



## **Broadcom iSCSI HBA FAQ**

## Revision History

<i>Revision</i>	<i>Date</i>	<i>Change Description</i>
iSCSI-FAQ100-R	03/05/10	Initial release

Broadcom Corporation  
5300 California Avenue  
Irvine, CA 92617

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## Introduction

This document answers frequently asked questions about the iSCSI host bus adapter (HBA) functionality of Broadcom high-speed controllers.

## Frequently Asked Questions

**Q:** What is a Broadcom® C-NIC?

**A:** Broadcom® has been shipping Converged NIC (C-NIC) solutions in the market since 2004 and has deployed over 35 million ports through partnerships with leading server suppliers. C-NIC provides users with the ability to use a Broadcom LOM or adapter with the following three capabilities:

- Layer 2 networking
- TCP/IP offload
- iSCSI HBA with full offload
- FCoE HBA with full offload

**Q:** What is iSCSI?

**A:** iSCSI stands for Internet Small Computer System Interface. It is an IP-based storage networking standard for linking data storage facilities. The iSCSI protocol is among the key technologies for deployment of the storage area network (SAN) by increasing the capabilities and performance of storage data transmission. Because of the ubiquity of IP networks, iSCSI can be used to transmit data over local area networks (LANs), wide area networks (WANs), and the Internet, and can enable location-independent data storage and retrieval.

**Q:** How does iSCSI work?

**A:** When an end user or application sends a request, the operating system generates the appropriate SCSI commands and data request, which then go through encapsulation and, if necessary, encryption procedures. A packet header is added before the resulting IP packets are transmitted over an Ethernet connection. When a packet is received, it is decrypted (if it was encrypted before transmission) and disassembled, separating the SCSI commands and request. The SCSI commands are sent to the SCSI controller and, from there, to the SCSI storage device. Because iSCSI is bidirectional, the protocol can also be used to return data in response to the original request.

**Q:** How does Broadcom iSCSI HBA differ from iSCSI software initiator?

**A:** Broadcom's iSCSI HBA offering is based on a hardware offload architecture designed to deliver low CPU utilization, dependable performance, reliability, and unified NIC and storage management for both 1 GbE and 10 GbE networks. The software initiator, on the other hand, consumes CPU cycles and consumes far more power to process iSCSI I/O.

**Q:** How does iSCSI HBA help reduce CPU utilization?

**A:** Software iSCSI initiators consume considerable CPU cycles when handling I/O-intensive workloads, leaving little headroom for growing user application requirements. Broadcom's iSCSI HBA architecture minimizes the CPU overhead so valuable CPU cycles are allocated to process user applications. Broadcom iSCSI HBA only uses 1/3 of the CPU cycles required by the software initiator for a 4K I/O size read operation<sup>1</sup>.

**Q:** How does the reduction in CPU utilization translate to server power savings?

**A:** There is a close correlation between CPU usage and power savings. Broadcom iSCSI HBA saves up to 60 watts of server power consumption when compared with software initiator for a 4K I/O size read operation<sup>1</sup>.

**Q:** How does iSCSI HBA perform when it comes to CPU effectiveness?

**A:** CPU effectiveness measures I/O performance (IOPS) per percent CPU. Broadcom competes favorably against software initiator by offering up to 3 times higher CPU effectiveness<sup>1</sup>.

**Q:** How does iSCSI HBA help with predictable performance for storage I/O?

**A:** By fully offloading the iSCSI and TCP/IP stacks, Broadcom iSCSI HBA does not need to compete with upper layer applications, such as e-mail or Web applications, for CPU processing cycles. The iSCSI performance is unaffected by the application workload.

**Q:** How does iSCSI HBA protect against data corruption in large networks?

**A:** The iSCSI header/data digest computation of Broadcom iSCSI HBA prevents data corruption that can occur in large networks with multiple switch hops. This allows iSCSI HBA to be used in a wide variety of IP network topologies.

**Q:** What operating systems are supported by Broadcom iSCSI HBA?

**A:** Broadcom iSCSI HBA supports the following operating systems:

- Microsoft Windows 2003, 2008, 2008R2
- Linux® Red Hat® 5.x, 4.x, and SLES 10SPx, 11SPx
- VMware® vSphere 4.x

**Q:** What is the maximum IOPS performance for Broadcom iSCSI HBA?

**A:** The maximum IOPS performance for Broadcom iSCSI HBA is as follows:

- The BCM57712 LOM and adapters offer over 1 million iSCSI IOPS for a 512-byte read.
- The BCM5709 dual-port LOM and adapters offer 240,000 IOPS for a 512-byte read<sup>1</sup>.

**Q:** Does Broadcom iSCSI HBA support Wake-on-LAN?

**A:** Yes. All Broadcom 1 GbE and 10 GbE LOM and adapters support WOL. Broadcom is the only 1 GbE iSCSI HBA vendor with WOL support.

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1. Test configuration: Dual-quad core Intel Xeon 5500 server running Microsoft® Windows® 2008 operating system at 4K read block size. BCM5709 1 GbE, BCM57712 10 GbE.

**Q:** Does Broadcom iSCSI HBA support IPv4 and IPv6?

**A:** Yes. All Broadcom 1 GbE and 10 GbE LOM and adapters support both IPv4 and IPv6. Broadcom is the only 1 GbE iSCSI HBA vendor with IPv6 support.

**Q:** Does Broadcom's 1 GbE iSCSI HBA solution have native PCI Express® (PCIe™) support?

**A:** Broadcom is the only 1 GbE iSCSI HBA vendor with native PCIe™ support. Native PCIe results in power savings over competitive products. For example, the Broadcom BCM5709-based dual-port adapter uses only ½ the power used by the competition.

**Q:** Can I use a common iSCSI HBA driver for 1 GbE and 10 GbE controllers?

**A:** Yes. Unique in the industry, Broadcom provides a single driver for five generations of 1 GbE and 10 GbE LOMs and adapters. Using a common driver preserves software compatibility with applications, as well as tying in with user experience and know-how.

**Q:** Can I use common management tools for Broadcom 1 GbE and 10 GbE iSCSI HBA?

**A:** Yes. Unique in the industry, Broadcom provides a single management application called Broadcom Advanced Control Suite (BACS) for five generations of 1 GbE and 10 GbE LOMs and adapters for the Microsoft Windows operating system.

**Q:** Does Broadcom offer APIs for management integration with other industry management applications?

**A:** Yes. Broadcom supports WMI and BMAPI for all 1 GbE and 10 GbE LOM and adapters.

**Q:** Does Broadcom HBA support remote boot (boot from SAN)?

**A:** Yes. iSCSI remote boot allows you to boot a server from a remote operating system image in the SAN.

**Q:** Does Broadcom iSCSI remote boot require a dedicated, specialized server, similar to that required for PXE Boot?

**A:** No. You can boot directly from the storage target.

**Q:** Can I use PXE boot instead of iSCSI remote boot?

**A:** Yes. Broadcom iSCSI HBA supports both PXE boot and iSCSI remote boot.

**Q:** Does Broadcom iSCSI HBA support multipath I/O (MPIO)?

**A:** Yes. MPIO is supported using the operating system once the OS boot completes.

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**BROADCOM CORPORATION**

5300 California Avenue

Irvine, CA 92617

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Phone: 949-926-5000

Fax: 949-926-5203

E-mail: [info@broadcom.com](mailto:info@broadcom.com)

Web: [www.broadcom.com](http://www.broadcom.com)