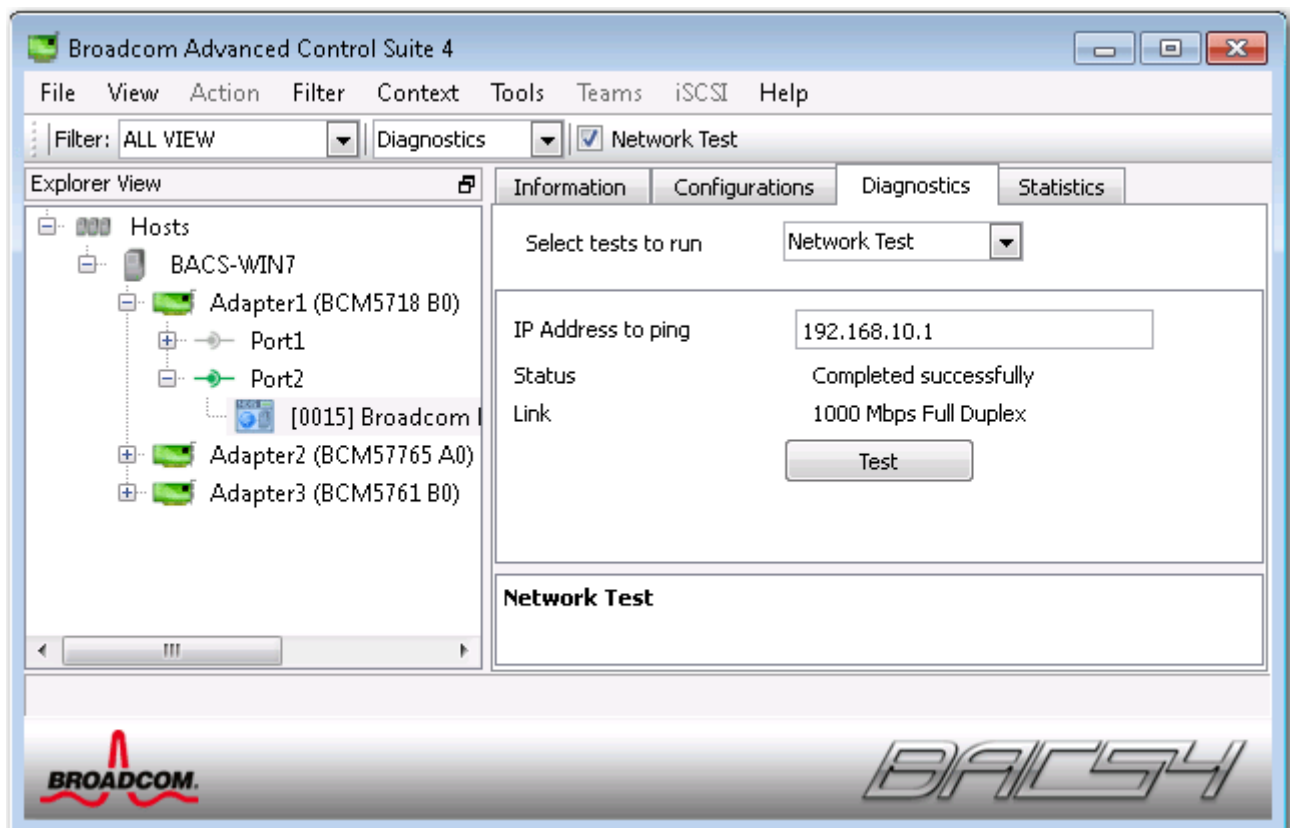


**Note:** The network test option is not available on adapters that are grouped into a team (see [Configuring Teaming](#)).

#### To run the network test

1. Click the name of the adapter to test in the Explorer View pane.
2. From the **Select a test to run** list, select **Network Test**. If the **Network Test** option is not available, then from the **Context View** tab on the right side of the window, select **Diagnostics** and then select **Network Test**.
3. To change the destination IP address, select **IP address to ping**. In the Network Test window, enter a Destination IP address, then click **OK**.
4. Click **Test**.

The results of the network test are displayed in the **Status** field.



## RUNNING DIAGNOSTIC TESTS

The **Diagnostic Tests** option on the **Diagnostics** tab lets you check the state of the physical components on a Broadcom network adapter. You can trigger the tests manually, or choose to have BACS 3 continuously perform them. If the test are performed continuously, then the number of passes and fails in the **Result** field for each test increments every time the tests are performed. For example, if a test is performed four times and there are no fails, the value in the **Result** field for that test is 4/0. However, if there were 3 passes and 1 fail, the value in the **Result** field is 3/1.



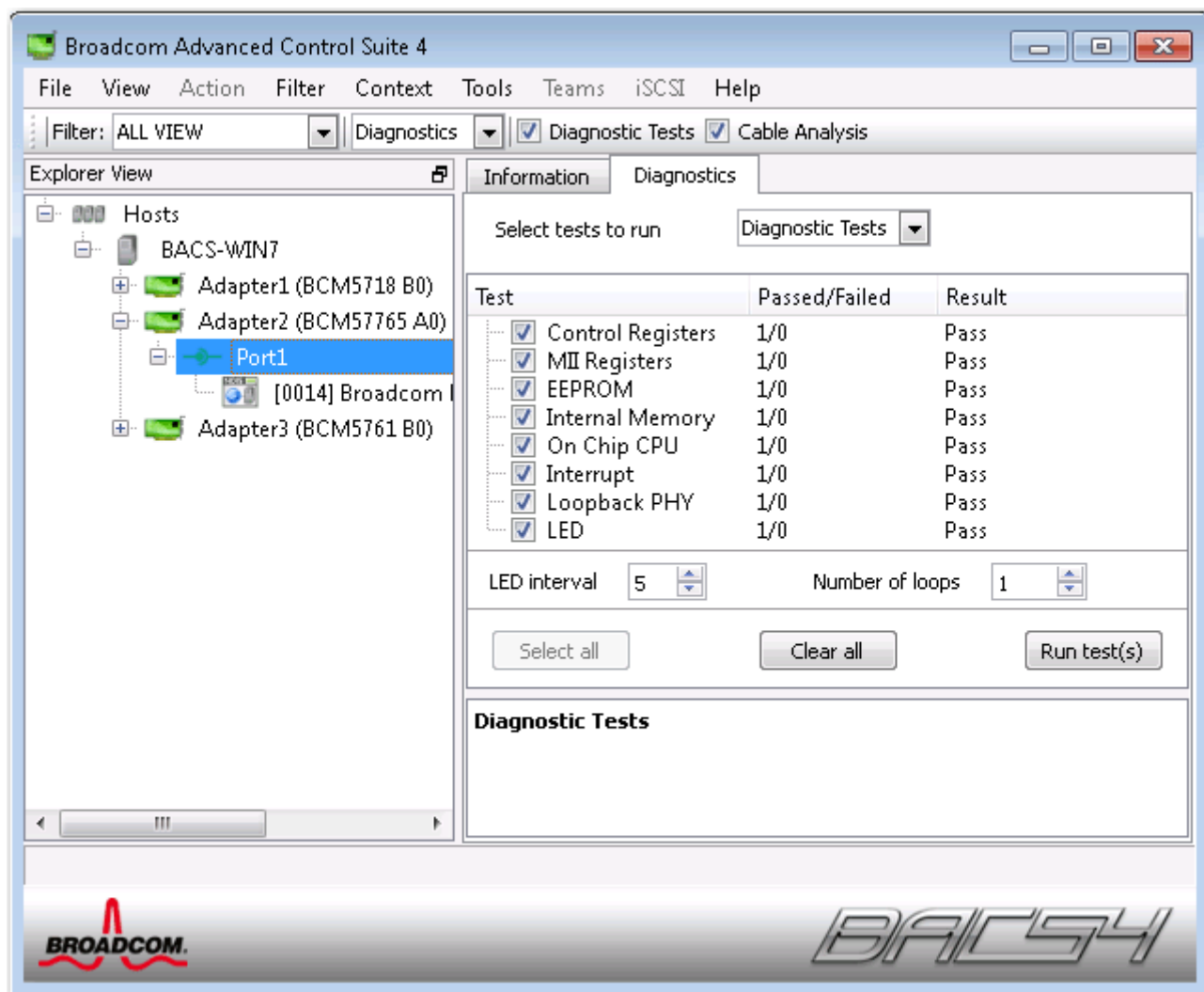
### NOTES:

- You must have administrator privileges to run diagnostic tests.
- The network connection is temporarily lost while these tests are running.
- Some tests are not supported on all Broadcom adapters.

### To run the diagnostic tests once

1. Click the name of the adapter to test in the Explorer View pane and select the Diagnostics tab.
2. From the **Select a test to run** list, select **Diagnostic Tests**.
3. Select the diagnostic tests you want to run. Click **Select All** to select all tests or **Clear All** to clear all test selections.
4. Select the number of times to run the tests from **Number of loops**.
5. Click **Run test(s)**.
6. In the error message window that warns of the network connection being temporarily interrupted, click **Yes**. The results are displayed in the **Result** field for each test.





**Control Registers.** This test verifies the read and write capabilities of the network adapter registers by writing various values to the registers and verifying the results. The adapter driver uses these registers to perform network functions such as sending and receiving information. A test failure indicates that the adapter may not be working properly.

**MI I Registers.** This test verifies the read and write capabilities of the registers of the physical layer (PHY). The physical layer is used to control the electrical signals on the wire and to configure network speeds such as 1000 Mbit/s.

**EEPROM.** This test verifies the content of the electrically erasable programmable read-only memory (EEPROM) by reading a portion of the EEPROM and computing the checksum. The test fails if the computed checksum is different from the checksum stored in the EEPROM. An EEPROM image upgrade does not require a code change for this test.

**Internal Memory.** This test verifies that the internal memory of the adapter is functioning properly. The test writes patterned values to the memory and reads back the results. The test fails if an erroneous value is read back. The adapter cannot function if its internal memory is not functioning properly.

**On-Chip CPU.** This test verifies the operation of the internal CPUs in the adapter.

**Interrupt.** This test verifies that the Network Device Driver Interface Specification (NDIS) driver is able to receive interrupts from the adapter.

**LoopBack MAC.** This test verifies that the NDIS driver is able to send packets to and receive packets from the adapter.

**LoopBack PHY.** This test verifies that the NDIS driver is able to send packets to and receive packets from the adapter.

**Test LED.** This test causes all of the port LEDs to blink 5 times for the purpose of identifying the adapter.

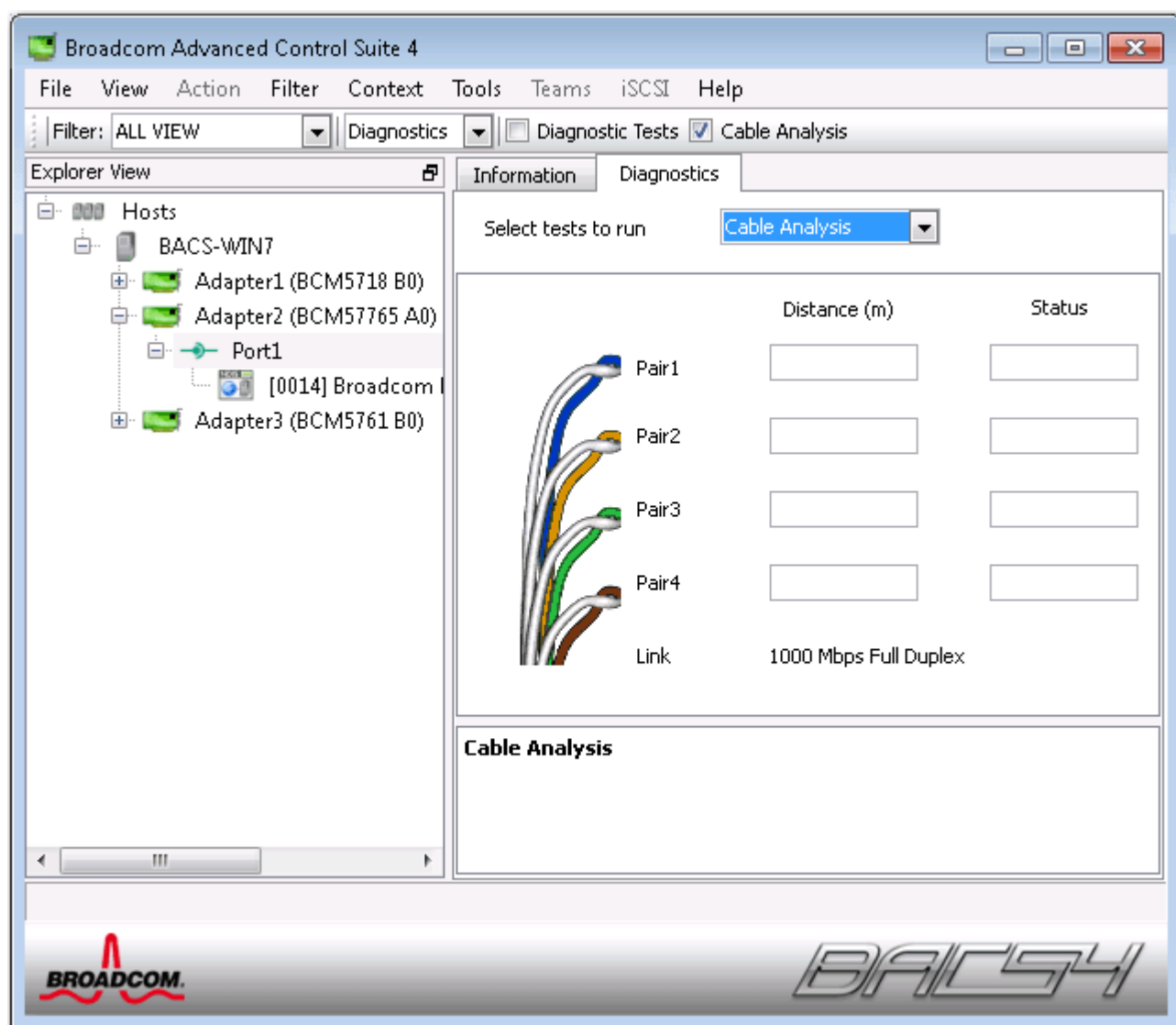
## ANALYZING CABLES

The **Cable Analysis** option on the **Diagnostics** tab lets you monitor the conditions of each wire pair in an Ethernet Category 5 cable connection within an Ethernet network. The analysis measures the cable quality and compares it against the IEEE 802.3ab specification for compliance.

- You must have administrator privileges to run the cable analysis test.
- The network connection is temporarily lost during an analysis.
- For Broadcom NetXtreme adapters, the cable analysis test can only run for gigabit link speed connections and when there is no connection.
- This option is not available for all Broadcom network adapters.

### To run a cable analysis

1. Connect the cable to a port on a switch where the port is set to **Auto** and the Speed & Duplex driver settings are also set to **Auto**.
2. Click the name of the adapter to test in the Explorer View pane.
3. From the **Select a test to run** list, select **Cable Analysis**. If the **Cable Analysis** option is not available, then from the **Context View** tab on the right side of the window, select **Diagnostics** and then select **Cable Analysis**.
4. Click **Run**.
5. In the error message window that warns of the network connection being temporarily interrupted, click **Yes**.



**Distance.** The valid cable distance in meters (except when the Noise result is returned).

**Status.** This shows the type of link on this cable pair.

- **Good.** Good cable/PCB signal paths, but no gigabit link.
- **Crossed.** Pin short or crosstalk along two or more cable/PCB signal paths.
- **Open.** One or both pins are open for a twisted pair.
- **Short.** Two pins from the same twisted pair are shorted together.
- **Noise.** Persistent noise present (most likely caused by Forced 10/100).
- **GB Link.** Gigabit link is up and running.
- **N/A.** Algorithm failed to reach a conclusion.

**Link.** The link connection speed and duplex mode.

**Status.** The status after the test is run, either completed or failed.

There are several factors that could have an effect on the test results:

- **Link partner.** Various switch and hub manufacturers implement different PHYs. Some PHYs are not IEEE compliant.
- **Cable quality.** Category 3, 4, 5, and 6 may affect the test results.
- **Electrical interference.** The testing environment may affect the test results.

## SETTING ADAPTER PROPERTIES

**Advanced** on the **Configurations** tab allow you to view and change the values of the available properties of the selected adapter. The potentially available properties and their respective settings are described below.

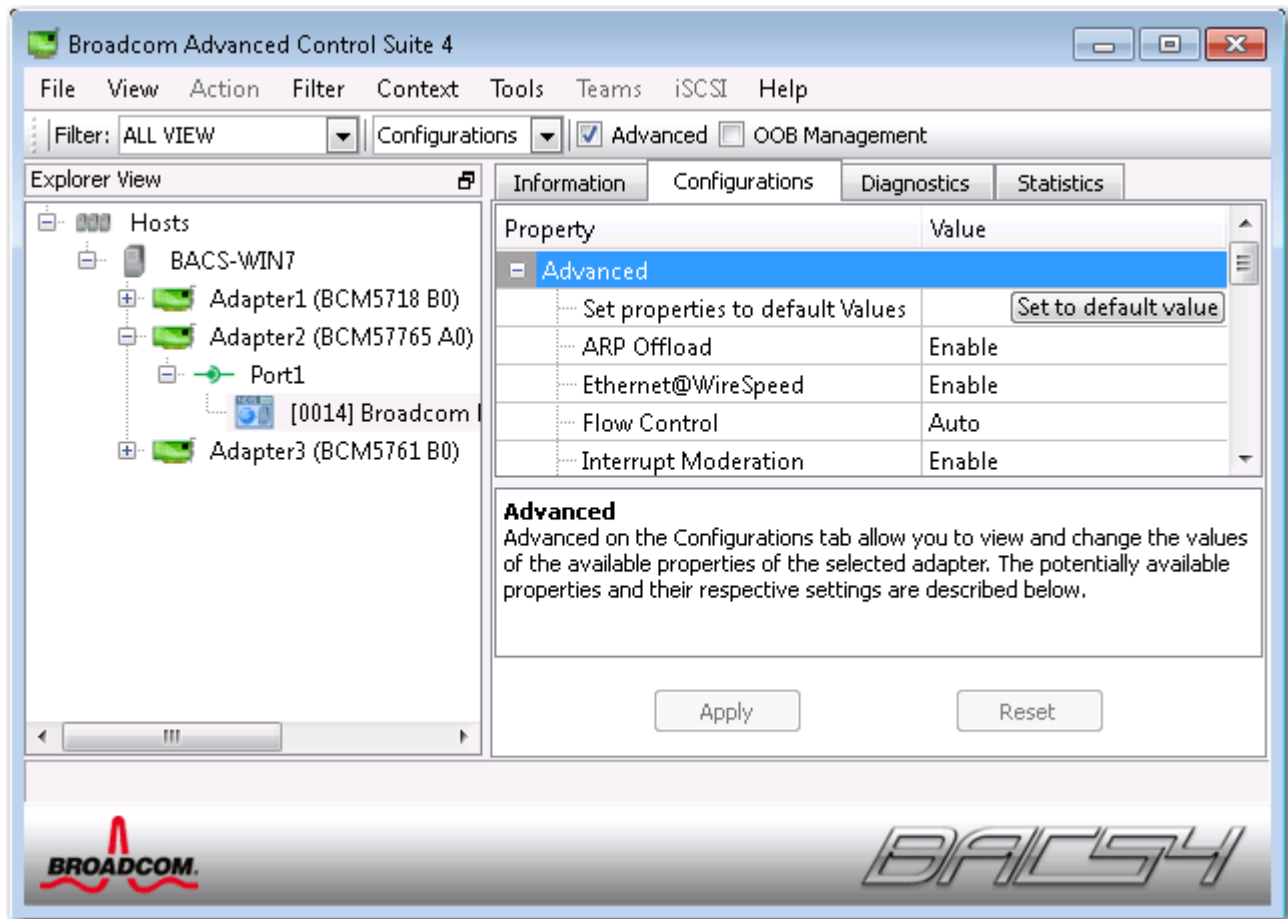


### NOTES:

- You must have administrator privileges to change the values for a property.
- The list of available properties for your particular adapter may be different.
- Some properties may not be available for all Broadcom network adapters.

