



# NDIA ATC Meeting Commercial Liaison Report

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# AGENDA

- Mergers/Acquisitions/Spin Offs
- Advancing Instrumentation in the 5G Era
- ONR S&T Expo
- PXI, VXI, AXIe, LXI Refresh

# Mergers/Acquisitions/Collaborations/New Starts

- Agilent Technologies' T&M spun off as a new entity: Keysight Technologies Inc.
- Astronics Corp acquired EADS North American Defense
  - Astronics Test Systems includes former DME as well as former EADS NAD
- Cobham Wireless and National Instruments have teamed up
  - Under the partnership, NI is acquiring Cobham's line of PXI modular hardware and will be Cobham's primary provider for PXI instruments.
- Teradyne, Inc. acquired Avionics Interface Technologies, LLC (AIT), a leading provider of equipment for testing avionics data buses.
- NI acquired BEEcube, a technology innovator and leading supplier of high-performance FPGA prototyping and deployment products .

# From 1G to 5G

How Moore's Law is Advancing  
Instrumentation in the 5G Era

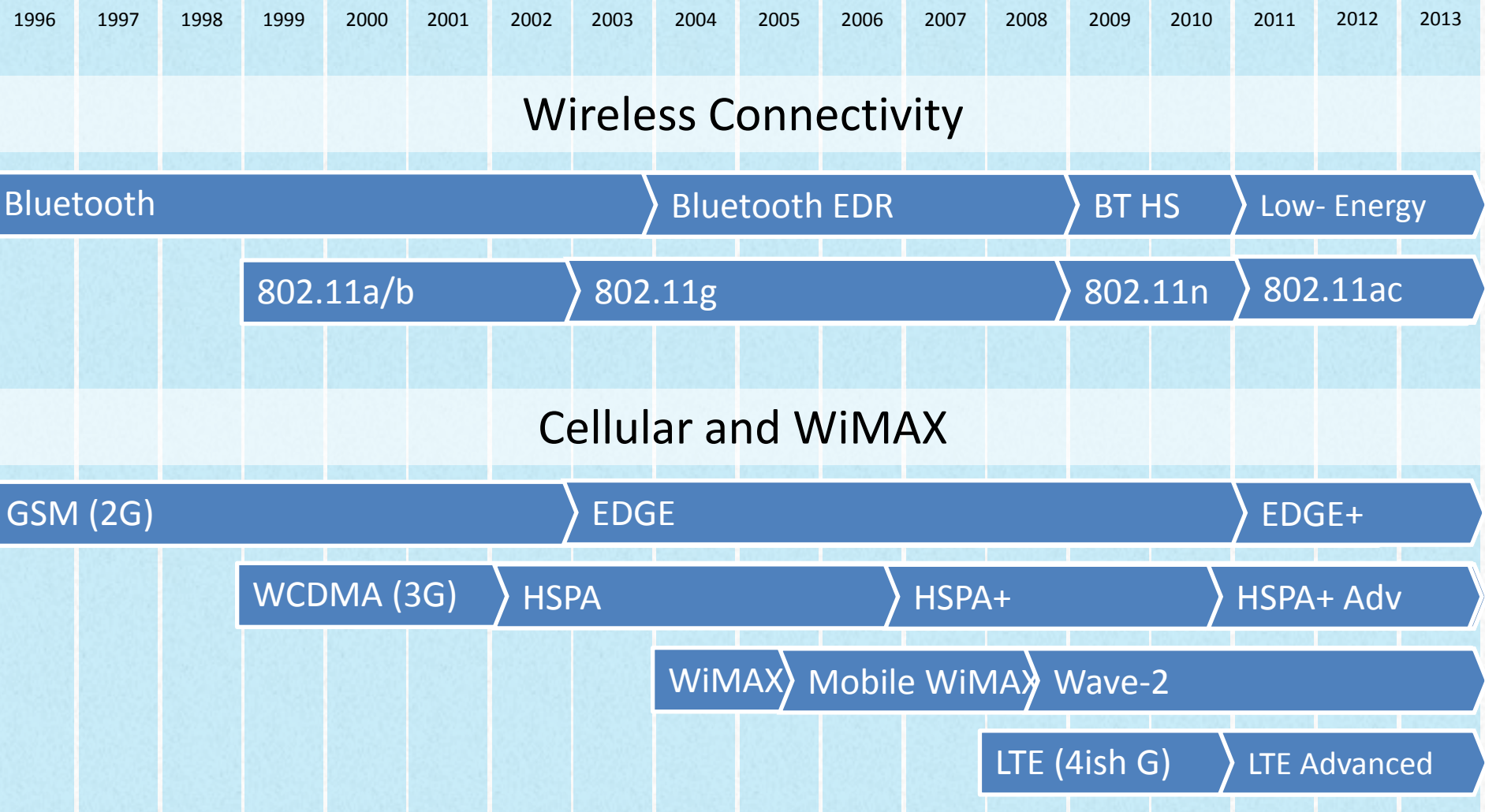
# Est. time to download a 100-minute HD Movie Sized at 1.4 GB



