SOLUTION BRIEF

Data Center, Cloud Computing, NFV Networking
FPGA-based acceleration

Accelerating IPSec with Arrive Technologies on the Intel® FPGA Programmable Acceleration Card N3000

Executive Summary

Arrive's FPGA-based IP security (IPSec) solution provides up to 100 Gbps wire speed in cryptography processing to support IPsec, at ultra-high density with one million Security Associations (SAs). It is also optimized for the Intel® FPGA Programmable Acceleration Card (Intel FPGA PAC) N3000 to provide flexibility and power and performance advantages.

Introduction

Targeting network functions virtualization (NFV) and cloud computing applications, Arrive's IPSec Acceleration IP Core solution will enable vendors to satisfy 5G IPSec security requirements and achieve the industry's highest throughput and low-latency IPSec on a single server enabling better CPU and RAM utilization. Arrive's IPSec Acceleration IP Core supports the Intel FPGA PAC N3000 for full network interface card (NIC) functionality for 4x 25GbE or 8x 10GbE. Arrive's IPSec also supports various virtualization technologies, such as SR-IOV and Virtual Ethernet Bridging (VEB/VEPA).

Business Challenge

As more and more businesses are trusting their mission-critical data to the cloud, providing secure encryption of network data and increasing overall throughput in data centers is critical.

Solution

Arrive's FPGA-based IPSec Acceleration IP Core, optimized for the Intel FPGA PAC N3000 provides a fast throughput of IPSec encryption to secure transmission of data and increase data center network traffic throughput.

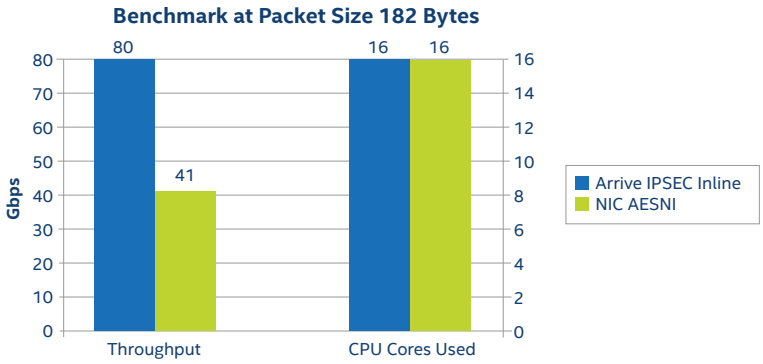

Figure 1. Benchmarks

Note: Benchmarking is performed by Arrive Technologies with Intel® Xeon® CPU E5-2679 v4 at 2.50 GHz 20 CPU cores server, 256 GB RAM and Intel FPGA PAC N3000. NIC (for AESNI benchmark) is 2X Intel XL710.

Authors

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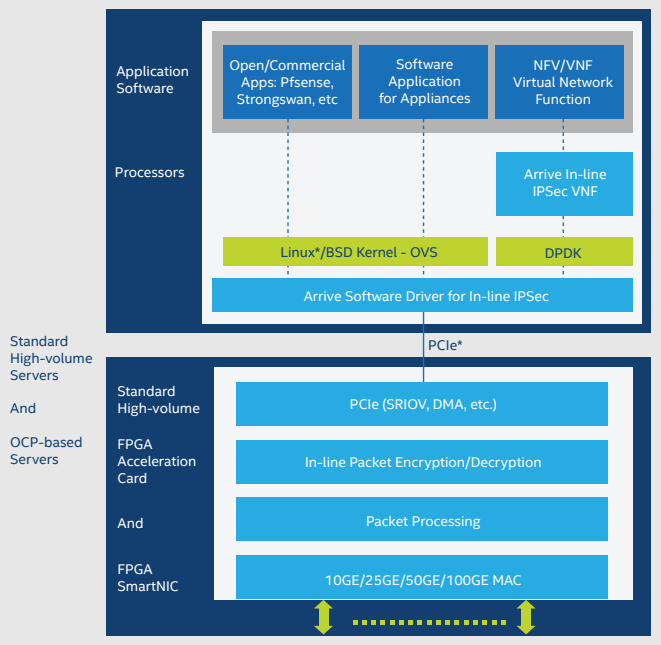

Figure 2. IPSec Acceleration IP Core Block Diagram

Key Features

- The IPSec Acceleration IP Core provides acceleration of up to 100 Gbps and supports dynamic workloads on the Intel FPGA PAC N3000
- Ethernet interfaces: 4x 25GbE or 8X 10GbE
- Host interface: two PCI Express* (PCIe*) Gen3 x8 lanes
- Up to 100 Gbps, bidirectional in-line or look-aside acceleration for IPSec for traffic encryption or decryption and authentication
- Various cryptography modes: AES-GCM (128/192/256), AES-CBC (128/192/256), SHA-1/2, and others
- Up to 100K concurrent flows with enhanced DDR4 SDRAM
- Virtualization technologies SR-IOV and VEB for multiple virtual machines (VMs)
- Operating system (OS) support: Linux*, Red Hat* Enterprise Linux OS
- NFV software solutions: Compatible with Data Plane Development Kit (DPDK), Open vSwitch (OVS), vector packet processing (VPP) or FD.io

Applications

- SmartNIC
- Virtual private cloud (VPC)
- NFV
- Virtual private network (VPN) servers

Conclusion

Arrive's FPGA-based IPSec Acceleration IP Core provides the highest IPSec throughput to accelerate encrypted network traffic through the data center. The Intel FPGA PAC N3000 is designed to accelerate network traffic and capable of customization to meet the exact needs of your network.

Call to Action

Learn more on our website at www.arrivetechnologies.com.

For more information on the Intel Programmable Acceleration Card N3000, visit https://www.intel.com/content/www/us/en/programmable/products/boards_and_kits/dev-kits/altera/intel-fpga-pac-n3000/overview.html

For sales inquires, contact your Intel sales representative.