### To set adapter properties

1. Click the name of the adapter in the Explorer View pane, and click the **Configurations** tab.
2. From the **Advanced** section, select the property you want to set.
3. To change the value of a property, select an item from the property's list or type a new value, as appropriate (selection options are different for different properties).
4. Click **Apply** to confirm the changes to all properties. Click **Reset** to return the properties to their original values.



**802.1p QOS.** Enables *quality of service*, which is an Institute of Electrical and Electronics Engineering (IEEE) specification that treats different types of network traffic diversely to ensure required levels or reliability and latency according to the type of traffic. This property is disabled by default. Unless the network infrastructure supports QoS, do not enable this property. Otherwise, problems may occur.

**Ethernet@Wirespeed.** Enables a Gigabit Ethernet adapter to establish a link at a lower speed when only two pairs of wires are available in the cabling plant. The default setting for this property is Enabled.

**Flow Control.** Enables or disables the receipt or transmission of PAUSE frames. PAUSE frames allow the network adapter and a switch to control the transmit rate. The side that is receiving the PAUSE frame momentarily stops transmitting.

- **Auto** (default). PAUSE frame receipt and transmission are optimized.
- **Disable.** PAUSE frame receipt and transmission are disabled.
- **Rx PAUSE.** PAUSE frame receipt is enabled.
- **Rx/Tx PAUSE.** PAUSE frame receipt and transmission are enabled.
- **Tx PAUSE.** PAUSE frame transmission is enabled.

**IPv4 Checksum Offload.** Normally, the checksum function is computed by the protocol stack. When you select one of the Checksum Offload property values (other than None), the checksum can be computed by the network adapter.

- **Rx Enabled.** Enables receive TCP/IP/UDP checksum offload.

- **Tx Enabled.** Enables transmit TCP/IP/UDP checksum offload.
- **Tx/Rx Enabled** (default). Enables transmit and receive TCP/IP/UDP checksum offload.
- **None.** Disables checksum offload.

**IPv4 Large Send Offload.** Normally, the TCP segmentation is done by the protocol stack. When you enable the Large Send Offload property, the TCP segmentation can be done by the network adapter. The default setting for this property is Enabled.

**Jumbo MTU.** Enables the network adapter to transmit and receive oversized Ethernet frames that are greater than 1514 bytes, but less than or equal to 9000 bytes in length (9600 bytes for network adapters that operate at 10 Gbps). This property requires the presence of a switch that is able to process jumbo frames.

Frame size is set at 1500 bytes by default. To increase the size of the received frames, raise the byte quantity in 500-byte increments.

**Locally Administered Address.** The Locally Administered Address is a user-defined MAC address that is used in place of the MAC address originally assigned to the network adapter. Every adapter in the network must have its own unique MAC address. This locally administered address consists of a 12-digit hexadecimal number.

- **Value.** Assigns a unique node address for the adapter.
- **Not Present** (default). Uses the factory-assigned node address on the adapter.

The appropriate assigned ranges and exceptions for the locally administered address include the following:

- The range is 00:00:00:00:00:01 to FF:FF:FF:FF:FF:FD.
- Do not use a multicast address (least significant bit of the high byte = 1).
- Do not use all 0s or all Fs.

**Receive Side Scaling.** Allows configuring network load balancing across multiple CPUs. The default setting for this property is Enabled.

**Speed & Duplex.** The Speed & Duplex property sets the connection speed and mode to that of the network. Note that Full-Duplex mode allows the adapter to transmit and receive network data simultaneously.

- **10 Mb Full.** Sets the speed at 10 Mbit/s and the mode to Full-Duplex.
- **10 Mb Half.** Sets the speed at 10 Mbit/s and the mode to Half-Duplex.
- **100 Mb Full.** Sets the speed at 100 Mbit/s and the mode to Full-Duplex.
- **100 Mb Half.** Sets the speed at 100 Mbit/s and the mode to Half-Duplex.
- **Auto** (default). Sets the speed and mode for optimum network connection (recommended).



#### NOTES:

- Auto is the recommended setting. This setting allows the network adapter to dynamically detect the line speed of the network. Whenever the network capability changes, the network adapter automatically detects and adjusts to the new line speed and duplex mode. A speed of 1 Gbit/s is enabled by selecting Auto, when that speed is supported.
- 1 Gb Full Auto must be attached to a link partner that is also capable of a 1 Gb connection. Since the connection is limited to a 1 Gb connection only, the Ethernet@Wirespeed feature will be disabled. If the link partner supports a 1 Gb connection only, the Wake on LAN feature may not work. Additionally, management traffic (IPMI or UMP) in the absence of an operating system may also be affected.
- 10 Mb Half and 100 Mb Half settings force the network adapter to connect to the network in Half-Duplex mode. Note that the network adapter may not function if the network is not configured to operate at the same mode.
- 10 Mb Full and 100 Mb Full settings force the network adapter to connect to the network in Full-Duplex mode.



The network adapter may not function if the network is not configured to operate at the same mode.

**Wake Up Capabilities.** Enables the network adapter to wake up from a low-power mode when it receives a network wake-up frame. Two types of wake-up frames are possible: Magic Packet and Wake Up Frame.

This property is only available for Broadcom NetXtreme adapters.

- **Both** (default). Selects both Magic Packet and Wake Up Frame as wake-up frames.
- **Magic Packet.** Selects Magic Packet as the wake-up frame.
- **None.** Selects no wake-up frame.
- **Wake Up Frame.** Selects Wake Up Frame as the wake-up frame and allows the network adapter to wake the system when an event such as a ping or an Address Resolution Protocol (ARP) request is received. This option works in conjunction with the operating system power mode saving and does not work if the Power Save setting does not enable WOL.

**WOL Speed.** Sets the speed at which the network adapter connects to the network while the network adapter is in Wake on LAN mode. By default, the WOL Speed property is set to Auto.

This property is only available for Broadcom NetXtreme adapters.

- **10 Mb.** Sets the speed to 10 Mbit/s. This is the network speed when the system is in a standby mode awaiting a wake-up frame.
- **100 Mb.** Sets the speed to 100 Mbit/s.
- **Auto** (default). Sets the speed for optimum network connection.



**NOTES:**

- Wake on LAN is supported at 10 Mbit/s or 100 Mbit/s.
- Wake on LAN is supported on only one adapter in the system at a time.

**Large Send Offload (IPv4).** Normally the TCP segmentation is done by the protocol stack. When you enable the Large Send Offload property, the TCP segmentation can be done by the network adapter.

**TCP/UDP Checksum Offload (IPv4).** Allows configuring checksum offload for the IPv4 protocol.

- **Disable.** Disables checksum offload.
- **Rx Enabled.** Enables receive TCP/IP/UDP checksum offload.
- **Tx Enabled.** Enables transmit TCP/IP/UDP checksum offload.
- **TX & Rx Enabled (default).** Enables transmit and receive TCP/IP/UDP checksum offload.

**Priority & VLAN.** Allows enabling both the prioritization of network traffic and VLAN tagging. VLAN tagging only occurs when the VLAN ID setting is configured with a value other than 0 (zero).

- **Priority & VLAN Enabled (default).** Allows for packet prioritization and VLAN tagging.
- **Priority & VLAN Disabled.** Prevents packet prioritization and VLAN tagging.
- **Priority Enabled.** Allows packet prioritization only.
- **VLAN Enabled.** Allows VLAN tagging only.



**Note:** If an intermediate driver is managing the network adapter for VLAN tagging, the **Priority & VLAN Disabled** and **Priority Enabled** settings should not be used. Use the **Priority & VLAN Enabled** setting and change the **VLAN ID** to 0 (zero).

**VLAN ID.** Enables VLAN tagging and configures the VLAN ID when **Priority & VLAN Enabled** is selected as the **Priority & VLAN** setting. The range for the VLAN ID is 1 to 4094 and must match the VLAN tag value on the connected switch. A value of 0 (default) in this field disables VLAN tagging.

#### Risk Assessment of VLAN Tagging through the NDIS Miniport Driver

Broadcom's NDIS 6.0 miniport driver provides the means to allow a system containing a Broadcom adapter to connect to a tagged VLAN. Unlike BASP, however, the NDIS 6 driver's support for VLAN participation is only for a single VLAN ID.

Also unlike BASP, the NDIS 6.0 driver only provides VLAN tagging of the outbound packet, but does not provide filtering of incoming packets based on VLAN ID membership. This is the default behavior of all miniport drivers. While the lack of filtering packets based on VLAN membership may present a security issue, the following provides a risk assessment based on this driver limitation for an IPv4 network:

A properly configured network that has multiple VLANs should maintain separate IP segments for each VLAN. This is necessary since outbound traffic relies on the routing table to identify which adapter (virtual or physical) to pass traffic through and does not determine which adapter based on VLAN membership.

Since support for VLAN tagging on Broadcom's NDIS 6.0 driver is limited to transmit (Tx) traffic only, there is a risk of inbound traffic (Rx) from a different VLAN being passed up to the operating system. However, based on the premise of a properly configured network above, the IP segmentation and/or the switch VLAN configuration may provide additional filtration to limit the risk.

In a back-to-back connection scenario, two computers on the same IP segment may be able to communicate regardless of their VLAN configuration since no filtration of VLAN membership is occurring. However, this scenario assumes that the security may already be breached since this connection type is not typical in a VLAN environment.

If the risk above is not desirable and filtering of VLAN ID membership is required, then support through an intermediate driver would be necessary.



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## VIEWING STATISTICS

The information provided on the Statistics tab allows you to view traffic statistics for both Broadcom network adapters and network adapters made by others. Statistical information and coverage are more comprehensive for Broadcom adapters.

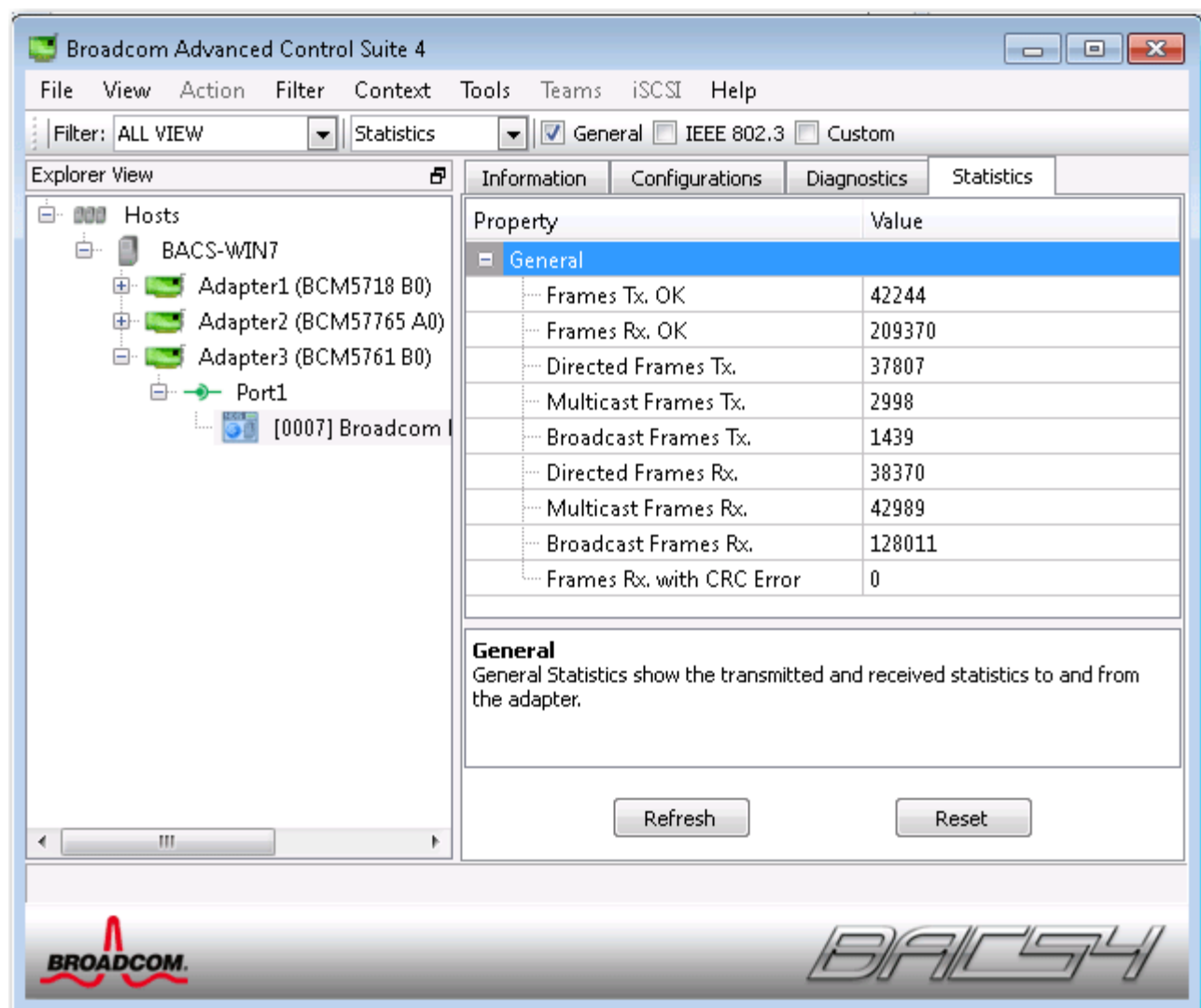
To view Statistics information for any installed network adapter, click the name of the adapter listed in the Explorer View pane, then click the Statistics tab.

Click **Refresh** to get the most recent values for each statistic. Click **Reset** to change all values to zero.



### NOTES:

- Team statistics are not compiled for a Broadcom network adapter if it is disabled.
- Some statistics may not be available for all Broadcom network adapters.



## General Statistics

General Statistics show the transmitted and received statistics to and from the adapter.

**Frames Tx OK.** A count of the frames that were successfully transmitted. This counter is incremented when the transmit status is reported as Transmit OK.

**Frames Rx OK.** A count of the frames that were successfully received. This does not include frames received with frame-too-long, frame check sequence (FCS), length, or alignment errors, nor frames lost due to internal MAC sublayer errors. This counter is incremented when the receive status is reported as Receive OK.

**Directed Frames Tx.** A count of directed data frames that were successfully transmitted.

**Multicast Frames Tx.** A count of frames that were successfully transmitted (as indicated by the status value Transmit OK) to a group destination address other than a broadcast address.

**Broadcast Frames Tx.** A count of frames that were successfully transmitted (as indicated by the transmit status Transmit OK) to the broadcast address. Frames transmitted to multicast addresses are not broadcast frames and are excluded.

**Directed Frames Rx.** A count of directed data frames that were successfully received.

**Multicast Frames Rx.** A count of frames that were successfully received and are directed to an active nonbroadcast group address. This does not include frames received with frame-too-long, FCS, length, or alignment errors, nor frames lost because of internal MAC sublayer errors. This counter is incremented as indicated by the Receive OK status.

**Broadcast Frames Rx.** A count of frames that were successfully received and are directed to a broadcast group address. This count does not include frames received with frame-too-long, FCS, length, or alignment errors, nor frames lost because of internal MAC sublayer errors. This counter is incremented as indicated by the Receive OK status.

**Frames Rx with CRC Error.** The number of frames received with CRC errors.

The total number of offloaded TCP connections.

---

## CONFIGURING TEAMING

The teaming function allows you to group any available network adapters together to function as a team. Teaming is a method of creating a virtual NIC (a group of multiple adapters that functions as a single adapter). The benefit of this approach is that it enables load balancing and failover. Teaming is done through the Broadcom Advanced Server Program (BASP) software. For a comprehensive description of the technology and implementation considerations of the teaming software, refer to the "Broadcom Gigabit Ethernet Teaming Services" section of your Broadcom network adapter user guide.

Teaming can be accomplished by either of the following methods:

- [Using the Broadcom Teaming Wizard](#)
- [Using Expert Mode](#)



### NOTES:

- For further information regarding teaming protocols, see "Teaming" in your Broadcom network adapter user guide.
- If you do not enable LiveLink™ when configuring teams, disabling Spanning Tree Protocol (STP) at the switch is recommended. This minimizes the downtime due to spanning tree loop determination when failing over. LiveLink mitigates such issues.
- BASP is available only if a system has one or more Broadcom network adapters installed.
- The Large Send Offload (LSO) and Checksum Offload properties are enabled for a team only when all of the members support and are configured for the feature.
- You must have administrator privileges to create or modify a team.
- The load balance algorithm in a team environment in which members are connected at different speeds favors members connected with a Gigabit Ethernet link over members connected at lower speed links (100 Mbps or 10 Mbps) until a threshold is met. This is normal behavior.
- Wake on LAN (WOL) is a feature that allows a system to be awakened from a sleep state by the arrival of a specific packet over the Ethernet interface. Because a virtual adapter is implemented as a software only device, it lacks the hardware features to implement WOL and cannot be enabled to wake the system from a sleeping state via the virtual adapter. The physical adapters, however, support this property, even when the adapter is part of a team.

## TEAM TYPES

You can create four types of load balance teams:

- Smart Load Balance and Failover
- Link Aggregation (802.3ad)
- Generic Trunking (FEC/GEC)/802.3ad-Draft Static
- SLB (Auto-Fallback Disable) – The Auto-Fallback Disable feature is configured for Smart Load Balance and Failover type teams in the Teaming Wizard.

### Smart Load Balance and Failover

In this type of team, a standby member handles the traffic if all of the load balance members fail (a failover event). All load balance members have to fail before the standby member takes over. When one or more of the load balance members is restored (fallback), the restored team member(s) resumes the handling of the traffic. The LiveLink feature is supported for this type of team.

