StreamStor 10 Gigabit Ethernet Daughterboard

User Manual

Copyright and Trademarks

The information in this document is subject to change without notice.

Printed in the United States.

Version 9.10

Publication date: March 8, 2010

TABLE OF CONTENTS

License Agreement and Limited Warranty

IMPORTANT: CAREFULLY READ THE TERMS AND CONDITIONS OF THIS AGREEMENT BEFORE USING THE PRODUCT. By installing or otherwise using the StreamStor Product, you agree to be bound by the terms of this Agreement. If you do not agree to the terms of this Agreement, do not install or use the StreamStor Product and return it to Conduant Corporation.

GRANT OF LICENSE. In consideration for your purchase of the StreamStor Product, Conduant Corporation hereby grants you a limited, non-exclusive, revocable license to use the software and firmware which controls the StreamStor Product (hereinafter the "Software") solely as part of and in connection with your use of the StreamStor Product. If you are authorized to resell the StreamStor Product, Conduant Corporation hereby grants you a limited non-exclusive license to transfer the Software only in conjunction with a sale or transfer by you of the StreamStor Product controlled by the Software, provided you retain no copies of the Software and the recipient agrees to be bound by the terms of this Agreement and you comply with the RESALE provision herein.

NO REVERSE ENGINEERING. You may not cause or permit, and must take all appropriate and reasonable steps necessary to prevent, the reverse engineering, decompilation, reverse assembly, modification, reconfiguration or creation of derivative works of the Software, in whole or in part.

OWNERSHIP. The Software is a proprietary product of Conduant Corporation which retains all title, rights and interest in and to the Software, including, but not limited to, all copyrights, trademarks, trade secrets, know-how and other proprietary information included or embodied in the Software. The Software is protected by national copyright laws and international copyright treaties.

TERM. This Agreement is effective from the date of receipt of the StreamStor Product and the Software. This Agreement will terminate automatically at any time, without prior notice to you, if you fail to comply with any of the provisions hereunder. Upon termination of this Agreement for any reason, you must return the StreamStor Product and Software in your possession or control to Conduant Corporation.

LIMITED WARRANTY. This Limited Warranty is void if failure of the StreamStor Product or the Software is due to accident, abuse or misuse.

Hardware: Conduant's terms of warranty on all manufactured products is one year from the date of shipment from our offices. After the warranty period, product support and repairs are available on a fee paid basis. Warranty on all third party materials sold through Conduant, such as chassis, disk drives, PCs, bus extenders, and drive carriers, is passed through with the original manufacturer's warranty. Conduant will provide no charge service for 90 days to replace or handle repair returns on third party materials. Any charges imposed by the original manufacturer will be passed through to the customer. After 90 days, Conduant will handle returns on third party material on a time and materials basis.

Software: The warranty on all software products is 90 days from the date of shipment from Conduant's offices. After 90 days, Conduant will provide product support and upgrades on a fee paid basis. Warranties on all third party software are passed through with the original manufacturer's warranty. Conduant will provide no charge service for 90 days to replace or handle repair returns on third party software. Any charges imposed by the manufacturer will be passed through to the customer.

DISCLAIMER OF WARRANTIES. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, CONDUANT CORPORATION DISCLAIMS ALL OTHER WARRANTIES AND CONDITIONS, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND NONINFRINGEMENT, WITH REGARD TO THE STREAMSTOR PRODUCT AND THE SOFTWARE.

SOLE REMEDIES. If the StreamStor Product or the Software do not meet Conduant Corporation's Limited Warranty and you return the StreamStor Product and the Software to Conduant Corporation, Conduant

Corporation's entire liability and your exclusive remedy shall be at Conduant Corporation 's option, either (a) return of the price paid, if any, or (b) repair or replacement of the StreamStor Product or the Software. Any replacement Product or Software will be warranted for the remainder of the original warranty period.

LIMITATION OF LIABILITIES. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL CONDUANT CORPORATION BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR ANY OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OF OR INABILITY TO USE THE STREAMSTOR PRODUCT AND THE SOFTWARE. IN ANY CASE, CONDUANT CORPORATION'S ENTIRE LIABILITY UNDER ANY PROVISION OF THIS AGREEMENT SHALL BE LIMITED TO THE AMOUNT ACTUALLY PAID BY YOU FOR THE STREAMSTOR PRODUCT AND THE SOFTWARE. BECAUSE SOME STATES AND JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY, THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

RESALE. If you are authorized to resell the StreamStor Product, you must distribute the StreamStor Product only in conjunction with and as part of your product that is designed, developed and tested to operate with and add significant functionality to the StreamStor Product; you may not permit further distribution or transfer of the StreamStor Product by your end-user customer; you must agree to indemnify, hold harmless and defend Conduant Corporation from and against any claims or lawsuits, including attorneys' fees, that arise or result from the use or distribution of your product; and you may not use Conduant Corporation's name, logos or trademarks to market your product without the prior written consent of Conduant Corporation.

