

AXIe: AdvancedTCA[®] Extensions for Instrumentation and Test

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Test Evolution Corporation

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AXIe Standard: What and Why

- **What is it?**
 - A next-generation, open standard that extends Advanced Telecom Computing Architecture (AdvancedTCA[®]) for general purpose and semiconductor test
- **Why another modular test standard?**
 - Higher performance per rack inch
 - Greater scalability
 - Integrates easily with PXI, LXI and IVI
 - More modularity, more flexibility, higher speeds => addresses a range of platforms
 - ATE Systems, rack-and-stack modular, bench top, module plug-ins
 - Significant reduction of development and unit costs

Why AdvancedTCA as a foundation?

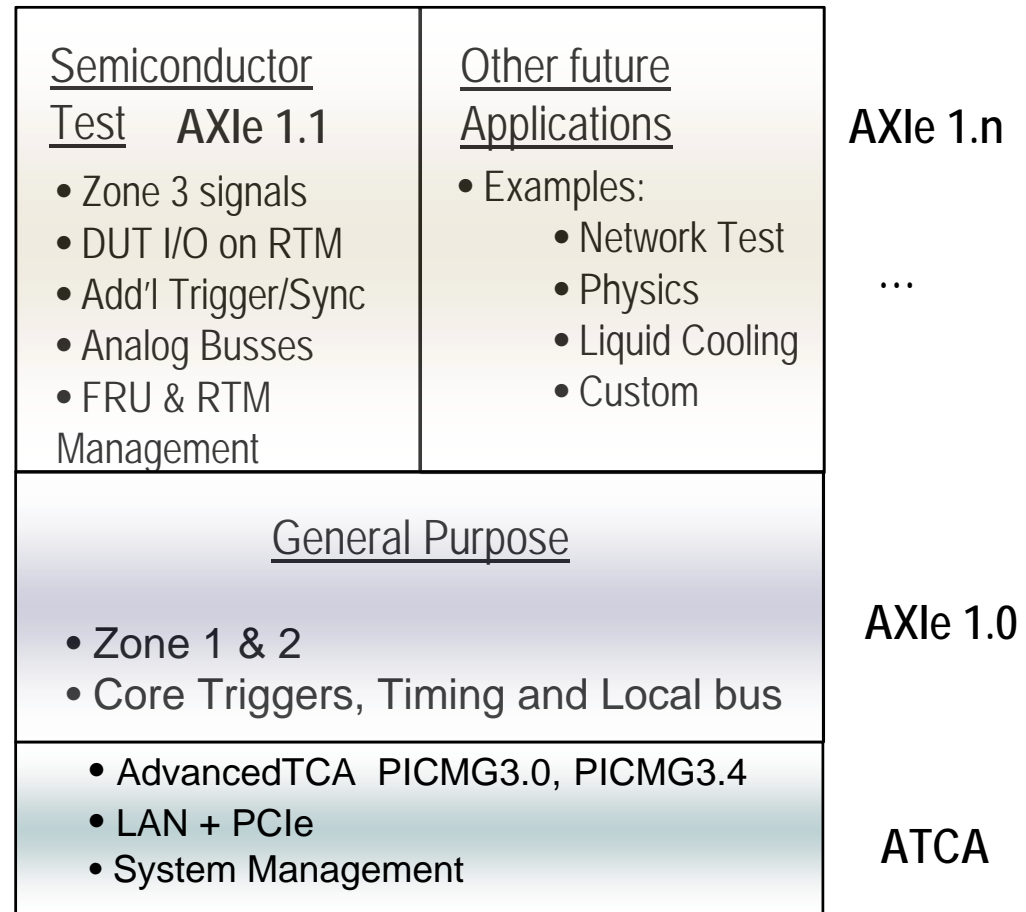
- **AdvancedTCA PICMG® 3.0 Standard:** *proven* open system architecture
- **Large board size**
 - Ideal for **high performance** instrumentation
 - Board size **matches that of planar instrument design**
- **Rack space efficiency**
 - Horizontal and vertical configurations
- **Scalability**
 - 1 slot to 14 slots, 1 Chassis to many, PXI/PCI adapters
- **Ideal for high power applications**
 - Single rail power management and robust cooling
- **Virtual LXI and PXI**
 - Base fabric support of LAN and PCIe data fabric support
- **Robust system management**
 - Intelligent Platform Management Interface (IPMI) enables both single chassis and multi-chassis system control functions
- **Extensions** for I/O, custom backplanes, liquid cooling

AXIe Standard Structure

AXIe is a scalable standard allowing a portfolio of applications, all of which can leverage general purpose instrumentation.