### Link Aggregation (802.3ad)

In this type of team, you can dynamically configure the network adapters that have been selected to participate in a given team. If the link partner is not correctly configured for IEEE 802.3ad link configuration, errors are detected and noted. All adapters in the team are configured to receive packets for the same MAC address. The outbound load balancing scheme is determined by the BASP driver. The link partner of the team determines the load balancing scheme for inbound packets. In this mode, at least one of the link partners must be in active mode.

### Generic Trunking (FEC/GEC)/802.3ad-Draft Static

This type of team is very similar to the link aggregation type, in that all adapters in the team must be configured to receive packets for the same MAC address. This mode does not provide link aggregation control protocol (LACP) or marker protocol support. This mode supports a variety of environments where the link partners are statically configured to support a proprietary trunking mechanism. Trunking supports load balancing and failover for both outbound and inbound traffic.

### SLB (Auto-Fallback Disable)

This team is identical to Smart Load Balance and Failover, with the following exception: when the standby member is active, if a primary member comes back online, the team continues using the standby member rather than switching back to the primary member. This type of team is supported only for situations in which the network cable is disconnected and reconnected to the network adapter. It is not supported for situations in which the adapter is removed/installed through Device Manager or Hot-Plug PCI. If any primary adapter assigned to a team is disabled, the team functions as a Smart Load Balancing and Failover type of team in which auto-fallback occurs. The LiveLink feature is supported for this type of team.

## STANDBY TEAM MEMBER AND AUTO-FALLBACK DISABLE MODE

You can designate one team member in an SLB type of team to be the standby member. The standby member does not actively send and receive normal network traffic while other adapters on the team are active. If all of the active adapters on the team fail or are disconnected, the standby member takes over the handling of the network activities.

In Auto-Fallback Disable mode, if a load balance member returns on line, the team continues using the standby member rather than switching back to using the load balance member. Consequently, the adapter that was initially designated a load balance member remains in an inactive state and becomes the new standby member.

## LIVELINK

LiveLink is a feature of BASP that is available for the Smart Load Balancing (SLB) and SLB (Auto-Fallback Disable) type of teaming. The purpose of LiveLink is to detect link loss beyond the switch and to route traffic only through team members that have a live link.

## USING THE BROADCOM TEAMING WIZARD

You can use the Broadcom Teaming Wizard to create a team, configure an existing team if a team has already been created, or create a VLAN.

### 1. Create or edit a team:

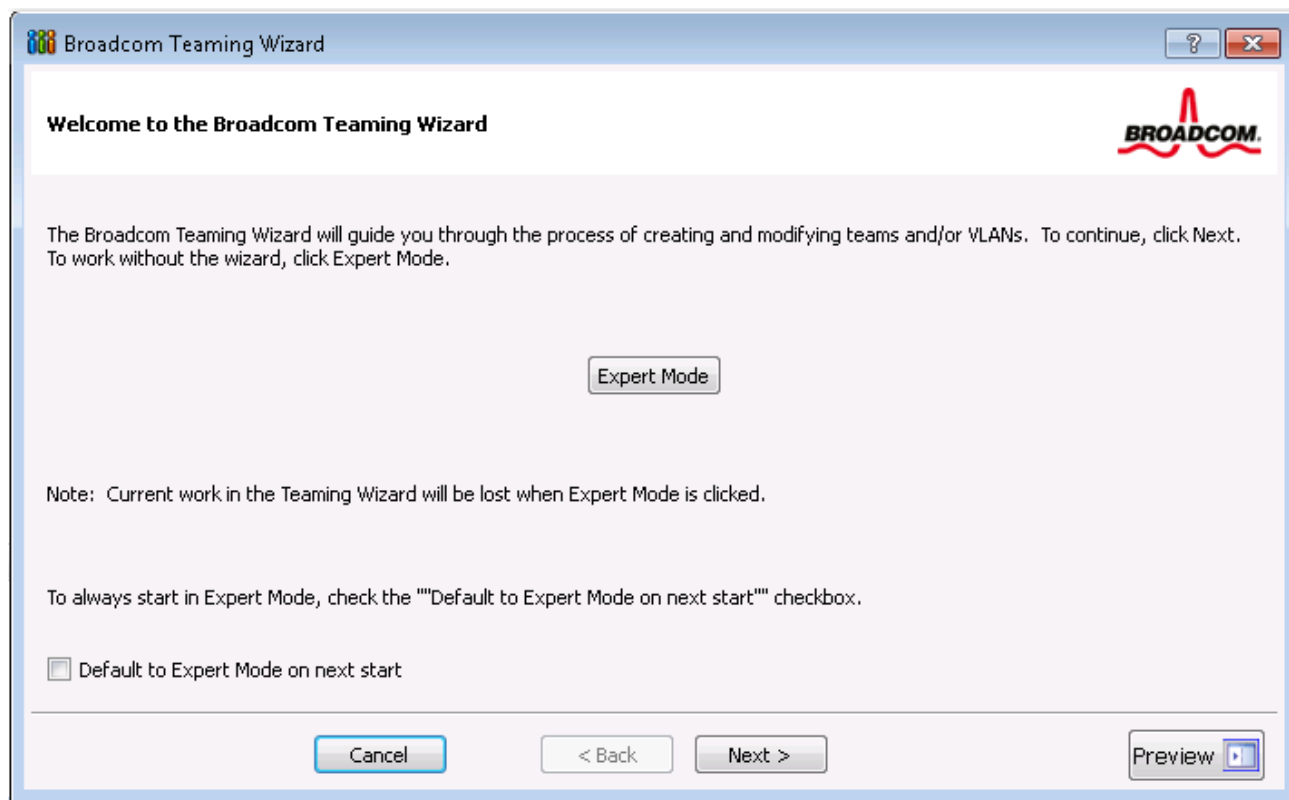
To create a new team, select **Create a Team** from the **Team** menu, or right-click one of the devices in the “Unassigned Adapters” section and select **Create a Team**. This option is not available if there are no devices listed in the “Unassigned Adapters” sections, which means all adapters are already assigned to teams.

To configure an existing team, right-click one of the teams in the list and select **Edit Team**. This option is only available if a team has already been created and is listed in the Team Management pane.



**Note:** If you prefer to work without the wizard for now, click **Expert Mode**. If you want to always use Expert Mode to create a team, select **Default to Expert Mode on next start**. See [Using Expert Mode](#).

### 2. To continue using the wizard, click **Next**.



3. Type the team name and then click **Next**. If you want to review or change any of your settings, click **Back**. Click **Cancel** to discard your settings and exit the wizard.

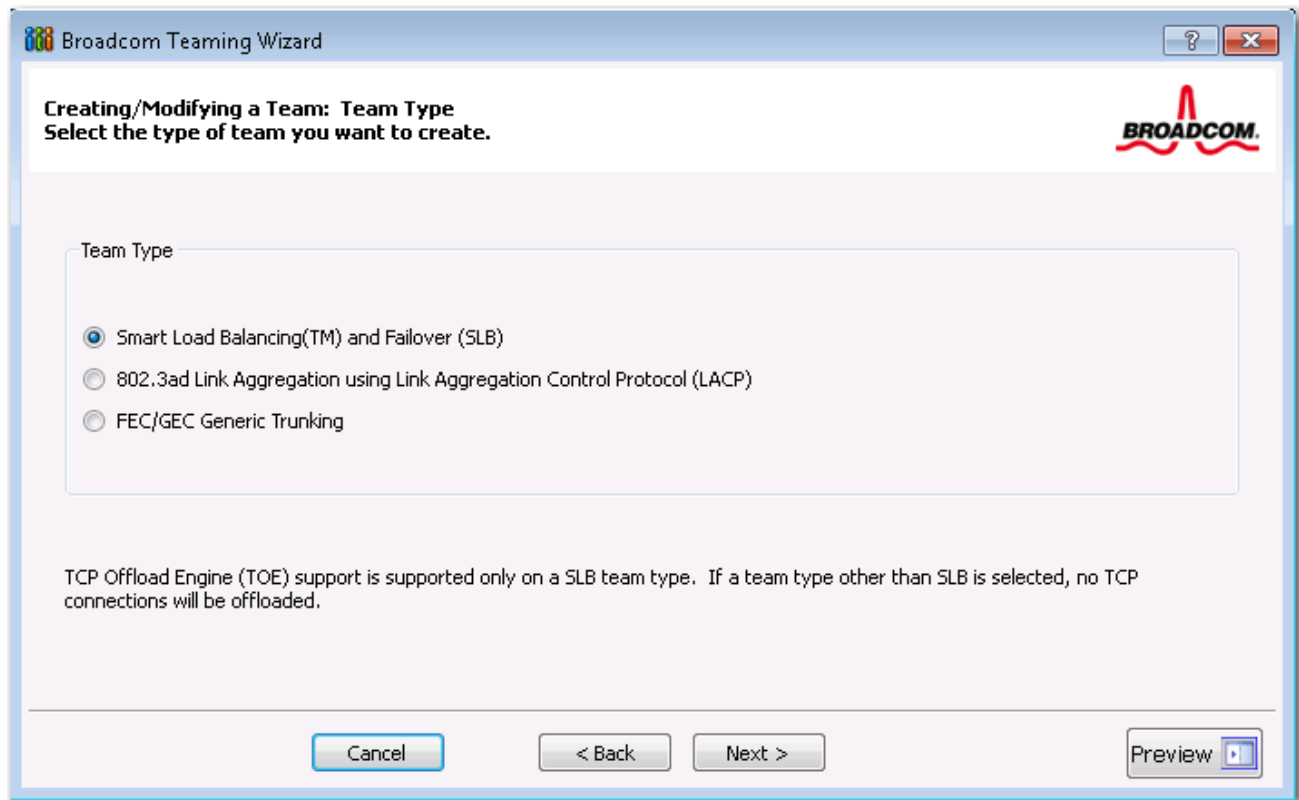


**Note:** The team name cannot exceed 39 characters, cannot begin with spaces, and cannot contain any of the following characters: & \ / : \* ? < > |

The screenshot shows the 'Broadcom Teaming Wizard' window. The title bar says 'Broadcom Teaming Wizard'. Inside the window, the text reads: 'Creating/Modifying a Team: Team Name' and 'You must assign your team a unique name.' The Broadcom logo is in the top right corner. Below the text, it says 'Enter the name for the team:' followed by a text input field containing 'Team 1'. At the bottom left, there is an information icon and a message: 'A team name has a maximum length of 39 characters. The name can use any symbolic character except & \ / : \* ? < > |'. At the bottom, there are four buttons: 'Cancel', '< Back', 'Next >', and 'Preview' with a small icon.



4. Select the type of team you want to create. If the team type is an SLB type team, click **Next**. If the team type is not an SLB type team, then a dialog box appears. Verify that the network switch connected to the team members is configured correctly for the team type, click **OK**, and continue.



5. From the **Available Adapters** list, click the adapter you want to add to the team and then click **Add**. Remove team members from the **Team Members** list by clicking the adapter and then clicking **Remove**. Click **Next**.



**Note:** There must be at least one Broadcom network adapter assigned to the team.

The TCP Offload Engine (TOE), Large Send Offload (LSO) and Checksum Offload (CO) columns indicate if the TOE, LSO, and/or the CO properties are supported for the adapter. The TOE, LSO, and CO properties are enabled for a team only when all of the members support and are configured for the feature. If this is the case, then the team offload capabilities appear on the bottom of the screen.



**Note:** Adding a network adapter to a team where its driver is disabled may negatively affect the offloading capabilities of the team. This may have an impact on the team's performance. Therefore, it is recommended that only driver-enabled network adapters be added as members to a team.

**Broadcom Teaming Wizard**

**Creating/Modifying a Team: Assigning Team Members**  
Specify which adapters to include in the team.  
Include adapters that you wish to set for the standby role.

Available Adapters	TOE	LSO	CO	RSS	Teamable	NDIS	MTU
[0015] Broadcom NetXtreme Gigabit Ethernet #3	No	Yes	Yes	Yes	Yes	6.20	1500
[0016] Broadcom NetXtreme Gigabit Ethernet #4	No	Yes	Yes	Yes	Yes	6.20	1500

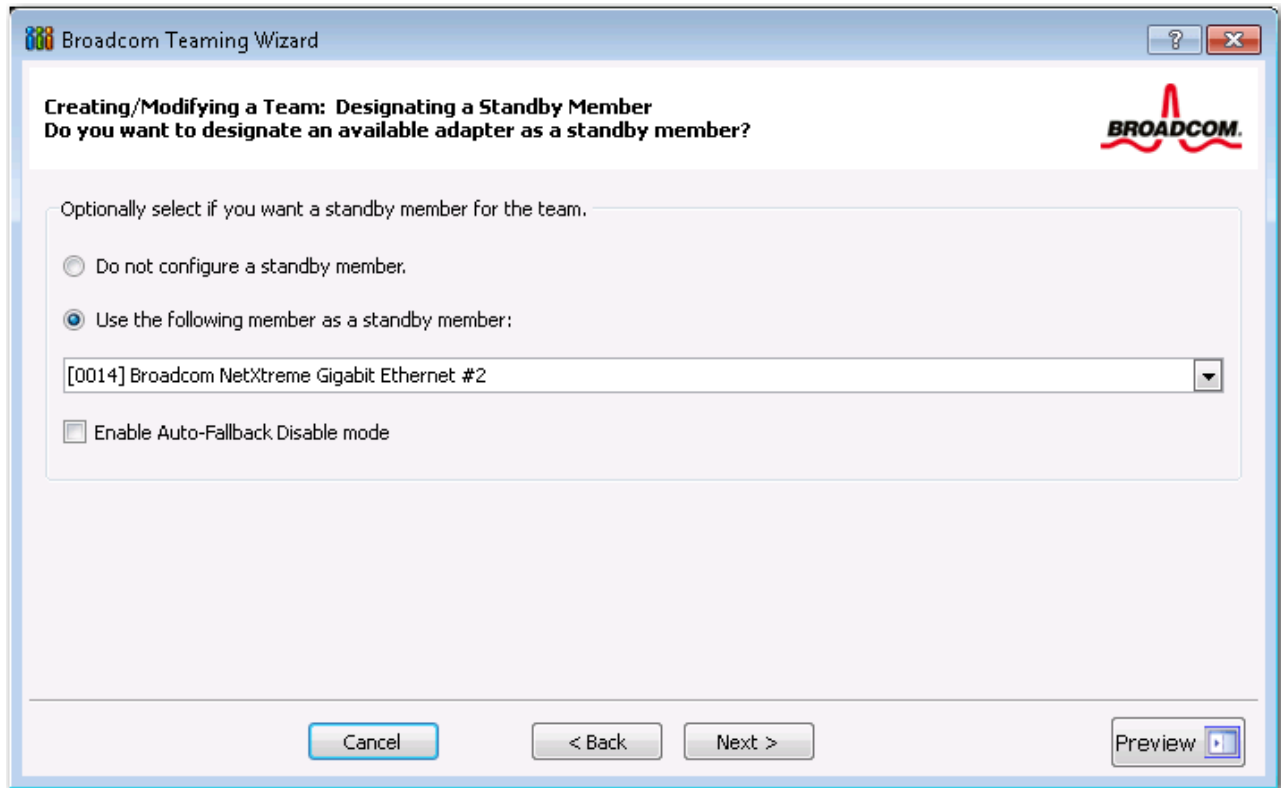
**Add** **Remove**

Team Members	TOE	LSO	CO	RSS	Teamable	NDIS	MTU
[0014] Broadcom NetXtreme Gigabit Ethernet #2	No	Yes	Yes	Yes	Yes	6.20	1500
[0007] Broadcom NetXtreme Gigabit Ethernet	No	Yes	Yes	Yes	Yes	6.20	1500

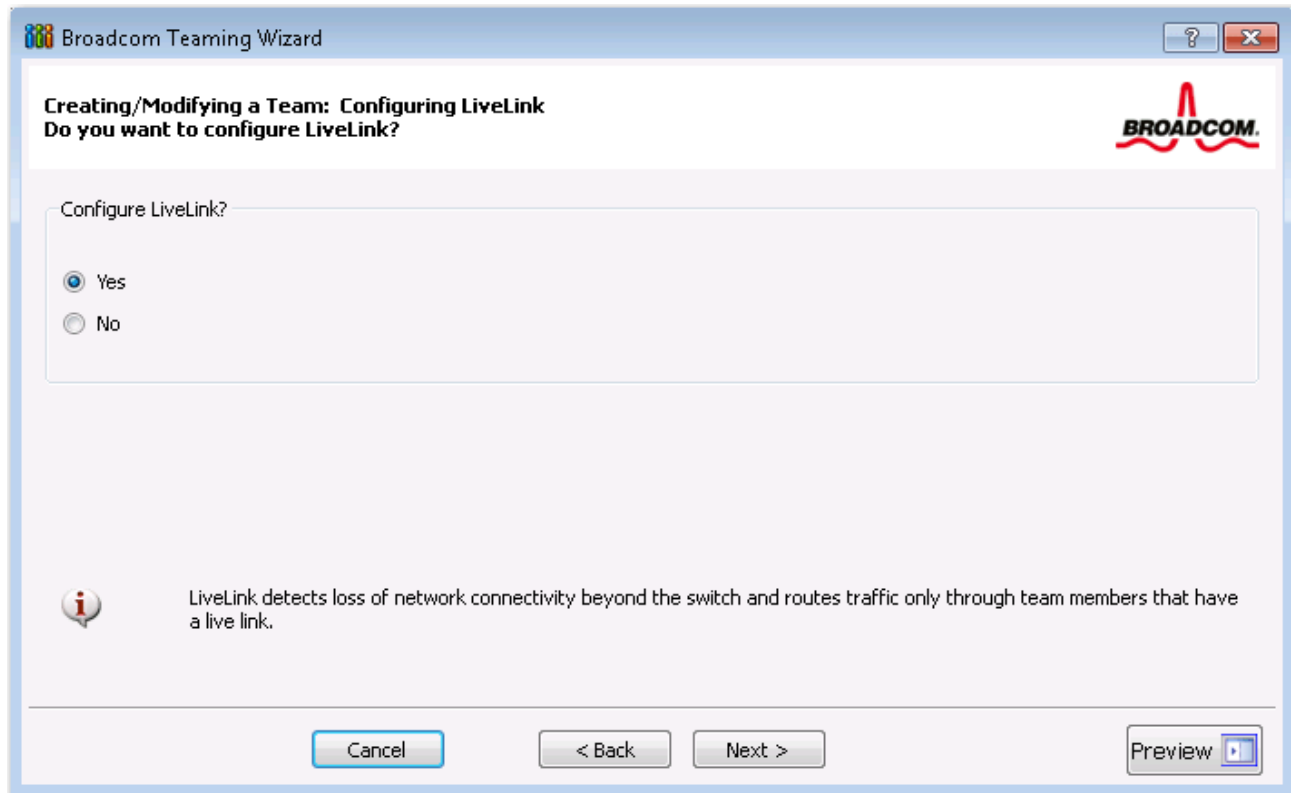
Team Offload Capabilities: LSO, CO, RSS Team MTU: 1500

**Cancel** **< Back** **Next >** **Preview**

6. If you want to designate one of the adapters as a standby member (optional), select **Use the following member as a standby member**, then choose the standby member from the list of adapters.
7. The Auto-Fallback Disable mode feature allows the team to continue using the standby member rather than switching back to the primary member if the primary member comes back online. To enable this feature, select **Enable Auto-Fallback Disable mode**. Click **Next**.



