a small MTCA solution

from wish list to “final” solution

Wish list from different customer groups

More or less a server with additional AMC slots

- **Small MTCA system**
  - 1 U system max 19” maybe even smaller
    - between 2-4 additional payload slots
    - **with (60%) / without RTM option (40%)**
    - With(50%) /without (50%)CLK and trigger
    - **With (80%) and without CPU (20%)**
      - CPU for control and payload
      - **CPU centric (80%)**
    - **Uplink option (min 2+10Gb)**
  - with 10/40 GTps backplane connectior

- **Previous solution**
  - 1 U boxes 2 slot / 4 slot + RTM
    - 1 GbE via Base eMCH
    - No CLK/trigger etc
    - 1-3 P2P connection options (DIPswitch)
    - Limited MCH functionality

Mechanical Concept in a nut-shell

Proof of concept NATIVE-C1

- Standard NATIVE-C1 Chassis
- Standard PM / AC, DC, (12V input)
- 1 double slot for CPU and MCH (embedded)
  - NAT-AMC-COMex V2.0
  - NAT-MCH-G4 derivate
- 4 additional single mid-size AMC slots

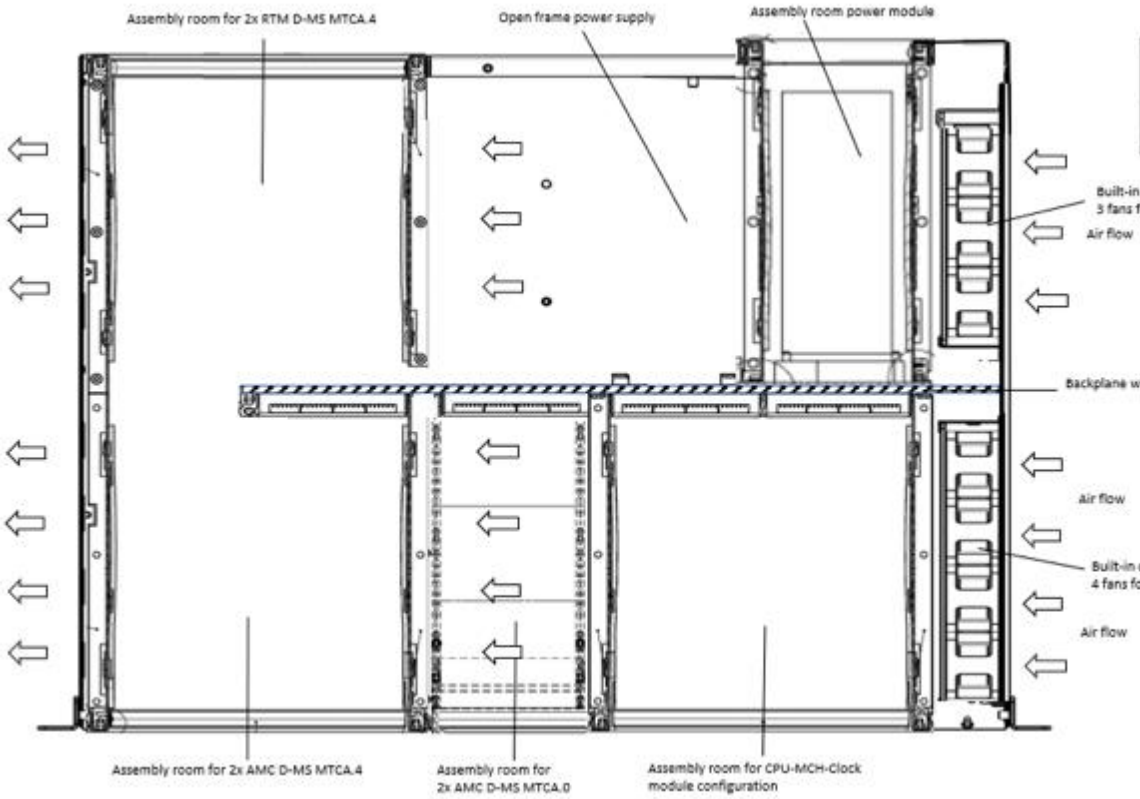
- no RTM slot
- Special backplane for 40GTps
  - CPU centric (fat pipe)
  - MCH centric (port 0,1)
- Cooling up to 580 W

