

DoD CIO Brief to JHU APL 5G IEEE Summit



***Mr. Frederick D. Moorefield, Jr.
Acting Principal Director for C4 and
Information Infrastructure Capabilities***

Principal Staff Assistant (PSA) to SECDEF For Information Technology

DoD CIO PSA Responsibilities

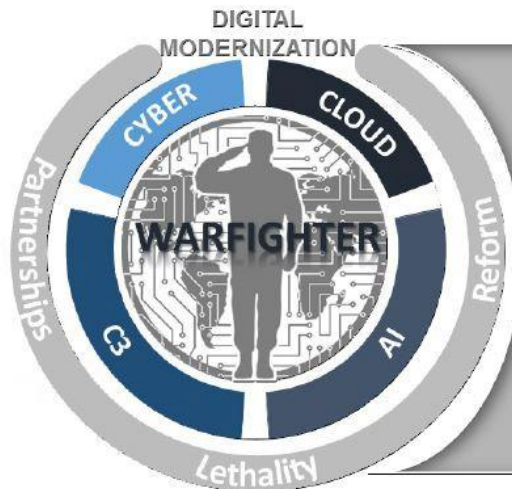
- *Spectrum Management*
- *Network Policy and Standards*
- *Information Systems*
- *Cybersecurity*
- *Positioning, Navigation, and Timing (PNT)*
- *Command, Control, and Communications (C3)*



Mr. Dana Deasy
DoD CIO

Key Focus Areas

- *Artificial Intelligence*
- *Cloud*
- *Cyber*
- *C3*



Deliver the lethality our warfighters need.

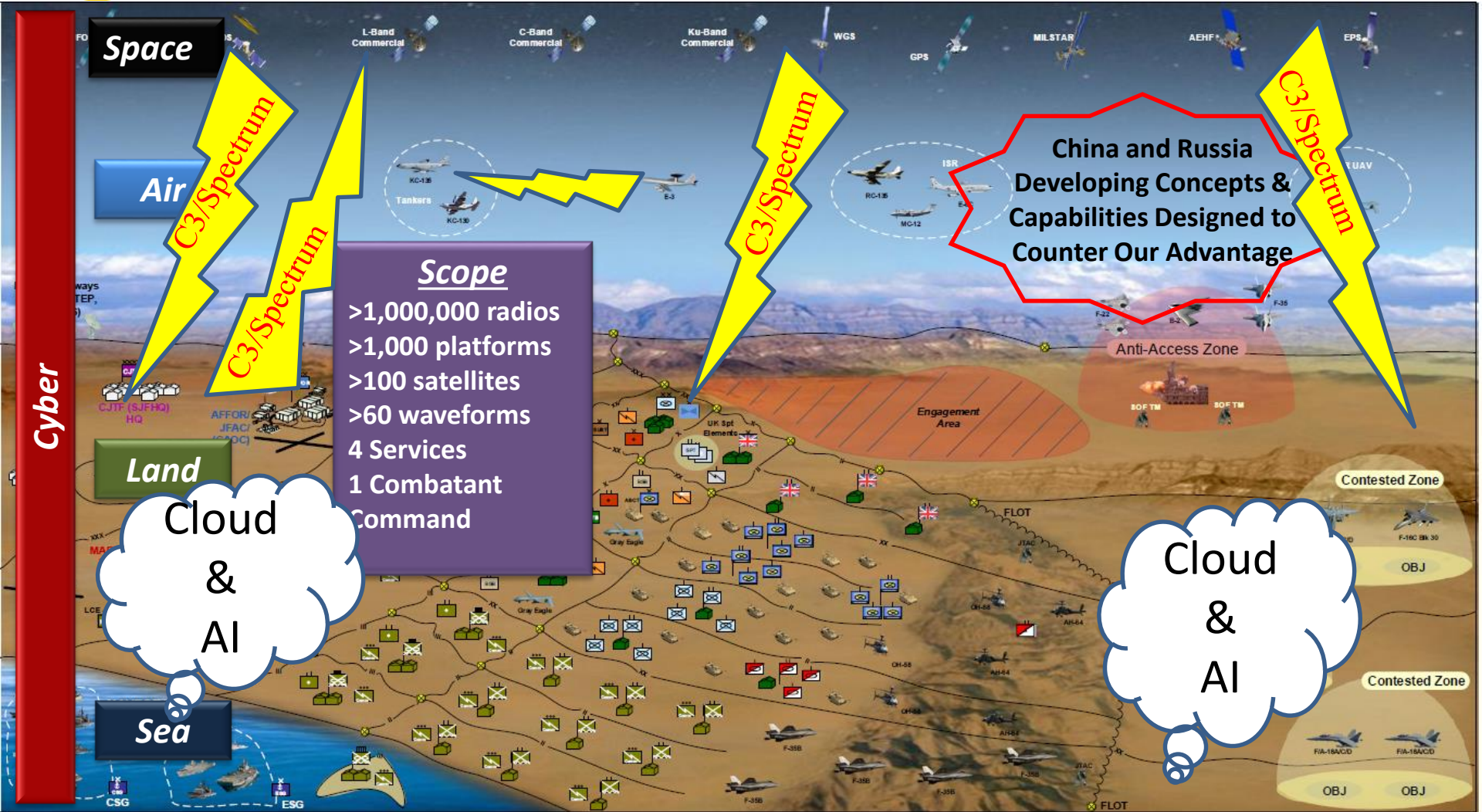
Foster partnerships that cut across barriers to mission success.

