
ATCA FREQUENTLY ASKED QUESTIONS

PICMG[®] 3 FREQUENTLY ASKED QUESTIONS

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WHAT IS PICMG 3?

PICMG 3 is a family of specifications, currently under development, that defines a new generation architecture for building high end, "carrier grade" equipment. The PICMG 3 specifications are oriented around switch fabric technology instead of a conventional parallel bus.

The specifications provide enough information to allow board, backplane, and chassis vendors to independently develop products that will be interoperable when integrated together. Details include board dimensions, equipment practice, connectors, power distribution, and a robust system management architecture that can be used independent of the switch fabric link technology.

WHAT MARKETS ARE TARGETED WITH THE PICMG 3 FAMILY OF SPECIFICATIONS?

The PICMG 3 efforts are designed to provide an open, multi-vendor architecture that is aimed at Central Office telecom applications.

Unlike CompactPCI[®], which began as an industrial computer specification and later evolved to address a variety of telecom and communications markets, PICMG 3 is being written specifically to address the \$100B per year (and still growing) market for central office grade equipment. As "convergence" moves the architecture of core telephone switching equipment from circuit switched designs to packet switched designs, core telecom manufacturers such as Lucent and Nortel see a need for an open industry specification that maintains the rigorous standards they need, such as NEBS and ETSI compliance, high availability, robust system management, DC power distribution, etc., but is open and non-proprietary. By outsourcing more hardware in the future, these companies can concentrate on their core competencies, which include services and software.

While it is not a target market, there is a surprising amount of interest on the part of military equipment suppliers in PICMG 3, as the high bandwidth communications capability and extremely robust mechanical and electrical definitions are attractive for next generation military communications equipment.

While PICMG 3 provides unprecedented processor density and data bandwidth, the specifications are not targeted directly at classic "server farm" applications, which generally do not require central office-grade reliability and robustness.

WHAT IS PICMG 3.X?

PICMG 3.x is a term sometimes used to describe the family of specifications. It is largely interchangeable with PICMG 3 as a descriptor. The specifications underdevelopment now include:

- PICMG 3.0. This is the overall general specification that defines mechanics, board dimensions, power distribution, power and data connectors, and system management. This is a "fabric agnostic" specification that is intended to serve the needs of a variety of fabrics currently on the market.
- PICMG 3.1. This defines an Ethernet switch fabric over the generic backplane fabric interconnect. It provides for data rates up to 10 Gbit/sec. per link.
- PICMG 3.2. This spec defines how InfiniBand[®] systems are built within the architecture and will specify link physical layers, protocols, and protocol mappings.
- PICMG 3.3 defines a StarFabric implementation over the backplane providing TDM, cell, control, and packet connectivity over the same fabric.

WILL THE PICMG 3 FAMILY GROW?

Yes. Any three PICMG Executive Members can propose a PICMG 3 subsidiary specification, and the PICMG Technical Officer is already receiving inquiries.

It seems reasonable to assume that mappings of Fibre Channel, 3GIO, and the cell based interconnect being proposed for PICMG 2.20 will also be developed for the PICMG 3.0 platform.

WILL THE SAME BACKPLANE WORK FOR DIFFERENT FABRICS?

The PICMG 3 family of specifications uses the Tyco/ERNI ZD high speed differential connector for data transport. This connector is capable of data rates up to 5 Gbit/second per pair and is a good choice for Ethernet, InfiniBand, and StarFabric. A number of other high speed fabrics can also be mapped to PICMG 3 and the ZD connector.

A sophisticated electronic keying methodology is used as part of the PICMG system management infrastructure to determine what boards are plugged into the system and what fabric topologies and fabric technologies they support. In general, an entire shelf will be populated with boards of a single fabric technology. PICMG 3 defines 8 high speed differential pairs per data link, each pair capable of data transmission up to 5 gigabits/second.

CAN PROPRIETARY TECHNOLOGIES BE DEPLOYED IN THE PICMG 3 ENVIRONMENT?

Yes. Any transport technology compatible with PICMG 3 backplane topologies and signaling characteristics may be deployed. It is anticipated that the System Management infrastructure will recognize the presence of user defined links and configure according to the same sort of interoperability rules used for those link technologies, which are explicitly supported.