

## MicroTCA in Real Life

Let Your **Application** benefit

[www.nateurope.com](http://www.nateurope.com)

## MicroTCA.4 Configuration and Maintenance

### Motivation

- Configuration Tools
  - Command Line Interface
  - Java-App
  - Web interface
- Examples of Configurations
  - Ethernet and PCIe Express Configurations
  - Emergency Configuration
- Maintenance Tools
  - Analysis locally: LEDs
  - Analysis remotely: inventory, current, revision
  - Firmware update

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## About N.A.T.

Network and Automation Technology

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- Founded in 1990, privately owned
- Hard- and Software design and manufacturing
- Focus on **innovation in communication**
- international and worldwide operations
- Headquarters

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- Presenter:
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## About N.A.T.

Network and Automation Technology

### Innovation

**N.E. Communication**

The brain of your MTCA.4 system

Key Features:  
▪ MTCA.4 Gigabit Ethernet  
▪ 10GbE and 10GbE SFP+  
▪ Special low latency and low jitter GbE module  
▪ MTCA.4 module for MTCA.4 chassis  
▪ MTCA.4 module for LxP backplane  
▪ complete product line

Let Your Application benefit

Accelerate Media Processing

The brain of your MTCA system

The QorIQ Family

Board Level Products   System Solutions   Upcoming Events   Latest News

MTCA Workshop at ITCY 2015, Sept. 15-17th, Hamburg, Germany  
IBIC 2015, Sept. 13-17th, Melbourne, Australia  
Mobile World Congress Mar 2nd-5th, 2015, booth 6B4C

New product NAT-2N4: New high performance module in MTCA form factor  
AMC module NATC-GDSP: New high performance module based on 8x OCT2234M DSPs  
NAT-series Firmware v2.17 and NATview v2.18: New versions of firmware and software for MTCA.4 modules  
MicroTCA Concept Version 1.0 now available

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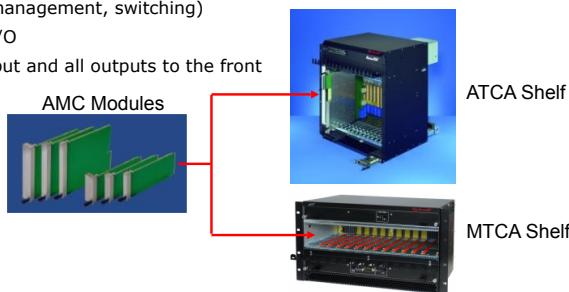
## MicroTCA.4 Configuration and Maintenance

- About N.A.T.
- Comparison of Standards
- Configuration Tools
  - Command Line Interface
  - NATView
  - Web interface
- Examples of Configurations
  - Ethernet and PCIe Express Configurations
  - Emergency Configuration
- Maintenance Tools
  - LEDs
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## AMC Pluggable in ATCA and MTCA Shelf

- The basic idea of MTCA is to have a shelf that contains just AMC modules
- Backplane directly accepts AMC modules
- AMCs are interchangeable between ATCA and MTCA
- The infrastructure of a ATCA Carrier was adapted into the MTCA shelf (power, management, switching)
- No rear I/O
- power input and all outputs to the front



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## Comparison of Standards Differences in latest specs

	<b>VPX</b>	<b>ATCA</b>	<b>MTCA</b>
<b>Common size</b>	<b>3U, 6U</b>	<b>2U, 3U, 12U</b>	<b>1U, 2U, 3U, 5U, 9U</b>
<b>Backplane</b>	passive, switched	passive, switched	passive, switched
<b>topologies</b>	<b>single star, dual star (1/2 switch), full mesh, daisy-chain, ring</b>	<b>dual star, dual-dual star, full meshed</b>	<b>single star, dual star</b>
<b>profiles</b>	yes	no	no
<b>Voltages</b>	<b>MP: 3.3V PP: 3.3V, 5.0V, 12.0V optional: ±3.0V, ±12.0V</b>	<b>MP: 3.3V PP: 48.0V</b>	<b>MP: 3.3V PP: 12.0V</b>
<b>Slot budget (PP)</b>	115W@5V, 384W@12V 768W@48V	400W@48V	80W@12V
<b>Pins per slot</b>	<b>728 (6U), 168 (3U)</b>	<b>234/414</b>	<b>170 (AMC) 260(AMC+RTM)</b>
<b>Link speed (Gbaud)</b>	1.25, 2.5, 5, 6.25, 8.0	1.25, 2.5, 5, 6.25, 8.0	1.25, 2.5, 5, 6.25, 8.0
<b>Link width</b>	<b>x1, x2, x4, x8</b>	<b>x1, x2, x4, x8</b>	<b>x1, x2, x4, x8</b>
<b>Fabrics</b>	GbE, XAUI, PCIe, SRIO	GbE, XAUI, PCIe, SRIO	GbE, XAUI, PCIe, SRIO
<b>Markets</b>	<b>Mil, Aerospace</b>	<b>Mil, Aerospace, core Net</b>	<b>all</b>

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Open Modular Computing Specifications  
PICMG is the leading specification development organization in the embedded computer market.

## Markets

Our diverse membership allows PICMG to develop compelling specifications in multiple markets. PICMG technologies are widely used in a broad swath of industries including industrial automation, military/aerospace, transportation, communications, test/measurement, physics/research, energy, medical, and more!

	COM Express	AdvancedTCA	CompactPCI	CompactPCI Serial	HPM	MicroTCA / AMC	SHB
Industrial Automation	X		X	X			X
Gaming	X						
Telecommunications	X	X			X	X	
Aerospace	X		X	X	X	X	
Defense	X	X	X	X	X	X	X
Railway	X		X	X	X	X	
Energy	X		X	X	X	X	X
Medical	X		X	X	X	X	
Test / Measurement	X	X	X	X	X	X	
Physics		X			X	X	X
Drones / UAV	X		X	X	X	X	

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## MicroTCA Architectural features - I/II

- all data transfer are
  - independent
  - simultaneous
  - bidirectional
- data connections determined by one switch card:
  - **base/common options** fabric: GbE
  - **storage** fabric: SATA
  - **fat pipe** fabric: PCIe or XAUI or SRIO
  - **extended fat pipe** fabric: XAUI or SRIO

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## MicroTCA Architectural features - I/II

- simple backplane architecture
  - ✓ reduces costs and risks, is re-useable in future
- all signals at same signal level (MLVDS)
  - ✓ no electrical clash
- switched connections
  - ✓ no blocking transfer
  - ✓ type of backplane connection depends on kind of switch
- all slots managed and controlled
  - ✓ detection of incompatibilities and faults
  - ✓ health management and fault isolation
  - ✓ hot-swap and hot-plug

