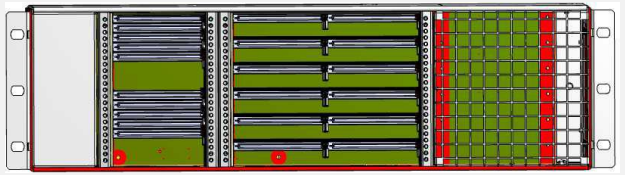
MTCA.4 Crate – From standard product to custom solution



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MTCA.4 Standard Crates

nVent SCHROFF Standard MTCA.4 Crates, 9 U, 12 AMC Slots

- Standard 12 Slot MTCA.4 Crate in 5 different flavors

Catalog#	Topology	JSM Slot	White Rabbit Support
11850-026	MTCA.4	No	No
11850-027	MTCA.4	Yes	Yes
11850-028	MTCA.4	Yes	No
11850-030	Data Aggregation	Yes	No
11850-031	Data Aggregation	Yes	Yes

- Standard 12 Slot MTCA.4 Crates for Double Full-size AMC’s in 4 versions

Catalog#	Topology	JSM Slot	Cooling
11890-119	CMS	Yes	bottom to top
11890-156	CMS	Yes	front to rear
11890-152	MTCA.4	Yes	bottom to top
11890-170	MTCA.4	Yes	front to rear

nVent SCHROFF Standard MTCA.4 Crates, other versions

- Standard 7 Slot Cube, entry system for lab use
  - MTCA.4 backplane topology
  - 7 Double Mid-size AMC Slots
  - Air flow from bottom to top

- Standard 6 Slot Crate, 3U with front to back air flow
  - Backplane topology derived from MTCA.4 with x16 fat pipe connections @ 2 slots
  - 6 Double AMC Slots, 4 of them with RTM
  - Space to build in a JSM module

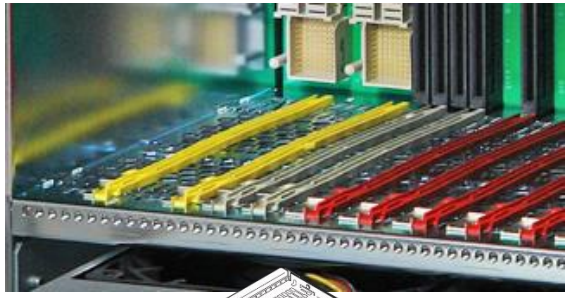
Standard MTCA.4 Crates cover the requirements of most Particle Accelerator Applications

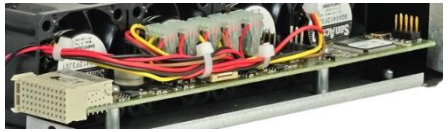
MTCA.4 Building Blocks

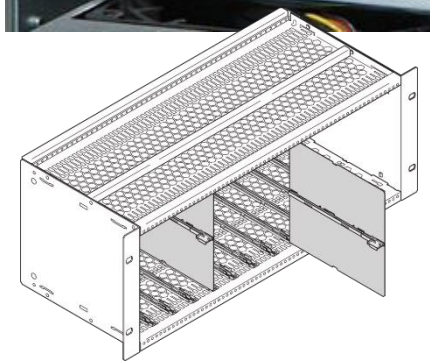
The foundation for customized solutions

nVent SCHROFF Standard MTCA.4 Building Blocks

- nVent SCHROFF Standard Crates are build on standard building blocks
  - Card Guides
  - Card Cages
  - EMC shielding concept
  - Mechanical concepts
  - Cooling units
  - Cooling unit management module (CU EMMC)
  - Air filters
  - Power Management mezzanine (PM EMMC)
  - Backplanes with Interfaces to Cooling units and JSM Slots
  - Filler and air blocker panels
  - Splitting kit
  - LLRF Backplane mounting kit







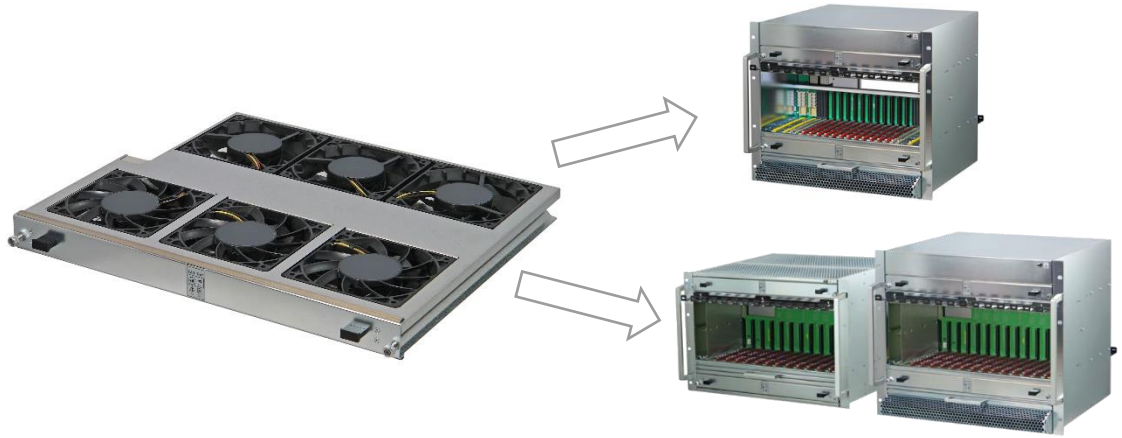
- Customized solutions are built leveraging the standard building blocks

