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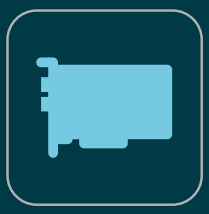
RECONFIGURABLE COMPUTING



Napatech SmartNICs

SOLUTION DESCRIPTION

Deploying Link™ Capture for Financial Applications

For Napatech FPGA-based SmartNICs

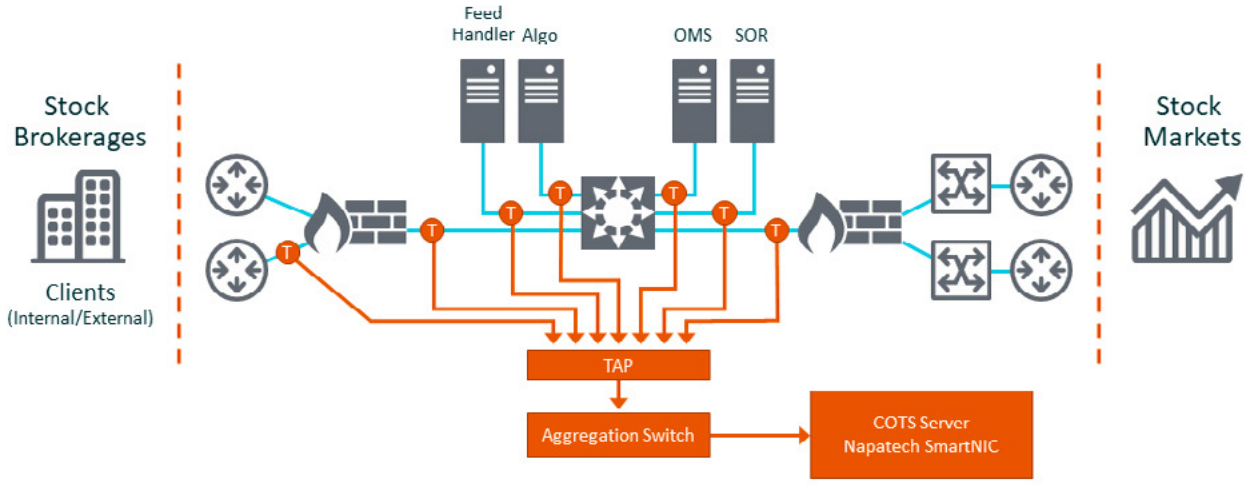
Build advanced solutions for Financial Applications using COTS servers and Napatech SmartNICs with Link™ Capture

As financial trading systems continue to become faster and more complex, standard Network Interface Cards (NICs) are unable to keep up with both the increased line speed as well as the regularly transmitted data microbursts.

Napatech FPGA-based SmartNICs, however, can handle line speeds up to 100 Gbps and include large onboard buffers designed to absorb microbursts, ensuring peak network performance at all times.

Key Benefits

- 100% guaranteed zero-packet loss - under all conditions
- Full throughput up to 100 Gbps bi-directional
- Nanosecond timestamping and packet merge
- 50 million flows with stateful match/action
- Flow records with metrics for both directions
- PCAP and DPDK API support



Example of Typical Datacentre with Co-Location

Use Case #1
Capturing and filtering high-frequency trading (HFT) data

With HFT demanding faster execution times and trading systems becoming more complex, it is crucial for any HFT platform to be able to capture all network traffic at all times as microbursts and data gaps may cause misplaced or even dropped orders.

Capture all packets up to 100 Gbps - with guaranteed 100% zero packet loss:

- Filter packets based on protocols unique to the financial trading industry
- Accurately report trade history data for regulatory compliance
- Identify data bursts/gaps which may cause misplaced or dropped orders

Use Case #2
Optimizing trade algorithms by replaying captured data

Replay captured data with nanosecond precision at line speed to continually optimize trade algorithms by measuring performance of previous trading days and testing against previous trading data.

- Measure performance of previous trading days
- Test revised algorithms against previous trading data via high-speed precision replay

Use Case #3

Analyzing network activity for cyber security threats

Forward captured data to a network traffic recorder application (e.g. ntop n2disk™) or SIEM (e.g. Splunk and Suricata) for network traffic analysis.

- Up to 3x lossless packet to disk performance on the ntop n2disk™ open-source network traffic recorder
- Offloads processing and analysis of networking traffic from the application software, while ensuring optimal use of the server's resources leading to effective application acceleration

See also

Case Study

Leading HFT organization deploys Napatech's FPGA SmartNIC and ntop's n2disk™ to create a powerful analytics solution for trade optimization and security monitoring

Link™ Capture Software Product Brief

Link™ Capture Software Feature Overview Data Sheet

Napatech Link™ Capture Software supports a broad range of applications and use cases. Where standard Network Interface Cards (NICs) suffer from intolerable packet loss for the target applications, Napatech guarantees line rate throughput with zero packet loss and replay for all packet sizes.

Zero Packet Loss - With guaranteed zero packet loss and deterministic performance under all conditions, Link™ Capture Software allows enterprises to develop and deploy their own applications based on COTS servers.

Hardware Timestamping - The ability to establish the precise time when frames have been captured or transmitted is critical to many applications. To achieve this, all Napatech FPGA SmartNICs can provide a high-precision time stamp, sampled with one nanosecond resolution, for every frame captured and transmitted.

Packet Sequencing - Napatech FPGA SmartNICs can sequence and merge packets received on multiple ports in hardware using the precise time stamps of each Ethernet frame. This is highly efficient and offloads a significant and costly task from the analysis application.

NUMA balancing - Upstream and downstream are combined using QPI Bypass over Intelligent Hardware Interconnect. This allows specific flows to be combined and directed to the right CPU cores for processing in a balanced and controlled manner, without loading the server system with expensive communication between NUMA nodes.

Intelligent multi-CPU distribution (RSS) - Napatech FPGA SmartNICs ensure that identified flows of related Ethernet frames are distributed in an optimal way to the available CPU cores. This ensures that the processing load is balanced across the available processing resources, and that the right frames are being processed by the right CPU cores.

Burst buffering - Napatech FPGA SmartNICs provide on-board memory for buffering of Ethernet frames. Buffering assures guaranteed delivery of data, even when there is congestion in the delivery of data to the application.

Optimum cache utilization - Napatech FPGA SmartNICs use a buffering strategy that allocates a number of large memory buffers where as many packets as possible are placed back-to-back in each buffer.

Traffic replay - For network security purposes, different traffic scenarios need to be recreated and simulated to toughen the infrastructure. The packets also need to be replayed to understand delays and disruptions caused by traffic bursts/peaks to improve Quality of Service (QoS).

Traffic forwarding - Get highest precision timestamping for traffic that needs to be redistributed to multiple network devices. Napatech FPGA SmartNICs systems can forward and/or split traffic captured on a single tapping point to a cluster of servers for processing, without using additional equipment.

Napatech FPGA-based SmartNICs enable you to build high-performance and affordable solutions using COTS servers. Our SmartNICs provide market-leading integration capabilities and integrates with a wide range of open-source, custom-developed and commercial applications.

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.