Enact reforms to maximize resources and minimize unnecessary risks.

“This is a period of unified purpose, intellectual rigor, and unwavering dedication to the National Defense Strategy's three lines of effort.” – DoD CIO, July 11, 2018



Framing Warfighter IT Environment



*Wired & Wireless, Space to Terrestrial
Multiple Systems, Multiple Networks, Multiple Devices*

More Spectrum Sharing is the **NEW NORMAL!**

“Where and When it Makes Sense”



Dr. Brian Teeple – Nuclear Scientist

FACTS

- *Airwaves are crowded and getting worse*
- *Spectrum sharing with non-traditional partners increasing*
- *Everyone's wireless needs are increasing*
- *Global phenomena*
- *More spectrum sharing is the new normal*

IT DOESN'T TAKE ROCKET SCIENTIST!

SUPPORT THE WARFIGHTER

Watch the Trends!

*“Now we are looking for new ways to share spectrum among incumbents and new users. This is rarely problem-free, even when it is technically possible. But with new and dynamic access techniques and technologies, sharing continues to offer a lot of promise. NTIA continues to work with the FCC to develop **sharing and repurposing approaches across low, medium, and high band spectrum ranges.**”* - NTIA Administrator David Redl, Remarks at NTIA Spectrum Symposium, June 12, 2018

