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RECONFIGURABLE COMPUTING

SOLUTION DESCRIPTION

Link™ Capture Software

FOR INTEL® PROGRAMMABLE ACCELERATION CARD WITH INTEL® ARRIA® 10 GX FPGA

Boosting Application Performance for Cybersecurity and Network Monitoring

Napatech's Link™ Capture Software takes advantage of the Intel® PAC to deliver line-rate packet capture and flow-aware forwarding up to 40 Gbps for all packet sizes. The solution offloads burdensome network and security workloads from the server's Xeon CPU cores.

intel FPGA Design Solutions Network Gold

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RECONFIGURABLE COMPUTING

SOLUTIONS
Cybersecurity
Monitoring
Infrastructure
Cloud and Edge
Mobile
Financial

PLATFORM
Link™ Capture Software Napatech
Link™ Capture Software Intel®
Link™ Inline Software
Link™ Virtualization Software
Link™ SmartNICs
Link™ SmartCards
FPGA Cloud Crypto

APPLICATION PERFORMANCE
Suricata
Bro
Snort
n2disk
Wireshark
TRex
+ More

SERVICES
Professional Services
Custom Development

Napatech Link™ Capture Software for Intel® Programmable Acceleration Card with Intel® Arria® 10 GX FPGA

Boosting Application Performance

Napatech has made its Link™ Capture Software available for the Intel® Programmable Acceleration Card (PAC) with Intel Arria® 10 GX FPGA. With this solution, you can build high-performance platforms based on low-cost, off-the-shelf servers.

The solution demonstrates enormous lossless performance advantages compared to a standard Network Interface Card (NIC), boosting leading cybersecurity and networking applications through hardware acceleration. Where standard NICs suffer from intolerable packet lost for the target applications, Napatech guarantees line rate throughput with zero packet loss for all packet sizes, which is essential for reliable network performance, test and security analysis.

Intel® Programmable Acceleration Card (PAC) with Intel Arria® 10 GX FPGA

Intel® Programmable Acceleration Card

Intel® Programmable Acceleration Card is a PCIe-based FPGA accelerator card for data centers that offers both inline and lookaside acceleration. It provides the performance and versatility of FPGA acceleration and is one of several platforms supported by the Acceleration Stack for Intel® Xeon® CPU with FPGAs. This acceleration stack provides a common developer interface for both application and accelerator function developers, and includes drivers, application programming interfaces (APIs), and an FPGA interface manager. Together with acceleration libraries and development tools, the acceleration stack saves developers time and enables code re-use across multiple Intel FPGA platforms.

The Intel PAC can be deployed in a variety of servers with its low-profile form factor, low-power dissipation, and passive heat sink. The versatile card can be implemented in many market segments, such as big data analytics, artificial intelligence, genomics, video transcoding, cybersecurity, and financial trading.

Napatech is among the leading providers of FPGA accelerator functions selected by Intel to provide complete solutions on the Intel PAC.

"Napatech's Link™ Capture Software for Intel® Programmable Acceleration Card (PAC) provides a much-needed boost for the networking and security applications found in enterprises today. With the Intel PAC now available from leading server manufacturers, FPGA-based acceleration has become pervasive and mainstream."

Luca Deri, ntop founder

Solution Value

Napatech Link™ Capture Software takes advantage of the Intel PAC's powerful Arria® 10 GX FPGA to deliver line-rate packet capture and flow-aware forwarding for all packet sizes up to 40 Gbps. The solution offloads the most burdensome network and security processing workloads from the server's Xeon CPU cores, returning valuable compute resources to the applications and services they were intended for. This allows users to:

- Increase application performance from every server
- Reduce system costs by using fewer servers to achieve target performance
- Limit OPEX by cutting rack space, power, cooling and management
- Diminish time-consumption on complex tasks due to additional computing power
- Achieve complete network visibility and limit massive costs
- from cyberattacks or infrastructure issues

Focus Use Cases

For security teams, it is imperative to have full visibility of the network traffic as even a single packet lost could represent a blind spot and render an entire forensic investigation useless. Similarly, for network operations teams, complete capture is essential for performing fully reliable network tests and troubleshooting, enabling optimal quality of service and avoiding network and equipment overload.

