NDIA Meeting
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Agenda for Commercial Liaison

- Request for analysis for Modular Platform optimization

- Open Modular Platforms considered
  - VXI – VME Extension for Instruments
  - LXI – LAN Extension for Instruments
  - PXI – PCI Extension for Instruments
  - AXIe – AdvancedTCA Extension for Instruments

Considerations for ATE being optimized NxTest Vision

1. Reduce overall cost of ownership
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.

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.
   - Simplified hardware modules to provide basic measurement functions.
   - Basic functional modules allow future re-configurability.

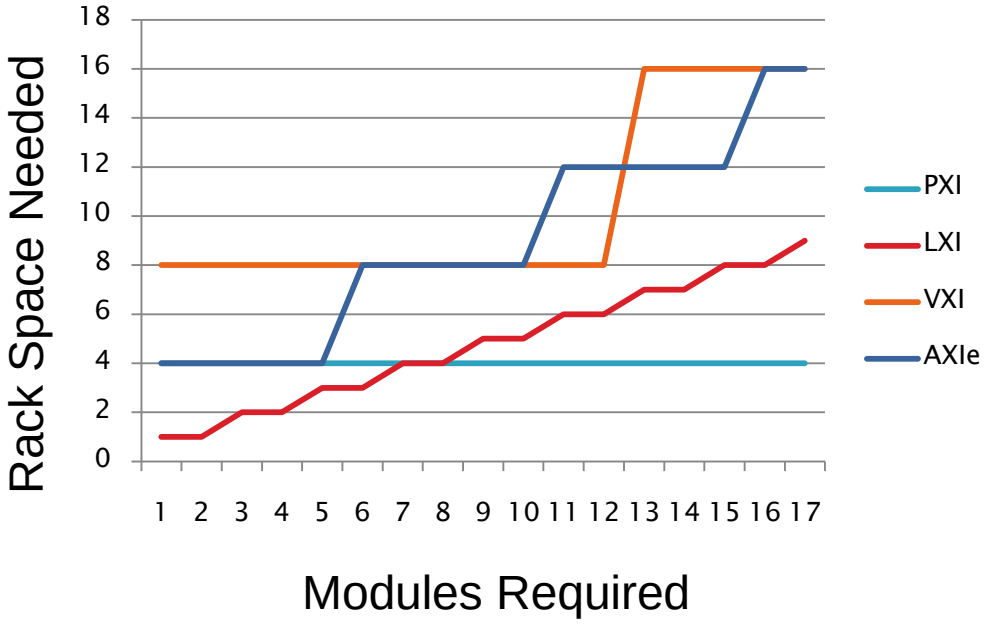
Reduction of ATE *Size* and Weight Comparing Rack Space vs Platform

- Is Smaller Better?
  - Can it make the measurement?
  - Reduced weight (improved reliability)
  - Can it be cooled?
  - Is there enough space for rugged connectors?

	PXI	VXI	LXI	AXIe
Card Cage EIA Rack Units	4	8	1U ½ width	4
Number of Card slots	17	12	8	5
Real Estate size (cm^2)	160	782	1100	900
Full Card Cage	2720	9384	8800	4500
Normalized per EIA Rack Unit	680	1173	2200	1125

Example 1
Instrument is small (<160 cm²) 6 ½ Digit DMM

	PXI	VXI	LXI	AXIe
DMMs per Card Cage	17	12	8	5
DMMs per EIA Rack Unit	4.25	1.5	2	1.25



Example 2

Instrument Components are large (Microwave Spectrum Analyzer)

	PXI	VXI	LXI	AXIe
µwave SA per Card Cage	2-	3	2	?
DMMs per EIA Rack Unit	.5-	.375	.5	?

- High performance Microwave products
  - •Can it make the measurement?
  - • Lower Noise requires dedicated power supply
  - •High isolation requires more shielding
  - •Higher power outputs requires more current

Example 3

High Power consumption instruments (High Speed Digital)

	PXI	VXI	LXI	AXIe
Power available per Slot	30 W	100 W	Module Dependent	200 W
PCIe maximum data bandwidth (Maximum Gen 2.0): Single peripheral slot to backplane All peripheral slots to system slot/embedded controller	4 GB/s 8 GB/s	40-320 MB/s	1GB/S	2 GB/s 26 GB/s