“The era of easy spectrum decisions is over.” -

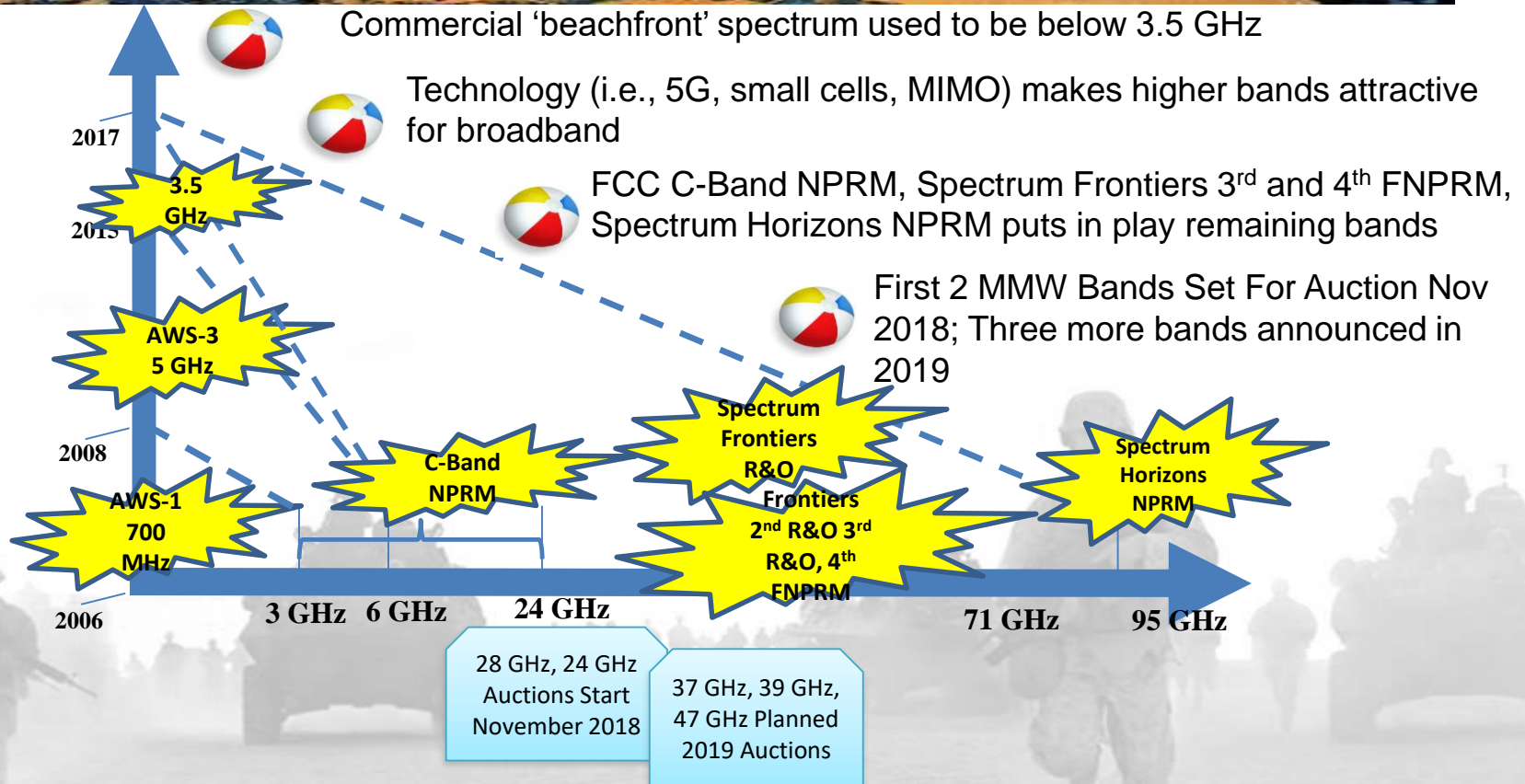
NTIA’s David Redl Brookings Institute Fireside Chat, Oct 12, 2018

“We’re at a point now where everything is wireless. I don’t even think we’ve reached the pinnacle of realizing what that really means. As the airwaves continue to get more and more crowded, more spectrum-sharing is going to be the new normal.” - Frederick Moorefield, Acting Principal Director for C4 and IIC, Law360 Interview, September 2018

“To meet the warfighter’s growing demand for spectrum access, DoD will exploit technology to increase DoD spectrum access efficiency, flexibility, and adaptability. This approach is intended to increase DoD capabilities while minimizing EME impact and improving upon today’s spectrum sharing opportunities.”