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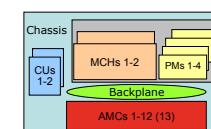
## MicroTCA Architectural features - II/II

- all data transfer are
  - independent
  - simultaneous
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- data connections determined by one switch card:
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## MicroTCA Architecture Advanced Mezzanine Cards (AMCs)

- AMC eco system
  - single and multi-core CPUs (Intel, Freescale, ARM, etc.)
  - single and multi-core GPP, NPUs, GPGPUs
  - communication line interfaces (E1/T1, SDH, ATM, 3G/4G/5G)
  - antenna interfaces (CPRI, OBSAI)
  - FPGAs (Xilinx, Intel-Altera, etc.)
  - DSPs (TI, Freescale, Octasic, etc.)
  - analogue and digital IO (ADCs, DACs, TTLs, etc.)
  - industrial busses (EtherCAT, Profibus, CANbus etc.)
  - SSD and HDD storage
  - Carrier Boards (FMC, XMC, PMC, IP)
  - Cross-Link (cPCI, PCIe, PCI)
  - Reference MMC, EMMC, AMC, RTM system
  - Timing Modules



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## MicroTCA.4 Configuration and Maintenance

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  - Java-App
  - Web interface
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The screenshot shows the "NAT-MCH by N.A.T." configuration tool's web interface. The top navigation bar includes "Safari", "Ablage", "Bearbeiten", "Darstellung", "Verlauf", "Leszeichen", "Entwickler", "Fenster", and "Hilfe". The address bar shows "192.168.178.67". The main content area has a yellow header "Setup" with "Base Configuration Switch: BASE 1Gbe" and a blue header "Maintenance" with "Board Information", "System Information", "Reboot NAT-MCH", "Update MCH", "Change Password", "N.A.T. Webpage", and "Home". Below these are sections for "Setup Functions" and "Maintenance Functions", each listing various configuration and management options with their descriptions.

Welcome to the HTML based NAT-MCH configuration tool.

Setup Functions:

- Port on/off
- Port VLAN
- 802.1Q VLAN
- 802.1p
- Port Mirroring
- Jumbo Frame
- Link Aggregation
- Rapid Spanning Tree
- Link Status
- PCIe/Memory counters
- Configure PCIe Virtual Switches

Maintenance Functions:

- Board Information
- System Information
- Reboot NAT-MCH
- Update MCH
- Change Password
- N.A.T. Webpage
- Home

Script Management:

- Backup/Restore settings to/from flash memory or file.

System Information:

- Provides hardware information of this NAT-MCH.

Reboot NAT-MCH:

- Allows rebooting over the Web-Interface.

Update MCH:

- Allows updating several components over the Web-Interface.

Change/Reset Password:

- Allows changing or resetting of the MCH Password over the Web-Interface.

N.A.T. Webpage:

- Opens the N.A.T. webpage in a new browser window.

Home:

- Shows this page.

Web Interface Release: V1.30 Final (11:35:34 Nov 26 2014)

**WEB SERVER**  
powered by Apache/2.4.18 (Ubuntu)

## JAVA Tool OS independent

The screenshot shows the NATView 2.25 Java-based management tool. The title bar says "NATView 2.25 - Registered for Volker Spiering, NATView Developer Build date: Fri Aug 29 12:58:13". The menu bar includes "Application", "Fru Sensor", "Tools", and "Help". The main interface features a central panel showing a rack-mounted system with various ports and components. A magnifying glass icon is overlaid on the left side. On the right, there is a detailed sensor monitoring window for "Sensor # 203 / LUN 0: Temp CPU = 40.0 degree Celsius (n/a -- n/a)". This window displays temperature data for multiple sensors, including CPU max, Temp PCB, and various FRUs, with thresholds for non-critical, critical, and non-recoverable levels. A legend indicates the color coding for these states.

Version 2.20 Dev (Revision #1207)

Licensed option

- FRU Editor
- Backplane View
- HPM Update
- MCH Scanner
- System Dump
- Event Log

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## Your Maintenance Tools

### Examples of command line interface (CLI)

- sdrrep\_info** - SDR repository information
- sel\_info** - System Event Log information
- show\_ekey** - Show all activated connections
- show\_fru** - Show all FRUs
- show\_fruinfo** - fru\_id FRU contents
- show\_cu** - Show cooling unit
- show\_pm** - Power Module Status
- show\_sensorinfo** - Show sensors for FRU
- version** - Print firmware version information
- ni** - Print network configuration
- history**

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# MicroTCA.4

## Configuration and Maintenance

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## Emergency Shutdown Only switch off the faulty FRU

Shelf manager parameter	Configuration
configuration flags:	
allow shelf FRU invalid	<input checked="" type="checkbox"/> yes 
temperature management	<input type="checkbox"/> disabled  <input checked="" type="checkbox"/> FRU on critical event 
emergency shutdown	<input checked="" type="checkbox"/> emergency shutdown on non recoverable event  <input type="checkbox"/> SYSTEM on critical event  <input type="checkbox"/> SYSTEM on non recoverable event 
Send SEND_MSG confirmation to SMS	
use external shelf manager	<input type="checkbox"/> no 

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## Web Interface Source of IP address

### **Change MCH Configuration**

MCH global parameter	Configuration
<b>remote interfaces:</b>	
Management interface at GbE port	<input type="checkbox"/> disabled <input checked="" type="radio"/>
RMCP access	<input type="checkbox"/> enabled <input checked="" type="radio"/>
telnet access	<input type="checkbox"/> enabled <input checked="" type="radio"/>
WEB access	<input type="checkbox"/> no IP address board configuration <input checked="" type="checkbox"/> DHCP <input type="checkbox"/> ShM IP link record <input type="checkbox"/> CM IP link record
IP address source for management port	
IP address source for GbE port	
RMCP session activity timeout minutes	0 <input type="radio"/> min <input checked="" type="radio"/> sec
RMCP session activity timeout seconds	60 <input type="radio"/> min <input checked="" type="radio"/> sec
default fan level	30 <input type="radio"/> percent <input checked="" type="radio"/> no
<b>MCH configuration flags:</b>	
enable backward compatibility V2.4	<input type="checkbox"/> no <input checked="" type="radio"/>
Enable alternative cooling scheme	<input type="checkbox"/> no <input checked="" type="radio"/>
Control rear transition module fans	<input type="checkbox"/> yes <input checked="" type="radio"/>
PM Assignment strategy	<input type="radio"/> strict <input checked="" type="radio"/> dynamic

