Probabilistic matching

Thousands of rules on 100G network traffic

SOLUTION BRIEF

XILINX ALVEO™

- 100 Gbps Throughput with a Single Core
- 13k rules in parallel
- Customizable

INTRODUCTION

Fast analysis of 100G network traffic on a single network card without involving the CPU is a key for several applications like: Lawful Interception, Deep Packet Inspection and Network Monitoring. Some applications require tens of thousands of simultaneous rules to be tracked in real-time. Others require very complex regular expressions. With a release of Grovf probabilistic matching engine we enhance our Security IP portfolio.

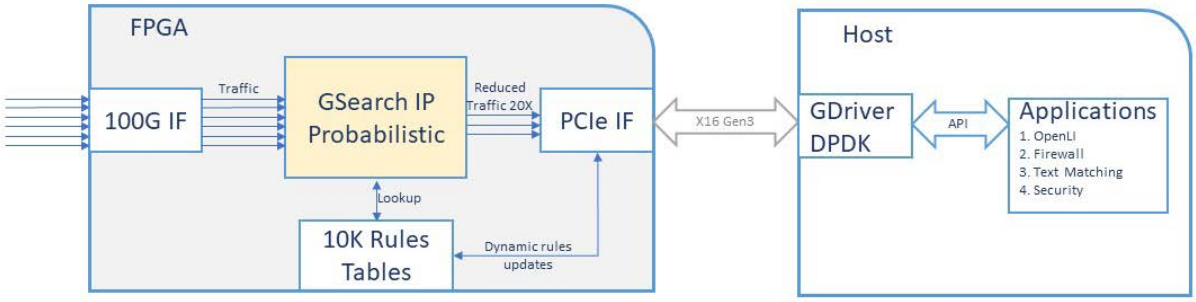
Grovf probabilistic match engine is an implementation of standard matching algorithm on FPGA chip achieving 100 Gbps throughput with a single IP core while supporting more than ten thousands of simultaneous rules. Rules can be dynamically added, deleted, and changed on the fly.

KEY BENEFITS

- Host drivers and reference examples for using in C, Java
- Cross-packet matching capability
- Supports Cloud as well as on-prem cards

SOLUTION OVERVIEW

The solution consists of two parts: Probabilistic match IP core on the FPGA side and the drivers in Host side: The data sources of the solution can be the NIC of the server using Linux Kernel or DPDK library, the network interface available directly on the acceleration card or any application running on the Linux environment for feeding the IP Engine Drivers with the data. Additionally, the engine can work as a front filter for our Regular Expression Engine or other data processing IP cores.



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SOLUTION DETAILS

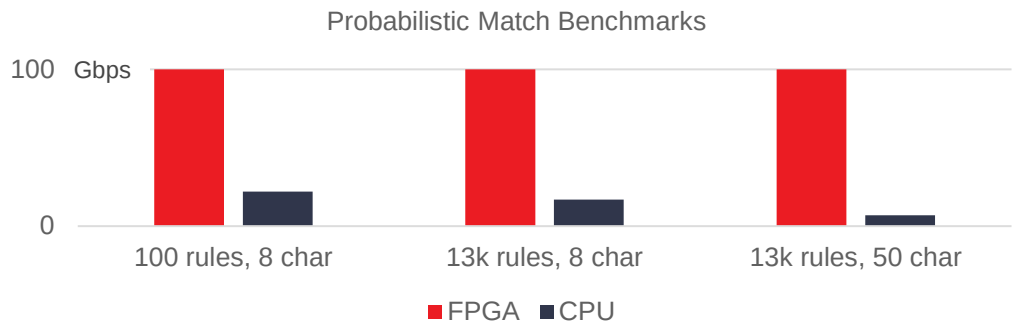
Specification of Grovf probabilistic matching engine:

Parameters	Details
Throughput	100 Gbps
LUT	31k LUTs
BRAM	528 BRAMs
Supported simultaneous rules:	13k
Rule size	Variable, from 3 to 50 chars
False detection, lose	Only false positives are possible, No lose

Note: for 10G networks HBM memory can be used instead of BRAMs. Supported simultaneous rules can be millions.

RESULTS

Grovf probabilistic matching engine achieves 100 Gbps throughput regardless of the searching rule size and the number of rules (Maximum 13k rules at 100Gbps speed). In comparison, software implementations are much slower. Software speed decreases as Rule size or number of Rules increase.



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