Accelerate network and cybersecurity applications

Gain unique value from a standard server

Key Benefits

- Protect application performance

- Minimize TCO by deploying a commercial off-the-shelf (COTS) server trusted by thousands of businesses

- Improve overall cost efficiency by meeting performance needs with fewer servers and minimizing rack space, power, cooling and management effort

- Run complex tasks faster with the additional computing power of the Intel FPGA PAC

- Guarantee lossless packet capture and forwarding with Napatech software

- Purchase and deploy server and Intel PAC as a single solution, ready to run Napatech software

A beast of networking burden

HPE ProLiant DL380 Gen10 + Intel® FPGA Programmable Acceleration Card (Intel FPGA PAC) is a standard server solution with a unique performance edge. It significantly accelerates cybersecurity and network monitoring applications when running Napatech software on the Intel FPGA PAC. It also improves overall cost efficiency by offloading compute and data intensive tasks to the FPGA, which enables better application performance with fewer CPU resources.

The combination of the HPE ProLiant DL380 Gen10 server and the Intel® FPGA PAC provides a low-cost, application-ready server solution with dedicated resources for accelerating leading cybersecurity and networking applications. With the addition of Napatech Link™ Capture Software, performance gaps and network throughput bottlenecks are no longer an issue.

Lossless performance gains

The HPE ProLiant DL380 Gen10 is an industry-leading server for multi-workload compute, offering the latest in security, performance and expandability. When running Napatech Link Capture Software, the Intel Programmable Acceleration Card with Intel Arria® 10 GX FPGA (Intel PAC with Intel Arria 10 GX FPGA) offloads the most burdensome processing workloads from the server's Intel® Xeon® Scalable processors, returning valuable compute resources to the applications and services for which they were originally intended. The Intel FPGA PAC supports a broad range of applications.

Compared to a standard NIC, which can drop network data packets when strained by computationally intense workloads, the HPE, Intel and Napatech combination guarantees line rate network throughput for all packet sizes with 100% lossless packet capture and forwarding.

Consequences of packet loss for network applications:

- Compromise intrusion detection and prevention
- Undermine network analytics
- Increase trouble-shooting time to resolution
- Inaccurate traffic analysis

Challenge: Handling intense workloads and traffic with low-cost servers

Businesses choose standard servers, such as the HPE ProLiant DL380 Gen10, to gain a range of various benefits including cost savings, versatility and modern security. However, the standard NIC in a vanilla server may prove insufficient for applications and services defined by computationally intense workloads which can put a significant burden on CPU resources. These workloads may cause the standard NIC to lose critical network packets and reduce application performance.

Within cybersecurity and network performance monitoring, affected application types can include intrusion detection systems (IDS), intrusion prevention systems (IPS), network forensics, lawful interception, network recording and playback, analytics and monitoring, test and measurement, network and application performance monitoring, as well as an ever-expanding list of home-grown IT applications.

All these application types have an unconditional requirement for line rate network throughput for all packet sizes, plus 100% lossless packet capture and forwarding, for a multitude of sessions, users, and flows. The very nature of these applications renders them ineffective if any fraction of traffic is lost.

You can't control what you can't see

For security teams, it is imperative to have full visibility of all network traffic. Even a single lost packet 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.

HPE ProLiant DL380 Gen10 highlights

- 2P 2U form factor

- Powered by up to 2x Second Generation Intel Xeon Scalable processors

- Industry-leading performance with up to 6TB of HPE Persistent Memory

- Versatility for multiple environments including big data, cloud and containers

- Up to 60% better performance than the previous generation

- Up to 20 NVMe storage drives

Improve ROI and TCO by enhancing existing capabilities

- Suricata IDS intrusion detection

- n2disk network traffic recorder

- Wireshark network protocol analyzer

- TRex traffic generation

Raise the standard

For businesses who need to overcome this challenge, yet also want the benefits of low-cost standard server deployments, the HPE ProLiant DL380 Gen10 server and Intel FPGA PAC are an ideal pairing available as a single solution.

The HPE ProLiant DL380 Gen10 is a secure, resilient and expandable server for multi-workload compute. Featuring Second Generation Intel Xeon® Scalable processors and up to 6TB of HPE Persistent Memory, it delivers world class performance for analytics workloads. It also reduces cost and complexity, with agile infrastructure management and up to 65% better performance than the previous generation in the same 2U rack space [1].

With the Napatech Link Capture Software loaded as an Acceleration Stack, it is possible to build high-performance platforms with SmartNICs based on low-cost, off-the-shelf servers. Unlike standard NICs, which invariably suffer from intolerable packet loss for the target applications, the HPE and Intel solution running Napatech software guarantees line rate throughput with zero packet loss for all packet sizes up to 40Gbps. Businesses can conduct reliable network performance, test and security analysis.

Use cases

Network operators of all types are using a wide range of software-based networking and security applications. This includes cloud data center operators, service providers in telco and cable, Fortune 5000 enterprises, and government agencies.