Application types that benefit from the solution's hardware acceleration include:

- Intrusion detection and prevention systems (IDS/IPS)
- Network forensics apps
- Lawful interception solutions
- Network recording & playback
- Analytics
- Monitoring
- Test & measurement
- Network performance monitoring
- Application performance monitoring

Common to these is the unconditional requirement for line rate network throughput for all packet sizes, with 100% lossless packet forwarding and capture, for a multitude of sessions, users and flows.

There are two primary dimensions to the improvement gains:

- First, the FPGA SmartNIC offloads the burdensome workloads that disproportionally consume the host CPU resources, returning those valuable cores to the applications and services for which they were intended.
- Second, the presence of the FPGA itself provides an increase in computing power inside of the system.

Suricata | Snort | Bro | n2disk | TRex | Wireshark | and more

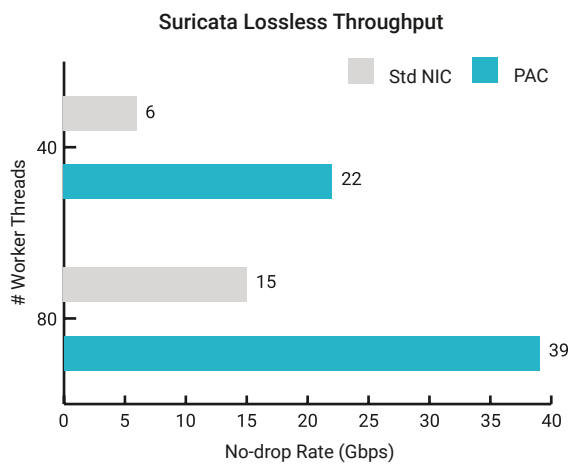
Application Benchmarks

Napatech Link™ Capture Software on Intel PAC delivers outstanding performance improvements for leading commercial and open source applications, as demonstrated below for Suricata, n2disk, Wireshark and TRex.

4x Suricata Performance Boost

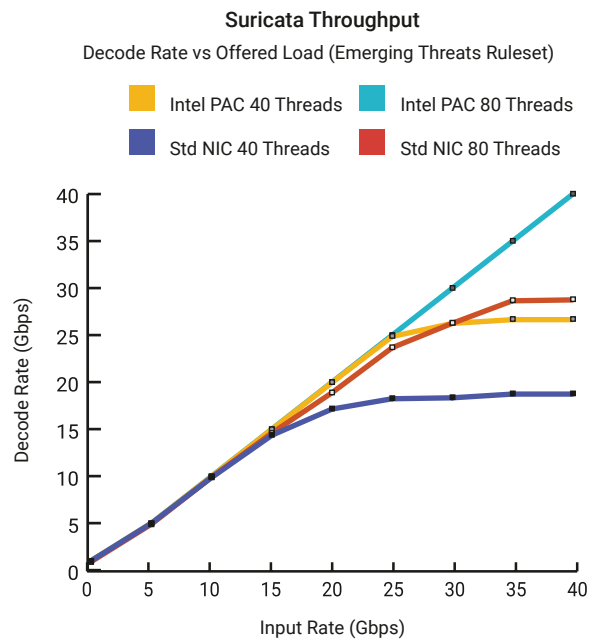
Suricata IDS detects known threats, policy violations and malicious behavior. However, as capable as Suricata is in reactively protecting a network, it will only be as effective as its implementation. Examining the contents of every network packet is extremely CPU-intensive, especially for a multi-gigabit traffic load. And this is often the limiting factor in Suricata performance: the packet processing on the CPU.

Combined, Intel PAC and Link™ Capture Software are uniquely suited for lossless acceleration of Suricata.



Optimized to capture all network traffic at full line rate with almost no CPU load on the host server (all frame sizes), the solution demonstrates significant lossless performance advantages for Suricata compared to a standard NIC:

- 4x lossless packet decode performance
- 100% lossless capture of all network traffic
- 40% improvement in CPU utilization