8. If you want to configure LiveLink, select **Yes**, otherwise select **No**, then click **Next**.



9. Select the probe interval (the number of seconds between each retransmission of a link packet to the probe target) and the maximum number of probe retries (the number of consecutively missed responses from a probe target before a failover is triggered).
10. Set the Probe VLAN ID to allow for connectivity with probe targets residing on a tagged VLAN. The number set must match the VLAN ID of the probe targets as well as the port(s) on the switch to which the team is connected.



**Note:** Each LiveLink enabled team can only communicate with Probe Targets on a single VLAN. Also, VLAN ID 0 is equivalent to an untagged network. If the Probe VLAN ID is set to a value other than 0, then a VLAN must be created with an identical VLAN tag value (see [Step 16. on page 79](#)).

11. Click the probe target at the top of the list, click **Edit Target IP Address**, type the target IP address in the **IP Address** box for one or all probe targets, and then click **OK**. Click **Next**.



**Note:** Only the first probe target is required. You can specify up to three additional probe targets to serve as backups by assigning IP addresses to the other probe targets.

12. Select a listed team member, click **Edit Member IP Address**, and then type the member IP address in the IP Address box. Repeat for all listed team members and then click **OK**. Click **Next**.



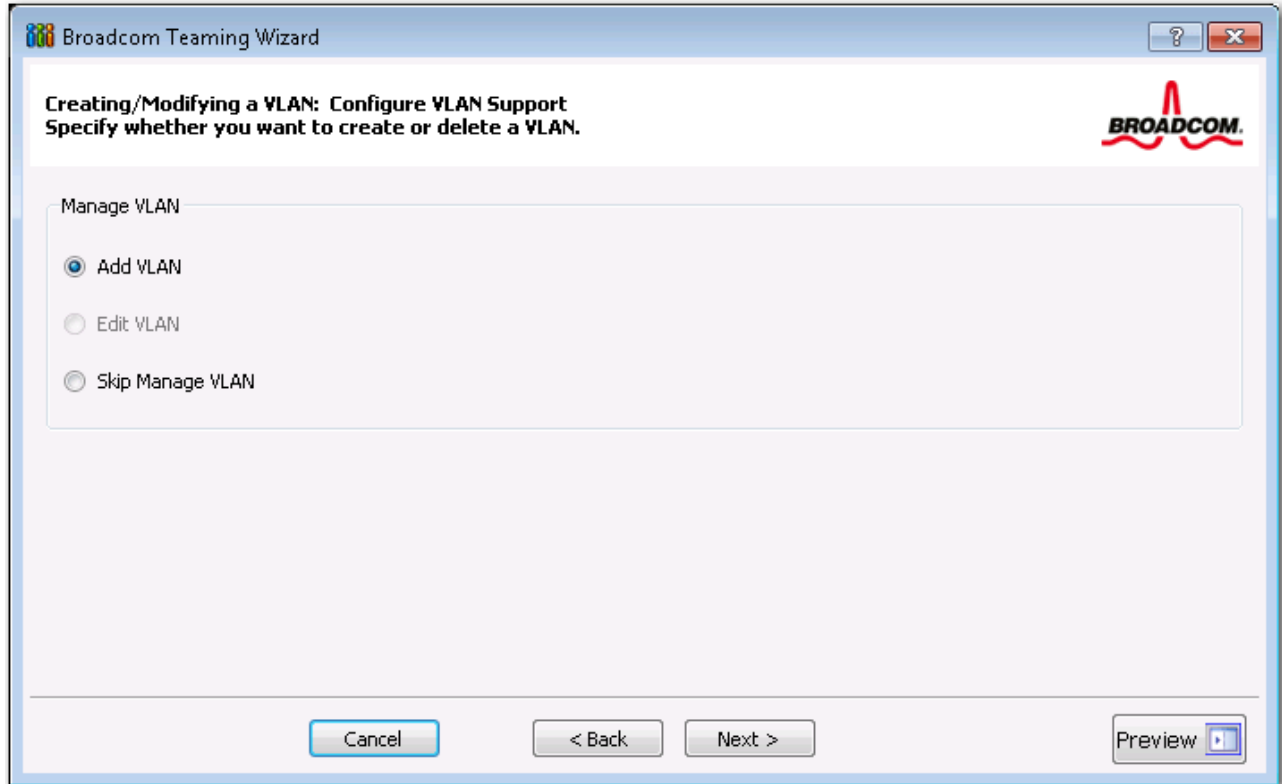
**Note:** All of the member IP addresses must be in the same subnet as the subnet of the probe targets.

13. If you want to create a VLAN on the team, select **Add VLAN**, or if you want to change the settings of an existing VLAN, select **Edit VLAN**, then click **Next**. If you do not want to create or edit a VLAN, select **Skip Manage VLAN**, then click **Next**, and continue with the wizard from the Finish screen (see [Step 18. on page 82](#) of this procedure).

VLANs enable you to add multiple virtual adapters that are on different subnets. The benefit of this is that your system can have one network adapter that can belong to multiple subnets.



**Note:** VLANs can only be created when all team members are Broadcom adapters.



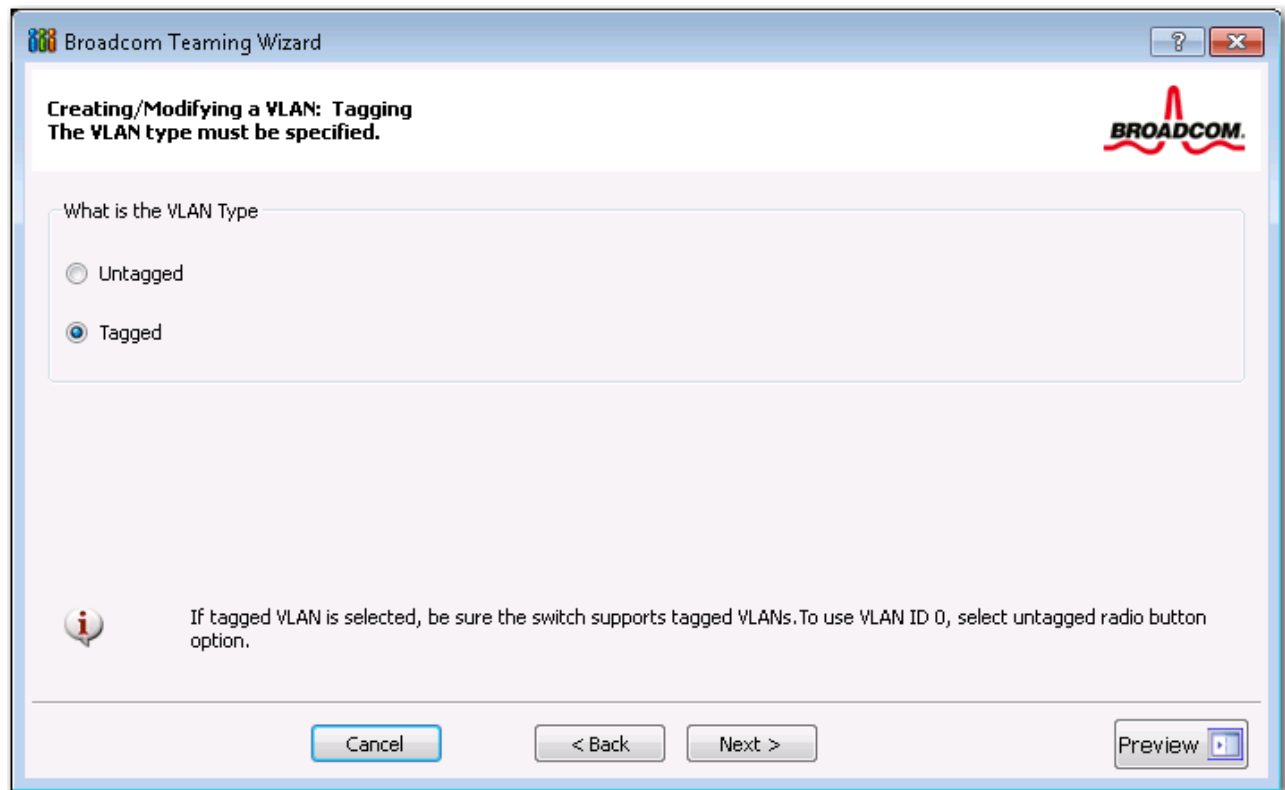
14. Type the VLAN name and then click **Next**.



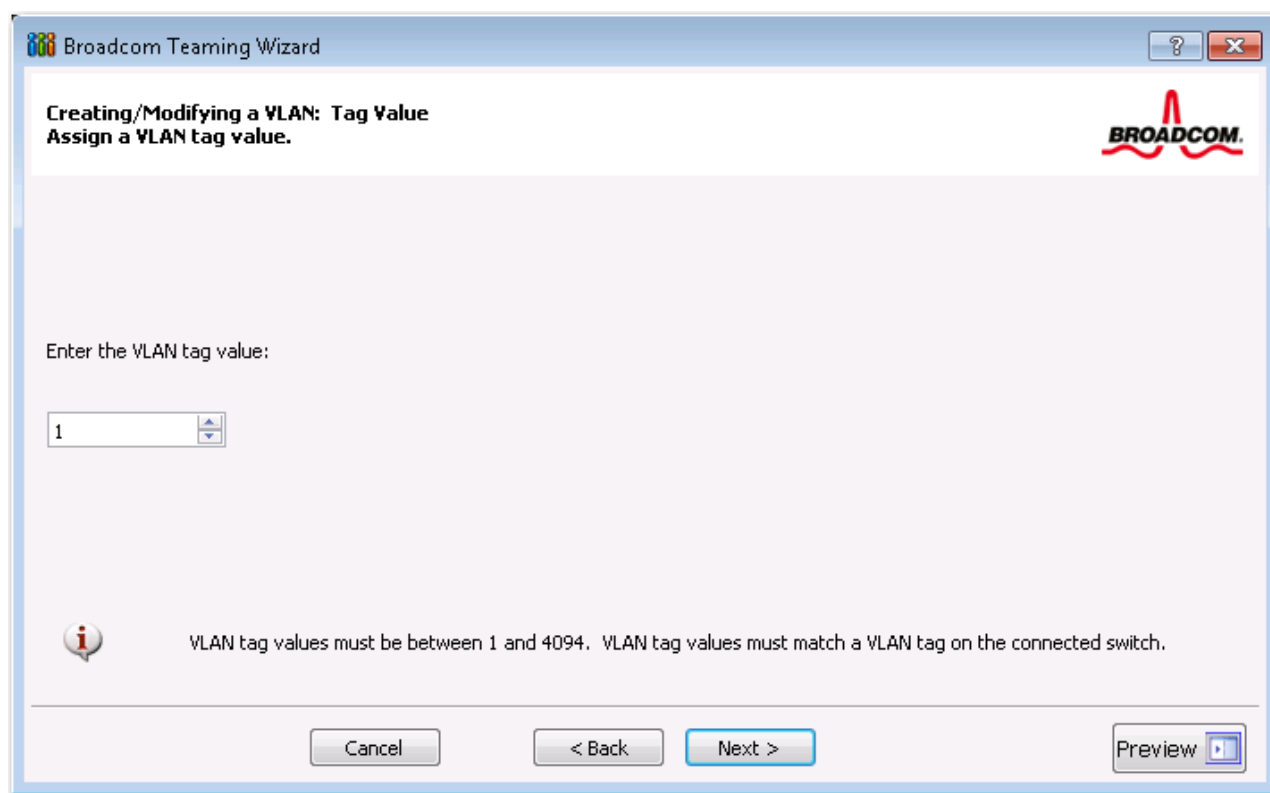
**Note:** The team name cannot exceed 39 characters, cannot begin with spaces, and cannot contain any of the following characters: & \ / : \* ? < > |

The screenshot shows the 'Broadcom Teaming Wizard' window. The title bar says 'Broadcom Teaming Wizard'. The main area has the heading 'Creating/Modifying a VLAN: Naming' and the instruction 'You must assign your VLAN a unique name.' with the Broadcom logo. Below this is a text input field labeled 'Enter a name for the VLAN' containing the text 'VLAN 1'. At the bottom, there is an information icon and a note: 'A single member SLB team will be created on instances when VLAN tagging is desired on one physical interface. A VLAN name has a maximum length of 39 characters. The name can use any symbolic character except & \ / : \* ? < > |'. Navigation buttons at the bottom include 'Cancel', '< Back', 'Next >', and 'Preview'.

15. To tag the VLAN, select **Tagged** and then click **Next**. Otherwise, click **Untagged**, click **Next**, and continue with the wizard to add additional VLANs (see [Step 17. on page 81](#) of this procedure).



16. Type the VLAN tag value and then click **Next**. The value must be between 1 and 4094.




**Broadcom Teaming Wizard**

**Creating/Modifying a VLAN: Tag Value**  
Assign a VLAN tag value.

Enter the VLAN tag value:

1

 VLAN tag values must be between 1 and 4094. VLAN tag values must match a VLAN tag on the connected switch.

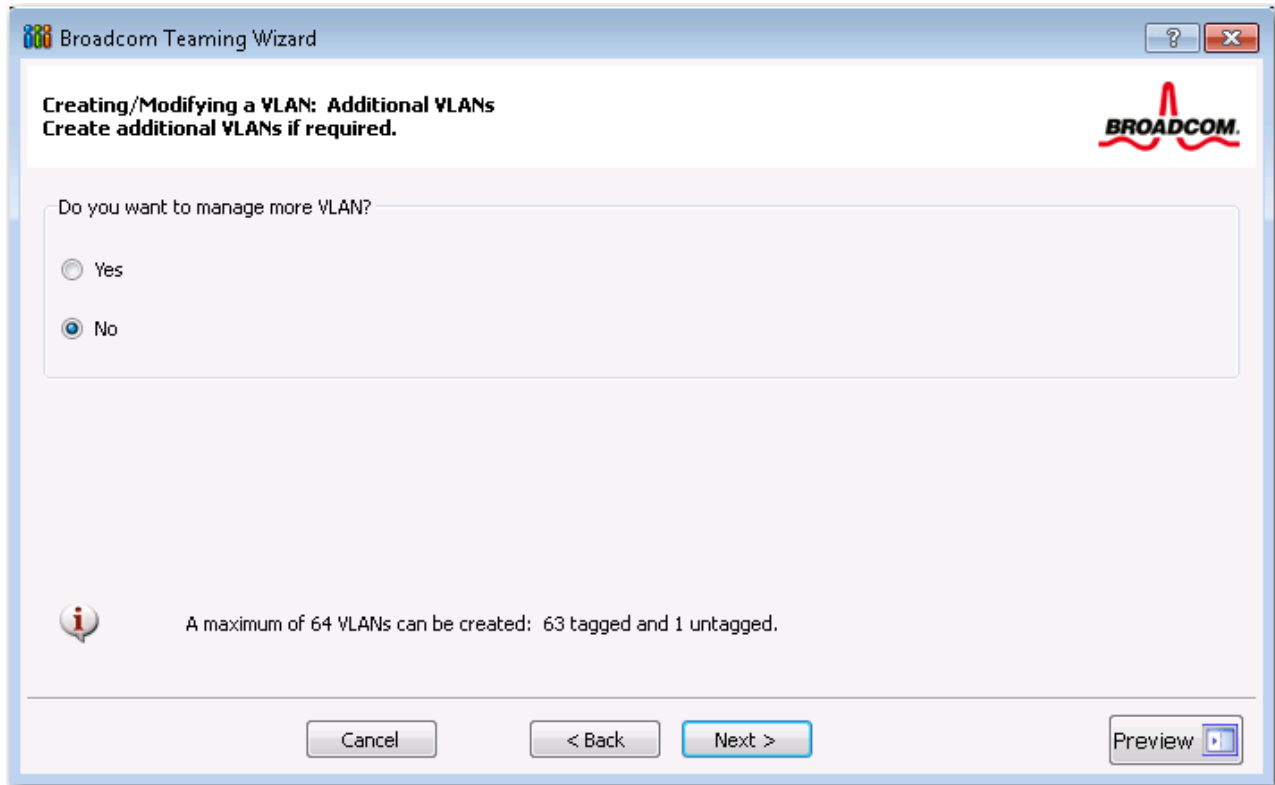
Cancel < Back Next > Preview



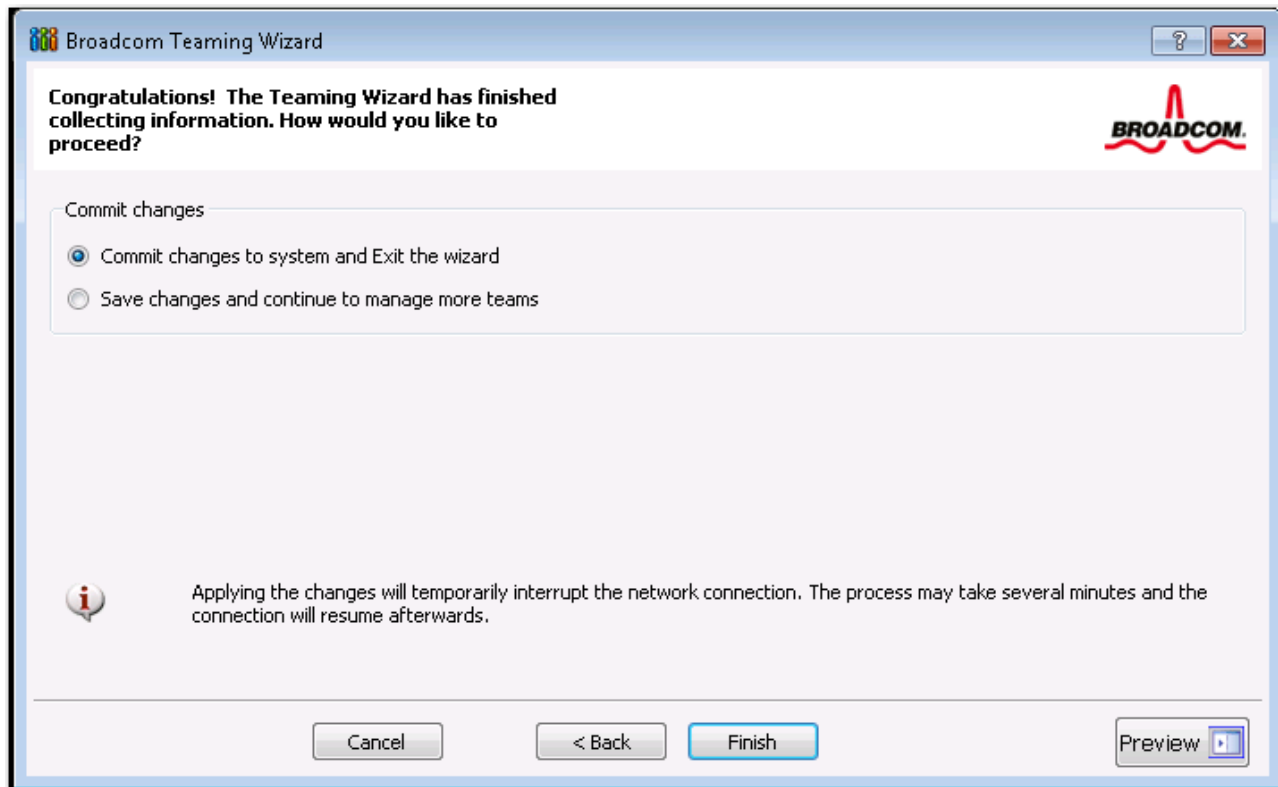
17. Select **Yes** to add or manage another VLAN and then click **Next**. Repeat until you do not want to add or manage any additional VLANs.



