



Link™ Capture Software



Plus More

## SOLUTION DESCRIPTION

**Guaranteed Zero Packet Loss with 60% Throughput Improvement**  
Link™ Capture Software for Napatech SmartNICs



Open Source



Homegrown IT



Commercial Apps

### Guaranteed Zero Packet Loss with 60% Throughput Improvement

Managing and securing modern networks is a continuous challenge. As the volumes of data increase from a growing number of devices, there is a need for continuous investment in new and more powerful network management, security and test and measurement solutions.

However, IT budgets are not growing at the same rate as data volumes or the number of devices to be connected. It is for this reason that more and more enterprises and government organizations are building their own solutions based on low-cost standard servers. The availability of commercial software as well as open source software and tools for in-house development are empowering enterprises and government organizations to build more affordable solutions that meet their exact needs and thereby stretch their limited IT budgets.

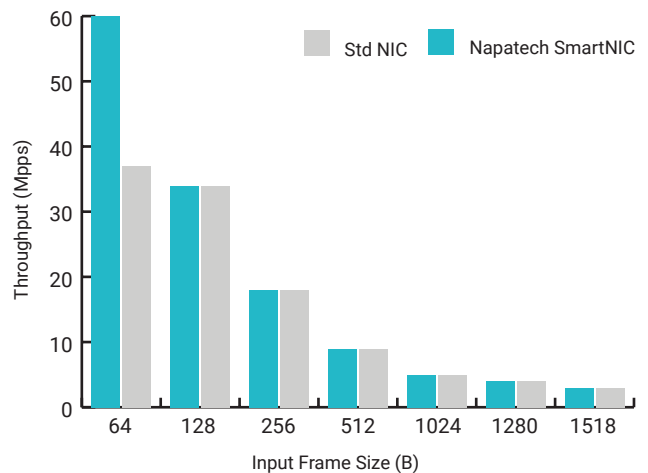
The challenge of building your own network management, security, or test and measurement solution is that low-cost servers, and in particular standard Network Interface Cards (NICs), are not ideal for these kinds of applications. Issues such as packet loss and non-deterministic performance undermine analysis efforts.

Napatech Link™ Capture Software addresses precisely these issues with a solution that guarantees zero packet loss and deterministic performance under all conditions. This allows enterprises and government organizations to build affordable, yet reliable network management, security and test and measurement solutions based on low-cost servers.

### The Napatech difference

Napatech Link™ Capture Software is designed to ensure that no packets are lost under any circumstances. Packet loss can occur in various ways, such as loss due to a lack of capacity on

Lossless Throughput Test



The standard NIC provides 61% line rate at 64 bytes compared to full theoretical throughput for the Napatech SmartNIC with Link™ Capture Software.

the NIC, PCIe bus congestion, bad memory management, busy CPUs, etc. All of these potential sources of packet loss have been taken into consideration, providing a highly reliable solution. For example, the Napatech SmartNIC with Link™ Capture Software has on-board buffer memory, which allows delays due to PCIe bus congestion or busy CPUs or even network congestion to be absorbed without losing packets. These are stored in buffer memory and transferred to the application as soon as it is possible.

### Outstanding lossless performance

Napatech Link™ Capture Software ensures that data is transferred from the SmartNIC to the application using a non-blocking data delivery mechanism that ensures efficient utilization of the PCIe bus and maximum throughput for all packet sizes.

Compared to a standard NIC, the Napatech SmartNIC provides full theoretical throughput for all packet sizes, also in burst situations, which are common in Ethernet networks.

## Turning acceleration into value

These performance advantages allow you to:

- Maximize your server performance by improving CPU utilization
- Minimize your TCO by reducing the number of servers required, thus optimizing rack space, power, cooling and operational expenses
- Diminish your time-to-resolution, thereby enabling greatly increased efficiency

## Test configuration

The outstanding lossless performance improvements were based on a test configuration using a Dell PowerEdge R740 with a standard NIC and the Napatech SmartNIC. Test configuration: dual-socket Dell R740 with Intel® Xeon® Gold 6138 2.0 GHz, 128GB RAM running CentOS 7.5.

## Lossless throughput tests

The tests were based on the RFC2544 standard for zero packet loss testing with one NIC attached to a single processor and one port assigned per logical core using one queue. For the standard NIC, this resulted in four logical cores and four queues for 4x10G ports, which provides a total throughput of 40G. The i40e DPDK PMD driver was used for the test and the l3fwd DPDK was used as the test application.



## Napatech SmartNICs

Napatech is the pioneer and preferred supplier of FPGA-based SmartNICs designed to improve application performance and provide ultimate network flexibility and security. Our industry-leading feature set provides capabilities that are crucial for high-speed, real-time data processing.

With Napatech SmartNICs, you can build affordable, high-performance solutions based on standard, low-cost servers. The card offers market-leading integration capabilities and provides a robust and well-documented Application Programming Interface (API) that seamlessly integrates with open source, custom-developed or commercial applications.

The SmartNIC's intuitive programming language enables on-the-fly filtering configuration and intelligent multi-CPU distribution. With added support for libpcap and WinPcap, programmers can quickly integrate Napatech SmartNICs into their system.

Napatech helps companies to reimagine their business by bringing hyperscale 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.

**NAPATECH RECONFIGURABLE COMPUTING**

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The test demonstrated that packet loss occurred for the standard NIC for packet sizes below 128 bytes or at throughput rates higher than 33.78 Mbps. The Napatech SmartNIC experienced no packet loss.

## Key solution features

- Guaranteed zero packet loss under all conditions
- Onboard packet buffering during micro-burst or PCI Express bus congestion scenarios
- Advanced host memory buffer management enabling ultra-high CPU cache performance
- Packet classification, match/action filtering and zero-copy forwarding
- Intelligent and flexible load distribution to as many as 64 queues improving CPU cache performance by always delivering the same flows to the same cores