Serial product NATIVEServer-R1

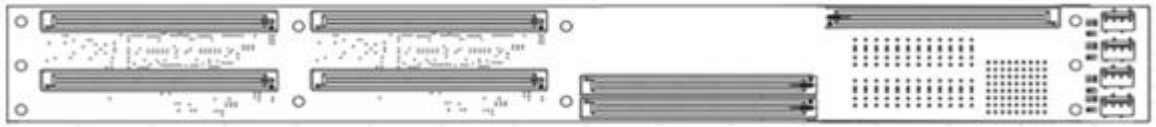
- Modified NATIVE-mini-R1 chassis
- Standard MTCA PM (AC,DC, (12V input)
- 1 double slot for CPU and MCH (embedded)
  - NAT-AMC-COMex V2.0
  - NAT-MCH-G4 derivate
- 2 additional single mid size AMC slots
- 2 additional double mid size AMC slots
- 2 RTM slots
- Special backplane for 40GT/sec
  - CPU centric (fat pipe)
  - MCH centric (port 0,1)
- Cooling up to 400-480 W

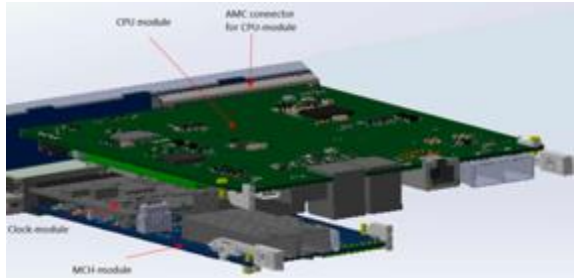
NATIVEServer-R1 (Chassis

- Chassis setup



- Backplane setup



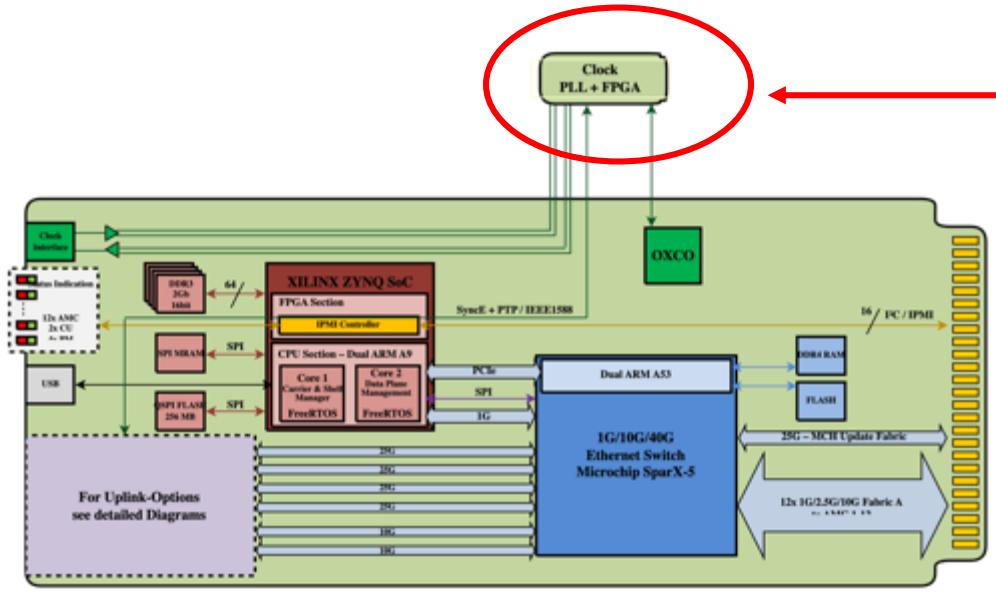


- Power module
  - 1 x FRU (AC & DC)
- Payload
  - 4 x FRU's (hot swap)
- Fixed mounted (embedded)
  - Management & Base switch
  - CLK Module
  - CPU board