ENTIRE AGREEMENT; SEVERABILITY. This Agreement constitutes the complete and exclusive agreement between you and Conduant Corporation with respect to the subject matter hereof and supersedes all prior written or oral agreements, understandings or communications. If any provision of this Agreement is deemed invalid under any applicable law, it shall be deemed modified or omitted to the extent necessary to comply with such law and the remainder of this Agreement shall remain in full force and effect.

GOVERNING LAW. This Agreement is governed by the laws of the State of Colorado, without giving effect to the choice of law provisions therein. By accepting this Agreement, you hereby consent to the exclusive jurisdiction of the state and federal courts sitting in the State of Colorado.

About This Manual

This manual is intended to serve the following purposes:

- to provide an overview of the StreamStor 10 Gigabit Ethernet (10GigE) daughterboard;
- to act as a reference for the operator; and
- to provide guidance on software capabilities and choices.

It is suggested that you periodically check the Conduant web site for the most recent software updates, application notes, and technical bulletins.

If you are unable to locate the information you need, please feel free to contact us by e-mail or phone.

Overview

The StreamStor 10 Gigabit Ethernet ("10GigE") daughterboard is a mezzanine IO board that can be used with a compatible StreamStor controller such as the Amazon.

The Conduant StreamStor 10GigE recording system is a "formatless" Ethernet packet recorder for recording real-time data streams. The system generally includes a mezzanine (or daughter) board on a StreamStor recording controller along with storage media (disk drives). The system is intended to provide a means to use 10GigE hardware to transport real-time data streams for recording purposes. This may involve routers or other network equipment but, in general, the system is not intended to function as network interface nor does it provide any facilities to respond to standard network protocols or queries. In addition, it is left to the user to define the data contents and format of the recorded data. Each Ethernet packet that arrives at the interface is assumed to carry one data frame to be recorded. This document describes the contents and format of these data frames. The source hardware must create the data frames in this format for successful recording on the StreamStor system.

Ethernet Packet Format

Packet structures will adhere to standard IEEE 802.3 Ethernet packet specification or the Ethernet jumbo-packet packet structure. The general structure of an Ethernet packet is shown in the following diagram.

	Preamble (8 bytes)
	MAC Client Header (typically 14-18 bytes)
MAC Client Data	Upper OSI layer parameters or other non-relevant data
	Data Frame
	Frame Check Sequence (4 bytes)

The components of an Ethernet packet include:

- Preamble – a synchronization pattern that allows the Ethernet hardware to synchronize properly to the Ethernet packet.
- MAC Client Header – contains such information as Source and Destination MAC addresses, type/length, and tag control information.
- MAC Client Data – this is the data that can be recorded depending on the Data Offset value.
- Upper OSI layer parameters – such parameters as OSI Layer 3 IP and higher-layer parameters may be contained here; they are assumed to be of fixed length for a given recording.
- Data Frame – the data frame contains the source generated data including any header data; the user must specify the byte offset from the beginning of the MAC Client Data at which recording is to start ('Data Offset'). This allows the user to decide whether to include or skip the OSI layer data and any header in the data payload.
- Frame Check Sequence (FCS) – a cyclic redundancy error-checking value that is only used to validate a valid packet (not recorded).
- Within each recording session, all Ethernet packets should have exactly the same length and structure.

Data Frame Format

Each data frame must meet the following guidelines:

- Each Ethernet packet arriving at the recorder contains one data frame.
- Each Ethernet packet should have a constant-sized OSI layer data size.
- Any data not intended to be recorded must be at the beginning of the data frame, immediately following any OSI layer data, and can be of any size.
- The data to be recorded starts at a specified offset from the start of the MAC Client Data section. If this offset is zero, everything in the MAC Client area, including any OSI layer data, is recorded. The offset can also be used to skip the recording of header data that is immediately following any OSI layer data.
- The data to be recorded in each packet must have a length that is an integral multiple of 8 bytes.