DoD EMS Strategy
September 11, 2013

National Policy Trends: Expanding Beachfront



Spectrum Repurposing Activities

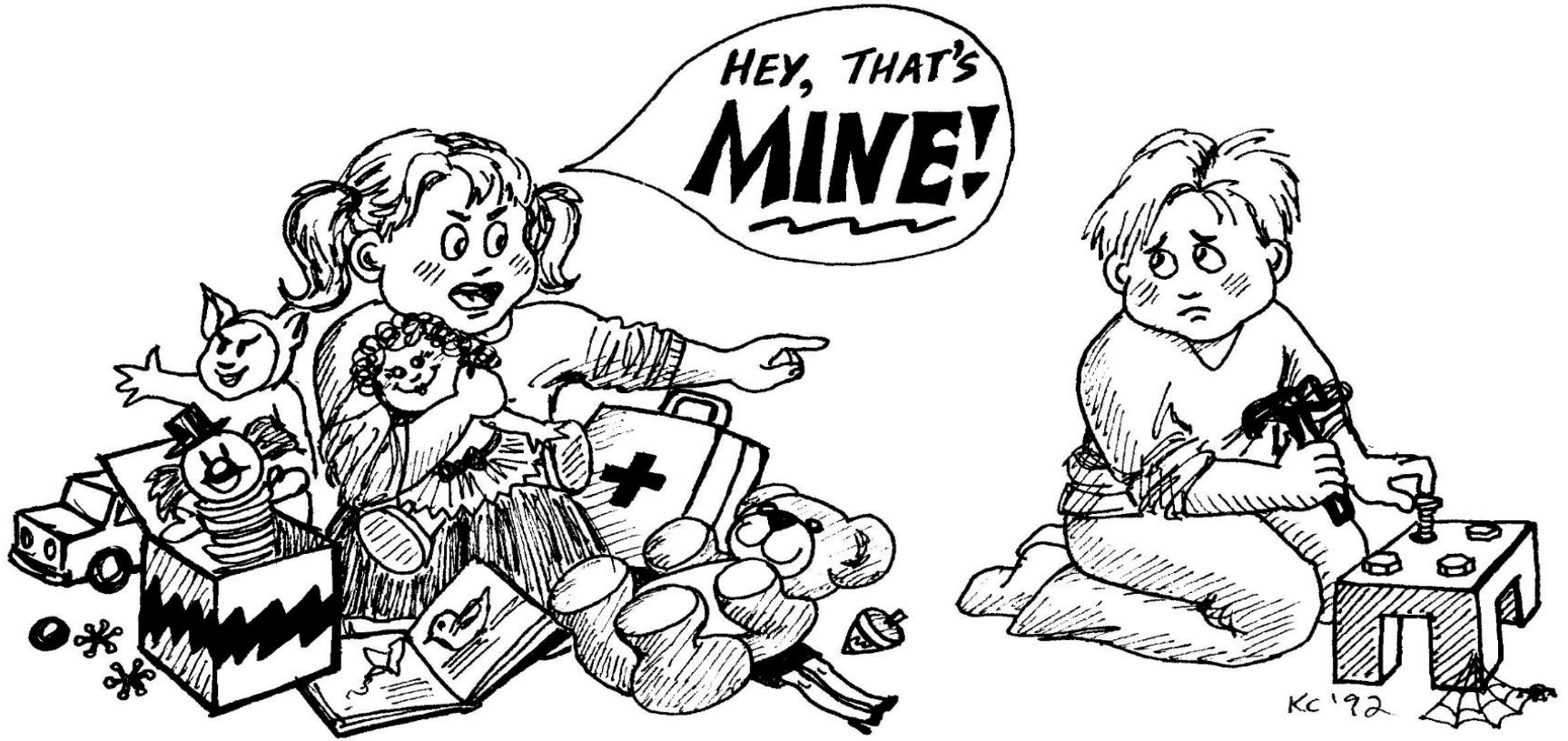
- **Mandates:**

- Spectrum Pipeline Act
 - (NTIA) Identify 30 megahertz of federal spectrum < 3 GHz by 2022; auction by 2024
 - (FCC) 50 megahertz (< 6 GHz) by Jan 2022
 - (FCC) 50 megahertz (< 6 GHz) by Jan 2024
- MOBILE NOW Act - Identifying the 255 megahertz
 - 100 megahertz < 8 GHz (unlicensed) by Dec 2022
 - 100 megahertz < 6 GHz (licensed) by Dec 2022
 - 55 MHz < 8 GHz (licensed or unlicensed) by Dec 2022
 - Feasibility study for 3100-3550 MHz (NTIA) by Mar 2020 – **Military Air, Ship, Ground based radar**
 - Feasibility study for 3.7–4.2 GHz (FCC) by Sep 2019 - **COMSATCOM**

- **Bands under consideration**

- 1300-1350 MHz (30 megahertz) – via Pipeline Plan – **Federal Air Surveillance Radar**
- 1675-1680 MHz (5 megahertz) – via Pipeline Plan – **Federal MetSats**
- 2020-2025 MHz (5 megahertz)
- 3.5 GHz (CBRS) – **Military Ship, Ground based radar**
- 3450-3550 MHz (100 megahertz) – selected for study – **Military Air, Ship, Ground based radar**
- 5850-5925 MHz (40/75 megahertz) – **Vehicular devices**
- 5.925-6.425 GHz; and 6.425-7.125 considered per FCC Mid-Band NOI – **Flight Test Telemetry/Fixed microwave**
- Millimeter wave – Spectrum Frontiers and Spectrum Horizon – **SATCOM, Fixed Microwave**

SPECTRUM SHARING



WE HAVE TO CONTINUE TO CHANGE THE PARADIGM!