**Note:** You can define up to 64 VLANs per team (63 VLANs that are tagged and 1 VLAN that is not tagged). Adding several VLANS may slow down the reaction time of the Windows interface due to memory and processor time usage for each VLAN. The degree to which Windows performance may suffer depends on system configuration.

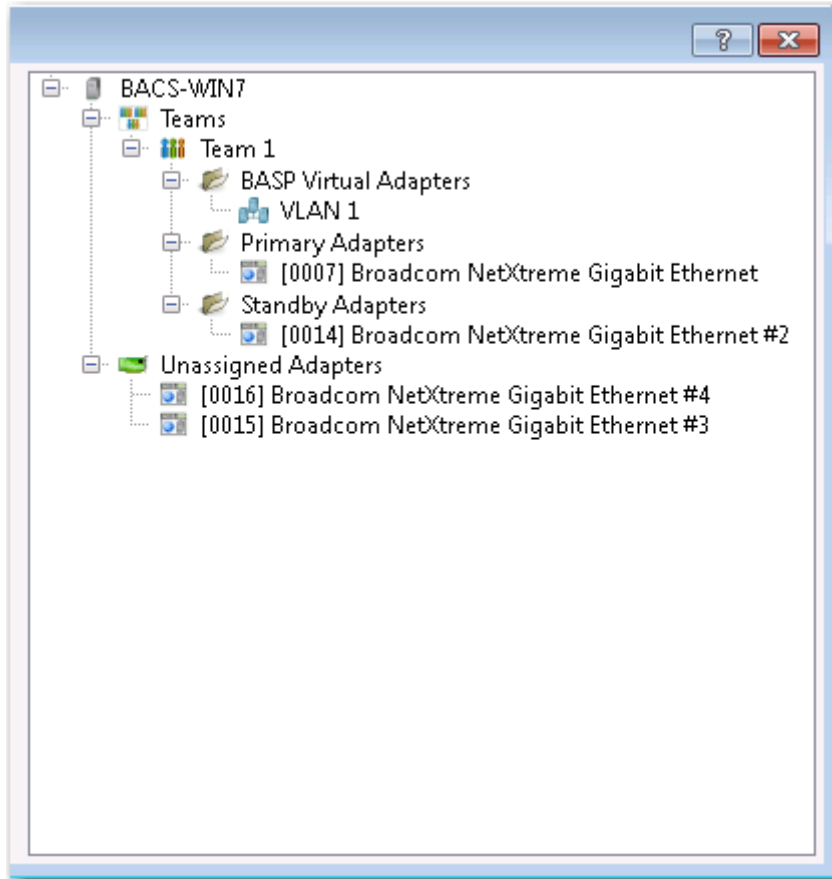


18. To apply and commit the changes to the team, select **Commit changes to system and Exit the wizard**. To apply your changes but continue using the wizard, select **Save changes and continue to manage more teams**. Click Finish.

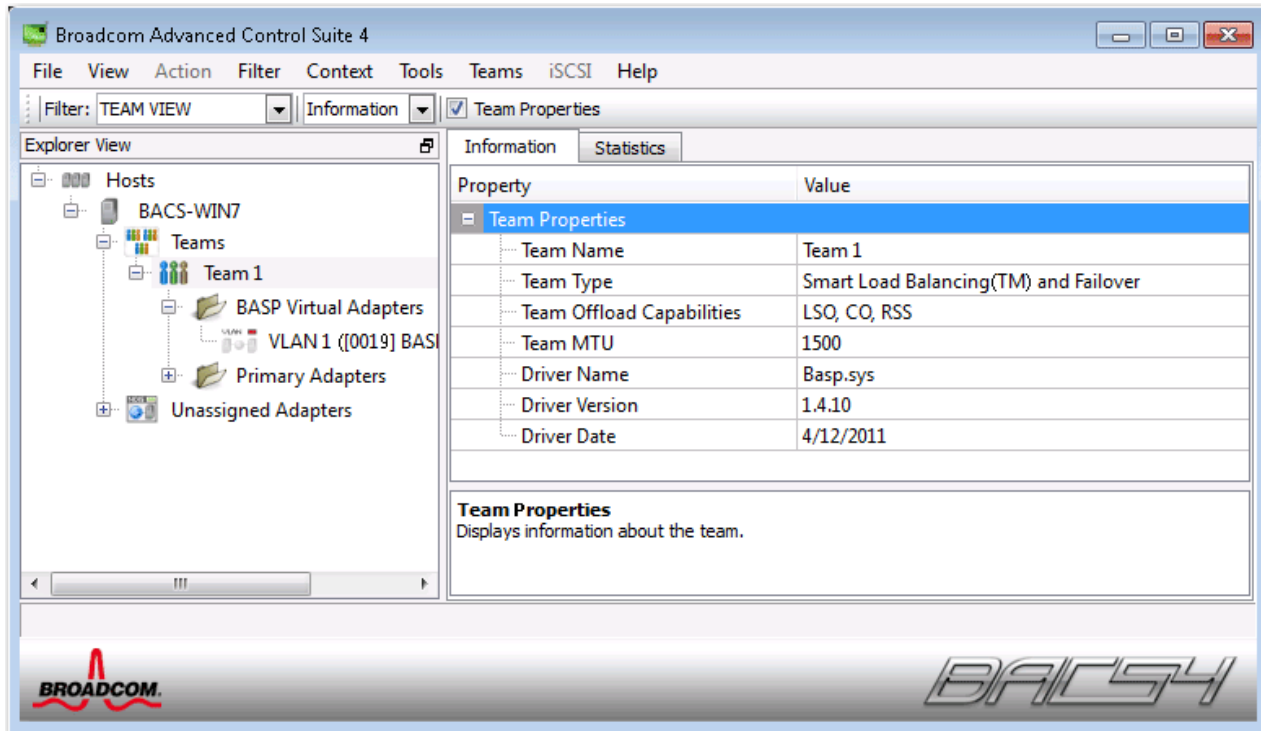




**Note:** At any point in the Broadcom Teaming Wizard procedure, click **Preview** to get a visual representation of what the team will look like before committing any changes.



19. Click the team name in the Team Management pane to view the team's properties in the **Information** tab, transfer and receive data in the **Statistics** tab.



## USING EXPERT MODE

Use Expert Mode to create a team, modify a team, add a VLAN, and configure LiveLink for a Smart Load Balance and Failover and SLB (Auto-Fallback Disable) team. To create a team using the wizard, see [Using the Broadcom Teaming Wizard](#).

To set the default Teaming Mode, select **Options** from the **Tools** menu, then select **Expert Mode** or **Wizard Mode** (the default is Wizard Mode).

## CREATING A TEAM



**Note:** Enabling Dynamic Host Configuration Protocol (DHCP) is not recommended for members of an SLB type of team.

1. From the **Teams** menu, select **Create Team**, or right-click one of the devices in the "Unassigned Adapters" section and select **Create a Team**. This option is not available if there are no devices listed in the "Unassigned Adapters" sections, which means all adapters are already assigned to teams.
2. Click **Expert Mode**.



**Note:** If you want to always use Expert Mode to create a team, click **Default to Expert Mode on next start**.

3. Click the **Create Team** tab.

**Manage Teams**

Create Team Preview

Property	Value
Team Name	Team 1
Team Type	Smart Load Balancing(TM) and Failover
Load Balance Members	Manage Members
<input type="checkbox"/> [0007] Broadcom NetXtreme Gigabit Ethernet	
<input type="checkbox"/> [0014] Broadcom NetXtreme Gigabit Ethernet #2	
<input checked="" type="checkbox"/> [0015] Broadcom NetXtreme Gigabit Ethernet #3	
<input checked="" type="checkbox"/> [0016] Broadcom NetXtreme Gigabit Ethernet #4	
Standby Member	<not configured>
Team Offload Capabilities	LSO, CO, RSS
Team MTU	1500
VLAN Configuration	Manage VLAN(s)
Enable LiveLink	<input type="checkbox"/> No

**Team Name**  
The team name cannot exceed 39 characters, cannot begin with spaces, and cannot contain any special characters.

☐ Wizard Mode

Create Clear Apply/Exit Cancel



**Note:** The **Create Team** tab appears only if there are teamable adapters available.

4. Click the **Team Name** field to enter a team name.
5. Click the **Team Type** field to select a team type.
6. Assign any available adapter or adapters to the team by selecting the adapter from the **Load Balance Members** list. There must be at least one adapter selected in the **Load Balance Members** list.
7. You can assign any other available adapter to be a standby member by selecting it from the **Standby Member** list.



**Note:** There must be at least one Broadcom network adapter assigned to the team.

The Large Send Offload (LSO), Checksum Offload (CO), and RSS indicate if the LSO, CO, and/or RSS properties are supported for the team. The LSO, CO, and RSS properties are enabled for a team only when all of the members support and are configured for the feature.



**Note:** Adding a network adapter to a team where its driver is disabled may negatively affect the offloading capabilities of the team. This may have an impact on the team's performance. Therefore, it is recommended that only driver-enabled network adapters be added as members to a team.

8. Type the value for **Team MTU**.
9. Click **Create** to save the team information.
10. Repeat steps 4. through 9. to define additional teams. As teams are defined, they can be selected from the team list, but they have not yet been created. Click the **Preview** tab to view the team structure before applying the changes.
11. Click **Apply/Exit** to create all the teams you have defined and exit the Manage Teams window.
12. Click **Yes** when the message is displayed indicating that the network connection will be temporarily interrupted.

**NOTES:**

- The team name cannot exceed 39 characters, cannot begin with spaces, and cannot contain any of the following characters: & \ / : \* ? < > |
  - Team names must be unique. If you attempt to use a team name more than once, an error message is displayed indicating that the name already exists.
  - The maximum number of team members is 8.
  - When team configuration has been correctly performed, a virtual team adapter driver is created for each configured team.
  - If you disable a virtual team and later want to reenoble it, you must first disable and reenoble all team members before you reenoble the virtual team.
  - When you create Generic Trunking and Link Aggregation teams, you cannot designate a standby member. Standby members work only with Smart Load Balancing and Failover and SLB (Auto-Fallback Disable) types of teams.
  - For an SLB (Auto-Fallback Disable) team, to restore traffic to the load balance members from the standby member, click the Fallback button on the Team Properties tab.
  - When configuring an SLB team, although connecting team members to a hub is supported for testing, it is recommended to connect team members to a switch.
  - Not all network adapters made by others are supported or fully certified for teaming.
13. Configure the team IP address.
    - a. From **Control Panel**, double-click **Network Connections**.
    - b. Right-click the name of the team to be configured, and then click **Properties**.
    - c. On the **General** tab, click **Internet Protocol (TCP/IP)**, and then click **Properties**.
    - d. Configure the IP address and any other necessary TCP/IP configuration for the team, and then click **OK** when finished.

## MODIFYING A TEAM

After you have created a team, you can modify the team in the following ways:

- Change the type of team
- Change the members assigned to the team
- Add a VLAN
- Modify a VLAN (using Expert Mode)
- Remove a team or a VLAN (using Expert Mode)

### To modify a team

1. From the **Team** menu, click **Edit Team**, or right-click one of the teams in the list and select **Edit Team**. This option is only available if a team has already been created and is listed in the Team Management pane.
2. The wizard Welcome screen appears. Click **Next** to continue modifying a team using the wizard or click **Expert Mode** to

work in Expert Mode.



**Note:** The **Edit Team** tab in Expert Mode appears only if there are teams configured on the system.

3. Click the **Edit Team** tab.

The screenshot shows the 'Manage Teams' dialog box with the 'Edit Team' tab selected. The 'Team' dropdown is set to 'Team 1'. The 'Property' table lists various team settings, including 'Team Name', 'Team Type', 'Load Balance Members', 'Standby Member', 'Team Offload Capabilities', 'Team MTU', 'VLAN Configuration', and 'Enable LiveLink'. The 'Load Balance Members' section shows a list of network interfaces with checkboxes, where '[0015] Broadcom NetXtreme Gigabit Ethernet #3' and '[0016] Broadcom NetXtreme Gigabit Ethernet #4' are selected. The 'VLAN Configuration' section has a 'Manage VLAN(s)' button. At the bottom, there is a 'Wizard Mode' checkbox and buttons for 'Update', 'Reset', 'Apply/Exit', and 'Cancel'.

Property	Value
Team Name	Team 1
Team Type	Smart Load Balancing(TM) and Failover
Load Balance Members	<input type="checkbox"/> [0007] Broadcom NetXtreme Gigabit Ethernet <input type="checkbox"/> [0014] Broadcom NetXtreme Gigabit Ethernet #2 <input checked="" type="checkbox"/> [0015] Broadcom NetXtreme Gigabit Ethernet #3 <input checked="" type="checkbox"/> [0016] Broadcom NetXtreme Gigabit Ethernet #4
Standby Member	<not configured>
Team Offload Capabilities	
Team MTU	N/A
VLAN Configuration	<input type="button" value="Manage VLAN(s)"/>
Enable LiveLink	<input type="checkbox"/> No

**Team Name**  
The team name cannot exceed 39 characters, cannot begin with spaces, and cannot contain any special characters.

☐ Wizard Mode

4. Make the desired changes, and then click **Update**. The changes have not yet been applied; click the **Preview** tab to view the updated team structure before applying the changes.
5. Click **Apply/Exit** to apply the updates and exit the Manage Teams window.
6. Click **Yes** when the message is displayed indicating that the network connection will be temporarily interrupted.

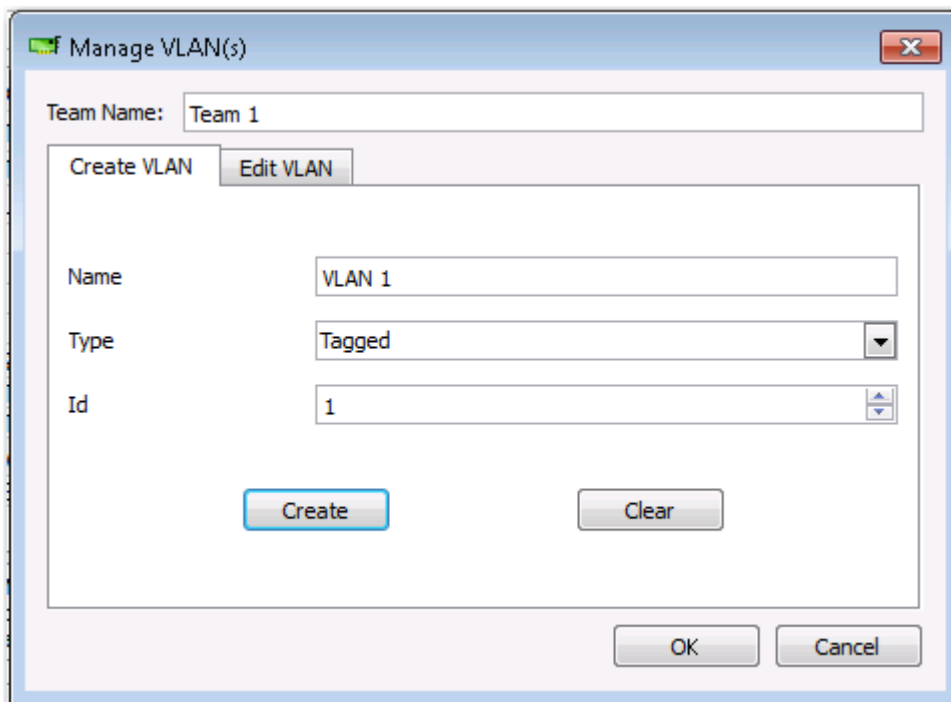
## ADDING A VLAN

You can add virtual LANs (VLANs) to a team. This enables you to add multiple virtual adapters that are on different subnets. The benefit of this is that your system can have one network adapter that can belong to multiple subnets. With a VLAN, you can couple the functionality of load balancing for the load balance members, and you can employ a failover adapter.

You can define up to 64 VLANs per team (63 VLANs that are tagged and 1 VLAN that is not tagged). VLANs can only be created when all teams members are Broadcom adapters. If you try to create a VLAN with a non-Broadcom adapter, an error message is displayed.

**To configure a team with a VLAN**

1. From the **Teams** menu, select **Add VLAN**.
2. The Welcome screen appears.
3. Click **Expert Mode**.
4. On the **Create Team** tab of the **Manage Teams** window, click **Manage VLAN(s)**.
5. Type the VLAN name, then select the type and ID.
6. Click **Create** to save the VLAN information. As VLANs are defined, they can be selected from the Team Name list, but they have not yet been created.
7. Continue this process until all VLANs are defined, then click **OK** to create them.



8. Click **Yes** when the message is displayed indicating that the network connection will be temporarily interrupted.



**Note:** To maintain optimum adapter performance, your system should have 64 MB of system memory for each of the eight VLANs created per adapter.

**Viewing VLAN Properties and Statistics and Running VLAN Tests****To view VLAN properties and statistics and to run VLAN tests**

1. Select one of the listed VLANs.
2. Click the **Information** tab to view the properties of the VLAN adapter.
3. Click the **Statistics** tab to view the statistics for the VLAN adapter.
4. Click the **Diagnostics** tab to run a network test on the VLAN adapter.



## Deleting a VLAN

The procedure below applies when you are in Expert Mode.

### To delete a VLAN

1. Select the VLAN to delete.
2. From the **Teams** menu, select **Remove VLAN**.
3. Click **Apply**.
4. Click **Yes** when the message is displayed indicating that the network connection will be temporarily interrupted.