- Extensions built for specific applications
- Accepts all AXIe 1.0 modules
- Can define specific Zone 3 and additional System Management and system resources.

- Frugal use of AdvancedTCA resources
- Zone 3 unused to allow compatibility with extended uses and existing AdvancedTCA modules
- Allows carrier boards
- Core system management



AXI 1.0 and AXI 1.n refer to standards, not revision numbers
Revisions handled as Revision X.Y

AXIe 1.0 vs 1.1 Features

Feature	1.0	1.1
PCIe & LAN Hub	X	X
Local Bus	X	X
Trigger Bus	X	X
Frequency Reference (CLOCK) & Sync (SYNC)	X	X
Star Trigger (STRIG)	X	***
Bidirectional DSTAR (4)		X
User Defined Synchronization Signals		X
Load Board Support		X
Field Calibration Support		X

*** Only with 14-slot (or fewer) chassis

AXIe leverages ATCA

AXIe

AdvancedTCA

- AdvancedTCA specific extensions
- IPMI and resource management
- Timing and Sync
- Zone 3 configurations

...draws from and works with existing instrument standards

PXI

- Virtual PXIe instruments
- PCIe communication

IVI

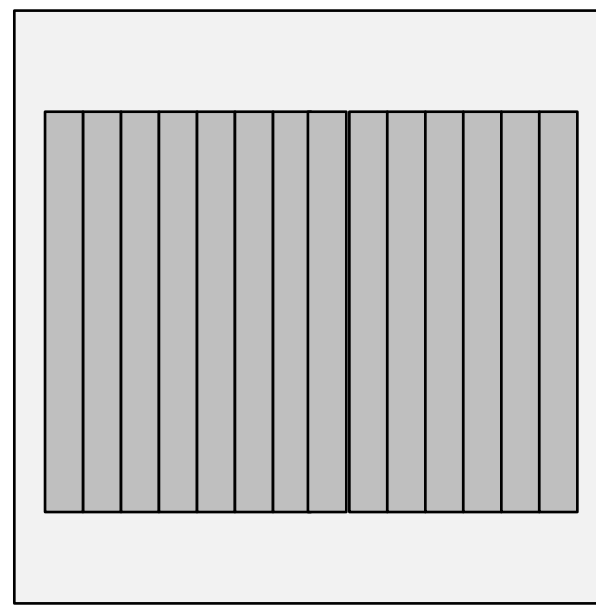
- Standard drivers work in all Application Development Environments
- VISA standard

LXI

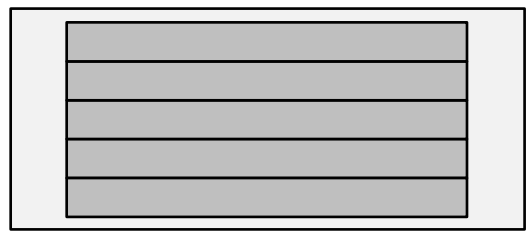
- Virtual LXI instruments
- LAN communication