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## Emergency Shutdown Only switch off the faulty FRU

**Ethernet switch parameter**

configuration source	no configuration
Ignore Backplane FRU Info	load from FLASH

**Clock module parameter**

configuration source	no configuration
----------------------	------------------

**PCIe parameter**

Current Configuration	
configuration flags:	
upstream slot power up delay	15 sec
PCIe hot plug delay for AMCs	0 sec
hot plug support	enabled
PCIe early ekey (before payload)	disabled
Use PCIe on MCH-RTM(disable AMC12)	yes

**Time Protocol/SNTP parameter**

Current Configuration	
configuration flags:	
Time server IP	192 . 145 . 119 . 188
'Check for Time' delay minutes	0 min
'Check for Time' delay hours	0 h
local time offset	1 h
SNTP or Time Protocol	Time Protocol
Time client	enabled

**DHCP parameter**

Current Configuration	
Host name	MTCA4TRAINING

## Configuration and Setting of Multiple MCHs

### Backup Settings

Backup current configuration settings to the onboard FLASH or an external file, or load settings from the onboard FLASH or an external file.

- Save
- Restore
- Generate
- Upload
- Verify

**NAT-MCH Configuration Backup**

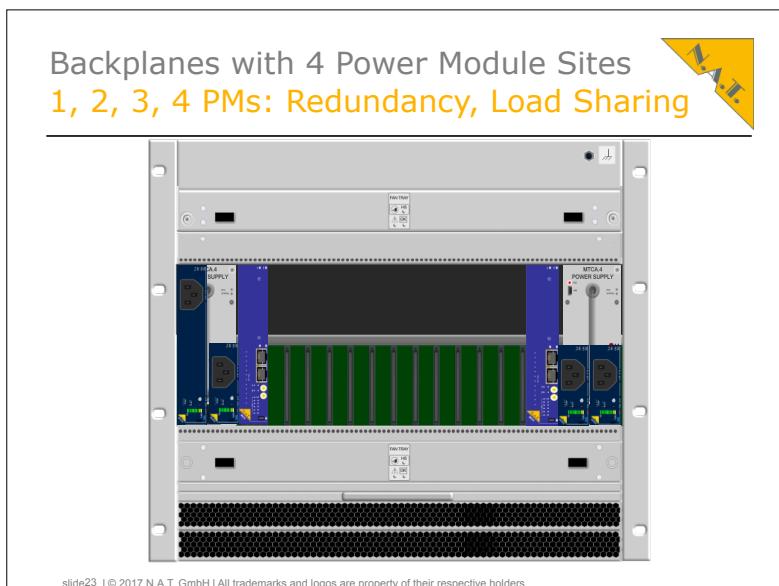
Running Configuration: nat\_mch\_cfg.txt

Restore the Running Configuration from the Startup Configuration

Save the Running Configuration
 to FLASH and load on Startup
 to FLASH only

Upload configuration file:
 Date auswählen | Keine Datei ausgewählt
 load on startup
 save to FLASH

Verify configuration file with the Startup Configuration:
Select file: Date auswählen | Keine Datei ausgewählt Verify



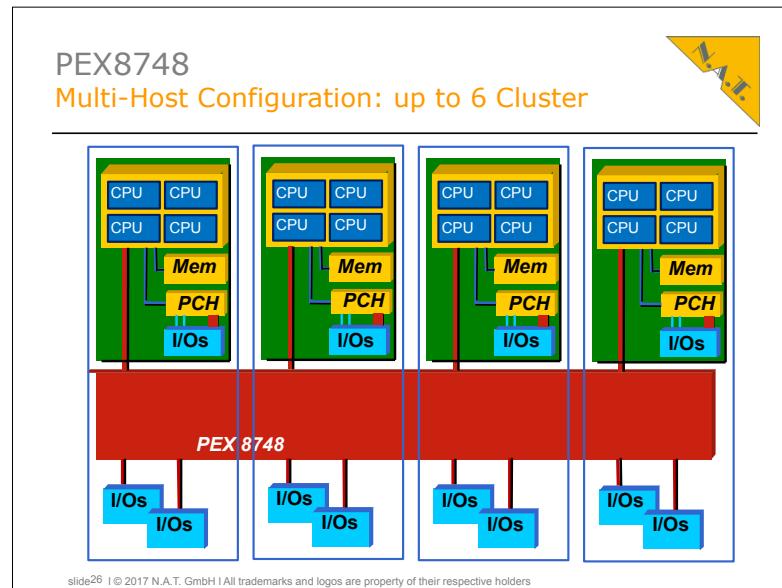
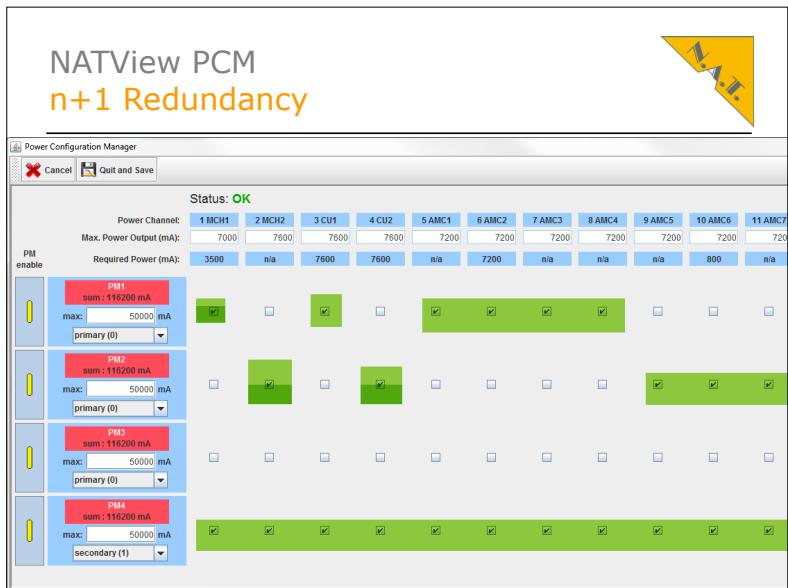
## NATView Power Configuration Manager

### Redundancy

Status: OK

Power Channel: 1 MCH1 2 MCH2 3 CU1 4 CU2 5 AMC1 6 AMC2 7 AMC3 8 AMC4 9 AMC5 10 AMC6 11 AMC7