Data Format

The data, which immediately follows the MAC Client Header, is defined as the MAC Client Data. The MAC Client Data area of the packet may include OSI layer data. If the user does not intend to record the OSI layer data, then an offset must be supplied to the StreamStor controller to skip over it. The offset value is defined as the number of bytes counted from the start of the MAC Client Data. Note that this offset may also skip over any header or other data at the start of the Data Frame area. Also, it must also be provided to the StreamStor controller prior to the start of a recording and must remain fixed throughout that recording session.

The amount of data to be recorded from each packet received is determined by the difference between the MAC Client Data size and the user-provided Data Offset. The amount of data recorded from each packet must be a multiple of 8 bytes. StreamStor supports the use of jumbo Ethernet packets up to 9000 bytes.

Data Recording

Recorded Data

Once the recording has started, the StreamStor system will record a portion of all received packets, from the start of the Data Offset to the end of the packet, exclusive of the CRC value. The Data Offset value must be provided to the StreamStor recorder prior to the start of a recording. Note that an offset value of zero is a valid choice. An offset value of zero will allow the recording of the following for each packet: any OSI layer data, the data frame header and the payload data. If there is no OSI layer data, a Data Offset value of 16 will skip over the Data Frame Header, thereby recording only the payload data of each packet.

Packet Order

Due to the nature of Ethernet hardware and network design, it is possible for packets to arrive at the recorder out of order. In point-to-point implementations, this ordering problem cannot occur. However, if routers or other network equipment is utilized in the movement of data to the recorder, this ordering problem can occur. Packets must include sequence numbers within the data stream to allow the order to be corrected upon data retrieval. Otherwise, the StreamStor hardware can be adapted to provide a minimal amount of re-ordering capability, if required.

Raw Mode

The StreamStor hardware supports a "raw" mode to record complete Ethernet packets for testing purposes. This includes the entire contents of the packet, as defined earlier, with the exception of the Preamble. Packets that do not conform to the modulo 8-byte size restriction will be padded at the end of the packet with a user-defined pattern inflate the size to modulo 8. Contact Conduant engineering for more information on this mode of operation.

Packet Filtering

In some environments, it may not be possible to prevent Ethernet packets from arriving at the recorder that are not intended for the recording. The StreamStor hardware can be programmed to filter packets based on the source

MAC address. This filtering mode must be enabled in the StreamStor programming interface and the source MAC address to filter must be provided.

Performance

The StreamStor recording rate does not match that of the 10 GigE interface. Therefore, the source data stream must be adjusted accordingly to avoid continuous saturation of the interface and resultant packet loss. The maximum recording data rate is 500 MB/s for Amazon-based systems or 800 MB/s for Amazon Express-based systems. The Amazon controller can buffer up to 1 GB while the Amazon Express can buffer up to 2 GB of data. Either controller's RAM buffer can offload from the interface hardware at approximately 800 MB/s. The 10 Gigabit Ethernet interface hardware is capable of buffering up to 5 jumbo packets which is approximately 45,000 bytes.

Physical Layer

Media

The StreamStor recorder follows the 10GBASE-CX4 (802.3ak-2004) standard for interconnection with data sources. It uses the XAUI 4-lane copper cabling which is similar to that used by InfiniBand technology. It is specified to work up at a distance of up to 3m (~10 ft). Each of the 4 lanes run at the standard 3.125 Gbps.

Connector

The cable connection to the StreamStor recorder is a standard CX4 design with screws. Since the latch-style connector is more prevalent, Conduant offers a CX4 cable with a screw-style connector at one end and a latch-style connector at the opposite end.

Programming

Configuring 10GigE with XLRSetMode

The StreamStor API function `XLRSetMode` is used to set the input path and functionality of the StreamStor. Table 1 lists the supported modes.

TABLE 1 – 10GigE I/O Modes	
XLRSetMode Mode	**Description**
`SS_MODE_SINGLE_CHANNEL`	Receives and sends data over one channel

Setting up Channels

The StreamStor system can be configured to perform the following operations:

- record from the 10GigeE port or
- record over the PCI bus or
- playback over the PCI bus.

The port and the PCI bus are each mapped to a specific channel number, as shown in Table 2.

TABLE 2 – Channel Mapping	
Channel Number	**Channel Description**
0	PCI
28	10GigE Port

The 10GigE daughterboard supports recording a single channel. Multi-channel recording over the 10GigE port is not yet supported.

Input and output channels must be "selected" and "bound" before your application can record or playback data. The API function `XLRSelectChannel` is used to select a channel. When you select a channel, subsequent channel-specific API calls will be performed on that channel.

