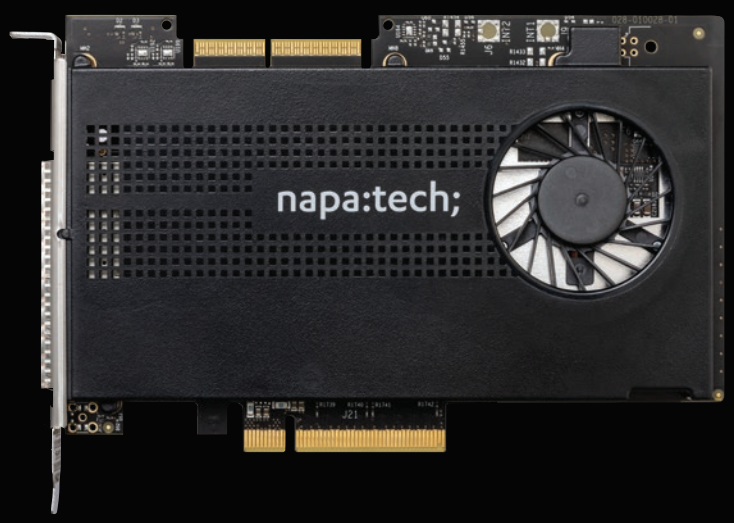
napa:tech;
RECONFIGURABLE COMPUTING

NT40A11 SmartNIC with Link-Capture™ Software

4×1G, 4×1/10G

DATA SHEET



Packet Capture and Replay
Use cutting-edge SmartNIC technology to add real-time line-rate performance to your application. The NT40A11 SmartNIC provides full packet capture of network data at 40 Gbps with zero packet loss. Nanosecond precision time-stamping and merge of packets from multiple ports ensures correct timing and sequencing of packets. The NT40A11 SmartNIC can also be used for 100% packet replay with nanosecond precision of all networking traffic for analytics, testing and simulation.

The NT40A11 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 NT40A11 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. Stateless flow processing with support for up to 36,000 flows enables CPU-hungry applications to intelligently select exactly which flows to process and which to ignore.

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

- Quality of experience optimization
- Financial 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 40 Gbps
  - Line rate 4 x 10 Gbps traffic burst, 800 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
- GTP, IP-in-IP, GRE, NVGRE, VxLAN, Pseudowire, Fabric Path, VNtag tunneling support
- Pattern match, network port, protocol, length, and error filters
- Custom flow definitions based on 2-, 3-, 4-, 5- or 6-tuple
- Flow match/actions: Forward to application or network port or drop packet
- Flow filtering
  - Up to 36,000 IPv4 or up to 7,500 IPv6 2-tuple flows
- Custom hash keys, symmetric hash key option
- CPU load distribution based on hash key or filter or per flow
  - To local CPU cores via host buffers/queues
- 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
- Extended RMON1 and counters per filter and per queue

Tx Packet Processing
- Line rate Tx up to 40 Gbps for packet size 64 – 10,000 bytes
- Replay as captured with nanoseconds precision
- Per-port traffic shaping
- Port-to-port forwarding
- 128 Tx queues, 4 MB Tx buffer size

Time Stamping
- Rx time stamp
- Time stamp formats: Unix 10 ns, Unix 1 ns, PCAP 1 us, PCAP 1 ns

Network Standards
- IEEE 802.3 1G, 10G Ethernet

Supported pluggable modules
- 1000BASE-T, SX, LX, ZX
- 10GBASE-T, SR, CR, LR, ER

Software
- Operating systems: Linux and Windows
- libpcap, WinPcap and DPDK
- Napatech NTAPI for highest performance and advanced features
- SDK tools included in source code for debugging and prototyping and as application examples

Hardware
- Xilinx KU11P FPGA
- 4 GB DDR4 SDRAM
- PCIe Gen3 8 lanes @ 8 GT/s
- 4 × SFP+ network ports
- Flash memory with support for two boot images
- Built-in thermal protection
- Physical dimensions: ½-length and full-height PCIe
- Weight excluding pluggable modules:
  - NT40A11-SCC: 316 g
  - NT40A11-NEBS: 317 g
- MTBF according to IEC TR 62380 (UTE C 80-810 –2004):
  - NT40A11-SCC: 830,076 hours
  - NT40A11-NEBS: 1,139,242 hours
- Power consumption including 10GBASE-SR modules and typical traffic load:
  - NT40A11-SCC: 24 Watts
  - NT40A11-NEBS: 24 Watts

Environment for NT40A11-SCC
- Operating temperature: 0 °C to 45 °C (32 °F to 113 °F)
- Operating humidity: 20% to 80%

Environment for NT40A11-NEBS
- Operating temperature: –5 °C to 55 °C (23 °F to 131 °F) measured around the SmartNIC
- Operating humidity: 5% to 85%
- Altitude: < 1,800 m
- Airflow: >= 2.5 m/s

Regulatory Approvals and Compliances
- PCI-SIG®, NEBS level 3, CE, CB, RoHS, REACH, cURus (UL), FCC, ICES, VCCI, RCM

Orderable port speed configurations

Product	Data Rates included
NT40A11-4×1	4 × 1 Gbps
NT40A11-4×10/1	4 × 1/10 Gbps

DN-1332 Rev. 2