MSAN-210

MVTX260x Port Mirroring

Application Note

Contents

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1.0 Purpose

This application note describes the port mirroring usage on the MVTX260x chipsets.

2.0 Scope

This document will cover Port Mirroring for the MVTX260x device. The reader should be familiar with the MVTX260x data sheet before reading this application note

3.0 Features

This application note describes the port mirroring usage on the MVTX260x chipsets. The MVTX260x chips provide port-mirroring function on the 10/100M ports. The traffic can be mirrored from either receive or transmit stream except on ports 7 (8th), 15 (16th), and 23 (24th). Ports 7, 15, and 23 take advantage of the Zarlink security mirroring feature which allows the mirrored data to be viewed by the CPU through the software steps outlined in this application note. For the unmanaged switches, port 23 is the designated mirror-to port. The MVTX260x supports two such mirrored source-destination pairs. A mirror port cannot also serve as a data port.

3.1 Unmanaged mode

The port mirroring functionality may be set by external pins on the MVTX260x. If this option is selected, then there can only be one mirroring pair, and the destination port must be port 23. There are 6 pins (PM_CT[5:0]). The first 5 bits select the port to be mirrored. The last bit selects either ingress or egress data. Again the unmanaged mode port mirroring function does not apply to port 7 and 15. The port mirroring control via external pins can be applied to the managed mode as well.

3.2 Managed Mode

In management mode, the port mirroring is set via four registers:

- MIRROR1_SRC: Sets the source port for the first port mirroring pair. Bits [4:0] select the source port to be mirrored. An illegal port number is used to disable mirroring (which is the default setting). Bit [5] is used to select between ingress (Rx) or egress (Tx) data. Bit [7] is used to select between external pin controls and register control for port mirroring.
- MIRROR1_DEST: Sets the destination port for the first port mirroring pair. Bits [4:0] select the destination port to be mirrored. The default is port 23.
- MIRROR2_SRC: Sets the source port for the second port mirroring pair. Bits [4:0] select the source port to be mirrored. An illegal port number is used to disable mirroring (which is the default setting). Bit [5] is used to select between ingress (Rx) or egress (Tx) data.
- MIRROR2_DEST: Sets the destination port for the second port mirroring pair. Bits [4:0] select the destination port to be mirrored. The default is port 0.

4.0 Flexible Port Mirroring Support

This section describes a flexible software solution to selectively mirror the incoming or outgoing traffics of a given MAC. If all MACs for the ingress and egress packets of a port are mirrored, then the function is similar to port mirroring. The main approach is to utilize the secure mode hardware, which forwards the monitored traffics of a given port to the CPU only. The driver then sets up the MAC entries that point the return traffics to the CPU port, so the traffic can be captured.

In the MVTX260x driver, the port mirroring function for ports 7, 15, and 23 are provided as an option. The software port mirroring implemented in the driver is described below.

First, the following MVTX2604 register needs to be program as follow:

- The ECR2 register for the mirror source port need the Security Enabled field to be set to Send Packet to CPU Only. Also for this register, the Learning Disable field needs to be set to 1. Setting these fields will cause all ingress packets to be forwarded to the CPU.

The driver then needs to be modified to perform the following functions:

- Ingress packets that have an unknown source MAC address needs to be learned by the driver. The driver must also send a control frame to the MVTX2604 to have this new source MAC address added to the CPU port.
- Forward all ingress packets of the mirror source port to the destination port if the destination MAC address has been learned. If the destination MAC address is unknown then flood the packet to the VLAN domain ports. Also, forward the ingress packets to the mirror destination port.
- Receive all packets destined for the mirror source port and forward it to the mirror source port.

If mirroring is disabled then the Security Enabled and Learning Disable field in the ECR2 register must be set to its default value and the driver functions to support this solution must not be executed.

Note: This software solution may not provide line rate traffic between the mirror source port and any mirror-to port. The actual line rate depends on the type and speed of the processor.

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