PM enable	Power Channel	Max. Power Output (mA):	Required Power (mA):
PM1	1 MCH1	7000	7600
PM1	2 MCH2	7600	n/a
PM1	3 CU1	7600	7600
PM1	4 CU2	7600	n/a
PM1	5 AMC1	7200	7200
PM1	6 AMC2	7200	n/a
PM1	7 AMC3	7200	n/a
PM1	8 AMC4	7200	n/a
PM1	9 AMC5	7200	n/a
PM1	10 AMC6	7200	800
PM1	11 AMC7	7200	n/a
PM2	1 MCH1	50000	50000
PM2	2 MCH2	50000	n/a
PM2	3 CU1	50000	7600
PM2	4 CU2	50000	n/a
PM2	5 AMC1	50000	7200
PM2	6 AMC2	50000	n/a
PM2	7 AMC3	50000	7200
PM2	8 AMC4	50000	n/a
PM2	9 AMC5	50000	n/a
PM2	10 AMC6	50000	800
PM2	11 AMC7	50000	n/a
PM3	1 MCH1	50000	50000
PM3	2 MCH2	50000	n/a
PM3	3 CU1	50000	7600
PM3	4 CU2	50000	n/a
PM3	5 AMC1	50000	7200
PM3	6 AMC2	50000	n/a
PM3	7 AMC3	50000	7200
PM3	8 AMC4	50000	n/a
PM3	9 AMC5	50000	n/a
PM3	10 AMC6	50000	800
PM3	11 AMC7	50000	n/a
PM4	1 MCH1	50000	50000
PM4	2 MCH2	50000	n/a
PM4	3 CU1	50000	7600
PM4	4 CU2	50000	n/a
PM4	5 AMC1	50000	7200
PM4	6 AMC2	50000	n/a
PM4	7 AMC3	50000	7200
PM4	8 AMC4	50000	n/a
PM4	9 AMC5	50000	n/a
PM4	10 AMC6	50000	800
PM4	11 AMC7	50000	n/a



### NAT-MCH by N.A.T.

**Setup**

Base Configuration  
Switch BASE\_1G\_E  
Age Time  
Port on/off  
Port VLAN  
802.1Q VLAN  
802.1X  
802.1p  
Port Mirroring  
Jumbo Frame  
Link Aggregation  
Rapid Spanning Tree  
Link Status  
BCM5396 counters  
Configure PCIe Virtual Switches

Maintenance

Board Information  
System Information  
Reboot NAT-MCH  
Update MCH  
Change Password  
N.A.T. Webpage  
Home

**PCIe Virtual Switch configuration**

Select Host AMCs (Upstream) for each virtual switch that shall be enabled first.  
Select Host AMCs (Non-Transparent Upstream) for each virtual switch that shall be enabled afterwards.  
Select which AMCs shall be connected to each virtual switch as downstream in the end.

Virtual Switch	Upstream AMC	NT-Upstream AMC	A M C 1	A M C 2	A M C 3	A M C 4	A M C 5	A M C 6	A M C 7
none	RTM	- none -	<input type="radio"/>						
Virtual Switch 0	AMC 6..4	- none -	<input checked="" type="radio"/>						
Virtual Switch 1	AMC 6..4	- none -	<input type="radio"/>						
Virtual Switch 2	- none -	- none -	<input type="radio"/>						
Virtual Switch 3	- none -	- none -	<input type="radio"/>						
Virtual Switch 4	- none -	- none -	<input type="radio"/>						
Virtual Switch 5	- none -	- none -	<input type="radio"/>						
Max. Link Speed	8.0 GT/s	8.0 GT/s	8.0 GT/s	8.0 GT/s	8.0 GT/s	8.0 GT/s	8.0 GT/s	8.0 GT/s	8.0 GT/s

Apply  
Note: You need to click apply before you can save your changes to EEPROM.

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### PCIexpress Configuration Command Line Interface

```
nat> mchcfg
MCH CFG: configuration modes
[ 2] reset to defaults
[ 9] modify PCIe configuration
Enter configuration mode (RET=0/0x0): 9
PCIE parameter:
-----
PCIE Virtual Switch configuration
change via web-interface
VS # | Host | NT-Host | Members
0 RTM none AMC01_4 AMC02_4 AMC03_4 AMC04_4 AMC05_4 AMC07_4 AMC12_4
1 AMC06_4 AMC06_4
Upstream slot power up delay: 15 sec
PCIE hot plug delay for AMCs: 0 sec
PCIE configuration flags:
hot plug support: enabled
PCIE early ekey (before payload): disabled
'no ekey' for PCIE: disabled
PCIE clustering: enabled
```

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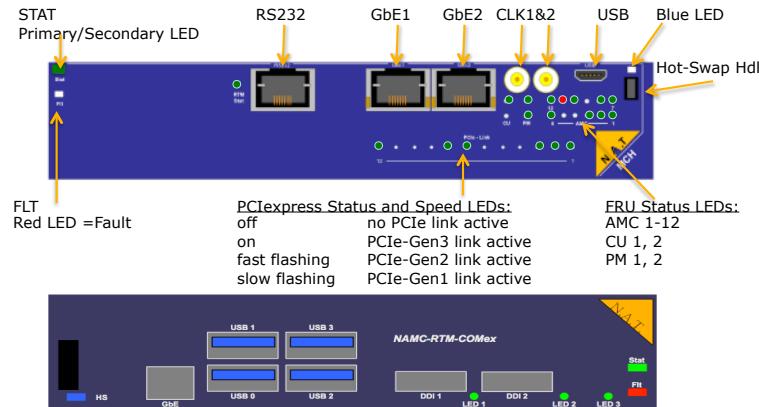
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### Maintenance Tools

- Analysis locally: LEDs
- Analysis remotely: inventory, current, revision
- Firmware update

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## Analysis locally LEDs



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## Analysis remotely: Webinterface Complete Systeminformation in seconds

- Complete System Information output of the following commands collected in text file:
  - history, version, bi, mch, show\_pm, show\_sensor\_info for all FRU-IDs
  - show\_fruinfo 253 (backplane)
  - show\_ekey, show\_link\_state, .....

**Setup**

```
Show MCH Configuration
Configure MCH Configuration
Switch [ICM5394] ID: 1
General settings
Port VLAN
802.1Q VLAN
802.1P
802.1X
Port Mirroring
Jumbo Frame
Link Aggregation
Rapid Spanning Tree
Link Status
BCMS396 counters
Configure PCIe Virtual Switches
```

**Maintenance**

```
Backup Settings
System Information [selected]
Update MCH
Change Password
N.A.T. Webpage
Home
```

**NAT-MCH System Information**

collecting information about your system  
please wait ...

