μTCA for physicists?
A project of PH-ESE group to evaluate platforms for µTCA based systems at CERN and in the HEP community

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on behalf of PH/ESE group

• Background
  – Raising interest and first projects in xTCA (and especially µTCA) in the HEP community
  – CERN has followed this new technology as an observer for the last 2 years
  – µTCA is perceived to be less complex than ATCA (but many of the concepts are the same)

• Motivation
  – As the xTCA standards offer many optional features interoperability is an issue
  – PH-ESE group recently has started to develop its first AMC (the GLIB card)
    • Some µTCA equipment has been purchased for the GLIB project and “first lessons” have been learned which may be relevant for other µTCA projects
  – Other xTCA projects are currently under development in ATLAS, CMS and LHCb
μTCA and MTCA.4

μTCA
• Standardized in 2006
• Many optional features
• Rapidly growing base of suppliers and products

MTCA.4
• Reduced set of features (e.g. less communication protocols)
• Additional rear transition modules (RTMs)
• Standard not yet ratified
• First commercial products available

Interoperability MTCA.4 <-> μTCA
• Most components (e.g. MCH) should work in both environments
• Some areas of potential incompatibility. E.g.:
  • Clock distribution
  • RTMs
  • Backplane topology
  • MMC F/W
Project scope

• Phase A:
  – Carry out technical evaluations of systems built to both the basic uTCA standard and the MTCA.4 sub-standard. System features that will be covered by the evaluation include:
    • Mechanics
    • Power supplies
    • Cooling
    • Backplane properties
    • MCH control
    • Redundancy
    • Scalability to large systems
  – Assess the respective advantages and disadvantages of the two alternatives
  – Objectives:
    • Understand and discuss with the community the issues related to this new technology. The discussion forum will be this Interest Group on xTCA systems
    • Design (at least) two AMC boards as tools for the evaluation phase:
      – An AMC load board with RTM
      – An evaluation AMC for the MMC designed by J.P. Cachemiche (Marseille).
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• Phase B:
  – Carry out informal market surveys and user surveys

• Phase C:
  – Eventually the support of a selected set of components of uTCA systems, if consensus is reached, could become part of the PH-ESE service activities.

• The results of all phases will be available to the community

• Additional information (e.g. list of items purchased so far)
  – https://twiki.cern.ch/twiki/bin/view/XTCA/PHESExEvaluationProject