High scalability of AXIe

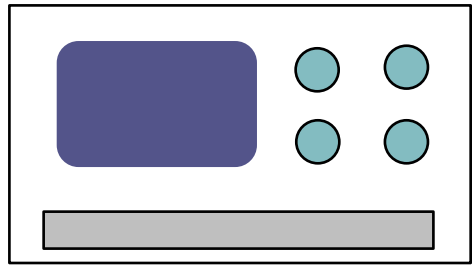
14 slot Vertical



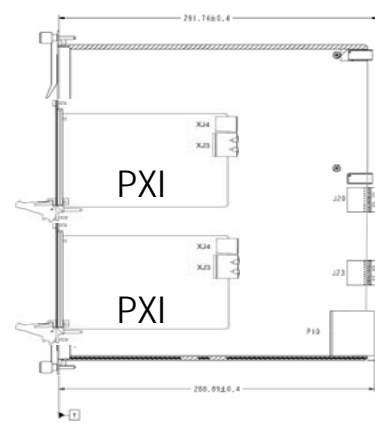
n U Horizontal



1U

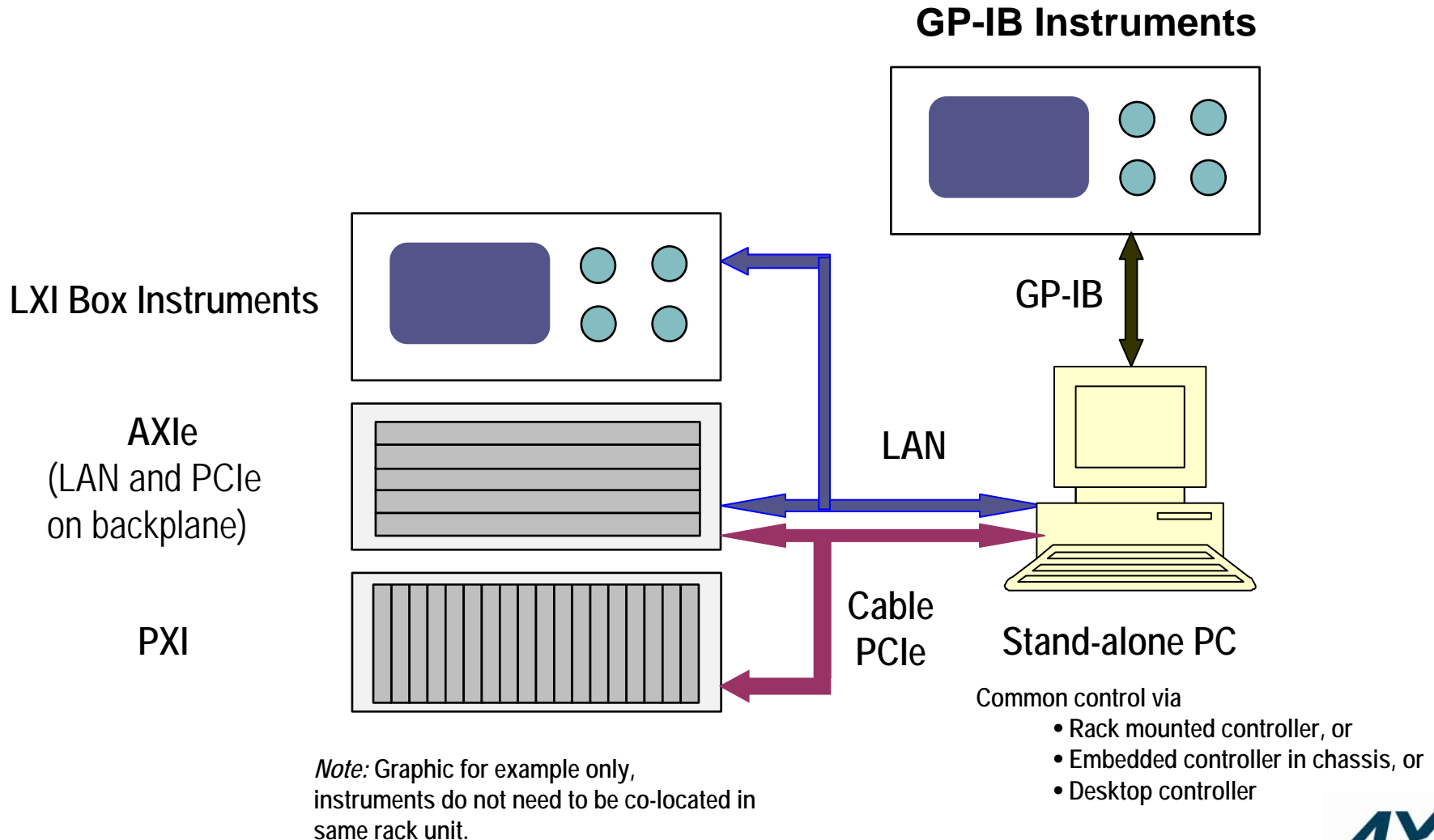


Specialty instrument with AXIe module

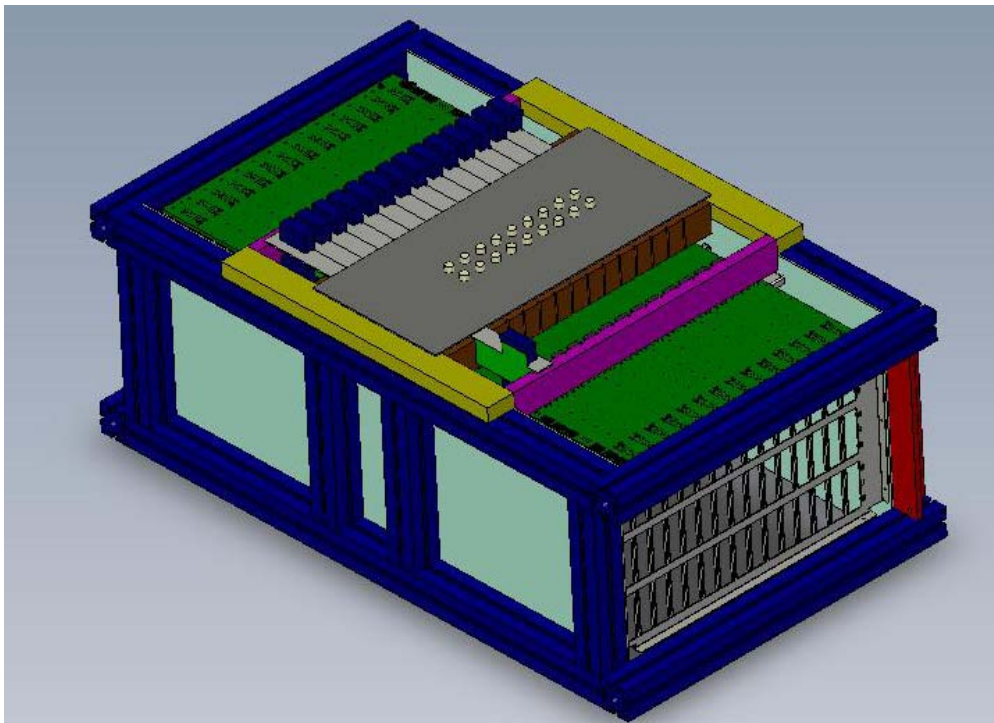


PXI carrier module

AXIe integration with Rack and Stack



AXIe integration in Semiconductor Test



Note: Graphic for example only.

- Scalable combinations of AXIe and PXI chassis
- Zone 3 Extensions for digital synchronization DUT I/O, and other ATE system resources
- Accepts standard PXI and AXIe 1.0 modules

Summary

- **Extending AdvancedTCA**
 - AXIe is based on AdvancedTCA with extensions for instrumentation and test.
- **General Purpose (1.0) & Semiconductor Test (1.1)**
 - AXIe will have a base standard of AXIe 1.0 for general instrumentation, and a layered standard of AXIe 1.1 for semiconductor test.
- **More Performance, Scalability, Flexibility**
 - AXIe delivers higher performance in a flexible, scalable platform.
- **PXI, LXI, IVI**
 - AXIe works well with other standards, such as PXI, LXI and IVI.
- **Lower costs**
 - Enables significant reduction of development and unit costs.
- **Longevity**
 - Promises longevity due to high performance coupled with layered standards

Next Steps

- **Potential future AXIe standard efforts**
 - AXIe 1.N standards for additional markets
 - Alternative Zone 3 definitions within new 1.N standards
 - Hybrid systems of AdvancedTCA/AXIe 1.n combinations
 - Fully integrated PXImc
 - MicroTCA[®] derivatives for AXIe
- **AXIe Consortium**
 - Quick completion of the AXIe 1.0 and 1.1 standards
 - For more information, go to www.axiestandard.org or email Bob Helsel, Executive Director at execdir@axiestandard.org