Please download file(s) below and attach them to your support request  
[nat\\_mch\\_sysinfo.txt](#)

Web Interface Release: V1.27 Final (22:41:59 Jun 26 2014)

-----  
\*\*\*\*\* End of History Buffer \*\*\*\*\*  
\*\*\*\*\* Version Information \*\*\*\*\*  
\*\*\* MCH CMU5M Firmware V2.15 Final (12:36:15 Jun 26 2014) \*\*\*  
\*\*\*\*\* Board Information \*\*\*\*\*  
MCH-MCH-PHY5 Rev: M4 PCB V1.2 Rev: 129937 FPGA V1.9 AVN 1.2 - sn: 113513-0109 - Rev: A0PT1-Bx3D - SMA CLK, SRAM, HS Ctrl, 2nd FRT ETH, LED MOD  
SATA: SATP Port attached to PCB V1.0 MC V1.3 FPGA V1.15 assembly option: HCSL buffer  
I2K MOD: I2K Port attached to PCB V2.3 MC V1.6 FPGA V1.4 (assembly option >X48 LOSC) - sn: 1  
The board has a second PCB V1.1 attached to V1.0 FPGA V1.1 - sn: 0455 - Rev:121182 - ComEx N  
FPGA V1.15 Final (12:41:13 Jun 26 2014)  
MCH/MEM Interface  
Management software  
Device Engineering (32:48:01 Jun 26 2014)  
Select daemon support  
Debug mode enabled  
Instruction cache enabled  
Instruction cache enabled  
PMU: Coldfire MCF 5445B  
RAM size: 32 MB

-----  
\*\*\*\*\* Board Information \*\*\*\*\*

## Analysis remotely Ethernet Link Status

**Setup**

Slot	A M C 1	A M C 2	A M C 3	A M C 4	A M C 5	A M C 6	A M C 7	A M C 8	F R T 1	F R T 2	U P D B	R T M B	C P U 1
Port	0	0	1	0	1	0	1	0	1	0	1	-	-
Links	EN	DIS	EN	EN									

**Link States of Ethernet Connections**

Slot	A M C 1	A M C 2	A M C 3	A M C 4	A M C 5	A M C 6	A M C 7	A M C 8	F R T 1	F R T 2	U P D B	R T M B	C P U 1
Port	0	0	1	0	1	0	1	0	1	0	1	-	-
Links	EN	DIS	EN	EN									

Legend:  
■ - Link is up  
■ - Link is down  
■ - Interface is enabled  
■ - Interface is disabled

**Maintenance**

```
Board Information
System Information
Reboot NAT-MCH
Update MCH
Change Password
N.A.T. Webpage
Home
```

Web Interface Release: V1.30 Final (11:35:34 Nov 26 2014)

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## Ethernet Analysis with Wireshark Mirroring inside GbE Port to Front GbE

**NAT-MCH by N.A.T.**

**Port Mirroring Configuration**

Slot	A	M	C	A	M	C	A	M	C	A	M	C	F	R	T	P	D	R	T	M	B	C	P
Port	0	0	1	0	1	0	1	0	1	0	1	0	-	-	-	-	-	-	-	-	-	-	
Ingress	<input type="checkbox"/>																						
Egress	<input type="checkbox"/>																						

Setup      Maintenance

Web Interface Release: V1.30 Final (11.35.34 Nov 26 2014)

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## Ethernet Analysis with Wireshark Mirroring IPMI Traffic

**NAT-MCH by N.A.T.**

**IPMI monitor over ethernet:**

DHCP parameter	Current Configuration
Host name	

**SNMP parameter**

SNMP parameter	Current Configuration
SNMP server	disabled
Destination IP for SNMP Traps	0 . 1 . 0 . 0 , 0 . 0 . 0 . 0

**Xilinx Virtual Cable parameter**

Xilinx Virtual Cable parameter	Current Configuration
Xilinx Virtual Cable Server	disabled
Base TCP Port	2542
Maximal User defined JTAG Frequency	1.01MHz

**IPMI monitor over ethernet:**

IPMI Monitor	Current Configuration
Target IP Address	192 . 168 . 100 . 58
Target UDP Port	623

Setup      Maintenance

Save | Discard Changes | Reset Configuration

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Wireshark (localhost) | Wireshark 1.10.6 | vrt1.13.0 from master|1:10

Frame 13: 68 bytes on wire (512 bits), 68 bytes captured (512 bits) on interface 0

Time: 11.22.2017, Source: 192.168.100.58 | Destination: 192.168.100.58 | Type: IPMI [0x00]

IPMP [0x00] > IPMP [0x00] | 68 bytes on wire (512 bits), 68 bytes captured (512 bits) on interface 0 (Fast Ethernet)

Ethernet II, Src: N.A.T. [00:0c:29:00:00:00], Dst: N.A.T. [00:0c:29:00:00:00] | 68 bytes on wire (512 bits), 68 bytes captured (512 bits) on interface 0 (Fast Ethernet)

Link Layer Control Protocol | Version: 2.0 | Flags: DF, DF, DF, DF, DF, DF | Src Port: 623 | Dst Port: 623 | Length: 68

Message Management Control | Version: 0x00 | Sequence ID: 0x00 | Message Length: 12

IPMI V1.5 Session Wrapper, session ID 0x00 | Authentication Type: NONE (0x00) | Session Identifier Number: 0x00000000 | Session ID: 0x00000000 | Message Length: 12

E-keying-debug flag: E-keying-debug Flag AMC in Slot 2 (FRU-ID 6)

Carrier manager parameter

carrier number default	0
quiesced event timeout	10 SEC

configuration flags:

allow carrier FRU invalid	yes
override carrier FRU	no
shutdown system if MCH goes down	no
enable Clock E-keying	no

debug flags:

IPMI	disabled
FRU	disabled
E-keying	disabled
sensor	disabled
event	disabled
power module	disabled
cooling unit	disabled
CM/Shm Interface	disabled
FRU communication to debug (0-all)	6

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## More Debug Information E-keying-debug Flag AMC in Slot 2 (FRU-ID 6)

**Carrier manager parameter**

carrier number default	0
quiesced event timeout	10 SEC

**configuration flags:**

allow carrier FRU invalid	yes
override carrier FRU	no
shutdown system if MCH goes down	no
enable Clock E-keying	no

**debug flags:**

IPMI	disabled
FRU	disabled
E-keying	disabled
sensor	disabled
event	disabled
power module	disabled
cooling unit	disabled
CM/Shm Interface	disabled
FRU communication to debug (0-all)	6

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## Analysis Remotely: CLI inventory, max. current, actual power consumption