**Note:** If you delete a team, any VLANs configured for that team are also deleted.

## Configuring LiveLink for a Smart Load Balancing and Failover and SLB (Auto-Fallback Disable) Team

LiveLink is a feature of BASP that is available for the Smart Load Balancing (SLB) and SLB (Auto-Fallback Disable) type of teaming. The purpose of LiveLink is to detect link loss beyond the switch and to route traffic only through team members that have a live link.

Read the following notes before you attempt to configure LiveLink.



### NOTES:

- Before you begin configuring LiveLink™, review the description of LiveLink. Also verify that each probe target you plan to specify is available and working. If the IP address of the probe target changes for any reason, LiveLink must be reconfigured. If the MAC address of the probe target changes for any reason, you must restart the team (see “Troubleshooting”).
- A probe target must be on the same subnet as the team, have a valid (not a broadcast, multicast, or unicast), statically-assigned IP address, and be highly available (always on).
- To ensure network connectivity to the probe target, ping the probe target from the team.
- You can specify up to four probe targets.
- The IP address assigned to either a probe target or team member cannot have a zero as the first or last octet.

### To configure LiveLink

1. From the **Teams** menu, select **Edit Team**.
2. Click Expert Mode (to configure LiveLink using the Teaming Wizard, see [Using the Broadcom Teaming Wizard](#)).
3. In the Manage Members window, click the **Edit Team** tab.
4. Select **Enable LiveLink**. The LiveLink Configuration options appear below.
5. It is recommended to accept the default values for **Probe interval** (the number of seconds between each retransmission of a link packet to the probe target) and **Probe maximum retries** (the number of consecutively missed responses from a probe target before a failover is triggered). To specify different values, click the desired probe interval in the **Probe interval (seconds)** list and click the desired maximum number of probe retries in the **Probe maximum retries** list.
6. Set the **Probe VLAN ID** to correspond with the VLAN where the probe target(s) resides. This will apply the appropriate VLAN tag to the link packet based on the shared configuration of the attached switch port(s).



**Note:** Each LiveLink enabled team can only communicate with Probe Targets on a single VLAN. Also, VLAN ID 0

is equivalent to an untagged network.

7. Select **Probe Target 1** and type the target IP address for one or all probe targets.



**Note:** Only the first probe target is required. You can specify up to 3 additional probe targets to serve as backups by assigning IP addresses to the other probe targets.

8. Select one of the listed team members and type the member IP address.



**Note:** All of the member IP addresses must be in the same subnet as the probe targets.

9. Click **Update**. Repeat these steps for each of the other listed team members.

10. Click **Apply/Exit**.

## Saving and Restoring a Configuration

### To save a configuration

1. From the **File** menu, select **Team Save As**.
2. Type the path and file name of the new configuration file, and then click **Save** (a .bcg extension is added).

The configuration file is a text file that can be viewed by any text editor. The file contains information about both the adapter and the team configuration.

### To restore a configuration

1. From the **File** menu, select **Team Restore**.
2. Click the name of the file to be restored, and then click **Open**.



**Note:** If necessary, go to the folder where the file is located.

3. Click **Apply**.
4. Click **Yes** when the message is displayed indicating that the network connection will be temporarily interrupted.
5. If a configuration is already loaded, a message is displayed that asks if you want to save your current configuration. Click **Yes** to save the current configuration. Otherwise, the configuration data that is currently loaded is lost.



**Note:** The team may take a very long time to restore if the team is configured with many VLANs and a static IP address.

## VIEWING BASP STATISTICS

The Statistics section shows performance information about the network adapters that are on a team.

To view BASP Statistics information for any team member adapter or the team as a whole, click the name of the adapter or team listed in the Team Management pane, then click the **Statistics** tab.

Click **Refresh** to get the most recent values for each statistic. Click **Reset** to change all values to zero.

**Tx. Packet.** This is the number of packets transmitted.

**Tx. Packet Discarded.** This is the number of packets discarded.

**Tx. Packet Queued.** This is the number of packets queued.

**Rx. Packet.** This is the number of packets received.

**Rx. Packet Discarded.** This is the number of packets discarded.

**Probes Retried.** This is the number of consecutively missed responses from a probe target before a failover is triggered.



# Specifications: Broadcom NetLink<sup>®</sup>/ NetXtreme<sup>®</sup> 57XX User Guide

- [10/100/1000BASE-T Cable Specifications](#)
- [Performance Specifications](#)
- [Environmental Specifications](#)

## 10/100/1000BASE-T CABLE SPECIFICATIONS

<i>Port Type</i>	<i>Connector</i>	<i>Media</i>	<i>Maximum Distance</i>
10BASE-T	RJ-45	Category 3, 4, or 5 unshielded twisted pairs (UTP)	100m (328 ft)
100/1000BASE-T <sup>1</sup>	RJ-45	Category 5 <sup>2</sup> UTP	100m (328 ft)

<sup>1</sup>1000BASE-T signaling requires 4 twisted pairs of Category 5 balanced cabling, as specified in ISO/IEC 11801:1995 and ANSI/EIA/TIA-568-A (1995) and tested for additional performance using testing procedures defined in TIA/EIA TSB95.

<sup>2</sup>Category 5 is the minimum requirement. Category 5e and Category 6 are fully supported.

## PERFORMANCE SPECIFICATIONS

<i>Feature</i>	<i>Specification</i>
<b>PCI Type Controllers (Single-Port BCM570X Controllers)</b>	
PCI Clock	66 MHz maximum
PCI-X Clock	133 MHz
PCI/PCI-X Data/Address	32-bit and 64-bit
PCI-X Data Burst Transfer Rate	400 Mbit/s (32-bit bus at 100 MHz) 800 Mbit/s (64-bit bus at 100 MHz) 600 Mbit/s (32-bit bus at 100 MHz) - BCM5701/BCM5703 only 1024 Mbit/s (64-bit bus at 100 MHz) - BCM5701/BCM5703 only
PCI Data Burst Transfer Rate	132 Mbit/s (32-bit bus) 264 Mbit/s (64-bit bus) 528 Mbit/s (64-bit bus at 66 MHz)
PCI Modes	Master/slave
<b>PCI Express<sup>™</sup> Type Controllers (BCM57XX Controllers)</b>	
PCI Express Interface	x1 link width
PCI Express Aggregated Bandwidth (Transmit and receive)	2.5 Gbps
10/100/1000BASE-T	10/100/1000 Mbps (full-duplex)



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## ENVIRONMENTAL SPECIFICATIONS

<i><b>Condition</b></i>	<i><b>Operating Specification</b></i>	<i><b>Storage Specification</b></i>
Temperature	0°C to 55°C (+32°F to +131°F)	–40°C to +85°C (–40°F to +185°F)
Relative humidity	5% to 85% (non-condensing) 40°C, 16 hour dwells at extremes	5% to 95% (non-condensing) 10°C/hour
Altitude	Up to 10,000 ft.	Up to 35,000 ft.
Shock	10g, 1/2 sine wave, 11 msec	60g, 1/2 sine wave, 11 msec
Vibration, peak to peak displacement	0.005 in. max (5 Hz to 32 Hz)	0.1 in. max (5 Hz to 17 Hz)
Vibration, peak acceleration	0.25g (5 Hz to 500 Hz) (Sweep Rate = 1 octave/min.)	0.25g (5 Hz to 500 Hz) (Sweep Rate = 1 octave/min.)

# Regulatory Information: Broadcom NetLink®/ NetXtreme® 57XX User Guide

- [FCC Class B Notice](#)
- [VCCI Class B Notice](#)
- [CE Notice](#)
- [Canadian Regulatory Information \(Canada Only\)](#)

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## FCC CLASS B NOTICE

The equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1) The device may not cause harmful interference, and 2) This equipment must accept any interference received, including interference that may cause undesired operation.

The equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. The equipment generates, uses and can radiate radio-frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If the equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for assistance.

**Do not make mechanical or electrical modifications to the equipment.**



**Note:** If the device is changed or modified without permission of Broadcom, the user may void his or her authority to operate the equipment.

Broadcom Corporation  
190 Mathilda Place  
Sunnyvale, California 94086 USA

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## VCCI CLASS B NOTICE

The equipment is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.



**Caution!** The potential exists for this equipment to become impaired in the presence of conducted radio frequency energy between the frequency range of 59–66 MHz. Normal operation will return upon removal of the RF energy source.



## CE NOTICE

БЪЛГАРСКИ Bulgarian	<p>Този продукт отговаря на 2006/95/EC (Нисковолтова директива), 2004/108/EC (Директива за електромагнитна съвместимост) и измененията на Европейския съюз.</p> <p><b>Европейски съюз, Клас B</b></p> <p>Това устройство на Broadcom е класифицирано за използване в типичната за Клас B жилищна среда.</p> <p>Изготвена е "Декларация за съответствие" според горепосочените директиви и стандарти, която се съхранява в Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
ČESKY Czech	<p>Bylo ustanoveno, že tento produkt splňuje směrnici 2006/95/EC (nízkonapěťová směrnice), směrnici 2004/108/EC (směrnice EMC) a dodatky Evropské unie.</p> <p><b>Evropská unie, třída B</b></p> <p>Toto zařízení společnosti Broadcom je klasifikováno pro použití v obvyklém prostředí domácnosti (třída B).</p> <p>„Prohlášení o shodě“ v souladu s výše uvedenými směrnici a normami bylo zpracováno a je uloženo v archivu společnosti Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
Danish	<p>Dette produkt er fundet i overensstemmelse med 2006/95/EC (Lavvoltsdirektivet), 2004/108/EC (EMC-direktivet) og den Europæiske Unions ændringer.</p> <p><b>Den Europæiske Union, Klasse B</b></p> <p>Denne Broadcom-enhed er klassificeret til anvendelse i et typisk Klasse B-hjemligt miljø.</p> <p>En "Overensstemmelseserklæring", som er i henhold til foregående direktiver og standarder, er udført og arkiveret hos Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
NEDERLANDS Dutch	<p>Dit product is in overeenstemming bevonden met 2006/95/EC (Laagspanningsrichtlijn), 2004/108/EC (EMC-richtlijn) en amendementen van de Europese Unie.</p> <p><b>Europese Unie/Klasse B</b></p> <p>Dit Broadcom-apparaat is geclassificeerd voor gebruik in een typische klasse B woonomgeving.</p> <p>Een "Verklaring van conformiteit" in overeenstemming met de voorgenoemde richtlijnen en standaarden is beschikbaar bij Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
English	<p>This product has been determined to be in compliance with 2006/95/EC (Low Voltage Directive), 2004/108/EC (EMC Directive), and amendments of the European Union.</p> <p><b>European Union, Class B</b></p> <p>This Broadcom device is classified for use in a typical Class B domestic environment.</p> <p>A "Declaration of Conformity" in accordance with the preceding directives and standards has been made and is on file at Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
EESTLANE Estonian	<p>Antud toode vastab direktiividele 2006/95/EÜ (Madalpinge direktiiv), 2004/108/EÜ (EMC direktiiv) ja ELi parandustele.</p> <p><b>Euroopa Liit, Klass B</b></p> <p>Antud Broadcom toode on klassifitseeritud kasutamiseks tüüpilises B-klassi koduses keskkonnas.</p> <p>Vastavalt ülaltoodud direktiividele ja standarditele on koostatud „Vastavusdeklaratsioon“, mis on arvel ettevõttes Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
Finnish	<p>Tämä tuote täyttää Euroopan unionin direktiivin 2006/95/EY (pienjännitedirektiivi) ja direktiivin 2004/108/EY (sähkömagneettisesta yhteensopivuudesta annettu direktiivi), sellaisina kuin ne ovat muutettuina, vaatimukset.</p> <p><b>Euroopan unioni, luokka B</b></p> <p>Tämä Broadcom-laitte on luokiteltu käytettäväksi tyypillisessä luokan B kotiympäristössä.</p> <p>Yllä mainittujen direktiivien ja standardien mukainen vaatimustenmukaisuusvakuutus on tehty, ja sitä säilyttää Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
FRANÇAIS French	<p>Ce produit a été déclaré conforme aux directives 2006/95/EC (Directive sur la faible tension), 2004/108/EC (Directive EMC) et aux amendements de l'Union européenne.</p> <p><b>Union européenne, classe B</b></p> <p>Cet appareil Broadcom est classé pour une utilisation dans un environnement résidentiel classique (classe B).</p> <p>Une « Déclaration de Conformité » relative aux normes et directives précédentes a été rédigée et est enregistrée auprès de Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>

DEUTSCH German	<p>Es ist befunden worden, dass dieses Produkt in Übereinstimmung mit 2006/95/EC (Niederspannungs-Richtlinie), 2004/108/EC (EMV-Richtlinie) und Ergänzungen der Europäischen Union steht.</p> <p><b>Europäische Union, Klasse B</b></p> <p>Dieses Gerät von Broadcom ist für die Verwendung in einer typisch häuslichen Umgebung der Klasse B vorgesehen.</p> <p>Eine Konformitätserklärung in Übereinstimmung mit den oben angeführten Normen ist abgegeben worden und kann bei Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
ΕΛΛΗΝΙΚΟΣ Greek	<p>Το προϊόν αυτό συμμορφώνεται με τις οδηγίες 2006/95/ΕΕ (Οδηγία περί χαμηλής τάσης), 2004/108/ΕΕ (Οδηγία περί ηλεκτρομαγνητικής συμβατότητας), και τροποποιήσεις τους από την Ευρωπαϊκή Ένωση.</p> <p><b>Ευρωπαϊκή Ένωση, Κατηγορία Β</b></p> <p>Αυτή η συσκευή Broadcom είναι κατάλληλη για χρήση σε ένα σύνθετο οικιακό περιβάλλον κατηγορίας Β.</p> <p>Μία «Δήλωση Συμμόρφωσης» σύμφωνα με τις προηγούμενες οδηγίες και πρότυπα υπάρχει και είναι αρχειοθετημένη στο Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
MAGYAR Hungarian	<p>A termék megfelel a 2006/95/EGK (alacsony feszültségű eszközökre vonatkozó irányelv), a 2004/108/EGK (EMC irányelv) és az Európai Unió ajánlásainak.</p> <p><b>Európai Unió, „B” osztály</b></p> <p>Ez a Broadcom eszköz „B” osztályú besorolást kapott, tipikus lakossági környezetben való használatra alkalmas.</p> <p>Az előbbiakban ismertetett irányelvek és szabványok szellemében „Megfelelőségi nyilatkozat” készült, amely az irországi Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
PORTUGUES Iberian Portuguese	<p>Este produto está em conformidade com 2006/95/EC (Directiva de baixa tensão), com 2004/108/EC (Directiva de compatibilidade electromagnética) e com as alterações da União Europeia.</p> <p><b>União Europeia, Classe B</b></p> <p>Este dispositivo Broadcom está classificado para utilização num ambiente doméstico típico Classe B.</p> <p>Foi elaborada uma “declaração de conformidade” de acordo com as normas e directivas anteriores, encontrando-se arquivada na Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
ITALIANO Italian	<p>Il presente prodotto è stato determinato essere conforme alla 2006/95/CE (Direttiva Bassa Tensione), alla 2004/108/CE (Direttiva CEM) e a rettifiche da parte dell'Unione Europea.</p> <p><b>Unione Europea, Classe B</b></p> <p>Il presente dispositivo Broadcom è classificato per l'uso nel tipico ambiente domestico di Classe B.</p> <p>Una "Dichiarazione di conformità" secondo gli standard e le direttive precedenti è stata emessa e registrata presso Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
LATVIAN Latvian	<p>Sis izstrādājums atbilst direktīvām 2006/95/EK (Direktīva par zemsprieguma iekārtām), 2004/108/EK (Direktīva par elektromagnētisko saderību) un to labojumiem Eiropas Savienības ietvaros.</p> <p><b>Eiropas Savienība, klase B</b></p> <p>Šī firmas Broadcom ražotā ierīce ir atzīta par derīgu darbām B klasei atbilstošos mājas apstākļos.</p> <p>“Atbilstības deklarācija”, kas ir saskaņā ar iepriekšminētajām direktīvām un standartiem, ir sastādīta un tiek glabāta firmā Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
Lithuanian	<p>Buvo nustatyta, kad šis produktas atitinka direktyvą 73/23/EEB (žemos įtampos direktyva), 89/336/EEB (elektromagnetinio suderinamumo direktyva) ir Europos Sąjungos pataisas.</p> <p><b>Europos Sąjunga, B klasė</b></p> <p>Šis „Broadcom“ prietaisas yra klasifikuotas naudoti įprastose B klasės gyvenamosiose aplinkose.</p> <p>Atitikties deklaracija pagal visas galiojančias direktyvas ir standartus yra sudaryta ir saugoma įrašyta faile Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>



Maltese	<p>Gie stabbilit li dan il-prodott hu konformi ma' 2006/95/KE (Direttiva dwar il-Vultaġġ Baxx), 2004/108/KE (Direttiva EMC), u emendi ta' l-Unjoni Ewropea.</p> <p><b>Unjoni Ewropea, Klassi B</b></p> <p>Dan it-tagħmir Broadcom hu kklassifikat għall-użu f'ambjent residenzjali tipiku ta' Klassi B.</p> <p>Saret "Dikjarazzjoni ta' Konformità" b'konformità mad-direttivi u ma' l-istandards imsemmijin qabel, u din tinsab iffajljata għand Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
POLSKI Polish	<p>Niniejszy produkt został określony jako zgodny z dyrektywą niskonapięciową 2006/95/WE i dyrektywą zgodności elektromagnetycznej 2004/108/WE oraz poprawkami do nich.</p> <p><b>Unia Europejska, klasa B</b></p> <p>Niniejsze urządzenie firmy Broadcom zostało zakwalifikowane do klasy B, do użytku w typowych środowiskach domowych.</p> <p>Zgodnie ze stosownymi dyrektywami i normami została sporządzona „Deklaracja zgodności”, która jest dostępna w aktach firmy Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
ROMÂN Romanian	<p>S-a stabilit că acest produs respectă cerințele Directivei 2006/95/CE privind echipamentele de joasă tensiune, ale Directivei 2004/108/CE (Directiva EMC) privind compatibilitatea electromagnetică și ale amendamentelor Uniunii Europene.</p> <p><b>Uniunea Europeană, Clasa B</b></p> <p>Acest echipament Broadcom este clasificat pentru utilizare într-un mediu casnic tipic de Clasă B. Conform directivelor și standardelor de mai sus, a fost emisă o „Declarație de Conformitate”, arhivată la sediul Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
SLOVENSKÝ Slovakian	<p>Tento výrobok vyhovuje požiadavkám smernice 2006/95/EC (smernica o nízkom napätí), 2004/108/EC (smernica o elektromagnetickej kompatibilitate) a neskorším zmenám a doplnkom Európskej.</p> <p><b>Európska únia, Trieda B</b></p> <p>Toto zariadenie Broadcom triedy B je určené pre domáce prostredie.</p> <p>„Vyhlasenie o zhode“ vydané v súlade s predchádzajúcimi smernicami a štandardmi sa nachádza v spoločnosti Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
Slovenian	<p>Ta izdelek je v skladu z 2006/95/ES (Direktiva o nizki napetosti), 2004/108/ES (Direktiva o elektromagnetni združljivosti) in dopolnili Evropske unije.</p> <p><b>Evropska unija, razred B</b></p> <p>Ta Broadcomova naprava je razvrščena za uporabo v značilnem bivalnem okolju razreda B.</p> <p>«Izjava o skladnosti» je bila sprejeta v skladu s predhodnimi direktivami in standardi in je shranjena na naslovu Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
ESPAÑOL Spanish	<p>Este producto se ha fabricado de conformidad con la Directiva para bajo voltaje 2006/95/EC (Low Voltage Directive), la Directiva para compatibilidad electromagnética 2004/108/EC (EMC Directive) y las enmiendas de la Unión Europea.</p> <p><b>Unión Europea, Clase B</b></p> <p>Este dispositivo Broadcom está clasificado para ser utilizado en un entorno doméstico convencional de Clase B.</p> <p>Se ha realizado una "Declaración de conformidad" de acuerdo con las directivas y estándares anteriores y está archivada en Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
SVENSK Swedish	<p>Denna produkt överensstämmer med EU-direktivet 2006/95/EC (lågspänningsdirektivet), 2004/108/EC (EMC direktivet), och andra ändringar enligt den Europeiska unionen.</p> <p><b>Europeiska unionen, klass B</b></p> <p>Den här Broadcom-enheten är klassificerad för användning i vanlig klass B-bostadsmiljö.</p> <p>En "Försäkran om överensstämmelse" i enlighet med de föregående direktiven och standarderna har framställts och finns registrerad hos Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>
TURK Turkish	<p>Bu ürünün 2006/95/EC (Düşük Voltaj Direktifi), 2004/108/EC (EMC Direktifi), ve Avrupa Birliği'nin ilavelerine uygun olduğu belirlenmiştir.</p> <p><b>Avrupa Birliği, B Sınıfı</b></p> <p>Bu Broadcom cihazı, tipik bir B sınıfı, ev içi ortamda kullanılmak üzere sınıflandırılmıştır.</p> <p>Yukarıda belirtilen direktifler ve standartlara uygun olarak, bir "Uygunluk Beyanı" hazırlanmıştır, ve Broadcom Corporation, 190 Mathilda Place, Sunnyvale, California 94086, USA.</p>

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## CANADIAN REGULATORY INFORMATION (CANADA ONLY)

### INDUSTRY CANADA, CLASS B

This Class B digital apparatus complies with Canadian ICES-003.

