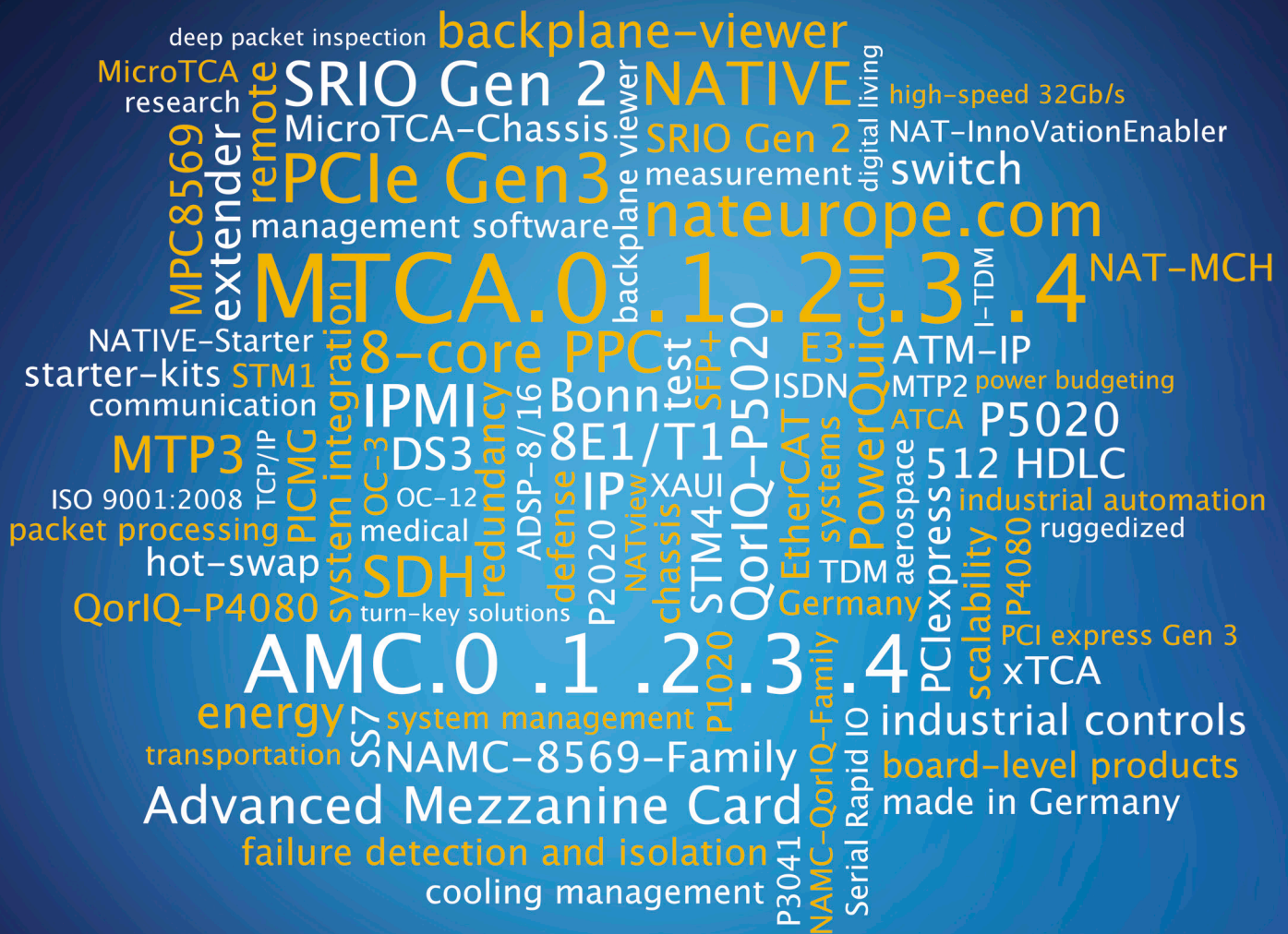




# Whenever your system needs to communicate **COMMUNICATE WITH N.A.T.**



**The MicroTCA Concept II by N.A.T.**



## NAMC-QorIQ-P4080

### NAMC-QorIQ-P4080-V6

Powerful octal-core packet processing engine built on eight Power Architecture e500mc cores—operating at frequencies up to 1.5 GHz in mid-size form factor, designated for applications requiring extensive multi-processing resources combined optionally with a free programmable data path engine.