The API functions `XLRBindInputChannel` and `XLRBindOutputChannel` are used to identify which channel(s) will be used for data input and which channel(s) will be used for output. Playback over the 10GigE port is not yet supported.

The StreamStor SDK User's Guide describes each of the above API commands. The chapter called "Channel Description and Selection" provides an overview on using channels.

Single Channel Operation

By default, the 10 GigE daughterboard is in single channel mode. You can explicitly set the mode to single channel by calling XLRSetMode with the mode parameter set to SS_MODE_SINGLE_CHANNEL.

When in SS_MODE_SINGLE_CHANNEL mode, the default binding for channel input and channel output is the PCI bus (channel 0). To change the binding, call XLRSelectChannel and XLRBindInputChannel and/or XLRBindOutputChannel.

The following code fragment shows the sequence of API calls to use if you want to record over the 10GigE port (channel 28).

```
XLRSetMode(xlrHandle, SS_MODE_SINGLE_CHANNEL);
XLRClearChannels (xlrHandle);
XLRBindInputChannel(xlrHandle, 28);
XLRSelect (xlrHandle, 28);
XLRRecord(xlrHandle, 0, 1);
   … record for a while …
XLRStop(xlrHandle);
```

It is important to note the order of the API calls. The XLRSelectChannel command selects the channel that subsequent API commands will act upon.

Programming Ethernet Registers

The 10 Gigabit Ethernet Daughterboard has requirements based on Ethernet Filtering and metrics. This section discusses how to use the Ethernet Filter Registers.

Ethernet Filter Control Register

The Ethernet Filter has its own set of registers which can be used to enable/disable raw mode, CRC checking, and to set promiscuous mode.

To configure the 10GigE daughterboard's Ethernet Filter, call the StreamStor API function XLRWriteDBReg32. The function prototype is:

```
XLR_RETURN_CODE XLRReadDBReg32( SSHANDLE device, int
Register, OUT UINT32 Value );
```

Where:

- device – the StreamStor handle
- Register – the index of the register to write
- Value – the value to write

The register index for the Ethernet Filter is #defined as:

```
SS_10GIGE_REG_ETHR_FILTER_CTRL
```

The 10GigE register indexes are described in Table 3. They are defined in the StreamStor header file `10GigeRegs.h`. We recommend that you use the identifier instead of the actual index in calls to `XLRWriteDBReg32`. Doing so will obviate the need to change the values if the registers change in future releases and will make your code easier to read.

For example, to set the Ethernet Filter Control Register to a value:

```
XLRReadDBReg32(sshandle,SS_10GIGE_REG_ETHR_FILTER_CTRL,value)
;
```

Raw Mode

Bit 0 of the Ethernet Filter Control Register is used to set/clear "raw mode." Raw mode is useful for debugging packets.

If raw mode is enabled, the packets pass completely to the MAC Client Data Filter. It is expected that the MAC Client Data filter will also have this mode enabled to allow StreamStor to capture the raw recovered and aligned packets from the XAUI interface.

If raw mode is enabled, all others modes are ignored.

CRC Disable Mode

Bit 2 of the Ethernet Filter Control Register is used to enable/disable CRC ("cyclic redundancy check") Disable Mode. This mode is normally disabled, which means that all Ethernet Frames are checked for CRC (Fault Symptom Code).

When CRC Disable Mode is disabled (the default), a payload is not passed to the Filter if it contains a CRC error. Furthermore, any CRC error detected increments the FSC Error Counter. To pass payloads without checking the CRC, set the CRC Check Disable bit.

The value of the CRC Check Disable bit does *not* effect the operation FSC Error Counter. This will allow the user to determine the CRC error rate even when processing bad packets. The FSC Error Counter is reset by the user writing a 0x0000_0000 to this register.

Promiscuous Mode

Bit 4 of the Ethernet Control Register is used to enable/disable "promiscuous mode." This mode is used to indicate how frames are passed. By default, this mode is enabled, allowing the Ethernet Filter to capture all frames without discrimination on the Address Compare.

10GigE Register Descriptions

Table 3 describes the 10GigE registers.