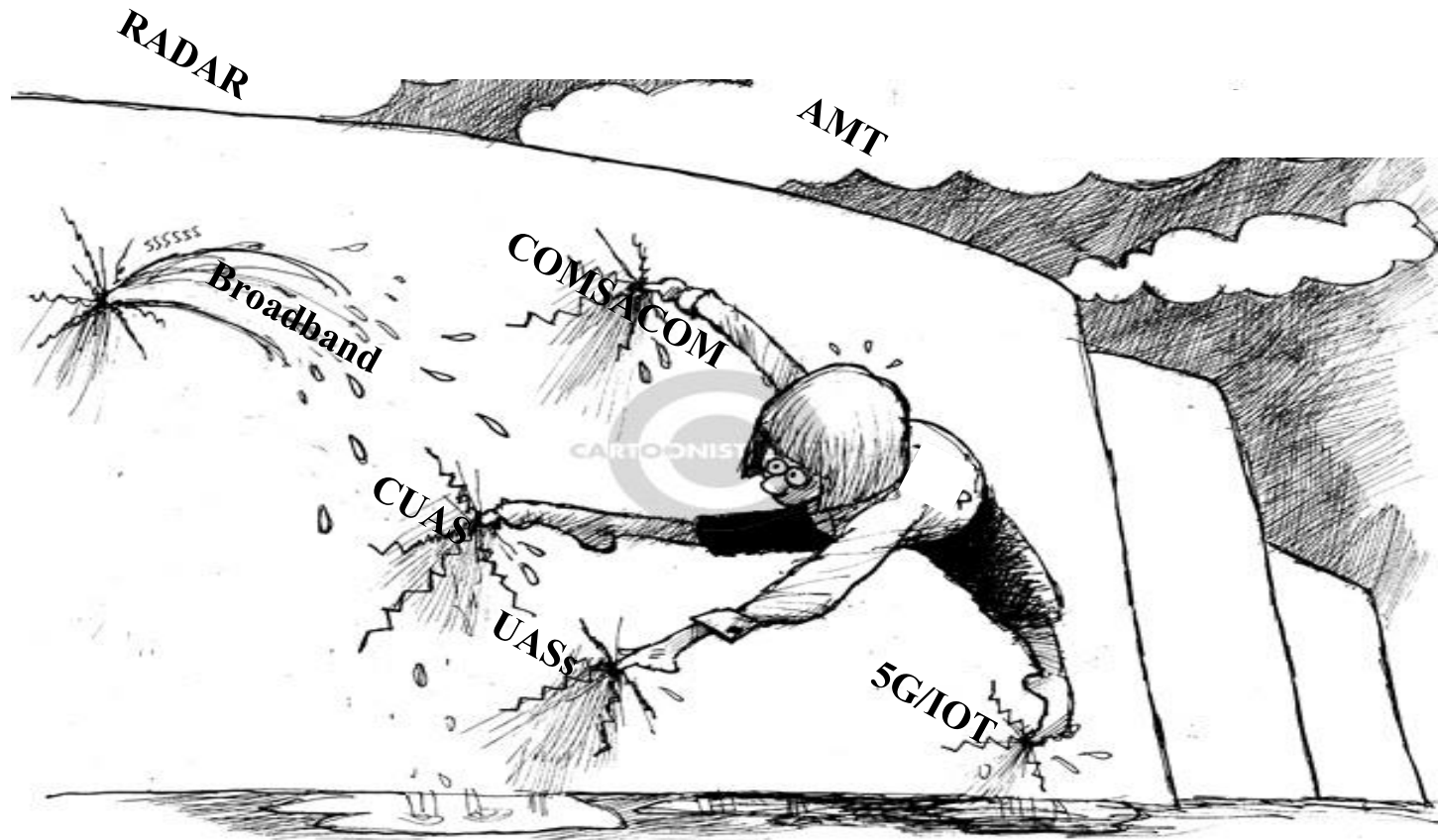


**IF YOU ONLY
FOCUS ON THE PROBLEM**



**YOU MIGHT
MISS THE EASY SOLUTION**

We Have to be *STRATEGIC*



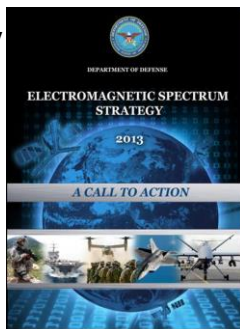
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WE HAVE TO GET AWAY FROM THE "WHAT'S NEXT" SYNDROME!

DoD Has Taken Action to Facilitate Spectrum Sharing

Electromagnetic Spectrum Strategy

- Published in 2103
- 2018/19 Update Ongoing
- Agile EMS Ops
- Real time, Dynamic, Distributed
- Partnerships
- Technology Innovation
- EMS Reform via Policy & Regs



Goal: EMS Access When and Where Need to Achieve Mission Success

National Spectrum Consortium

- Established in 2013
- Public/Private Partnership
- CIO/AT&L Partnership
- Over 200 industry members
- Technologies and Contract available to other Feds



Goal: Development of Innovative Spectrum Sharing Technologies

Spectrum Access R&D Program

- DoD enterprise spearheaded by the DoD CIO, ASD R&E, & Joint Staff, to develop and field innovative spectrum technologies
- Leverages DoD's Science & Technology/Research & Development (S&T/R&D) resources while drawing upon the expertise of academia/industry via the National Spectrum Consortium (NSC)
- Leverages the ongoing DoD EMS Strategy activities focusing on:
 - EMS efficiency, flexibility and adaptability to improve spectrum access
 - EMS agility to dynamically sense and move to unused spectrum bands
 - EMS resilience to operate in both congested and contested spectrum environments
- DoD funding 27 projects with \$500M from spectrum auction funds



National Advanced Spectrum Communications Test Network

- Spectrum Sharing Through Collaboration
- One stop shop for trusted testing of spectrum sharing technologies
- Mission: Increase Federal and commercial spectrum access by accelerating the development of spectrum sharing technologies
- Benefits: Access to 23 test ranges, 3 service labs plus DARPA, Speed to meet tight time constraints, and more.....



