Contribution ID: **135** Type: **Poster**

MicroTCA and AdvancedTCA Equipment Evaluation and Customization for LHC Experiments

Wednesday 24 September 2014 16:53 (1 minute)

The MicroTCA and AdvancedTCA industry standards are candidate modular electronics platforms for the upgrade of the current generation of high energy physics experiments at CERN. The PH-ESE group at CERN launched an xTCA evaluation project with the aim of performing technical evaluations and providing support for commercially available components. Over the past years, different equipment from different vendors has been evaluated. This paper summarizes our evaluation results of commercial MTCA and ATCA equipment. Special emphasis is put on the component requirements defined in view of future equipment procurement. Customized prototypes developed according to these generic specifications are presented.

Summary

Originally developed for the telecommunication industry, MicroTCA and AdvancedTCA have gained momentum also in the high energy physics community where they are going to be deployed as platforms for data acquisition, trigger and control systems. Several independent groups at CERN and in external institutes have started to develop ATCA and MTCA modules and the question arises as to how these modules should eventually be housed. In this framework, the PH-ESE group at CERN launched the xTCA Evaluation Project with the goal of providing technical evaluation of xTCA systems as well as support service and tools to the community. For this purpose, several commercial components from different manufacturers have been evaluated with a clear focus on the infrastructure equipment such as shelves, power supplies, power modules, cooling modules etc.

During the TWEPP2013 conference the first comprehensive evaluation results and test procedures have been presented. Since then, new components have been released and tested against their technical specification. Interoperability problems and technical issues have been uncovered and addressed by cooperating with the manufacturers. This article provides update on the latest test results on xTCA equipment from different manufacturers such as ELMA, NAT, Schroff, Comtel, ASIS and Vadatech. It focuses on power modules electrical testing, shelf cooling performance evaluation and IPMI conformity tests. The experience and know-how gained during the evaluation phases allowed us to define technical specifications for the main xTCA components in view of future equipment procurement. Jointly with the experiment requirements, this resulted in the definition of custom MicroTCA and AdvancedTCA shelves developed specifically for the LHC Experiments. The ATCA shelf was customized to adapt to existing rack thermal management infrastructure. The custom MTCA shelf, in addition to the vertical airflow design, implements a unique backplane topology designed for maximum power availability and installation flexibility. This paper describes for the first time these custom designs focusing on their evaluation results.

Additionally, it summarizes completely the tests that have been carried out on commercial xTCA equipment. Special emphasis is put on to the definition of the qualification and acceptance procedures for each component topology.

Author: DI COSMO, Matteo (Ministere des affaires etrangeres et europeennes (FR))

Co-authors: VASEY, Francois (CERN); JOOS, Markus (CERN); HAAS, Stefan (CERN); MICO, Sylvain (CERN); BOBILLIER, Vincent (CERN)

Presenter: DI COSMO, Matteo (Ministere des affaires etrangeres et europeennes (FR))

Session Classification: Second Poster Session

Track Classification: Systems