

Test architecture-related standards

VXI, PXI

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Request for Review and Report Relative to Test Architecture-related Standards and Approaches

1. Several test architecture-related standards and approaches are widely used in automatic testing, and new standards and approaches are being introduced. IVI, VXI, PXI, PCI, LXI and AXIe each have a set of unique characteristics.
2. It is requested that the NDIA Automatic Test Committee perform a review of these test architecture-related standards and approaches, and prepare a report comparing them (and any other architectures or standards that are in general use or that may be introduced in the relatively near term). The report should include at a minimum the following information:
 - Application and use of each standard or approach throughout the automatic test industry
 - The IEEE and industry standards that each implements
 - Advantages and weaknesses of each
 - Features of each including scalability, modularity, bus speeds, frequency ranges, power, etc
 - Relative cost of implementation
 - Physical dimensions of chassis and modules; number of slots available
 - Electrical and mechanical requirements
 - Availability of products that use the standard or approach
 - Market trends (growing or declining market shares); outlook for the future of the standard or approach
3. The objective is to provide a comprehensive report that the Services can use as a reference source when developing solutions to weapon system automatic testing requirements.

Helping DoD Achieve their NxTest Vision

For future military ATE systems

1. Reduce overall cost of ownership

- Achieve higher utilization from lower quantities of basic measurement modules.
- Elimination of redundant hardware and software.

2. Reduce long-term support costs

- Reduce the amount and frequency of replacing discontinued commercial test equipment by using long-lifetime basic functional modules.
- Reduce the expenses of rewriting test software and re-verifying system performance from frequent COTS product obsolescence.
- Reduce number of unique instruments in test systems.
- Utilize simplified hardware modules with basic functionality.
 - To support backwards and forward compatibility
 - To protect the Test Program Set



Helping DoD Achieve their NxTest Vision

For future military ATE systems


3. Common systems architecture deployable across all services

- A common module definition will promote flexibility, interoperability, and competition

4. Reduction in test system size and weight

- Eliminating unneeded displays, keypads, etc. from instruments used in ATS
- Repackaging basic functional modules into a smaller form factor.
- Reducing the number of redundant functional blocks.

5. Morph-able and scalable

- A common module definition will promote flexibility, interoperability, and competition.
 - Common functional software modules reduce future code generation.
 - Simplified hardware modules to provide basic measurement functions.
 - Basic functional modules allow future re-configurability.
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Architectures from different perspectives

Many of the items requested (previous slide) may have a different “best” answer depending on the perspective of the evaluator. Attempt to offer alternatives based on differing perspectives.

Equipment Provider (Software and Hardware)

System Integrator

End User or Depot (Army, Air Force, Navy, Marines)