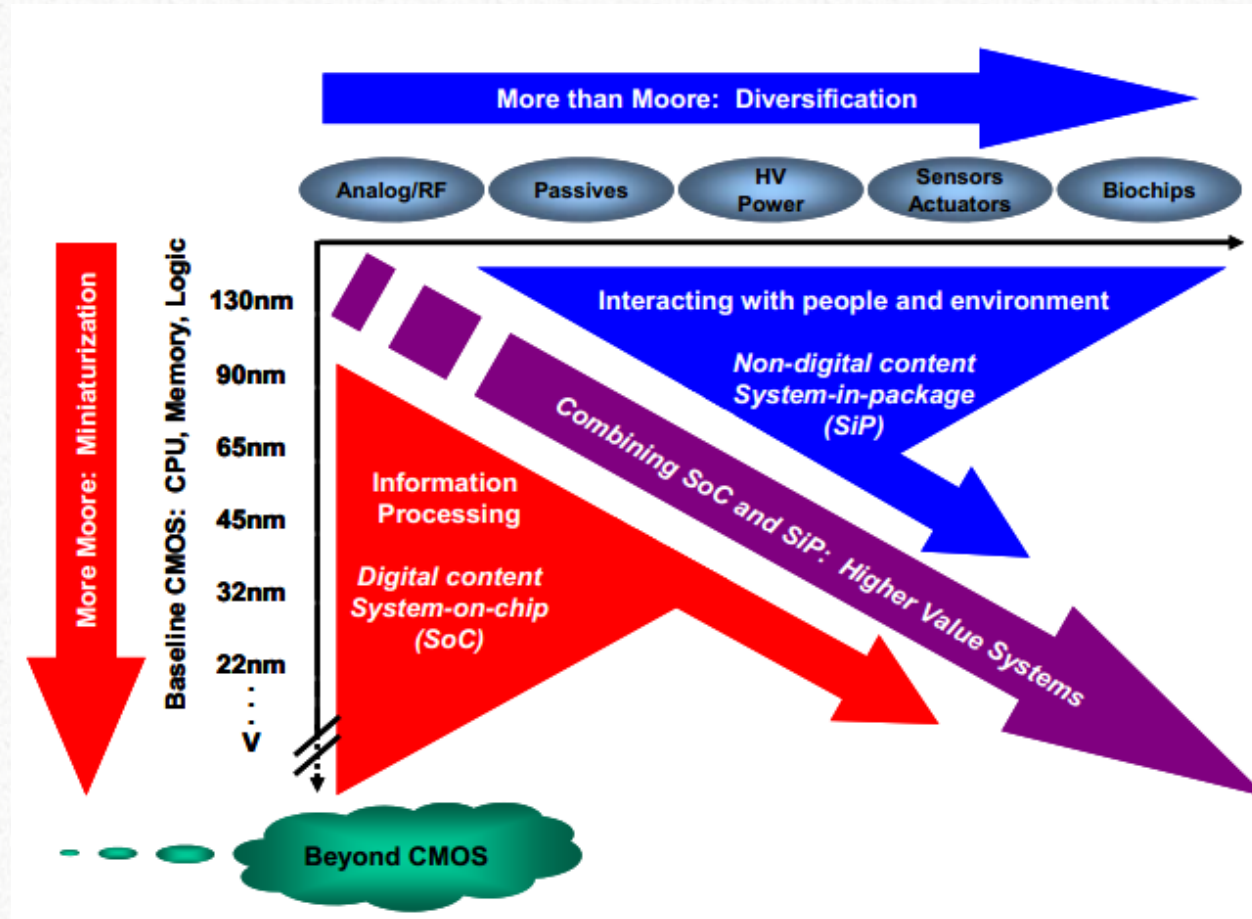
Year	1984	1991	2001	2009	2015
Technology	1G	2G	3G/3G+	3.9G/LTE	4G/LTE-Adv
Bitrate	N/A	300 kbps	42 kbps	129 Mbps	300 Mbps
Ch. BW	30 kHz	200 kHz	5 MHz	20 MHz	100 MHz