#### front panel interfaces

- XAUI (SFP+), 1x GbE, 1x USB, 1x RS232

#### backplane interfaces

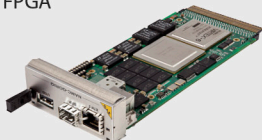
- fat pipe: PCIe, SRIO, or XAUI
- base fabric: 2x GbE

#### on-board

- QorIQ P4080
- Xilinx Virtex-6 FPGA

Latest FPGA  
Technology

Multi Core



## NAMC-QorIQ-P5020

### NAMC-QorIQ-P5020-V6

Powerful dual-core packet processing engine with the 64-bit, e5500 core built on Power Architecture technology, frequencies scalable to 2.2 GHz designated for today's packet oriented applications like LTE or VoIP, optionally with a high-performance customizable FPGA.

#### front panel interfaces

- 1x GbE, 1x USB, 1x RS232

#### backplane interface

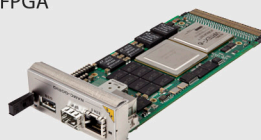
- fat pipe: PCIe, SRIO, or XAUI
- base fabric: 2x GbE, 2xSATA

#### on-board

- QorIQ P5020
- Xilinx Virtex-6 FPGA

Latest FPGA  
Technology

Multi Core



## NAMC-QorIQ-P3041

### NAMC-QorIQ-P3041-V6

Powerful packet processing engine with four e500mc cores, built on Power Architecture technology, operating at up to 1.5GHz in mid-size form factor, designated for today's packet oriented network applications.

#### front panel interfaces

- 1x GbE, 1x USB, 1x RS232

#### backplane interfaces

- fat pipe: PCIe, SRIO, or XAUI
- base fabric: 2x GbE, 2xSATA

#### on-board

- QorIQ P3041
- Xilinx Virtex-6 FPGA

Latest FPGA  
Technology

Multi Core



## NATIVE-SX

#### size

- 197 x 134mm table top
- depth: 252 mm

#### slots

- 2 full- and 3 mid-size AMCs
- 1 full-size MCH for fat pipe support

5 full-size AMCs  
coming soon

#### power supply

- 110-240VAC, 300W output, front pluggable

#### cooling unit

- single fan (integrated)

#### backplane configuration

- direct SATA / SAS connections
- single star base fabric and fat pipe, PICMG compliant



## NATIVE-C1

#### size

- 1U 19" rack-mounted
- depth: 206 mm

#### slots

- 6 mid-size AMCs
- 1 full-size MCH for fat pipe support

#### power supply

- 110-240VAC, 600W output, front pluggable, or
- 48VDC, 390W or 780W output, front pluggable

#### cooling units

- 2 redundant hot-swap fan trays for AMCs

#### backplane configuration

- direct SATA / SAS connections
- single star base fabric and fat pipe, PICMG compliant



## NATIVE-C2

Also available  
as Starter Kit

#### size

- 2U 19" rack-mounted
- depth: 206 mm

#### slots

- 12 mid-size AMCs, horizontally-mounted
- 2 full-size MCHs for fat pipe support

#### power supply

- 2 power modules
- 110-240VAC, 600W output, front pluggable, or
- 48VDC, 390W or 780W output, front pluggable

#### cooling units

- 2 redundant hot-swap fan trays for AMCs

#### backplane configuration

- direct SATA / SAS connections
- dual star base fabric and fat pipe, PICMG compliant



## NAMC-STM1/ NAMC-STM4

STM1/SDH or STM4/SDH line interface providing add/drop functionality at DS0 and subrates level including TDM cross connect and I-TDM interworking for termination and monitoring in midsize form factor.

#### front panel interfaces

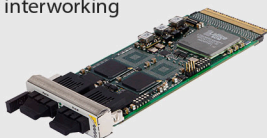
- 2 single or multi mode OC-3 or OC-12 transceivers

#### backplane interfaces

- 2x GbE, and optional PCIe

#### on-board

- single or dual add-drop multiplexer for STM1/SDH
- quad add-drop multiplexer for STM4/SDH
- TDM cross connection, TDM to I-TDM interworking



## NAMC-8569-ATM

Multi-service ATM board featuring conversion between optical OC-3/STM1 ATM traffic, Ethernet and TDM data designated to connect systems to ATM legacy data, designated networks.

#### front panel interfaces

- OC-3, OC-12, DS3 or Ethernet

#### backplane interfaces (opt.)

- 2x GbE and either of the following combinations: SRIO x4, PCIe x4, 2x SRIO x1, PCIe x1 and SRIO x1, IPMI

#### on-board

- PowerQUICC III MPC8569
- AAL1, AAL2 and AAL5 processing engine



## NAMC-8569-xE1/T1

Signalling processing engine providing 8 or 16 E1/T1 line interfaces including TDM cross connect and I-TDM interworking in mid-size or full-size form factor.