Custom Solutions

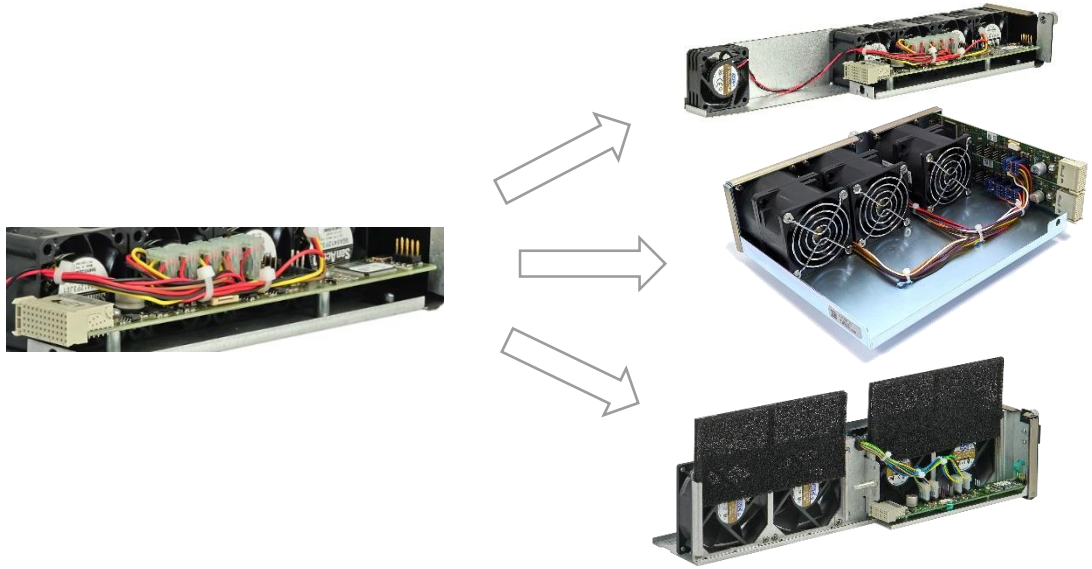
Adaptions to application requirements based on Standard building blocks

Examples for re-using MTCA building blocks

- Standard Cooling unit for 12 Slot Crates is used in many standard and custom Crates
- Custom Crate solutions built with Standard Cooling Unit and custom fan arrangement



- Standard MTCA.4 CU EMMC is used on all Standard and custom Crate solutions
- Different fan arrangements realized by adaption of the firmware