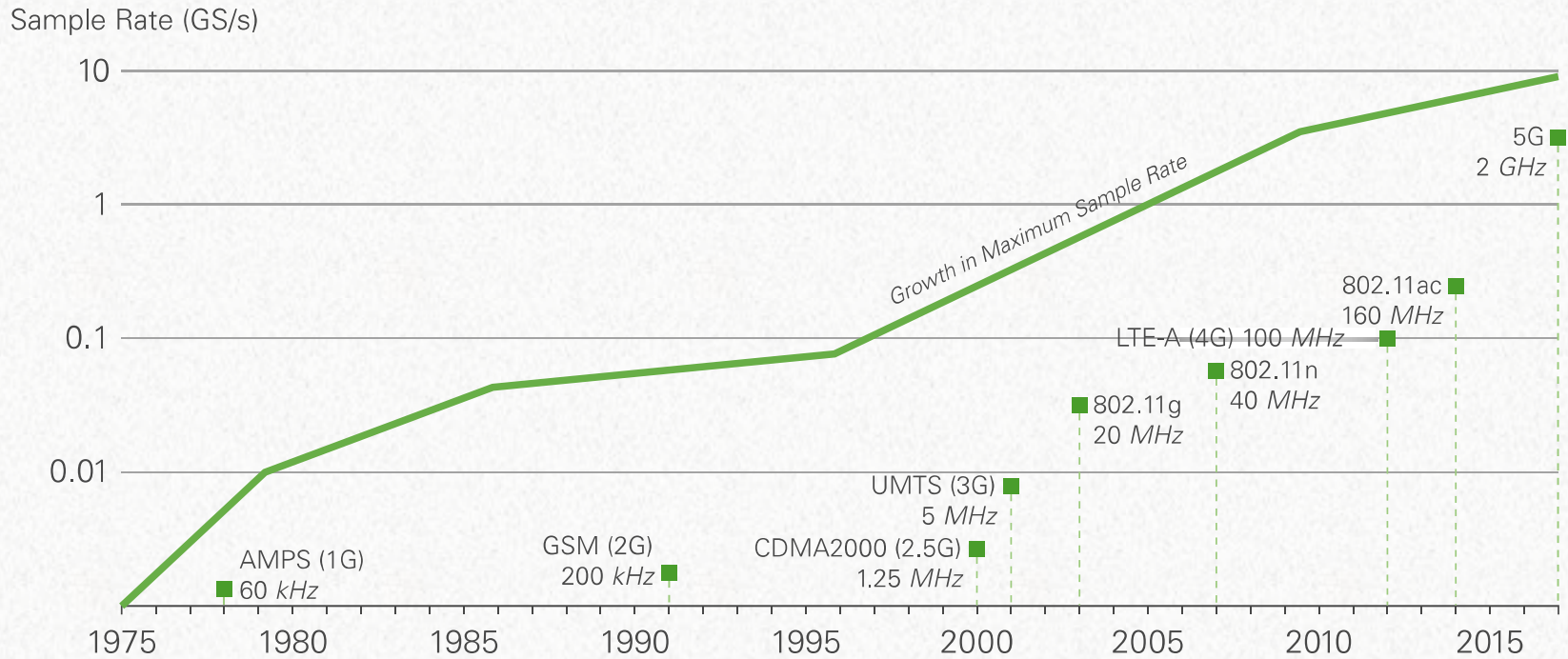
# Evolution of Wireless Standards



# More than Moore



# From 1G to 5G





# ONR S&T Expo

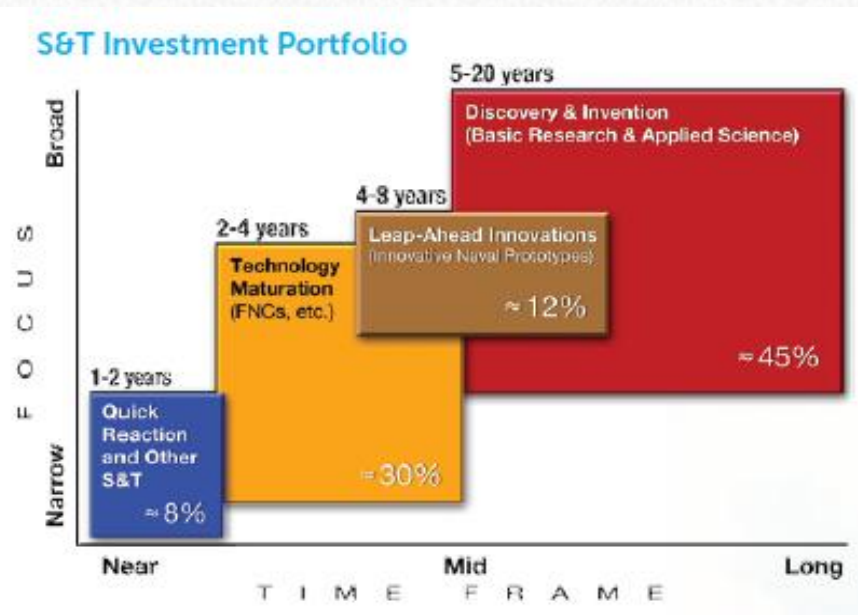
- February 4th -5<sup>th</sup>, 2015
- 2700 attendees



- For more than 90 years, the naval science and technology (S&T) community has been delivering technological advantages to the Fleet.
- Game-changing capabilities are born from scientific research, and investments made today will ensure U.S. naval power throughout the 21st Century.
- S&T budget is approximately 1 percent of DoN's budget.