#### front panel interfaces

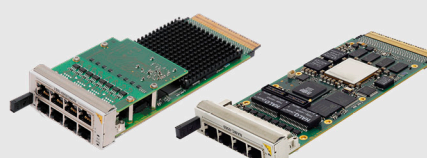
- 8 E1/T1 (mid-size) or 16 E1/T1 (full-size)

#### backplane interfaces

- 2x GbE and either of the following combinations: SRIO x4, PCIe x4, 2x SRIO x1, PCIe x1 and SRIO x1, IPMI

#### on-board

- TDM cross connection, TDM to I-TDM interworking
- PowerQUICC III MPC8569
- Firmware: ISDN, SS7





## NAMC-8569-CPU

Multi-service, low cost, low power, general purpose PrAMC, addressing high-performance broadband access equipment including 3G/WiMAX/LTE base stations, radio network controllers and gateways in mid-size form factor.

### front panel interfaces

- GbE, RS232, USB

### backplane interfaces

- 2x GbE and either of the following combinations: SRIO x4, PCIe x4, 2x SRIO x1, PCIe x1 and SRIO x1

### on-board

- PowerQUICC III MPC8569 (1,3 GHz)
- Lattice FPGA



## NAMC-MPX

Versatile carrier module for MPX compliant mezzanines in mid-size form factor, together with MPX processor module serving as a full featured PrAMC.

### front panel interfaces

- 2x GbE, 1x USB

### backplane interfaces

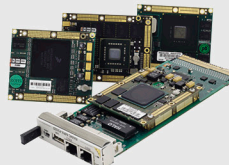
- fat pipe: SATA, PCIe, SRIO and XAUI
- base fabric: 2x GbE

### on-board (by MPX mezzanines) Freescale Power Architecture

- QorIQ P1011
- QorIQ P2020
- PowerQUICC III MPC8548
- PowerQUICC II Pro MPC8349

### Intel Atom

- Intel Atom E6xx



Extenders

## NAMC-EXT-RTM/-PS

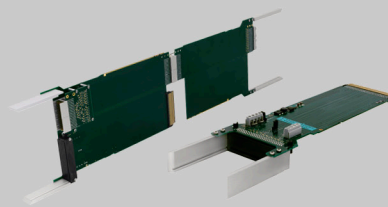
### NAMC-EXT/-PS

Both extender kits provide a versatile means to speed up the development process and to trouble shoot AMC cards within an ATCA or MTCA environment.

- wirebridge for management and payload power measurements
- test pads for backplane and RTM signals
- pads to connect JTAG equipment

### Variants:

- NAMC-EXT-RTM-PS and NAMC-EXT-PS offer an additional on-board 3.3V power supply for stand-alone operation of AMC for MTCA.4 for MTCA.0



## NATIVE-R5

Also available  
as Starter Kit

### size

- 5U table top, depth: 373,3 mm

### slots

- 6 double mid-size AMCs + RTM
- 1 full-size MCH with fat pipe support

### power supply

- 110-240VAC, 300W output

### cooling units

- 4 fans for AMCs and 2 fans for RTMs

### backplane configuration

- direct SATA / SAS connections
- single star base fabric and fat pipe, PICMG compliant
- p2p connections at AMC ports 12-15 (MTCA.4)
- trigger, clock and interlock signals



## NATIVE-R9

### size

- 9U 19" rack-mounted
- depth: 373.3 mm

### slots

- 12 single/double width mid-size AMCs + RTM
- 2 MCH with fat pipe support

### power supply

- up to 4 power modules
- 110-240VAC, 600W output, or
- 48VDC, 390W or 780W output

### cooling units

- 2 redundant hot-swap fan trays for AMCs and RTMs

### backplane configuration

- direct SATA / SAS connections
- dual star base fabric and fat pipe, PICMG compliant
- p2p connections at AMC ports 12-15 (MTCA.4)
- trigger, clock and interlock signals



## NAT-PM-DC780

The DC version of the two N.A.T. PMs, offers power conversion from two -48VDC input sources to 16 independent 12 V channels for payload power and 3.3 V for management power.

### size

- full size, single width

AC version  
coming soon

### key features

- 780W output power (380W optional)
- optical load indicator
- support of N+1 and 2+2 redundancy
- 16 channels of 12 V @ max. 6.6 A / 3.3 V @ max. 150 mA
- support of 12 AMCs, 2 CUs, 2 MCHs with individual control management and payload power
- dual -48V input
- 95,5% conversion efficiency (min)
- supports field upgrades through HPI protocol
- Shared Management Power (SMP)

### Intelligent Security System

- output over-voltage and -temperature protection
- input under-voltage shutdown
- output short circuit protection
- IEC/EN/UL60950-1 safety standard compliant
- programmable current limiting threshold per output channel



## NAMC-xE1/T1

Cost efficient AMC providing 8 or 16 E1/T1 line interfaces including TDM cross connect and I-TDM interworking in mid- or full-size form factor.