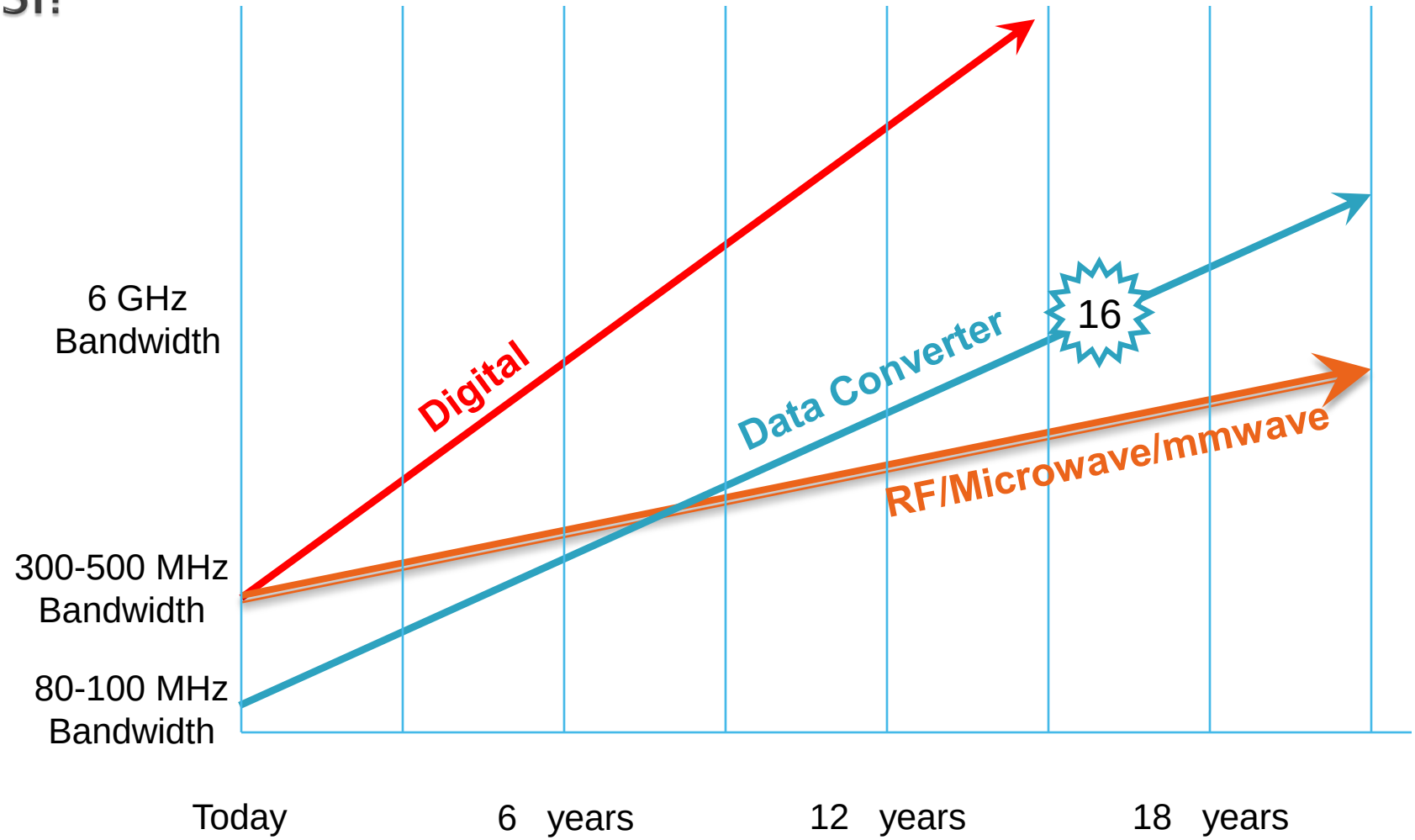
- High Speed Digital products
  - Bandwidths exceeding GB/sec
  - High Speed FPGA
  - High Bandwidth Data Converters (DAC, ADC)
  - Cooling becoming major issue
- How much Bandwidth is required for the Application?

Component technology cycle time

- Components double in performance or for the same performance the cost will be cut in half.
- Commercial component technology is >6GHz

Digital	D/A and /or A/D Conversion	RF/μwave /mmwave
•DSP Speed •μprocessor speed •Memory size and speed	•Higher sample rate for a given dynamic range •Higher dynamic range for a given sample rate	•Asymptotically approaching the performance limits •Advances in size and cost are key
~18 Months	*~24-36 Months*	*~36-96 Months*

When will we have Components available for the Ideal SI?



Summary

- There is no best answer.
- Required measurement performance drives decision
- Not all measurements are available in each of the Modular formats
  - Systems Engineering must decide on optimum configuration
- Time will take care of size challenges

- Biggest challenges
  - Power handling
  - Data throughput
  - Cooling (environmental)

Questions?