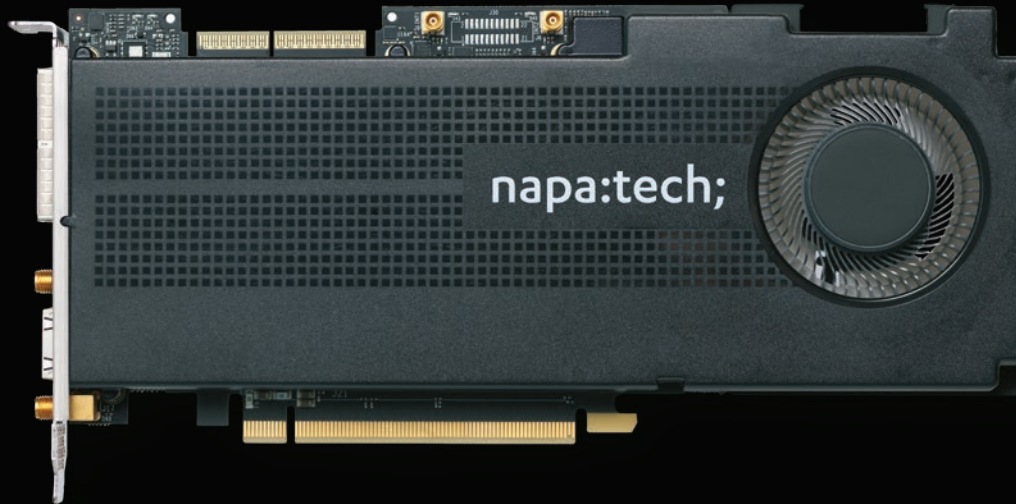# napa:tech;
SMARTNIC+IPU SOLUTIONS

NT400D13 PCIe4 SmartNIC with Link-Capture™ Software

2×200G, 2X100G, 2x40G, 8x10/25G

DATA SHEET

Packet Capture and Replay

Use cutting-edge SmartNIC technology to add real-time line-rate performance to your application. The NT400D13 SmartNIC provides full packet capture of network data at 200 Gbps with zero packet loss. Nanosecond precision time- stamping and merge of packets from multiple ports ensures correct timing and sequencing of packets. The SmartNIC can also be used for 100% packet replay with nanosecond precision of all networking traffic for analytics, testing and simulation. The PCIe4 ×16 host interface supports up to 220 Gbps full-duplex packet transfer between network ports and server memory.

The NT400D13 SmartNIC enables full utilization of CPU cores through advanced receive side scaling with support for tunneling protocols, such as GTP, IP-in-IP, NVGRE and VxLAN. The NT400D13 SmartNIC can also remove duplicate packets, slice packets and filter packets to reduce the amount of data and thereby offload the server system and applications.

Applications

Napatech SmartNICs enable implementation of high- performance network appliances based on standard servers. Examples of applications include:

- Quality of experience optimization
- Financial trading latency measurement
- Customer experience analysis
- Data loss prevention
- Cyber defense
- Fraud detection and compliance management
- Infrastructure management and security
- Network and application performance
- Troubleshooting and compliance

Wireshark

Suricata

n2disk

Snort

Zeek

TRex

FEATURE HIGHLIGHTS AND SPECIFICATIONS

Rx Packet Processing

- Zero packet loss for packet size 64 – 10,000 bytes
  - Sustained traffic up to 220 Gbps
  - Line rate 2 × 200 Gbps traffic burst, 450 milliseconds buffering
- Multi-port packet merge, sequenced in time stamp order
- L2, L3 and L4 protocol classification
- L2 and L3/L4 (IP/TCP/UDP) checksum verification
- Tunneling support: GTP, IP-in-IP, GRE, NVGRE, VxLAN, Pseudowire, Fabric Path and VNtag
- Pattern match, network port, protocol, length, and error filters
- Stateless flow management
  - Configurable flow definitions based on 2-, 3-, 4-, 5- or 6-tuple
  - Up to 36,000 IPv4 or up to 8,000 IPv6 addresses
- Flow match/actions:
  - Forward to specific CPU queue or load distribute over CPU queues
  - Forward (hairpin) to network port
  - Drop packet, slice packet, strip header, mask packet, color packet
- Custom hash keys, symmetric hash key option
- CPU load distribution based on hash key or filter or per flow
- 128 Rx queues, 16 MB – 1 TB Rx buffer size
- Packet descriptors with metadata
- IP fragment handling
- Deduplication
- Slicing at dynamic offset or fixed offset from start or end of packet
- Header stripping, protocol layers between outer L2 and inner L3
- Packet masking, 1 – 64 bytes at dynamic or fixed offset
- Extended RMON1 and counters per filter and per queue