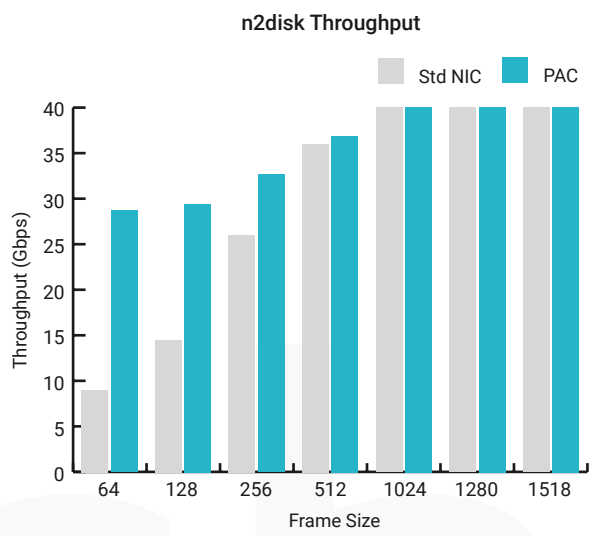
3x n2disk™ Performance Boost

n2disk™ is a powerful network traffic recorder application that enables users to capture and store network packets at multi-gigabit rate from a live network. n2disk allows security teams to seize, store and retrieve all network data on demand, providing retrospective PCAP evidence for vector identification, forensic analysis or operational troubleshooting.

A prerequisite for n2disk™ to be successful is that all network packets are captured with zero loss. But with a multi-gigabit traffic load, standard server deployments often struggle to keep up.

The Intel PAC and Link™ Capture Software solution enables enormous performance advantages for n2disk:

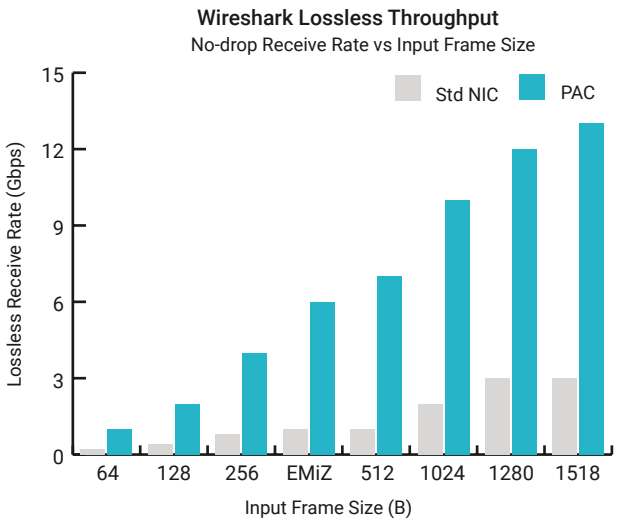
- Up to 3x lossless packet to disk performance
- Guaranteed capture to disk of packet bursts up to 600 milliseconds



7x Wireshark Performance Boost

Wireshark is a widely-used network protocol analyzer allowing users to see what is happening on their networks at a microscopic level. To decode all traffic, it is a fundamental requirement that Wireshark "sees everything". If any traffic is missed, full protocol analysis is not possible. And if the capture server is overburdened and too slow to handle the incoming packet rate, packets are discarded, and information lost forever.

Intel PAC with Napatech Link™ Capture Software dramatically increases capture and protocol analysis, allowing network engineers to utilize the full power of Wireshark to understand network traffic, find anomalies, and diagnose network issues at incredible speeds. The solution demonstrates enormous lossless performance advantages for Wireshark: up to 7x lossless capture and decode performance compared to a standard NIC.