The combined HPE and Intel solution running Napatech software supports several leading third-party, commercial, and open-source applications, including Suricata for cybersecurity, n2disk for network recording, Wireshark for network performance monitoring, and TRex for traffic generation.

There are two primary dimensions to how Napatech software enhances these applications. First, FPGA-based hardware and the Napatech Link Capture Software offload 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 the HPE server. This two-dimensional improvement promises a broad improvement on overall system performance.

Cybersecurity: Suricata IDS

Suricata IDS detects known threats, policy violations, and malicious behavior. It examines the contents of every network packet, which is an extremely CPU-intensive task for multi-gigabit traffic loads. The CPU's packet processing capacity is often the limiting factor in Suricata performance.

Running on an Intel FPGA PAC inside the HPE ProLiant DL380 Gen10 server, Napatech Link Capture Software delivers lossless acceleration of Suricata. This includes capture of all network traffic at full line rate, with almost no CPU load on the host server for all frame sizes, representing a significant advantage over a standard NIC.

[1] Internal lab testing performed in January 2017 comparing HPE Gen9 to Gen10 Smart Array Controllers with 4 KB random read test.

Network recording: n2disk

n2disk is a powerful network traffic recorder application. It enables users to capture and store network packets at multi-gigabit rates from a live network. Security teams use n2disk to seize, store, and retrieve all network data on demand, providing retrospective packet capture (PCAP) evidence for vector identification, forensic analysis, or operational troubleshooting.

For n2disk to be effective, network packets must be captured with zero loss. Yet with a multi-gigabit traffic load, standard server deployments often struggle to keep up. The HPE and Intel solution running Napatech Link Capture Software provides the architecture to support heavier loads than standard CPU-based server deployments.

Network performance monitoring: Wireshark

Wireshark is a widely-used network protocol analyzer. It enables 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. But full protocol analysis is only possible if traffic can be fully captured at lossless rates. If the capture server is overburdened or too slow, information is lost forever.

Running on the HPE and Intel solution, Napatech Link Capture Software unleashes the full power of Wireshark with broader bandwidth and decoding performance than a standard NIC.

Traffic generation: TRex

TRex is an open-source, low-cost, stateful, and stateless traffic generator. Its efficacy depends on both the ability to generate packets at line rate across all packet sizes, and to receive the generated traffic once it has traversed the device under test (DUT). Testing is compromised if traffic reception does not match generation capabilities, because it is impossible to identify whether the DUT or the test equipment itself is dropping traffic.

Compared to a standard NIC, the HPE and Intel solution running Napatech Link Capture Software offers the potential for improved traffic generation and reception performance utilizing the additional performance of the FPGA.

Solution architecture

- HPE ProLiant DL380 Gen10 server powered by Intel Xeon Scalable processors

- Intel PAC with Intel Arria 10 GX FPGA

- Intel Open Programmable Acceleration Engine (OPAE) software, ready to run Napatech Link Capture Software as an Acceleration Stack

- Use-case specific application software selected by the end customer

Solution value

The ability of the HPE and Intel solution running Napatech Link Capture Software to accelerate applications and assure reliable network throughput delivers immediate, measurable value.

Firstly, users have more compute resources available on every server. This creates a multiplier effect on performance across all applications. Secondly, businesses significantly reduce system costs by using fewer servers to achieve their target performance, while reducing the associated operational costs of rack space, power, cooling, and management. The HPE ProLiant DL380 Gen10 provides further efficiencies with simplified deployment and high performance in a low-cost server. Third, with the additional computing power of the FPGA-based co-processor, the time it takes to perform complex tasks is significantly reduced. Finally, the solution ensures lossless packet capture and forwarding, guaranteeing full visibility into networking communication for mission-critical business tools where the lack of visibility can be very costly.

This value benefits a range of important stakeholders across the organization.

- Finance and CFOs have a proven, application-ready solution option for reducing capital expenditure (CAPEX) and operating expenditure (OPEX) of equipment deployed for networking and cybersecurity.

- Network teams no longer have to choose between performance, agility and cost. The HPE and Intel solution running Napatech software delivers all three.

- In-house application developers and DevOps teams can leverage a high-performance networking platform that delivers hardware performance at the speed of software innovation.

Conclusion

Intense cybersecurity and network monitoring workloads are often too much for general-purpose server deployments. The standard NICs in these servers are prone to loss of network packets and decreased application performance.

The combination of the HPE ProLiant DL380 Gen10 server and Intel FPGA PAC with Intel Arria 10 GX FPGA, running Napatech Link Capture Software, provide a best-of-both-worlds answer to this performance gap. The HPE and Intel solution provides outstanding performance in a low-cost, standard server. The Napatech software turns the Intel FPGA PAC into a SmartNIC, which delivers validated and significant acceleration of cybersecurity and network monitoring applications. Businesses of all sizes can improve the overall cost efficiency of their cybersecurity and network monitoring deployments by achieving better performance with fewer servers, as well as reductions in associated operating costs.

For more information, contact your HPE representative.

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