### front panel interfaces

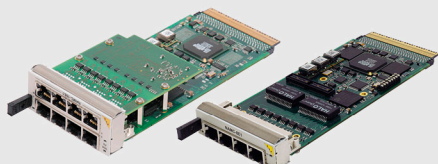
- 8 E1/T1 (mid-size) or 16 E1/T1 (full-size)

### backplane interfaces

- 2x GbE, and optional PCIe

### on-board

- TDM cross connection, TDM to I-TDM interworking



## NAMC-ADSP-8/16

Multi-purpose telecommunication resource board in mid-size form factor for applications with extensive need for voice or data computation.

### front panel interfaces

- 8 or 16 LEDs depending on ADSP

### backplane interfaces

- GbE, PCIe x1, IPMI

### on-board

- 8 or 16 ADSP-BF535P (350MHz)
- 32MB SDRAM and 1MB FLASH per DSP
- boot loader via PCI
- I-TDM (1000BX), TDM cross connect



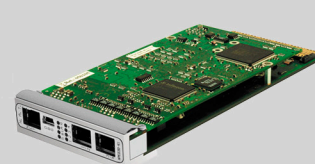
Carriers

## NAMC-PMC

A single-width, mid- or full-size AMC carrier for one PMC module.

### key features

- usage of standard off-the-shelf PMC boards in
- MTCA environments
- deployment of a rich variety of available PMC modules
- extension of PMC product life cycle



# MicroTCA Markets



## Let Your Application benefit

open standard | no single vendor lock-in

### Telecommunication

- solutions from simple to complex
- redundancy
- low latency
- optimized for converging networks
- TDM-Packet interworking

### Medical

- low latency
- multi-cluster
- multi-graphic

### Defence & Aerospace

- longevity
- ruggedized
- conduction cooled
- field replaceable
- bandwidth from 1Gbps to 20 Gbps

### Transportation

- multi-cluster
- high speed graphics
- robustness

## About N.A.T. (Network and Automation Technology)

N.A.T. was founded in 1990 with the aim of developing high-performance network solutions. From the beginning the goal has been to base these on an individual combination of hardware and software modules. Constant growth during the last 22 years and substantial knowledge in networking technologies has brought N.A.T. to the forefront of the embedded and (tele-)communications market.

Make our expertise your solution - talk to us... we care.

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Carrier Hubs

### MicroTCA Carrier Hub

Central management and data switch (GbE, XAUI, SRIO, PCIe) with clock distribution and generation in compact- or mid- or full-size form factor as well as single or double width

#### base-board

- central mgmt. for 1-13 AMCs, 2 CUs, 1-4 PMs
- e-keying, redundancy, load sharing
- on-board external carrier and shelf managers
- layer 2, non-blocking, low latency GbE switch, supporting VLAN, port based rate control and RSTP (Rapid Spanning Tree Protocol)

#### clock mezzanine

- either on-board Stratum3/3E type PLL, supporting GPS and telecom frequencies
- source of clock reference configurable from either on-board PLL or any of the 12 AMC or from an external clock via the front panel connectors

#### fat pipes switch mezzanine

- SRIO (Gen2)
- PCIe (Gen3)
- 1GbE and 10GbE (XAUI)
- Xilinx Kintex-7 FPGA combined with SRIO (Gen2)

#### software support

- configuration via web browser or Command Line Interface (CLI) or scripting
- Java based visualization tool NATview with FRU editor and backplane connection viewer
- remote management support
- comprehensive debug support

#### front panel interfaces

- 2x GbE links supporting port trunking
- 2 clock connectors (input or output)
- 2 fat pipe uplinks (CX-4 and SFP+)
- status indicator LEDs for AMCs, CUs, and PMs
- console interface via USB or RS232

#### COM Express RTM support

(combined with double width MCH and PCIe Hub module)

- supporting all standard type 6 COM Express modules
- one 2.5" or two half 1.8" SATA storage devices
- x4 PCIe connection to hub module
- 1x GbE connection to MCH switch, 1x GbE at front panel
- 2x display port and 4x USB 3.0 interfaces at front panel
- PCIe Mini card support including SIM card



System Manager

### NATview

User friendly graphic tool to view and control the components of the MicroTCA system independent of any operating system.

#### key features

- tree structured representation of sensor and actuator
- sensor value history, threshold setting, auto update
- intelligent alarm monitoring and prioritization
- logging events, alarms
- FRU (Field Replaceable Unit) editor
- backplane connection viewer