Up to 7 times lossless capture performance compared to a standard NIC

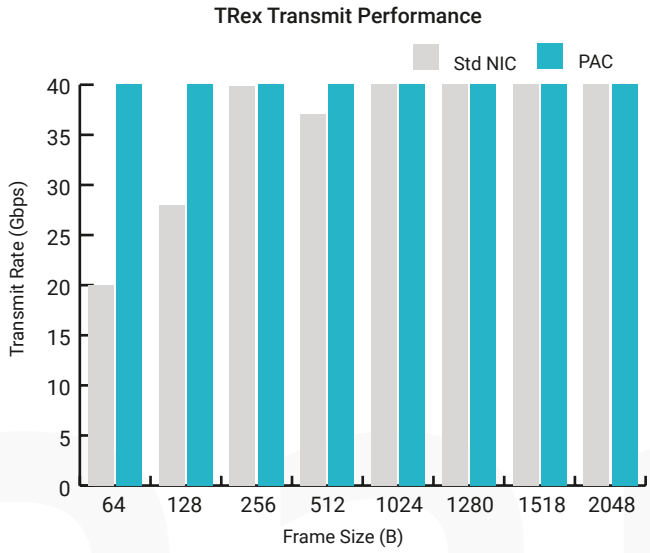
4x TRex Performance Boost

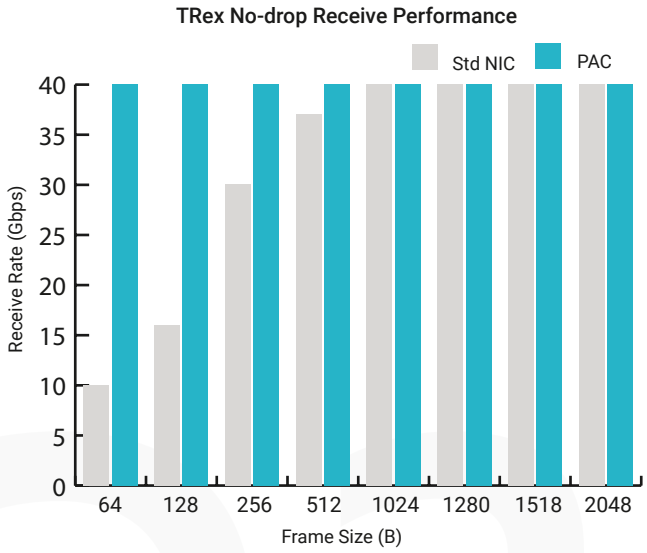
TRex is an open source traffic generator. As for any other traffic generation solution, the ability for TRex to reliably generate packets at line rate across all packet sizes is paramount. Whether simply packet blasting or replaying PCAP files for testing, the ability to send traffic for small packets at the maximum speed is a prerequisite.

Traffic reception is also of critical importance. The ability to receive the generated traffic once it has traversed the Device Under Test (DUT) is the only way of measuring the effectiveness of the solution. If the traffic reception does not match the generation capabilities, testing is compromised as one cannot identify if it is the DUT that is dropping traffic or the test equipment itself.

Optimized for lossless transmit and receive, the Intel PAC and Napatech Link™ Capture Software solution demonstrates substantial performance advantages for TRex compared to a standard NIC:

- 2x traffic generation performance
- 4x traffic reception performance





When running on the Intel PAC with Napatech Link™ Capture Software, TRex can generate and receive traffic at 40G line rate regardless of packet size.

Solution Architecture
The complete solution consists of the following components:

- Standard server platform capable of supporting the Intel PAC (Dell, Fujitsu, HP, etc.)
- Intel® Programmable Acceleration Card with Intel Arria®
- 10 GX FPGA
- Intel Open Programmable Acceleration Engine (OPAE) software
- Napatech Link™ Capture Software & license
- Use-case specific application software selected by the end-customer

Key Features
Napatech Link™ Capture Software on Intel PAC uniquely delivers the following key features:

- Full theoretical throughput up to 40 Gbps bi-directional at all packet sizes
- Support for both 10 Gbps and 40 Gbps configurations
- Zero packet loss under all conditions
- Deterministic performance
- Precise timestamping of all packets
- PCAP and DPDK API support

The solution supports 1x40 GigE and 4x10GigE configurations and is built upon PCAP and DPDK host APIs to simplify integration across commercial, open source and in-house applications.

How to Buy
Up to five Link™ Capture Software licenses can be purchased through the Napatech Webstore. Larger orders should be placed through Napatech Sales.

FPGA Design Solutions Network
Gold

The Intel FPGA Design Solutions Network (DSN) is an ecosystem of experienced, independent worldwide companies that provide customers with valuable products and services that complement Intel FPGAs, SoCs, and Intel Enpirion® Power Solutions. DSN partners offer a broad range of products and services including boards, intellectual property (IP), engineering services, development tools, and training to help customers accelerate product development and reduce time to market.

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RECONFIGURABLE COMPUTING

Napatech helps companies to reimagine their business, by bringing hyper-scale computing benefits to IT organizations of every size.

We enhance open and standard virtualized servers to boost innovation and release valuable computing resources that improve services and increase revenue.

Our Reconfigurable Computing Platform™ is based on a broad set of FPGA software for leading IT compute, network and security applications that are supported on a wide array of FPGA hardware designs.

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