**Notice:** The Industry Canada regulations provide that changes or modifications not expressly approved by Broadcom could void your authority to operate this equipment.

### INDUSTRY CANADA, CLASSE B

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

**Avis :** Dans le cadre des réglementations d'Industry Canada, vos droits d'utilisation de cet équipement peuvent être annulés si des changements ou modifications non expressément approuvés par Broadcom y sont apportés.

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# User Diagnostics: Broadcom NetLink®/ NetXtreme® 57XX User Guide

- [Introduction](#)
- [System Requirements](#)
- [Running Broadcom NetXtreme User Diagnostics](#)
- [Diagnostic Test Descriptions](#)
- [Diagnostic Test Messages](#)

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## INTRODUCTION

Broadcom NetXtreme User Diagnostics is an MS-DOS based application that runs a series of diagnostic tests (see [Table 1](#)) on the Broadcom NetXtreme Gigabit Ethernet adapters in your system. Broadcom NetXtreme User Diagnostics also allows you to update device firmware and to view and change settings for available adapter properties. Broadcom NetXtreme User Diagnostics can be run in either of the following modes:

- MS-DOS Command Prompt mode
- Broadcom Command Line Interface (CLI) mode

In either mode, you can view the version of the adapter software and specify which adapter to test and which tests to perform. The MS-DOS Command Prompt mode is useful for viewing and changing the settings for available properties, updating and loading device firmware, viewing the version of and printing the error log (if any) to a file. The Broadcom CLI mode is useful for enabling/disabling available properties and enabling/disabling/selecting and setting the speed and duplex mode of available protocols.

To run Broadcom NetXtreme User Diagnostics, create an MS-DOS 6.22 bootable floppy disk containing the B57udiag.exe file. Next, start the system with the boot disk in the floppy disk drive. See either [Running in MS-DOS Command Prompt Mode](#) or [Running in Broadcom Command Line Interface Mode](#) for further instructions.



**Note:** The B57udiag.exe file is on the installation CD.

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## SYSTEM REQUIREMENTS

**Operating System:** MS-DOS 6.22

**Software:** B57udiag.exe

## RUNNING BROADCOM NETXTREME USER DIAGNOSTICS

### RUNNING IN MS-DOS COMMAND PROMPT MODE

At the MS-DOS prompt, type b57udiag using the command options as shown in [Table 1](#).



**Note:** In MS-DOS Command Prompt mode, you must include b57udiag at the beginning of the command string each time you type a command.

**Table 1: MS-DOS Command Prompt Mode Command Options**

<b>Command Options</b>	<b>Description</b>
b57udiag	Performs all of the tests on all of the Broadcom NetXtreme Gigabit Ethernet adapters in your system.
b57udiag -c <num>	Specifies the adapter to test, or the adapter on which to update the firmware or to view or change the settings for available properties.
b57udiag -cmd	Changes to the Broadcom CLI mode.
b57udiag -w <value>	Enables/disables the Wake on LAN (WOL) property. 1 = Enable 0 = Disable
b57udiag -mba <value>	Enables/disables Multi-Boot Agent (MBA) protocol. 1 = Enable 0 = Disable
b57udiag -mbap <value>	Selects the specific MBA protocol. 0 = Preboot Execution Environment (PXE) 1 = Remote Program Load (RPL) 2 = Bootstrap Protocol (BOOTP)
b57udiag -mbas <value>	Selects the MBA speed and duplex mode. 0 = Auto 1 = 10 Mbps speed, half-duplex operation 2 = 10 Mbps speed, full-duplex operation 3 = 100 Mbps speed, half-duplex operation 4 = 100 Mbps speed, full-duplex operation 6 = 1000 Mbps speed, full-duplex (fiber)
b57udiag -firm <file>	Updates the EEPROM of the selected adapter based on the match between the existing image file name and the new image <file name>. <b>Examples:</b> b57udiag -firm ee5751c3.40a b57udiag -firm ee5721c3.40a
b57udiag -firmall <file>	Updates the EEPROM of all of the adapters based on the <file name> image match.
b57udiag -ver	Displays the version of the software/eprom.bin file.

**Table 1: MS-DOS Command Prompt Mode Command Options (Cont.)**

<b>Command Options</b>	<b>Description</b>
b57udiag -pxe <file>	Loads the Preboot Execution Environment (PXE) firmware from a file. <b>Example:</b> b57udiag -pxe b57mmba.nic <b>Note:</b> This command should be used only for add-in adapters. For LOM adapters, the PXE firmware is loaded automatically during startup.
b57udiag -elog <file>	Prints the error log to a file.
b57udiag -pipmi <file>	Loads the Intelligent Platform Management Interface (IPMI) from a file. Do not use. IPMI is not supported on desktop and mobile platforms.
b57udiag -ipmi <value>	Enables/disables IPMI. Do not use. IPMI is not supported on desktop and mobile platforms.
b57udiag -help	Displays this table of MS-DOS Command Prompt Mode Command Options.

## RUNNING IN BROADCOM COMMAND LINE INTERFACE MODE

At the MS-DOS prompt, type `b57udiag -cmd`, and use the command options as shown in [Table 2](#)



**Note:** The values for settings are in decimal notation unless otherwise indicated.

**Table 2: Broadcom Command Line Interface (CLI) Mode Commands**

Command	Description																																																	
upgfrm	Updates the PXE or Boot Code from a file																																																	
dir	Displays the file directory in NVRAM. Example: <table><tr><th>Entry</th><th>Type</th><th>SRAM Addr</th><th>EEP Offset</th><th>Length</th><th>Execute</th><th>Version</th></tr><tr><td></td><td>Boot Code</td><td>08003000</td><td>00000200</td><td>000011B0</td><td>CPUA (2</td><td>5705-v3.27</td></tr><tr><td>0</td><td>PXE</td><td>00010000</td><td>000013B0</td><td>0000C854</td><td>No</td><td>7.0.1</td></tr><tr><td>1</td><td>ASF CFG</td><td>00000000</td><td>0001027C</td><td>000001D4</td><td>No</td><td>ASFIPMIc V2.15</td></tr><tr><td>2</td><td>ASF CPUB</td><td>C0034000</td><td>00010450</td><td>00002654</td><td>No</td><td>ASFIPMIc V2.15</td></tr><tr><td>3</td><td>ASF CPUA</td><td>08000000</td><td>00012AA4</td><td>000035B4</td><td>No</td><td>ASFIPMIc V2.15</td></tr><tr><td>4</td><td>INIT</td><td>C0034000</td><td>00016058</td><td>00001A94</td><td>CPUB</td><td>ASFIPMIc V2.15</td></tr></table>	Entry	Type	SRAM Addr	EEP Offset	Length	Execute	Version		Boot Code	08003000	00000200	000011B0	CPUA (2	5705-v3.27	0	PXE	00010000	000013B0	0000C854	No	7.0.1	1	ASF CFG	00000000	0001027C	000001D4	No	ASFIPMIc V2.15	2	ASF CPUB	C0034000	00010450	00002654	No	ASFIPMIc V2.15	3	ASF CPUA	08000000	00012AA4	000035B4	No	ASFIPMIc V2.15	4	INIT	C0034000	00016058	00001A94	CPUB	ASFIPMIc V2.15
Entry	Type	SRAM Addr	EEP Offset	Length	Execute	Version																																												
	Boot Code	08003000	00000200	000011B0	CPUA (2	5705-v3.27																																												
0	PXE	00010000	000013B0	0000C854	No	7.0.1																																												
1	ASF CFG	00000000	0001027C	000001D4	No	ASFIPMIc V2.15																																												
2	ASF CPUB	C0034000	00010450	00002654	No	ASFIPMIc V2.15																																												
3	ASF CPUA	08000000	00012AA4	000035B4	No	ASFIPMIc V2.15																																												
4	INIT	C0034000	00016058	00001A94	CPUB	ASFIPMIc V2.15																																												
setwol	Enables/disables the Wake on LAN (WOL) property setwol e = Enable WOL setwol d = Disable WOL																																																	

**Table 2: Broadcom Command Line Interface (CLI) Mode Commands (Cont.)**

<b>Command</b>	<b>Description</b>
<b>setpxe</b>	Enables/disables Preboot Exchange Environment (PXE) and sets PXE speed setpxe e           = Enable PXE setpxe d           = Disable PXE setpxe s 0        = Auto (default) setpxe s 1        = 10 Mbps speed, half-duplex operation setpxe s 2        = 10 Mbps speed, full-duplex operation setpxe s 3        = 100 Mbps speed, half-duplex operation setpxe s 4        = 100 Mbps speed, full-duplex operation
<b>setasf</b>	Enables/disables Alert Standard Format (ASF) setasf e           = Enable ASF setasf d           = Disable ASF
<b>setmba</b>	Enables/disables Multi Boot Agent (MBA) and selects the MBA protocol. setmba d           = Disable MBA setmba e 0        = Enable Preboot Execution Environment (PXE) MBA (default) setmba e 1        = Enable Remote Program Load (RPL) MBA setmba e 2        = Enable Boot Protocol (BootP) MBA setmba s 0        = Auto speed and duplex (default) setmba s 1        = 10 Mbps speed, half-duplex operation setmba s 2        = 10 Mbps speed, full-duplex operation setmba s 3        = 100 Mbps speed, half-duplex operation setmba s 4        = 100 Mbps speed, full-duplex operation setmba s 6        = 1000 Mbps full-duplex (fiber)
<b>setipmi</b>	Enables/disables Intelligent Platform Management Interface (IPMI). Do not use. IPMI is not supported on desktop and mobile platforms.
<b>nictest</b>	Runs the specified diagnostic tests Specify which individual test(s) within a group or which group(s) of tests to run by including the test designation or group designation in the command string, as shown in the examples below: nictest abcd       = Run all tests nictest b          = Run all tests in group B nictest a3b1       = Run tests A3 and B1 only nictest a124b2     = Run tests A1, A2, A4, and B2
<b>exit</b>	Changes from the Broadcom CLI mode to the MS-DOS command prompt mode
<b>device</b>	Selects the device (adapter) device <n>        = Device number in hexadecimal notation (default = 00000000) device r           = Remove all current Broadcom adapters and rescan available adapters device s           = Silent mode (adapters are not displayed)
<b>version</b>	Displays the version of the adapter software
<b>help</b>	Displays this list of commands
<b>reset</b>	Resets the Broadcom NetXtreme Gigabit Ethernet chip reset c            = Simulate a cold reset reset w            = Wait for firmware signature reset t            = Display the time from reset to firmware invert signature



**Table 2: Broadcom Command Line Interface (CLI) Mode Commands (Cont.)**

<b>Command</b>	<b>Description</b>
<b>cls</b>	Clears the screen
<b>asfprg</b>	Loads Alert Standard Format (ASF) into NVRAM Do not use. Alert Standard Format (ASF) is not for system platforms.

## DIAGNOSTIC TEST DESCRIPTIONS

The diagnostic tests are divided into 4 groups: Register Tests (Group A), Memory Tests (Group B), Miscellaneous Tests (Group C), and Driver Associated Tests (Group D). The diagnostic tests are listed and described in [Table 3](#).

**Table 3: Diagnostic Tests**

<b>Test</b>		<b>Description</b>									
<b>Number</b>	<b>Name</b>										
<b>Group A: Register Tests</b>											
A1	Indirect Register	This test uses an indirect addressing method to write an increment of data to the MAC hash register table and read back data for verification. The memory read/write is done 100 times while incrementing test data.									
A2	Control Register	Each register specified in the configuration content defines the read-only bit and the read/write bits. The test writes 0s and 1s to the test bits to ensure the read-only bits are not changed, and that read/write bits are changed. This test attempts to read the register configuration file (Ctrlreg.txt) for the register definitions. If the file does not exist, a default register offset and mask bits are used. <table> <tr> <td>Offset</td><td>Read-Only Mask</td><td>Read/Write Mask</td></tr> <tr> <td>0x00000400</td><td>0x00000000</td><td>0x007FFF8C</td></tr> <tr> <td>0x00000404</td><td>0x03800107</td><td>0x00000000</td></tr> </table>	Offset	Read-Only Mask	Read/Write Mask	0x00000400	0x00000000	0x007FFF8C	0x00000404	0x03800107	0x00000000
Offset	Read-Only Mask	Read/Write Mask									
0x00000400	0x00000000	0x007FFF8C									
0x00000404	0x03800107	0x00000000									
A3	Interrupt	This test verifies the interrupt functionality. It enables an interrupt and waits 500 ms for the interrupt to occur and reports an error if it cannot generate the interrupt.									
A4	Built-In Self-Test	This is the hardware built-in self-test (BIST).									
A5	PCI Cfg Register	This test verifies the access integrity of the PCI configuration registers.									
<b>Group B: Memory Tests</b>											

*Table 3: Diagnostic Tests (Cont.)*

<i>Test</i>		<i>Description</i>
<i>Number</i>	<i>Name</i>	
B1	Scratch Pad	<p>This test tests the onboard scratchpad SRAM. The following tests are performed:</p> <p><b>Address Test:</b> This test writes each address with a unique increment of data and reads back data to ensure data is correct. After filling the entire address with the unique data, the program reads back the data again to ensure that the data is still correct.</p> <p><b>Walking bit.</b> For each address, data one is written and read back for testing. Then it shifts the data left one bit, so the data becomes two and repeats the same test. It repeats the test 32 times until the test bit is shifted out of the test address. The same test is repeated for entire test range.</p> <p><b>Pseudo-Random Data.</b> A precalculated pseudo-random data set is used to write unique data to each test RAM. After passing the test, the program reads back the data one more time to ensure that the data is still correct.</p> <p><b>Data Read/Write Test:</b> This test writes test data to the SRAM and reads it back to ensure that the data is correct. The test data used is 0x00000000, 0xFFFFFFFF, 0xAA55AA55, and 0x55AA55AA.</p> <p><b>Alternate Data Pattern Test:</b> This test writes test data into the SRAM, writes complement test data to the next address, and reads back both to ensure the data is correct. After the test, the program reads back data one more time to ensure that the data is still correct. The test data used is 0x00000000, 0xFFFFFFFF, 0xAA55AA55, and 0x55AA55AA.</p>
B2	BD SRAM	This test tests the Buffer Descriptor (BD) SRAM. This test performs in the same way as the Scratch Pad Test described in B1.
B3	DMA SRAM	This test tests the direct memory access (DMA) SRAM by performing the Scratch Pad Test described in test B1.
B4	MBUF SRAM	This test tests the memory access buffer (MBUF) SRAM by performing the Scratch Pad Test described in test B1.
B5	MBUF SRAM via DMA	<p>This test uses 8 data test patterns. A 0x1000-sized data buffer is used for this test. Before each pattern test, the buffer is initialized and filled with the test pattern. It then performs a 0x1000-sized transmit DMA from the host buffer to the adapter MBUF memory.</p> <p>The test verifies the data integrity in the adapter MBUF memory against the host memory and repeats the DMA for the entire MBUF buffer. Then, the test performs a receive DMA from the adapter to the host. The 0x1000-byte test buffer is cleared to 0 before each receive DMA. After the test verifies the integrity of the data, the test is repeated for the entire MBUF SRAM range. The 8 test patterns are described below.</p> <p><b>Test Pattern Description</b></p> <p>16 00s and 16 FF's Fills the entire host DMA buffer with 16 bytes of 00s and then 16 bytes of FF's.</p> <p>16 FF's and 16 00s Fills the entire host DMA buffer with 16 bytes of FF's and then 16 bytes of 00s.</p> <p>32 00s and 32 FF's Fills the entire host DMA buffer with 32 bytes of 00s and then 32 bytes of FF's.</p> <p>32 FF's and 32 00s Fills the entire host DMA buffer with 32 bytes of FF's and then 32 bytes of 00s.</p> <p>00000000 Fills the entire host DMA buffer with all 00s.</p> <p>FFFFFFFF Fills the entire host DMA buffer with all FF's.</p> <p>AA55AA55 Fills the entire host DMA buffer with data 0xAA55AA55.</p> <p>55AA55AA Fills the entire host DMA buffer with data 0x55AA55AA.</p>

Table 3: Diagnostic Tests (Cont.)