Table 3 – 10 GigE Register Descriptions			
Address	**Bits**	**Register Preprocessor Identifier**	**Description**
0x1		Reserved	Daughter Card Specific Control
0x2	31:0	`SS_10GIGE_REG_WRAP`	Read-write register to validate path
0x3		`SS_10GIGE_REG_MAC_FLTR_CRTL`	MAC Client Data Filter Specific Control
	4	Byte Length Check Enable	Turns on Byte Length Checking
	3	Clear Monitor Counters	Clear the monitor counters.
	2	Monitor Mode 2	Enables Monitor Mode 2 (exclusive of Mode 1 below)
	1	Monitor Mode 1	Enables Monitor Mode 1 (exclusive of Mode 2 above)
	0	Disable Filter	Disable the MAC Client Data Filter Behavior. Pass Raw Packets through.
0x4		`SS_10GIGE_REG_DATA_PAYLD_OFFSET`	The value of the DPOFST (Data Payload Offset)
0x5		`SS_10GIGE_REG_DATA_FRAME_OFFSET`	The value of the DFOFST (Data Frame Offset)
0x6		`SS_10GIGE_REG_PSN_OFFSET`	The value of PSN Offset
0x7		`SS_10GIGE_REG_BYTE_LENGTH`	The expected Byte Length
0x8		`SS_10GIGE_REG_FILL_PATTERN`	Skipped Payload fill Patterns.
0x9		`SS_10GIGE_REG_TOTAL_PKTS`	Status Register indicating the total number of packets transmitted.
0xA		`SS_10GIGE_REG_NUM_ERR_PKTS`	Status Register indicating the total number of packets which have length error.
0xB		`SS_10GIGE_REG_MON_MODE2_ERR_PKTS`	Total number of packets with Mode 2 errors
0xC		`SS_10GIGE_REG_MON_MODE1_ERR_PKTS`	Total number of packets with Mode 1 errors
0xD		`SS_10GIGE_REG_ETHR_FILTER_CTRL`	Ethernet Filter Specific Control
	4	Promiscuous Mode	Disable Source Address Comparison and pass all data. (Reset = 1) which is enabled.
	2	CRC Check Disable	Disable Checking Ethernet Frame FCS

	0	Disable Filter	Disable the Ethernet Frame Filter allows Raw Ethernet Packets to be passed forward to recording.
0xE		`SS_10GIGE_REG_ETHR_PKT_LENGTH`	Ethernet Filter Specific Packet length
	31	Packet Length Check Enable	Turns on Packet Length Checking
	15 – 0	Packet Length	The expected Length of the Packet
0xF		`SS_10GIGE_REG_ETHR_TOTAL_PKTS`	Ethernet Status Register indicating the total number of packets transmitted.
0x10		`SS_10GIGE_REG_ETHR_FSC_ERR_PKTS`	Ethernet Status Register indicating the total number of packets with FSC Ethernet Errors.
0x11		`SS_10GIGE_REG_ETHR_LGTH_ERR_PKTS`	Ethernet Status Register indicating the total number of packets with Length Errors.
0x12		`SS_10GIGE_REG_ETHR_ADDR_RJT_PKTS`	Ethernet Status Register indicating the total number of packets with this unit rejected because of the address filter.
0x13		`SS_10GIGE_REG_SRC_ADDR_0_LSB`	Least Significant 4-bytes of the Source Address Compare
0x14		`SS_10GIGE_REG_SRC_ADDR_0_MSB`	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x15		`SS_10GIGE_REG_SRC_ADDR_1_LSB`	Least Significant 4-bytes of the Source Address Compare
0x16		`SS_10GIGE_REG_SRC_ADDR_1_MSB`	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x17		`SS_10GIGE_REG_SRC_ADDR_2_LSB`	Least Significant 4-bytes of the Source Address Compare

0x18		SS_10GIGE_REG_SRC_ADDR_2_MSB	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x19		SS_10GIGE_REG_SRC_ADDR_3_LSB	Least Significant 4-bytes of the Source Address Compare
0x1A		SS_10GIGE_REG_SRC_ADDR_3_MSB	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x1B		SS_10GIGE_REG_SRC_ADDR_4_LSB	Least Significant 4-bytes of the Source Address Compare
0x1C		SS_10GIGE_REG_SRC_ADDR_4_MSB	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x1D		SS_10GIGE_REG_SRC_ADDR_5_LSB	Least Significant 4-bytes of the Source Address Compare
0x1E		SS_10GIGE_REG_SRC_ADDR_5_MSB	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x1F		SS_10GIGE_REG_SRC_ADDR_6_LSB	Least Significant 4-bytes of the Source Address Compare
0x20		SS_10GIGE_REG_SRC_ADDR_6_MSB	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x21		SS_10GIGE_REG_SRC_ADDR_7_LSB	Least Significant 4-bytes of the Source Address Compare
0x22		SS_10GIGE_REG_SRC_ADDR_7_MSB	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.

