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RECONFIGURABLE COMPUTING

Link™ Capture Software

Wireshark

Up to 14x Wireshark Performance Increase

Link™ Capture Software for Napatech SmartNICs

Wireshark is a widely-used network protocol analyzer allowing users to see what is happening on their networks at a microscopic level. It is the de facto standard across many commercial and non-profit enterprises, government agencies, and educational institutions for troubleshooting and protocol analysis.

Wireshark has a rich feature set including deep inspection of hundreds of protocols, live capture and offline analysis. However, as capable as Wireshark is at inspecting and analyzing network protocols, it will only be as effective as its implementation.

The ability to capture and analyze traffic at lossless rates is of the utmost importance for Wireshark to be successful. 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.

But examining the contents of every network packet is extremely CPU-intensive, especially for a multi-gigabit traffic load. And this is the limiting factor in Wireshark performance: the packet processing on the CPU.

In addressing this challenge, Napatech has created a hardware acceleration solution, based on the Napatech Link™ Capture Software, that alleviates the load on the CPU and thereby greatly increases Wireshark capture performance.

The Napatech Difference

The 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 offloads processing and analysis of networking traffic from the application software, while ensuring optimal use of the standard server's resources leading to effective Wireshark acceleration.

Wireshark Lossless Throughput
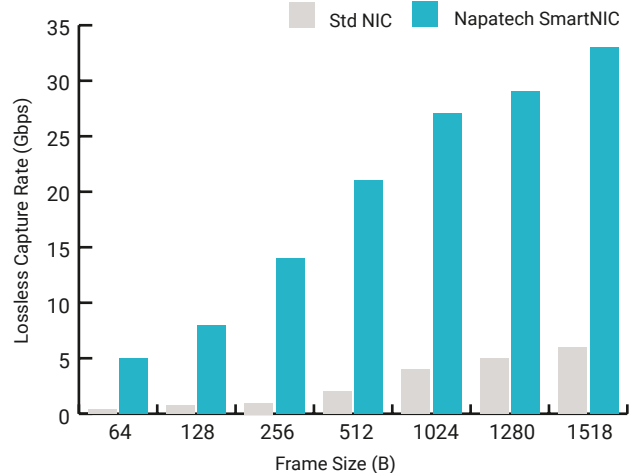
Up to 14 times lossless capture performance compared to a standard NIC.

Outstanding Lossless Performance

Optimized to capture all network traffic at full line rate, with almost no CPU load on the host server, the solution demonstrates enormous lossless performance advantages for Wireshark: up to 14x lossless capture and decode performance compared to a standard network interface card (NIC).

Turning Acceleration into Value

These performance advantages ultimately allow you to:

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

Test Configuration

The outstanding improvements achieved with this solution were demonstrated by comparing Wireshark performance running on a Dell PowerEdge R740 with a standard 40G NIC card and the Napatech NT200 SmartNIC with Link™ Capture Software. Test configuration: dual-socket Dell R740 with Intel® Xeon® Gold 6138 2.0 GHz, 128GB RAM running Ubuntu 14.04 LTS.

Lossless Throughput Tests

For the lossless throughput test, traffic was sent at fixed rates and packet sizes and throughput was measured as the rate at which Wireshark is able to receive and analyze the packets.

Additional testing for "back-to-back frames" was applied as described in the RFC 2544 benchmarking methodology to send a burst of frames with minimum inter-frame gaps to the Device Under Test (DUT) and count the number of frames received/ forwarded by the DUT. The back-to-back value is defined as the number of frames in the longest burst that the DUT can handle without the loss of any frames. With same- size capture buffer configurations, the Napatech SmartNIC delivers 60 times higher back-to-back frame performance. When required for highly bursty traffic patterns, the Napatech solution can allocate significantly larger host buffers, providing hundreds of times higher back-to-back capture performance.

Key Solution Features

- Lossless capture and protocol decode for up to 33 Gbps on a single thread for traffic analysis, inspection and detection
- 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

Napatech Link™ Capture Software

The stunning benchmarks for Wireshark were achieved by deploying Napatech's Reconfigurable Computing Platform, based on FPGA-based Link™ Capture Software and Napatech SmartNIC hardware.

Napatech's Reconfigurable Computing Platform flexibly offloads, accelerates and secures open, standard, high-volume and low-cost server platforms allowing them to meet the performance requirements for networking, communications and cybersecurity applications.

Wireshark

Wireshark, one of the industry's foremost network protocol analyzers, is an ideal example of the type of critical enterprise applications that can achieve better performance through hardware acceleration with the combination of the Napatech SmartNIC and Napatech Link™ Capture Software.

NAPATECH RECONFIGURABLE COMPUTING

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