- **show\_fru**

```
FRU Information:
-----
#  FRU   Device  State  Name
=====
0   MCH     M4    NMCH-CM
3   mcmc1  M4    NAT-MCH-MCMC
6   AMC2  M4    SIS8300
7   AMC3   M1    NAMC-LM
8   AMC4   M4    TAMC220-10
9   AMC5   M4    TAMC651
10  AMC6   M1    CCT AM 310/302
40   CU1   M4    Schroff uTCA CU
50   PM1   M4    NAT-PM-AC600
60   Clk1  M4    MCH-Clock
61   Hub1  M4    MCH-PCIe
64   RTM1  M4    MCH-RTM-ComEx
93   RTM4  M1    TAMC220-RTM
=====
```

- **show\_pm**

```
nat> show_pm
-----
PM1: - online, primary(fru 50) : budget 50.0 A (alloc 23.5 A)
avail 26.5 A)
PM2: - unknown
PM3: - unknown
PM4: - unknown
|-----|
| chan  FRU FruId primPM secPM PS1 POn ENA MP PP Amps |
|-----|
| 1     MCH1  3     1      -       Y     Y     Y     Y     Y     5.5
| 2     MCH2  4     -      -       -     -     -     -     -     -
| 3     CU1   40    1      -       Y     -     Y     Y     Y     4.5
| 4     CU2   41    -      -       -     -     -     -     -     -
| 5     AMC1   5     1      -       -     -     -     -     -     -
| 6     AMC2  6     1      -       Y     -     Y     Y     Y     5.0
| 7     AMC3   7     1      -       Y     -     Y     Y     Y     - (overcurrent)
| 8     AMC4   8     1      -       Y     -     Y     Y     Y     4.0
| 9     AMC5   9     1      -       Y     -     Y     Y     Y     4.5
| 10    AMC6   10    1      -       Y     -     Y     Y     Y     -
| 11    AMC7   11    -      -       -     -     -     -     -     -
| 12    AMC8   12    -      -       -     -     -     -     -     -
| 13    AMC9   13    -      -       -     -     -     -     -     -
| 14    AMC10  14    -      -       -     -     -     -     -     -
| 15    AMC11  15    -      -       -     -     -     -     -     -
| 16    AMC12  16    -      -       -     -     -     -     -     -
|-----|
```

- **show\_sensorinfo 50**

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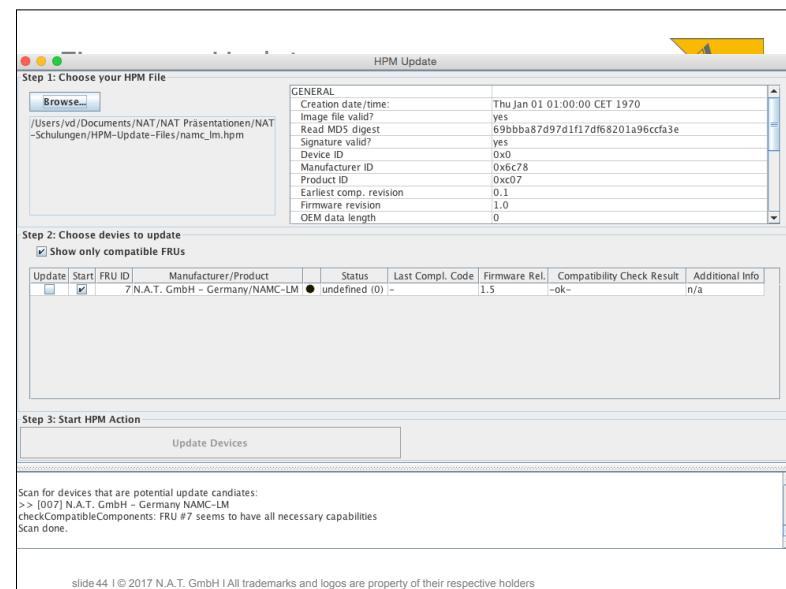
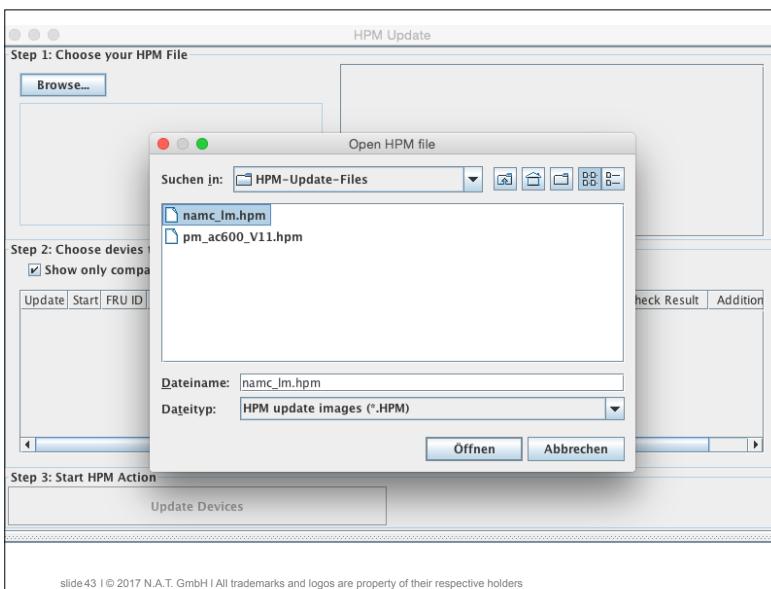
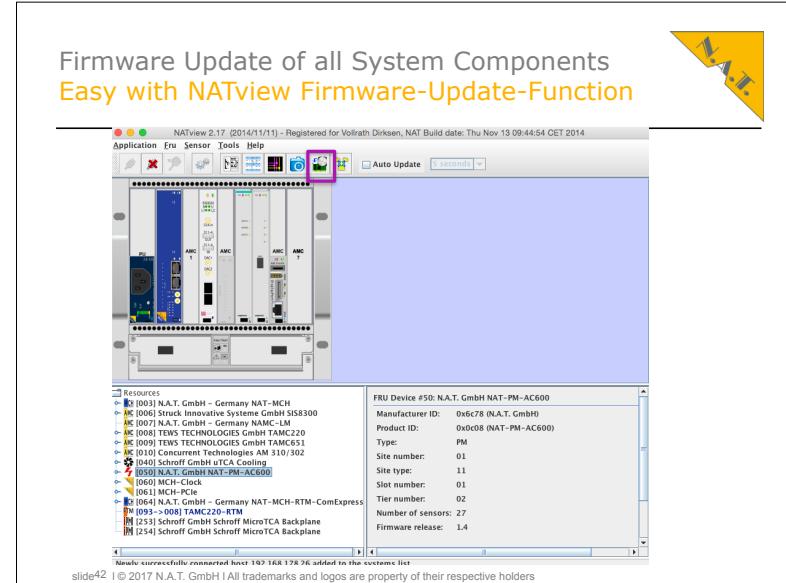
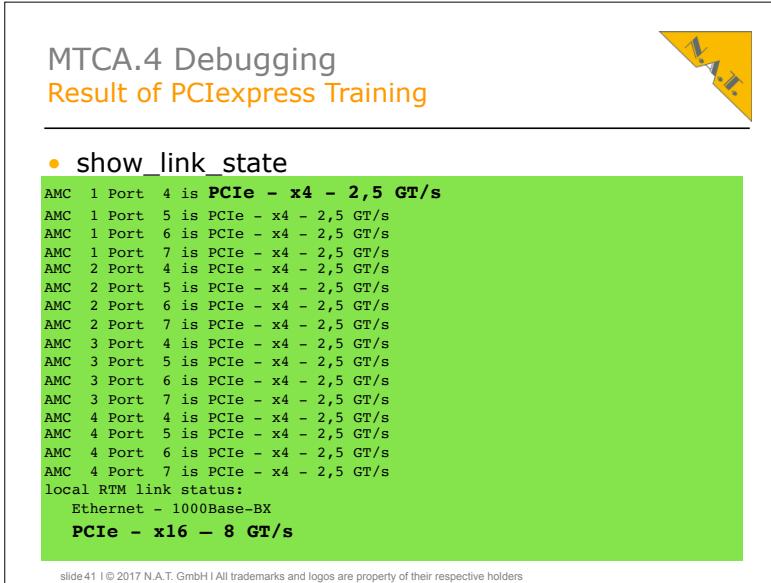
```
nat> show_sensorinfo 50
Sensor Information for FRU 50 / PM1
-----
#  SDRTYPE Sensor Entity Inst  Value  State  Name
=====
30  MDevLoc  0x0a  0x61      NAT-PM-AC600
1   Full     Temp   0x0a  0x61  33 C  ok    T_CPU
2   Full     Temp   0x0a  0x61  48 C  ok    T_XFIRM
3   Full     Temp   0x0a  0x61  35 C  ok    T_PSB
4   Full     Temp   0x0a  0x61  54 C  ok    T_PFC1
5   Full     Temp   0x0a  0x61  49 C  ok    T_REC
6   Full     Voltage 0x0a  0x61  264 V  ok    VINAC
7   Full     Voltage 0x0a  0x61  444 V  ok    VINDC
8   Full     Voltage 0x0a  0x61  12.4 V  ok    12V
9   Full     Voltage 0x0a  0x61  3.4 V  ok    3.3V
10  Full     Current 0x0a  0x61  5.50 A  ok    I_Sum
11  Compact   Current 0x0a  0x61  2.20 A  ok    I_CH01
12  Compact   Current 0x0a  0x61  0.00 A  ok    I_CH02
13  Compact   Current 0x0a  0x61  0.50 A  ok    I_CH03
14  Compact   Current 0x0a  0x61  0.00 A  ok    I_CH04
15  Compact   Current 0x0a  0x61  0.00 A  ok    I_CH05
16  Compact Current 0x0a  0x61  2.20 A  ok    I_CH06
17  Compact   Current 0x0a  0x61  0.00 A  ok    I_CH07
18  Compact   Current 0x0a  0x61  0.30 A  ok    I_CH08
19  Compact   Current 0x0a  0x61  0.30 A  ok    I_CH09
20  Compact   Current 0x0a  0x61  0.00 A  ok    I_CH10
21  Compact   Current 0x0a  0x61  0.00 A  ok    I_CH11
22  Compact   Current 0x0a  0x61  0.00 A  ok    I_CH12
```