0x23		SS_10GIGE_REG_SRC_ADDR_8_LSB	Least Significant 4-bytes of the Source Address Compare
0x24		SS_10GIGE_REG_SRC_ADDR_8_MSB	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x25		SS_10GIGE_REG_SRC_ADDR_9_LSB	Least Significant 4-bytes of the Source Address Compare
0x26		SS_10GIGE_REG_SRC_ADDR_9_MSB	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x27		SS_10GIGE_REG_SRC_ADDR_A_LSB	Least Significant 4-bytes of the Source Address Compare
0x28		SS_10GIGE_REG_SRC_ADDR_A_MSB	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x29		SS_10GIGE_REG_SRC_ADDR_B_LSB	Least Significant 4-bytes of the Source Address Compare
0x2A		SS_10GIGE_REG_SRC_ADDR_B_MSB	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x2B		SS_10GIGE_REG_SRC_ADDR_C_LSB	Least Significant 4-bytes of the Source Address Compare
0x2C		SS_10GIGE_REG_SRC_ADDR_C_MSB	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x2D		SS_10GIGE_REG_SRC_ADDR_D_LSB	Least Significant 4-bytes of the Source Address Compare
0x2E		SS_10GIGE_REG_SRC_ADDR_D_MSB	Most Significant 2-bytes of the Source Address + Enable

	31	Enable Address	Enable this Address to be compared.
0x2F		`SS_10GIGE_REG_SRC_ADDR_E_LSB`	Least Significant 4-bytes of the Source Address Compare
0x20		`SS_10GIGE_REG_SRC_ADDR_E_MSB`	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.
0x31		`SS_10GIGE_REG_SRC_ADDR_F_LSB`	Least Significant 4-bytes of the Source Address Compare
0x32		`SS_10GIGE_REG_SRC_ADDR_F_MSB`	Most Significant 2-bytes of the Source Address + Enable
	31	Enable Address	Enable this Address to be compared.

Resetting the Ethernet Total Packets Counter

Regardless of the mode, the Ethernet Total Packets counter will count the number of Ethernet Packets processed by this filter without regard to errors or filtering. This counter can be reset by the user by writing a 0x0000_0000 to this register.

The Ethernet Packet Length is used to frame expected packet sizes. This value is calculated by the user prior to enabling the StreamStor for record; as the packet and payload sizes are known prior to the recording. This register is updated with the expected length in bytes. If bit 31 of this register is set (logical 1), then the checking is enabled. If checking is enabled then any packet which is an unexpected length is rejected and the Ethernet Length Error Packets counter is incremented. If Promiscuous Mode is enabled the counter is updated but the payload is allowed to flow to the next filter. The Ethernet Length Error Packet counter can be reset by the user writing an 0x0000_0000 into this register.

Ethernet Source Address Filter

The Ethernet Filter also has the ability to discriminate based on the Source Address. Each source address is made up of two registers. The second register also has an enable bit for the convenience of the firmware. A complete table can be loaded but prior to enable record a simple read-modify-write can be performed to enable the correct Source Address Filter.

It is assumed that the user will use both the Ethernet Total Packet Count and the MAC Client Data Filter Total Payload Count to determine if the correct number of Source Based Events has occurred.

Technical Support

Conduant wants to be sure that your StreamStor system works correctly and stays working correctly. In the event, however, that you are unable to get your system to work properly, or if a working system ceases to function, we will do all that we can to get your system back online.

Solving the problem is largely a matter of data collection and steps that must be taken one at a time. In order for us to better serve you, we ask that you take the time to perform the following steps prior to calling us. This way, you can provide us with the most meaningful information possible that will help us solve the problem.

Is the problem one that obviously requires replacement parts due to physical damage to the system? If yes, then please gather the information described below and report the problem to tech support, by phone or through the Conduant web site.

Have you confirmed that no cabling has been inadvertently disconnected or damaged while working around the equipment?

Is the StreamStor card properly seated in the PCI (CPCI/PXI) slot?

Do all the systems have good power connections and voltages?

Does the confidence test sscfg.exe (on Windows) or ssopen/sstest (on Linux) run OK?

Has the software installation been corrupted? Try re-installing software.

Have you checked the Conduant web site for technical bulletins?

Have you recently installed a new Linux kernel or compiler or a new Windows Service Pack?

If the above steps did not resolve the problem, then please initiate a trouble ticket on the support section of the Conduant website at www.conduant.com. Please provide as much information about your system and the problem as possible. We will do all that we can to resolve the problem as quickly as possible.