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MTCA - Hardware Platform Management Systems Basics Tutorial

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High Reliability, Availability and Serviceability (RAS) are among the most desirable features of control systems in modern High-Energy Physics (HEPs) and other big-scale scientific experiments. One of the recent developments that have influenced this field was the emergence of the xTCA standards (Advanced and Micro-Telecommunications Computing Architecture). The standards developed for telecommunication industry have been successfully applied in other domains such as accelerator control systems.

The Intelligent Platform Management Interface (IPMI) with PICMG extension was applied in xTCA to enhance the availability of the system and simplify hardware diagnostics. The IPMI standard was initially developed to manage computer systems and monitor its operation. In case of xTCA, it provides useful features for shelf management, monitoring of crucial parameters, like: temperature, voltages, supply currents and fan speed. The system manages power, cooling and interconnect resource in the shelf via e-keying mechanism.

The tutorial introduces the basics of hardware platform management in MTCA systems. The presentation provides information concerning IPMI basics with PICMG extension and hardware required for shelf management. Finally, the example implementation of Management Controller for Advanced Mezzanine Card (MMC) and Rear Transition Module (RMC) will be presented.

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