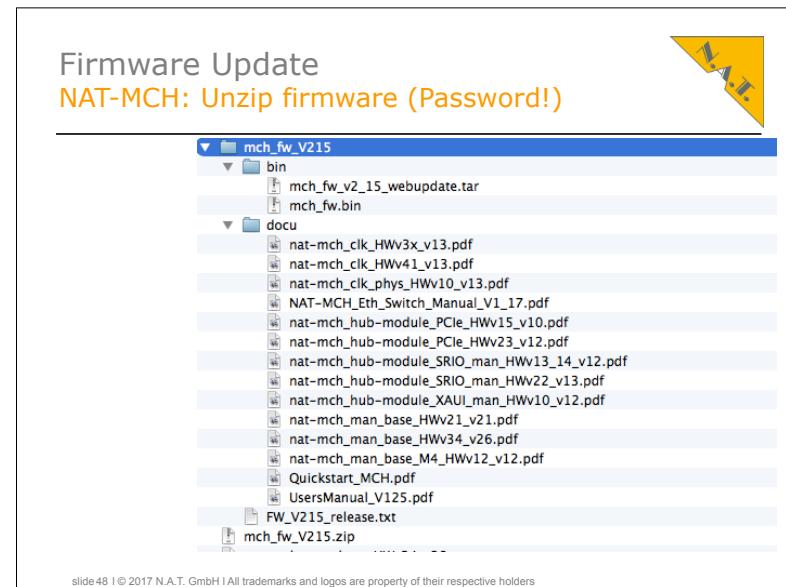
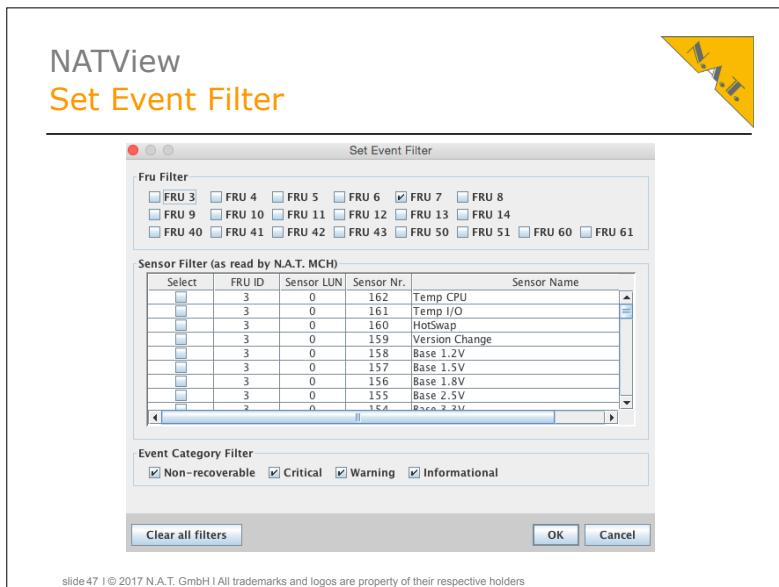
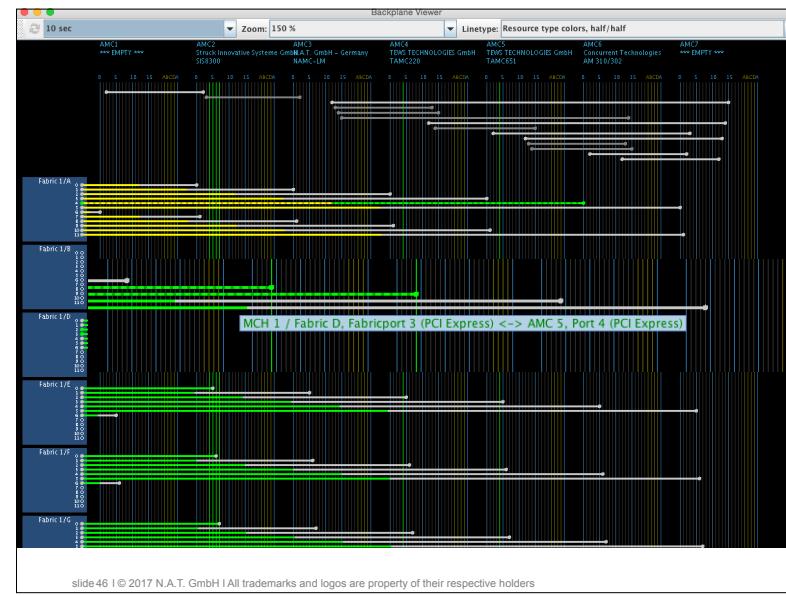
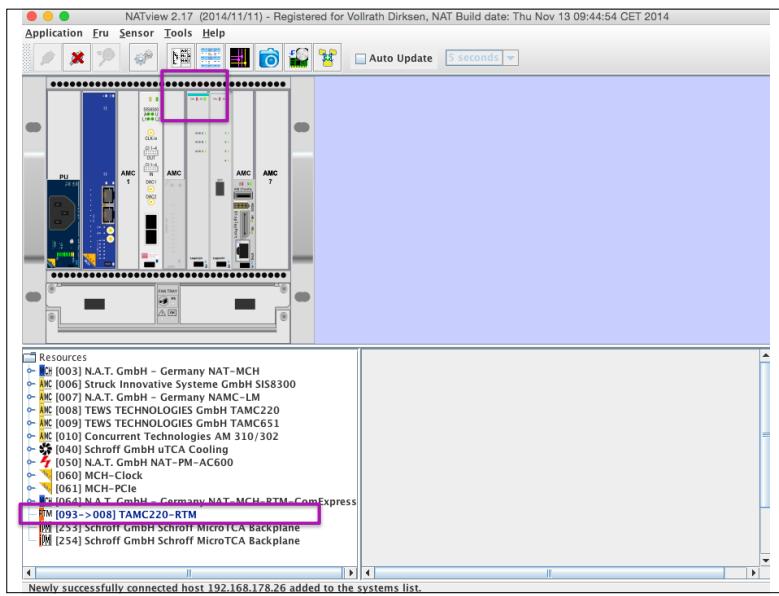
## MTCA.4 Debugging E-Keying