How it works: MCH connectivity

See MCH-G4 presentation in next hour

Based on standard MCH-G4



eMCH Features

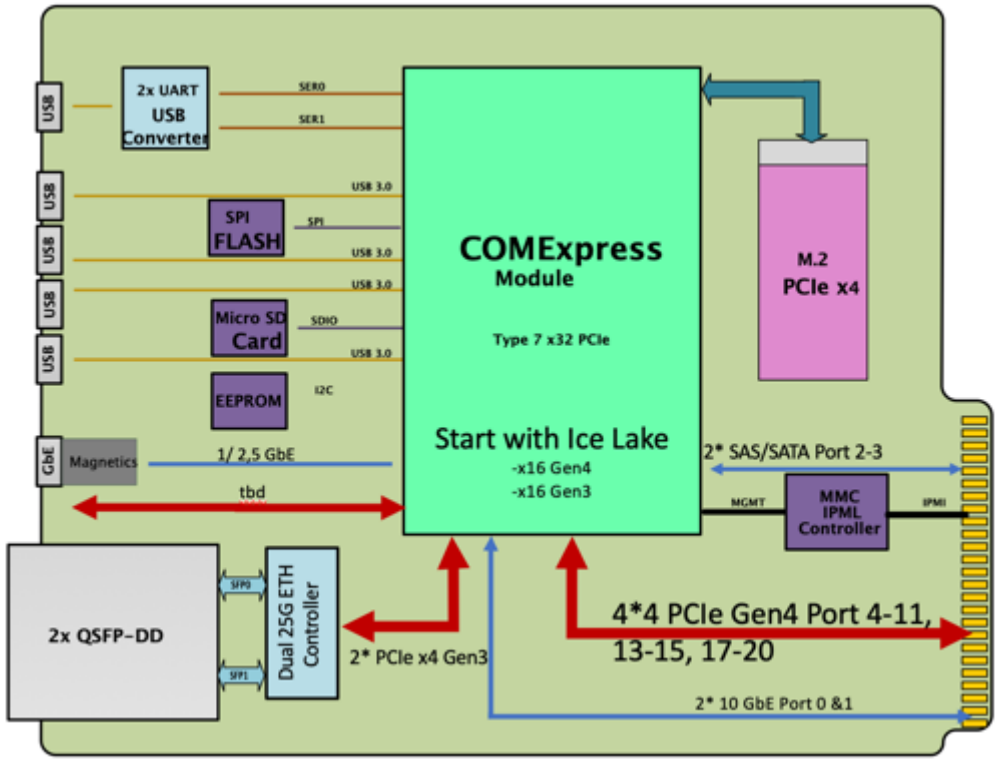
- 3 different physical uplink option
- 2 x 10 GbE to all boards P0,1
- Clock module as an option
  - ETH switch ready for IEEE1588 boundary
- Same SW/FW as standard MCH-G4
  - Including new WEB interface

➔eMCH means embedded MCH

➔Minor modification to MCH-G4

How it works: CPU-connectivity

Based on NAT-AMC-COMex V2



Features

- Uplink 2 * 25 GbE via QSFP-DD
- GPIO connector to front
- 4 x 4 lanes PCIe Gen4 (64GTps)
- 2 x 10 GbE towards eMCH
- M2 storage device up to 1 TB
- Different CPU versions available
  - Based on INTEL D1700 Ice Lake ff.
  - 4 Core / 40 W TDP
  - 10 core 90 W TDP

➔ CPU is embedded

NATIVEServer-R1 (1U System)

- 1U 19“ rackmount MTCA.4 System
  - AMCs
    - 2x single mid-size AMCs or 1 single full size AMC (x4 PCIe Gen 4)+ 2x 10 GbE+CLK-lines)
    - 2x double mid-size AMCs or 1 double full size AMC (x4 PCIe Gen 4)+ 2x 10 GbE+CLK-lines)
  - RTMs
    - 2x double mid-size uRTMs or 1 double full size RTM
  - Built-in PrAMC and eMCH
    - 1x double size CPU: NAT-AMC-COMex ➔ Intel IceLake CPU Gen D1700
    - 1x single size NAT-MCH-G4 incl. CLK module (Option only)
  - Cooling
    - 7 fans in push configuration from right-to-left, 40.2 m^3/h (23.7cfm) ea.
  - Power Module
    - 480W AC/DC standard MTCA PM or just 12 V DC input (future)

Summary: NATIVE-Server-R1

- Available to the market
  - Beta customer: Q2 2024
  - GA: Q3 2024
- Server with Generation 4 eMCH and embedded CPU card
  - 2 CPU options from the beginning (2 core 40W to 10 core 90 W)
  - NAT-MCH-G4 derivate eMCH-Gen4
    - Same WEB interface
    - 3 Uplink option 2*25 Gbps (SFP, RJ45 or iX)
    - CLK/Trigger as an option
      - Can work as IEEE1588 slave
      - Can work as (internal) boundary switch
  - Backplane to support per AMC
    - 2* 10 Gbps Port 0/1 Payload to eMCH
    - 4* 10 GTps Port 4-7 Payload to CPU
- Chassis supports up to 480 W

Thank you very much!

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