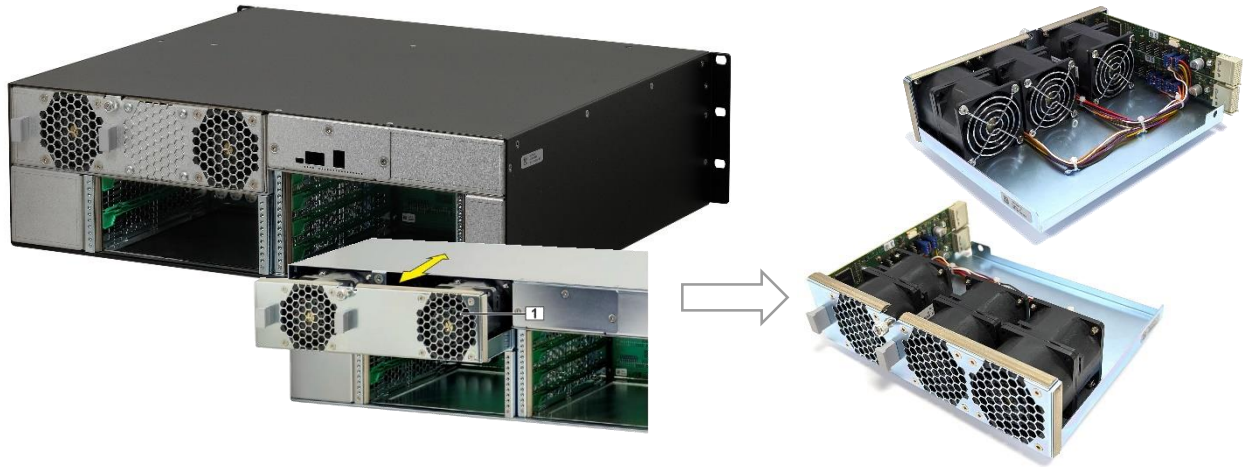
nVent

Customized version of 2 Slot MTCA.0 System

- Standard MTCA.0 System with 2 Single AMC Slots, integrated PSU with AMC present signal detection and side to side cooling
- Custom solution:
  - Using all inner parts of the Standard Chassis
  - Integrated into a 19” chassis with telescopic rails
  - Interface cutouts on front and backside with cable connections to AMC boards
  - Air channels for front to rear cooling

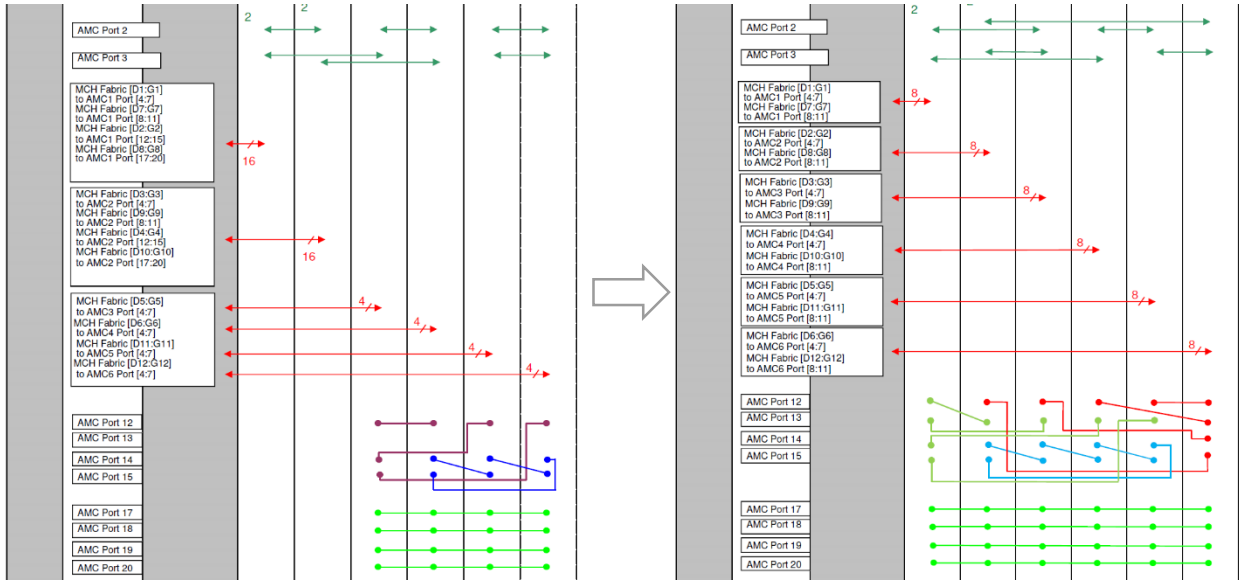
Customized version of 3U front to rear Crate

- Standard Crate comes with Cooling unit with 2 fans and one CU EMMC
  - Already prepared for third fan which also requires second CU EMMC as it exceeds the 80 W power budget



- Customized version with 3 fans and 2 CU EMMC’s

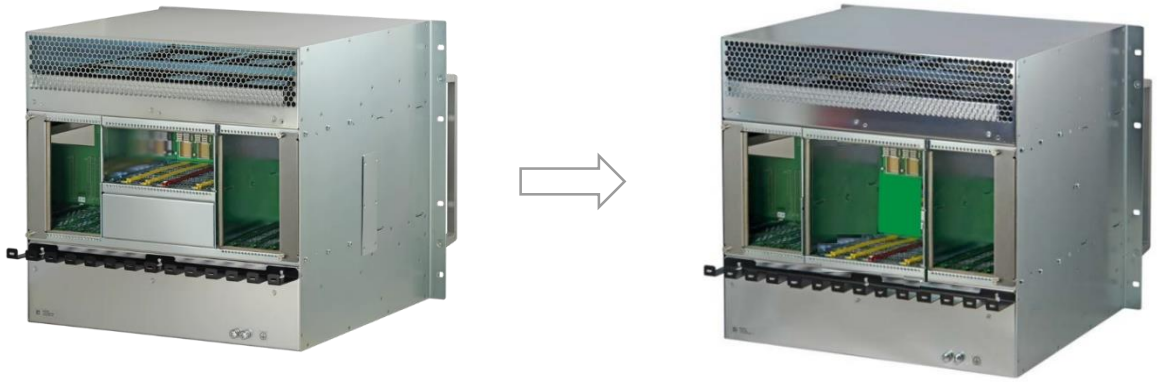
- Standard Crate has x16 connections to AMC 1 and 2, x4 connections to all other AMC slots
- Custom version with changed storage interface, x8 connections to all slots and enhanced connections at Ports 12 to 20