- **show ekey**

```
EKeying information - activated Links:
-----
AMC FRU State Channel Type Port
-----
AMC1  5  M4  0  PCIe  4 <-> MCH1 Fabric D downstream Gen 1, no SSC
5 <-> MCH1 Fabric E downstream Gen 1, no SSC
6 <-> MCH1 Fabric F downstream Gen 1, no SSC
7 <-> MCH1 Fabric G downstream Gen 1, no SSC
AMC2  6  M4  0  PCIe  4 <-> MCH1 Fabric D downstream Gen 1, no SSC
5 <-> MCH1 Fabric E downstream Gen 1, no SSC
6 <-> MCH1 Fabric F downstream Gen 1, no SSC
7 <-> MCH1 Fabric G downstream Gen 1, no SSC
AMC3  7  M4  0  PCIe  4 <-> MCH1 Fabric D downstream Gen 1, no SSC
5 <-> MCH1 Fabric E downstream Gen 1, no SSC
6 <-> MCH1 Fabric F downstream Gen 1, no SSC
7 <-> MCH1 Fabric G downstream Gen 1, no SSC
.....
```

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## MCH Firmware Update Web Interface

**Setup**

- Base Configuration
- Switch** BASE 1GbE
  - Age Time
  - Port on/off
  - Port VLAN
  - 802.1Q VLAN
  - 802.1X
  - 802.1p
  - Port Mirroring
  - Jumbo Frame
  - Link Aggregation
  - Rapid Spanning Tree
  - Link Status
  - BCM5396 counters
  - Configure PCIe Virtual Switches

**Maintenance**

- Board Information
- System Information
- Reboot NAT-MCH
- Update MCH**
- Change Password
- N.A.T. Webpage
- Home

**Firmware Update for NAT-MCH**

\* Upload TAR archive for NAT-MCH:

Select file: Date auswählen | mch\_fw...date.tar

**Notes:**  
 Select only a .tar-file here, do not select a .zip or .bin file.  
 After clicking Upload you can select the components to be updated.

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## MCH Firmware Update Web Interface

Device	Current FW version	Update FW version	Update this device?
<b>Base board</b>	V2.15	V2.16	<input checked="" type="checkbox"/>
<b>Clock module</b>			
<b>Hub module</b>			
PCIe Atmel	V1.9	V1.9	<input type="checkbox"/>
PCIe HUB Module FPGA	V1.5	V1.5	<input type="checkbox"/>

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## MicroTCA.4 Configuration and Maintenance

- About N.A.T.
- Comparison of Standards**
- Configuration Tools**
  - Command Line Interface
  - Java-App
  - Web interface
- Examples of Configurations**
  - Ethernet and PCIe Express Configurations
  - Emergency Configuration
- Maintenance Tools**
  - Analysis locally: LEDs
  - Analysis remotely: inventory, current, revision
  - Firmware update

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## It is time ... to change your Computing Platform!

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Thank you very much!  
Questions?



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**MTCA.4 Training:**  
<https://teclab.desy.de/services/training/>  
[www.nateurope.com/services/support.html](http://www.nateurope.com/services/support.html)

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