<b>Test</b>																																																		
<b>Number</b>	<b>Name</b>	<b>Description</b>																																																
B7	CPU GPR	This test tests the CPU General Purpose registers and performs in the same way as the Scratch Pad Test (B1) over 3 different voltages (1.1V, 1.2V, and 1.3V).																																																
<b>Group C: Miscellaneous Tests</b>																																																		
C1	NVRAM	Incremental test data is used in the electrically erasable programmable read-only memory (EEPROM) test. The test fills the test range with test data and reads the data back to verify the content. Afterwards, the test fills the test range with 0s to clear the memory.																																																
C2	CPU	This test opens the Cpu.bin file. If the file exists and content is good, the test loads code to the RX CPU and TX CPU and verifies the CPU execution.																																																
C3	DMA	This test tests both high-priority direct memory access (DMA) and low-priority DMA. The test moves data from the host memory to the adapter SRAM and verifies the data. The test then moves data back to the host memory to again verify the data.																																																
C4	MII	<p>The medium independent interface (MII) test function is identical to that of the Control Register Test (A2). Each register specified in the configuration contents defines the read-only and read/write bits. The test writes 0s and 1s to the test bits to ensure that the read-only bit values are not changed and that the read/write bits are changed.</p> <p>The test attempts to read the register configuration file (Miireg.txt) for the register definitions. If the file does not exist, the following table is used:</p> <table> <tr> <th>Offset</th><th>Read-Only Mask</th><th>Read/Write Mask</th></tr> <tr><td>0x00</td><td>0x0000</td><td>0x7180</td></tr> <tr><td>0x02</td><td>0xFFFF</td><td>0x0000</td></tr> <tr><td>0x03</td><td>0xFFFF</td><td>0x0000</td></tr> <tr><td>0x04</td><td>0x0000</td><td>0xFFFF</td></tr> <tr><td>0x05</td><td>0xEFFF</td><td>0x0000</td></tr> <tr><td>0x06</td><td>0x0001</td><td>0x0000</td></tr> <tr><td>0x07</td><td>0x0800</td><td>0xB7FF</td></tr> <tr><td>0x08</td><td>0xFFFF</td><td>0x0000</td></tr> <tr><td>0x09</td><td>0x0000</td><td>0xFF00</td></tr> <tr><td>0x0A</td><td>0x7C00</td><td>0x0000</td></tr> <tr><td>0x10</td><td>0x0000</td><td>0xFFBF</td></tr> <tr><td>0x11</td><td>0x7C00</td><td>0x0000</td></tr> <tr><td>0x19</td><td>0x7C00</td><td>0x0000</td></tr> <tr><td>0x1E</td><td>0x0000</td><td>0xFFFF</td></tr> <tr><td>0x1F</td><td>0x0000</td><td>0xFFFF</td></tr> </table>	Offset	Read-Only Mask	Read/Write Mask	0x00	0x0000	0x7180	0x02	0xFFFF	0x0000	0x03	0xFFFF	0x0000	0x04	0x0000	0xFFFF	0x05	0xEFFF	0x0000	0x06	0x0001	0x0000	0x07	0x0800	0xB7FF	0x08	0xFFFF	0x0000	0x09	0x0000	0xFF00	0x0A	0x7C00	0x0000	0x10	0x0000	0xFFBF	0x11	0x7C00	0x0000	0x19	0x7C00	0x0000	0x1E	0x0000	0xFFFF	0x1F	0x0000	0xFFFF
Offset	Read-Only Mask	Read/Write Mask																																																
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0x06	0x0001	0x0000																																																
0x07	0x0800	0xB7FF																																																
0x08	0xFFFF	0x0000																																																
0x09	0x0000	0xFF00																																																
0x0A	0x7C00	0x0000																																																
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0x1E	0x0000	0xFFFF																																																
0x1F	0x0000	0xFFFF																																																
C5	VPD	The VPD test first saves the contents of the vital product data (VPD) memory before performing the test. The test then writes 1 of the 5 test data patterns (0xFF, 0xAA, 0x55, increment data, or decrement data) into VPD memory. By default, an incremental data pattern is used. The test writes and reads back the data for the entire test range, and then restores the original contents of the VPD memory.																																																

**Table 3: Diagnostic Tests (Cont.)**

<b>Test</b>		<b>Description</b>
<b>Number</b>	<b>Name</b>	
C6	ASF Hardware	<p><b>Reset Test.</b> This test sets the reset bit and polls for self-clearing bits. This test verifies the reset value of the registers.</p> <p><b>Event Mapping Test.</b> This test sets the SMB_ATTN bit. By changing ASF_ATTN_LOC bits, the test verifies the mapping bits in TX_CPU or RX_CPU event bits.</p> <p>Counter Test</p> <ul style="list-style-type: none"> <li>• Clears WG_TO, HB_TO, PA_TO, PL_TO, RT_TO bits (by setting the bits) and ensures that the bits clear.</li> <li>• Clears the timestamp counter. Writes a 1 to each of the PL, PA, HB, WG, RT counters. Sets the TSC_EN bit.</li> <li>• Polls each PA_TO bit and counts up to 50. Checks if the PL_TO bit is set at the end of the count to 50. Continues to count up to 200. Checks if all other TO bits are set and verifies if the timestamp counter is incremented.</li> </ul>
C7	Expansion ROM	This test tests the ability to enable, disable, and access the expansion read-only memory (ROM) on the adapter.
<b>Group D: Driver Associated Tests</b>		
D1	MAC Loopback	This test is an internal loopback data transmit/receive test. It initializes the medium access control (MAC) into an internal loopback mode and transmits 100 packets. The data should be routed back to the receive channel and received by the receive routine, which verifies the integrity of data. A 100-Mbit/s data rate is used for this test unless Gigabit Ethernet is enabled.
D2	PHY Loopback	This test is same as the MAC loopback test (D1), except that the data is routed back via a physical layer device (PHY). A 100-Mbit/s data rate is used for this test unless Gigabit Ethernet is enabled.
D5	MII Miscellaneous	This test tests the autopolling and PHY interrupt capabilities. These are functions of the PHY.
D6	MSI	This test tests the message signal interrupt (MSI) capability of the adapter. Refer to PCI Specification, version 2.3, for the MSI definition.

## DIAGNOSTIC TEST MESSAGES

```

/* 0 */ "PASS",
/* 1 */ "Got 0x%08X @ 0x%08X. Expected 0x%08X",
/* 2 */ "Cannot perform task while chip is running",
/* 3 */ "Invalid NIC device",
/* 4 */ "Read-only bit %s got changed after writing zero at
offset 0x%X",
/* 5 */ "Read-only bit %s got changed after writing one at
offset 0x%X",
/* 6 */ "Read/Write bit %s did not get cleared after writing
zero at offset 0x%X",
/* 7 */ "Read/Write bit %s did not get set after writing one
at offset 0x%X",
/* 8 */ "BIST failed",
/* 9 */ "Could not generate interrupt",
/* 10 */ "Aborted by user",
/* 11 */ "TX DMA:Got 0x%08X @ 0x%08X. Expected 0x%08X",
/* 12 */ "Rx DMA:Got 0x%08X @ 0x%08X. Expected 0x%08X",

```

```
/* 13 */ "TX DMA failed",
/* 14 */ "Rx DMA failed",
/* 15 */ "Data error, got 0x%08X at 0x%08X, expected 0x%08X",
/* 16 */ "Second read error, got 0x%08X at 0x%08X,
expected 0x%08X",
/* 17 */ "Failed writing EEPROM at 0x%04X",
/* 18 */ "Failed reading EEPROM at 0x%04X",
/* 19 */ "EEPROM data error, got 0x08X at 0x04X,
expected 0x%08X",
/* 20 */ "Cannot open file %s",
/* 21 */ "Invalid CPU image file %s",
/* 22 */ "Invalid CPU image size %d",
/* 23 */ "Cannot allocate memory",
/* 24 */ "Cannot reset CPU",
/* 25 */ "Cannot release CPU",
/* 26 */ "CPU test failed",
/* 27 */ "Invalid Test Address Range\nValid NIC address
is 0x%08X-0x%08X
and exclude 0x%08X-0x%08X",
/* 28 */ "DMA:Got 0x%08X @ 0x%08X. Expected 0x%08X",
/* 29 */ "Unsupported PhyId %04X:%04X",
/* 30 */ "Too many registers specified in the file, max is %d",
/* 31 */ "Cannot write to VPD memory",
/* 32 */ "VPD data error, got %08X @ 0x04X, expected %08X",
/* 33 */ "No good link! Check Loopback plug",
/* 34 */ "Cannot TX Packet!",
/* 35 */ "Requested to TX %d. Only %d is transmitted",
/* 36 */ "Expected %d packets. Only %d good packet(s) have been
received\n%d unknown packets have been received.\n%d bad packets
have been received.",
/* 37 */ "%c%d is an invalid Test",
/* 38 */ "EEPROM checksum error",
/* 39 */ "Error in reading WOL/PXE",
/* 40 */ "Error in writing WOL/PXE",
/* 41 */ "No external memory detected",
/* 42 */ "DMA buffer %04X is large, size must be less than %04X",
/* 43 */ "File size %d is too big, max is %d",
/* 44 */ "Invalid %s",
/* 45 */ "Failed writing 0x%x to 0x%x",
/* 46 */ "",
/* 47 */ "Ambiguous command",
/* 48 */ "Unknown command",
/* 49 */ "Invalid option",
/* 50 */ "Cannot perform task while chip is not running.
(need driver)",
/* 51 */ "Cannot open register define file or content is bad",
/* 52 */ "ASF Reset bit did not self-clear",
/* 53 */ "ATTN_LOC %d cannot be mapped to %cX CPU event bit %d",
/* 54 */ "%s Register is not cleared to zero after reset",
/* 55 */ "Cannot start poll_ASF Timer",
/* 56 */ "poll_ASF bit did not get reset after acknowledged",
/* 57 */ "Timestamp Counter is not counting",
/* 58 */ "%s Timer is not working",
/* 59 */ "Cannot clear bit %s in %cX CPU event register",
/* 60 */ "Invalid \"EEPROM_FILENAME\" file size, expected %d
but only can read %d bytes",
```

```
/* 61 */ "Invalid magic value in %s, expected %08x but found %08x",
/* 62 */ "Invalid manufacture revision, expected %c but found %c",
/* 63 */ "Invalid Boot Code revision, expected %d.%d but found %d.%d",
/* 64 */ "Cannot write to EEPROM",
/* 65 */ "Cannot read from EEPROM",
/* 66 */ "Invalid Checksum",
/* 67 */ "Invalid Magic Value",
/* 68 */ "Invalid MAC address, expected %02X-%02X-%02X-%02X-%02X-%02X",
/* 69 */ "Slot error, expected an UUT to be found at location
%02X:%02X:00",
/* 70 */ "Adjacent memory has been corrupted while testing block
0x%08x-0x%08x\nGot 0x%08x @ address 0x%08x. Expected 0x%08x",
/* 71 */ "The function is not Supported in this chip",
/* 72 */ "Packets received with CRC error",
/* 73 */ "MII error bits set: %04x",
/* 74 */ "CPU does not initialize MAC address register correctly",
/* 75 */ "Invalid firmware file format",
/* 76 */ "Resetting TX CPU Failed",
/* 77 */ "Resetting RX CPU Failed",
/* 78 */ "Invalid MAC address",
/* 79 */ "Mac address registers are not initialized correctly",
/* 80 */ "EEPROM Bootstrap checksum error",
```

# Troubleshooting: Broadcom NetLink®/ NetXtreme® 57XX User Guide

- [Hardware Diagnostics](#)
- [Checking for Network Link and Activity](#)
- [Checking if Current Drivers are Loaded](#)
- [Running a Cable Length Test](#)
- [Testing Network Connectivity](#)
- [Software Problems and Solutions](#)



**Note:** For additional information, go to *Broadcom Ethernet NIC Frequently Asked Questions* at [http://www.broadcom.com/drivers/faq\\_drivers.php](http://www.broadcom.com/drivers/faq_drivers.php).

## HARDWARE DIAGNOSTICS

Loopback diagnostic tests are available for testing the adapter hardware. These tests provide access to the adapter internal/external diagnostics, where packet information is transmitted across the physical link (for instructions and information on running tests in an MS-DOS environment, see [User Diagnostics](#); for Windows environments, see [Running Diagnostic Tests](#) in Broadcom Advanced Control Suite).

## CHECKING FOR NETWORK LINK AND ACTIVITY

See [Testing the Network](#) or [Viewing Adapter Information](#) to check the state of the network link and activity as indicated by the port LEDs.

## CHECKING IF CURRENT DRIVERS ARE LOADED

### Linux

To verify that the tg3 driver is loaded properly, run:

```
lsmod
```

If the driver is loaded, a line similar to the one below is displayed, where *size* is the size of the driver in bytes, and *n* is the number of adapters configured.

**Table 1: Linux**

<i>Module</i>	<i>Size</i>	<i>Used by</i>
TG3	<i>size</i>	<i>n</i>



## RUNNING A CABLE LENGTH TEST

In Windows environments, a cable test is run. See [Analyzing Cables](#) for information about running a cable length test.

## TESTING NETWORK CONNECTIVITY



**Note:** When using forced link speeds, verify that both the adapter and the switch are forced to the same speed, or that at least one link partner is configured for auto-negotiation.

### Linux

To verify that the Ethernet interface is up and running, run `ifconfig` to check the status of the Ethernet interface. It is possible to use `netstat -i` to check the statistics on the Ethernet interface. Go to [Linux Driver Software](#) for information on `ifconfig` and `netstat`.

Ping an IP host on the network to verify connection has been established:

From the command line, type `ping IP address`, and then press ENTER.

The ping statistics that are displayed indicate whether the network connection is working or not.

## SOFTWARE PROBLEMS AND SOLUTIONS

**Problem:** The following message is received when attempting to deploy a RIPREP image through Remote Installation Services (RIS): "The operating system image you selected does not contain the necessary drivers for your network adapter. Try selecting a different operating system image. If the problem persists, contact your administrator. Setup cannot continue. Press any key to exit."

**Solution:** This problem is not isolated to the Broadcom adapter. However, based on several inquiries, we are publishing the following instructions based on other customers successfully working around this issue:

1. Place the Broadcom driver files in the original image folder (the image folder created when `risetup.exe` was executed for the first time).

Example:

```
i:\RemoteInstall\Setup\English\Images\ (Original Image)
```

2. Place the Broadcom driver files in the i386 subfolder under the original image folder.

Example:

```
i:\RemoteInstall\Setup\English\Images\ (Original Image) \i386
```

3. Place the Broadcom driver files for the network adapter in the RIPREP Image folder.

Example:

```
i:\RemoteInstall\Setup\English\Images\ (RIPREP Image)
```

4. Place the Broadcom adapter drivers in the i386 subfolder where the RIPREP Image is located.

Example:

```
i:\RemoteInstall\Setup\English\Images\ (RIPREP Image) \i386
```

The Microsoft Knowledge base articles listed below were used as a reference for the following instructions:



<http://support.microsoft.com/default.aspx?scid=kb;EN-US;254078>

<http://support.microsoft.com/default.aspx?scid=kb;EN-US;246184>

5. Create the following path and place all Broadcom driver files in ..\(\RIPREP Image)\\$oem\$\\$1\Drivers\network
6. Edit the riprep.sif file located in ..\(\RIPREP Image)\i386\Template to include the following information under the [Unattend] section:  
OemPreinstall = yes  
OemPnPDriversPath = "Drivers\network"  
DriverSigningPolicy = Ignore
7. Create the following path and place all Broadcom driver files in ..\(\Original Image)\\$oem\$\\$1\Drivers\nic
8. Edit the ristndrd.sif file located in ..\(\Original Image)\i386\templates to include the following information under the [Unattend] section:  
OemPreinstall = yes  
OemPnPDriversPath = "Drivers\nic"  
DriverSigningPolicy = Ignore
9. Restart the Remote Installation service. This can be performed from a command line with the following commands:  
net stop binlsv  
net start binlsv

### Using the System Preparation Tool

**Problem:** I want to be sure that my Broadcom NetXtreme adapter works properly if I use the System Preparation utility (Sysprep.exe) to install an existing configuration on my system.

**Solution:** On the Sysprep.inf file, modify the [Unattend] header as shown below:

```
[Unattend]
OemPnPDriversPath=Drivers\Net
OemPreinstall = Yes
```

The driver files for the Broadcom NetXtreme adapter must reside in this folder, which is located on the system drive (where the operating system resides). If other drivers are to be loaded, then Drivers\Net can be appended to the paths listed and separated by a semicolon:

Example:

```
OemPnPDriversPath=Drivers\Video;Drivers\Net
```

For Windows XP, the driver files to be included are B57win32.inf, B57win32.cat, and B57xp32.sys.

The Sysprep utility must run with the -pnp switch, which enables the system to rescan for new devices that can be added during the mini-setup.

A Sample Sysprep.inf file for Windows XP is shown below.

```
-----
;SetupMgrTag
[Unattended]
OemSkipEula=Yes
OemPreinstall=Yes
TargetPath=\Windows
UnattendedInstall=Yes
OemPnPDriversPath=Drivers\Net
[GuiUnattended]
```

```

AdminPassword="password"
EncryptedAdminPassword=NO
AutoLogon=Yes
AutoLogonCount=99
OEMSkipRegional=1
OEMDuplicatorstring="XP System"
TimeZone=4
OemSkipWelcome=1
[UserData]
FullName="User"
OrgName="Organization"
ComputerName=*
[SetupMgr]
DistFolder=C:\sysprep\i386
DistShare=whistlerdist
[Identification]
JoinDomain=workgroup
[Networking]
InstallDefaultComponents=Yes
-----

```

## Broadcom Boot Agent

<b>Problem:</b>	Unable to obtain network settings through DHCP using PXE.
<b>Answer:</b>	For proper operation make sure that the Spanning Tree Protocol (STP) is disabled or that portfast mode (for Cisco) is enabled on the port to which the PXE client is connected. For instance, set spantree portfast 4/12 enable.

## Miscellaneous

**Table 2: Miscellaneous**

<b>Problem</b>	<b>Solution</b>
When uninstalling BACS, the following warning message appears: "The setup must update files or services that cannot be updated while the system is running. If you choose to continue, a reboot will be required to complete the setup."	The warning message appears when some components are still being used by the system and cannot be removed. Reboot the system to complete the uninstall.
Large Send Offload (LSO) stopped working since updating the 32-bit Windows XP operating system to Service Pack 2.	Microsoft's implementation of the Windows Firewall feature included in Service Pack 2 appears to cause LSO to stop working correctly. Microsoft provide the solution to this problem in Knowledge Base article 842264. If the problem persists, you may need to run the latest Windows update in order for this feature to begin working again. Specifically, the security update available at the following link should re-activate the LSO capability of our adapter: <a href="http://www.microsoft.com/downloads/details.aspx?FamilyID=81049a86-6f39-4a27-a643-391262785cf3&amp;DisplayLang=en">http://www.microsoft.com/downloads/details.aspx?FamilyID=81049a86-6f39-4a27-a643-391262785cf3&amp;DisplayLang=en</a> .