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MicroTCA Hardware Standards and Software Guidelines for Physics and General Applications: A Progress Overview

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Instrumentation standards for Physics applications began in Europe in the late 1950s and in the mid- 1960s a European-US collaboration produced the first widely accepted standard called NIM (Nuclear Instrument module), a simple packaging and signal standard for analog and fast digital logic that is still in use today. This was followed by three more increasingly powerful standards each enabled by the amazing growth of the electronics integrated circuit, microprocessor, firmware and multi-Gigahertz serial communications technologies which make up today's world of the petabyte data collection and mining for not just experiments but medical imaging diagnostics across all of society, the massive experiments of the LHC, XFEL, ESSB and many others, and hopefully soon the long-awaited ILC in Kitakami Japan. Each of these scientific programs drives many new complex technologies which impact the need for new smarter standards. The lab –industry collaboration known as PICMG xTCA for Physics has reached the latest milestone in lab standards called MTCA.4 and MTCA.4.1, a complete hardware-software system integrated with Intelligent Platform Management and a number of hardware Classes and software Guidelines and use cases to increase the interoperability of new applications modules developed by the growing lab-industry collaboration.

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