Tx Packet Processing

- Line rate Tx up to 200 Gbps for packet size 64 – 10,000 bytes
- Replay as captured with nanoseconds precision
- Per-port traffic shaping
- Port-to-port forwarding
- L2 and L3/L4 (IP/TCP/UDP) checksum generation
- 128 Tx queues, 4 MB Tx buffer size

Time Stamping and Synchronization

- Rx time stamp
- Tx time stamp inject
- OS time synchronization
- PPS synchronization
- IEEE1588 PTP over RJ45 management port
- Time stamp formats: Unix 10 ns, Unix 1 ns, PCAP 1 µs, PCAP 1 ns

Network Standards

- IEEE 802.3 200G, 100G, 40G, 25G, 10G Ethernet

Supported pluggable modules

- 200GBASE-SR4, FR4, LR4
- 100GBASE-SR4, SR-BiDi, LR4, PSM4
- 40GBASE-SR4, SR-BiDi, LR4
- 25GBASE-SR, LR, LR-BiDi
- 10GBASE-SR, CR, LR, ER

Software

- Linux operating system
- libpcap
- Napatech NTAPI for highest performance and advanced features
- SDK tools included in source code for debugging and prototyping and as application examples

Hardware

- Intel® Agilex™ AGFB022 FPGA
- 18 GB DDR4 SDRAM (16 GB + ECC)
- PCIe Gen4 16 lanes @ 16 GT/s
- 2 × QSFP56 network ports
- 2x SMA-F, PPS input/output (10 MHz ready HW)
- 2x MCX (reserved for future)
- RJ45 1000BASE-T PTP port
- Stratum-3 compliant TCXO
- Flash memory with support for two boot images
- Cooling options and physical dimensions:
  - NT400D13-SCC: Active cooling, Single-slot, full-height, 3/4-length
  - NT400D13-PC: Passive cooling Single-slot, full-height, half-length
- MTBF according to IEC TR 62380 (UTE C 80-810 −2004):
  - NT400D13-SCC: 497,216 hours
  - NT400D13-PC: 593,730 hours
- Typical power consumption for 80% of line rate traffic load:
  - NT400D13 with 2x100GBASE-SR4: ~80 W
  - NT400D13 with 2x200GBASE-SR4: ~105 W

Accessories (not included)

- PCI Express 2×3 (6-pin) AUX power adapter cable
- PCI Express 12VHPWR AUX power adapter cable

Board Management

- MCTP over SMBus
- PLDM for Monitor and Control
- Built-in thermal protection

Environment for NT400D13-SCC (active cooling)

- Operating temperature: 0 °C to 45 °C (32 °F to 113 °F)
- Operating humidity: 20% to 80%

Environment for NT400D13-PC (passive cooling)

- Operating temperature: −5 °C to 45 °C (23 °F to 113 °F)
- Operating humidity: 5% to 85%
- Altitude: < 1,800 m
- Airflow: >= 3.5 m/s

Regulatory Approvals and Compliances

- PCI-SIG®, CE, CB, RoHS, REACH, cURus (UL), FCC, ICES, VCCI, RCM

Orderable port speed configurations

Product	Data Rates included
NT400D13-2×200/2x100	2 × 200 Gbps and 2 × 100 Gbps
NT400D13-2×200/2x40	2 × 200 Gbps and 2 × 40 Gbps
NT400D13-2×200/8x10/25	2 × 200 Gbps and 8 × 10/25 Gbps

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