Mahlet String Filter Engine

Product Brief

Mahlet Consulting, Inc.

Solutions for Networks

Mahlet Consulting Inc. Columbia, Maryland 21045

1. Introduction

The Mahlet String Filter Engine (MSFE) is an FPGA core that will parse the payload of a 10G Ethernet frame against a user-created table of ASCII strings. Incoming 10G Ethernet frames that match one or more entries in the string table is forwarded to a “pass” port. Non-matching frames are routed to a “drop” port.

The MSFE can search for ASCII strings up to 1500 bytes in Ethernet frames up to 9000 bytes. The core can store up to 100k entries in its string table.

Multiple MFSEs can be instantiated in parallel to increase throughput.

2. Key Features

- Core is build-time configurable to set maximum payload and match string length
- Operates at full 10G line rate with 64-byte frames
- String table is stored in internal Block RAM
- Streaming input/output busses use the Avalon Streaming Interface
- Processor Interface port uses Avalon Memory-Mapped Interface
- String table can be updated while processing traffic
- User-programmable delimiters
- Software-accessible frame counts are available at key points in the core
- Internal storage can be sized using generics
- Can interoperate with the Mahlet IP Filter and Mahlet Multiport Steer

3. MSFE Block Diagram

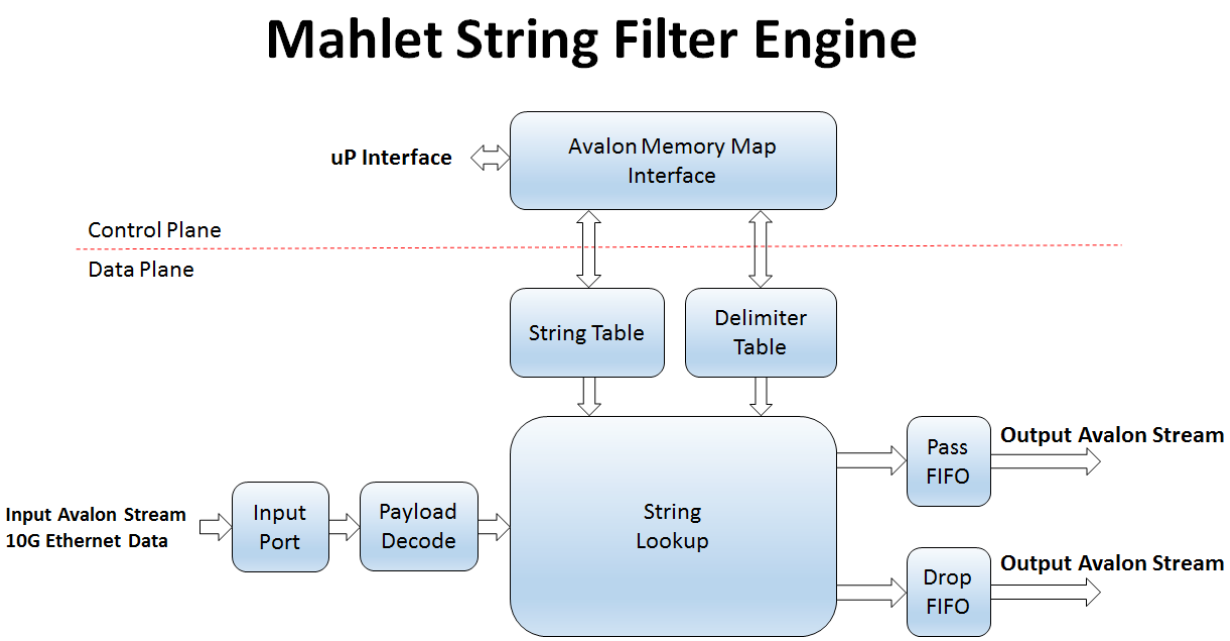

Figure 1: Mahlet SFE Block Diagram

4. MSFE Operations Overview

4.1. FPGA Core Generic Configuration

- Set maximum Ethernet frame size
- Set maximum string size
- Set FIFO sizes

4.2. Software Configuration

- String table update can take place without process interruption
- String table entries can be deleted at any time using control software
- Software can read frame counts at several points in MSFE
    - Input port
    - Pass frames
    - Drop frames

4.3. Traffic Processing

- Software controls internal string table
- Software control internal delimiter table.
- Incoming 10G Ethernet frame's payload is parsed into individual ASCII strings using user-defined delimiters
- ASCII strings found in incoming 10G Ethernet frame are checked against string table

- If match is found in string table, frame is forwarded to “pass” FIFO”. Else, frame is forwarded to “drop” FIFO
- Overflow frames are forwarded to “drop” port

5. MSFE Implementation Summary

The following is a summary logic and memory utilization of the MSFE when configured for 1500-byte frames and 1500-byte string entries

Vendor	Device	Logic (ALMs)	Memory (bits)	Freq (MHz)
Altera	Stratix V GX	50045.0	2174976	156.25

6. References

Avalon Interface Specifications:

https://www.altera.com/content/dam/altera-www/global/en_US/pdfs/literature/manual/mnl_avalon_spec.pdf

7. Contact Info

Mahlet Consulting Inc.
8840 Stanford Blvd.
Suite 4000
Columbia, Maryland 21045
Email: info@mahletconsulting.com
Phone: 301-356-6620

8. Revision History

Date	Revision	Change
1-8-2016	0.1	Initial Document