# S&T Investment Priorities

What ONR Does Now Affects Test in the Future



\*Data from 2015 ONR Naval Strategy

- Quick Reaction S&T - war fighter centric technology projects responsive to the immediate needs identified by the fleet.
- Technology Maturation - delivers critical component technologies to naval acquisition programs.
- Leap-Ahead Innovations - higher risk is typically accepted to produce a higher payoff.
- Discovery & Invention - fundamental science with a long time span needed to mature discoveries.

# The Nine Naval S&T Focus Areas Are:

- Assure Access to Maritime Battlespace
- Autonomy and Unmanned Systems
- Electromagnetic Maneuver Warfare
- Expeditionary and Irregular Warfare
- Information Dominance – Cyber
- Platform Design and Survivability
- Power and Energy
- Power Projection and Integrated Defense
- Warfighter Performance

# Electromagnetic Maneuver Warfare

- Spectrum Dominance
  - Understanding the electromagnetic environment through sensing
  - Assuring access to the full spectrum for battle space awareness, threat assessment and offensive and defensive operations
  - Influencing/controlling the opponent's battle space picture
- Electronic Warfare
  - Full-spectrum electronic sensing measures
  - Integrated and coordinated electronic attack
- Advanced Electronics, Sensing and Response Techniques
  - Ultra-wide-band apertures and electronics
  - Management and control algorithms for spectral management across battle force



# Better Buying Power 3.0

## Affects the Test Community

- "To make the most of the research dollars, DoD plans to rely heavily on the **concept of rapid prototyping.**"
- DOD doesn't have enough money to pump into development of as many new weapons systems right now, it needs to repeat what it did in the 1970s when it decided to pump money into research for the prototypes that eventually became the Apache helicopter, the Abrams tank, the Aegis naval weapons system and the Patriot missile a decade later when military funding was flowing freely once again.
- DOD will develop a handbook of "methods and best practices" by July 2015 to inform DoD managers on how to engage with commercial technology companies.



# PXI & AXIe Refresh

- PXI Alliance:
  - ~ 65 Members
  - > 1500 + Products
  - PXI-7: PXI Multicomputing HW Spec, Rev 1.0
  - PXI -8: PXI Multicomputing SW Spec ,Rev 1.0
  - PXI-9: PXI & PXI Express Trigger Management Spec,Rev 1.0
  - [www.pxisa.org](http://www.pxisa.org)
- Annual Meeting
  - Autotestcon 2015
  - National Harbor, MD
  - November 2<sup>nd</sup> – 5<sup>th</sup>
- AXIe Consortium:
  - ~ 9 Members
  - ~ 20 Products
  - AXIe 1.0 Base Arch Spec, Rev 2.0
  - AXIe 2.0 Base Software Spec, Rev 1.0
  - AXIe 3.1 Semiconductor Test Extension ,Rev 1.0
  - [www.axiestandard.org](http://www.axiestandard.org)

# VXI & LXI Refresh

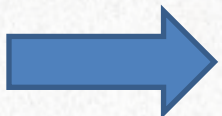
- VXI Bus Consortium:
  - 14 Members
  - ~ 1500 Products
  - VXI 4.0
  - <http://vxibus.org>
- LXI Consortium
  - ~ 50 Members
  - > 2600 products(9/10/14)
  - LXI 1.4 (Core/Extended)
  - Will be releasing the LXI Reference Design .
  - <http://lxistandard.org>
- LXI Meeting & Plug Fest  
Denver, CO , May 4 - May 6, 2015

# Technology Venue for Future Meetings

- Autonomous Systems/Proposed Standards.
- Multichannel RF/Microwave
- Synthetic/Software Defined Instrumentation
- ADC & DAC Technology
- Compact Signal Switching
- Advances in Modular Architectures
- Robotics Impact on T&M
- Embedded Design & Test
- Reconfigurable/FPGA based Instrumentation
- Heterogeneous Computing
- Automation/Abstraction Tools
- **Other technologies** as nominated by NDIA ATC members:
  - Technology focused



- **NDIA ATC Supplier Inputs encouraged/needed.**



Questions/Discussion?