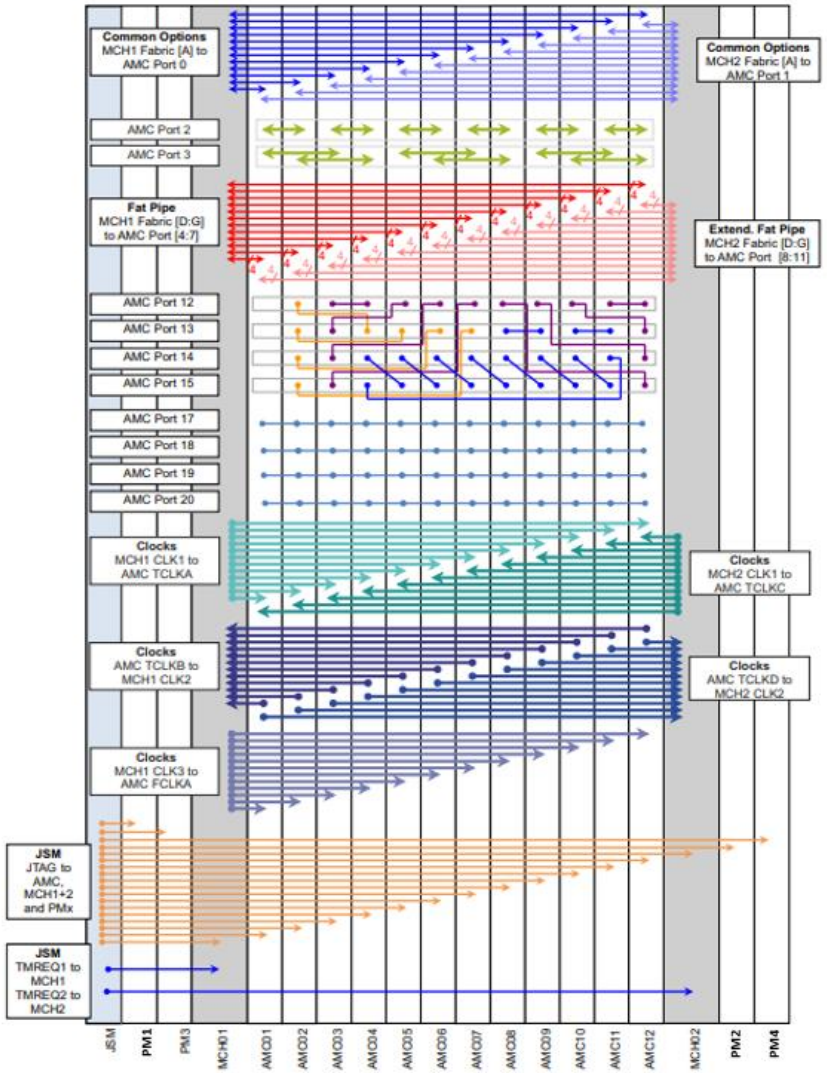


Custom solution with 4 Double Full-size Rear PM‘s

- Standard System: 11890-170, 9U, 12 Slot, double Full-size AMC slots
  - Front: 12 double Full-size AMC Slots, 2 Single Full-size MHC slots, 2 Single Full-size PM Slots
  - Rear: 4 Single Full-size PM slots, 1 Single Full-size JSM slot, one spare, 6 Double Full-size RTM Slots

- Customized Solution:
  - Rear card cage changed to accept 4 Double Full-size PM’s, inserted upside down
  - New backplane design in accordance to MTCA.0 Rev3 with MTCA.4 topology





Custom 3U, 12 Slot MTCA.0 Crate with Front to back cooling

- Accepting 12 AMC modules with 95 W each, 2 MCH‘s and 2 timing modules
  - Total Heat dissipation: Pv = 1526 W
- Reusing standard components and building blocks or modified building blocks
  - Outer housing modified from 3U standard MTCA.0 Crate
  - Air inlet perforation from nVent SCHROFF ATCA Systems
  - Standard MTCA card cage cutted to required height, standard card guides
  - Standard Splitting Kits
  - Customized backplane based on standard routing strategies
  - Standard counter rotating fans from 3U MTCA.4 crate and standard MTCA.4 CU EMMC
- Using the internal thermal calculation, simulation and thermal test capabilities to ensure that cooling requirements are met

Thank you!