1. Title of presentation: Introduction to MicroTCA.4

This tutorial covers the basics of MTCA.4. It begins with background information on why the existing MicroTCA and AMC standards did not satisfy the needs of the Physics community and what new features were required. The physical features of MTCA.4 like board sizes, connector definitions, module insertion/extraction and also the management interface between the RTM and the Front board are explained. Then it gives an overview of management features which have been added in MTCA.4 to manage the RTM and the Cooling Unit.

Presenter: Alex Mao, nVent

茅峻峰 (Alex Mao) / Product Marketing Manager, APAC / nVENT
Fifteen years of Product / Program Management and Marketing in Electronic Industries, throughout BU, R&D and Operation. Ownership and accountability in developing Embedded Computing Modules, ATCA, Network Appliance, Rack-Mount Servers
Now responsible for nVENT/Schroff xTCA product marketing in APAC

2. Title of presentation: Cooling Strategies – MicroTCA crates installed in electronics cabinets

MicroTCA is a sophisticated Technology with high processing power and many features but also challenges such as high heat generation. With older technologies, a small amount air movement inside the crate was sufficient to keep electronics cool. With today's high performance and high-density electronics, a stronger, dedicated cooling strategy for the crate and cabinet level is required to keep electronics running well.  This presentation demonstrates different cooling strategies for MicroTCA crates, associated cabinets, and possible traps that should be avoided.

Presenter: Christian Ganninger, nVent

Christian Ganninger, Global Product Manager Systems. Christian studied electrical engineering at the University of Applied Science in Karlsruhe, Germany. Since May 2005 he is Product Manager Backplanes at Pentair. Later he took over the Product Management for MicroTCA, Power Supplies and Rugged Enhanced Systems. Since January 2014 he is Global Product Manager Systems.

3.  Title of presentation: MicroTCA Management and Configuration


In this talk the remote management of an MicroTCA system is presented. Starting with inventory listing, power budget and actual current consumption also active GbE and PCIexpress data links and their speed are shown. Via Web Interface the MicroTCA can be configured in a short time e.g. multiple PCIexpress cluster in one MicroTCA crate. With one mouse click a complete MicroTCA System information File with all inventories, serial numbers, sensors and history alarms is generated (video).

Presenter: Tony Wei (PhD) Chief Technologis
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4. Title of presentation: MicroTCA environment for beamline control in particle accelerators

The main goal of a particle accelerator is that a stable photon/particle beam within the required specifications is guaranteed to be delivered to users – i.e. a scientist / industrial user / medical user (some examples of new applications of particle accelerators will be given).

Thus, every particle accelerator requires a diagnostic system to maintain its design performance during operations and it is normally based over a closed-loop architecture in such architecture, at the sensor level, many beam position monitors are placed both along the particle accelerator itself, both over the beamlines of the particle accelerator. Such beam position monitors standardly use 4 analogue signals (generated from the interaction with the beam indeed) in order to calculate the beam position in X and Y as well as the intensity of the beam.

CAEN ELS offers several MicroTCA boards – both in FMC and AMC standards – in order to:

- monitor the signals coming from beam position monitors;

- bias the beam position monitors;

- general purpose AMC boards to be integrated with FMC plugins.

Such boards will be presented as well as their integration in ready to be installed "turn-key" systems used in order to control entire beamlines as well as complete systems able to prevent "safety critical" issues – systems known as MPS (Machine Protection Systems).

Presenter: Mattia Tortora, CAENels

Graduated at the Trieste University – March 2016:

Master degree in Industrial Engineering – Process control and material science with 110/110 cum Laude.

Working with CAEN ELS since May 2016 as Sales & Support Engineer.

5. Title of presentation: MicroTCA.4 evolution and industrial applications

In this talk, there will be a short look back, an insight view of available products, new product offerings as well as an overview of the existing ecosystem. Based on the scalability of MicroTCA, the talk will also list examples of real world applications from different application fields, not only physics.

The talk will highlight the universal usage of MicroTCA and acceptance in all kind of industries.

Presenter: Thomas Holzapfel, powerBridge Computer

Senior key account manager research & development in powerBridge. Thomas is a long-time expert in embedded industry. Starting as a software engineer in software for VME based CPU boards in late 80s, he joined powerBridge more than 15 years ago. Thomas is part of the PICMG MicroTCA team, and at powerBridge responsible for the research and engineering programs in high energy physics institutes.

6. Title of presentation: Application of MicroTCA at the European XFEL

The Accelerator for the European X-Ray Free Electron Laser delivers femtosecond electron bunches at an energy of currently 14GeV at a repetition rate of up to 4.5MHz in bursts of up to 2700 pulses every 100ms to distribute them between different undulator beamlines. The emitted femtosecond x-ray laser pulses at wavelengths between 0.05nm and 6nm can serve up to three experiments in parallel. To run this accelerator a large number of different fast detectors and diagnostics, regulation and feedback systems are required which are to a large extend read out and controlled by - or directly implemented in - MTCA.4 hardware. The presentation will give an overview of the different MTCA applications at the E-XFEL with a more detailed description of some examples form the longitudinal diagnostics systems.

Presenter: Dr. Bernd Steffen, DESY

Dr. Bernd Steffen is a physicist working in the group for beam controls at DESY with an emphasis on longitudinal diagnostics for electron beams. He finished his PhD in 2007 with a thesis on electro-optic bunch length detection and was working on electron beam diagnostics for the Swiss FEL at the Paul-Scherrer-Institute and for the E-XFEL at DESY afterwards.

7.  Title of presentation: Application of MicroTCA at SINAP

The low-level RF system based on MicroTCA has been developed for several years in SINAP. The LLRF application has been prototyped and run successfully on beam at several facility, such as DCLS, UED at Shanghai Jiao, Tong University, SXFEL, LINAC at SIRUS, etc. This presentation describes the system hardware and software architectures, the LLRF operating status in the machine and the new LLRF system architectures based on MicroTCA.

Presenter: Lin LI

Email addr : lilin@sinpa.ac.cn

Affiliation: Shanghai institute of Applied Physics

8. Title of presentation: Digitizer Boards and applications

Struck is one of the early adopters of the MTCA.4 standard. The 125 MSPS 16-bit SIS8300 was the first MCTA.4 digitizer card on the market. The latest –Xilinx Kintex Ultrascale based- member of the family, the SIS8300-KU and firmware aspects will be discussed. Applications with various rear transition modules (RTMs) in accelerator controls and other fields will be presented. Use cases of the new SIS8160 FMC carrier and JESD digitizer FMCs up to 2.5 GSPS 14-bit will be illustrated.

Presenter: Dr. Mathias Kirsch, Struck

Matthias is managing partner at Struck and received his PhD in Physics from the University of Erlangen-Nuernberg, Germany.

9. Title of presentation: MicroTCA Technology Lab at DESY

MicroTCA Technology Lab at DESY was established to promote MicroTCA as a modular and open platform for wide range of applications and to facilitate adoption of MicroTCA in different markets. Together with its industrial partners, and building on years of experience of designing, building and operating free-electron lasers FLASH and European XFEL, MicroTCA Technology Lab can offer application-oriented design services, from hardware, firmware, software to system integration and consulting. In addition, the lab serves as a hub for training and support activities. Activities of the lab and current projects will be presented.

Presenter: Jan Marjanovič, DESY

Jan Marjanovič is an FPGA developer at MicroTCA Technology Lab at DESY. Currently he is engaged in development of several MicroTCA-based applications. His interests include modular electronics, with emphasis on MicroTCA and FMC standards, digital signal processing and high-level synthesis.