Goal: Maintaining operational capabilities in the face of increasingly congested and contested spectrum environments

Goal: To create an environment of trust to support impartial testing and evaluation of new spectrum sharing technologies



DoD 5G Contributions

Spectrum

- DoD CIO, with support from the MILDEPS/DISA, is actively working domestically with FCC and NTIA to identify spectrum for 5G ensuring no impact to military operations
- The Department is also supporting the State Department as part of their Ambassador-led delegation to globally identify spectrum for 5G as part of the International Telecommunication Union (ITU) World Radiocommunications Conference 2019.
- DoD participated in the White House 5G kickoff event held September 28.

Standards

- DoD is a member of the IEEE and other 5G technical standard development bodies

Procurement

- DoD CIO proactively works with industry and through the interagency process to identify requirements that would allow DoD to use 5G/IoT in an operational/tactical environment with the appropriate protections (encryption, resiliency, etc.)
- 5G integration into DoD's standard offerings (e.g. Blackberry and other comms devices) being investigated

Supply Chain

- DoD has begun Department-level planning to address the supply chain risk issue

Closing Thoughts

- Technology
- Innovation
- Research and Development
- Operations
- Partnerships both public and private
- Engineering
- Acquisition
- Cyber Security
- Data
- Global
- Lethality/Mission Effectiveness

EXTRAORDINARY OPPORTUNITY IS BEFORE US!

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Future Spectrum Sharing/Standards Thoughts

- Requirements for access to airwaves growing on all sides
 - Feds, non-Feds, Globally
- More spectrum sharing the new normal
- No more beachfront – all bands are fair game!
 - Low, Mid, High Bands
- Understand the environment in which you are expected to operate
 - Spectrum segregation no longer viable
 - Cohabitation a must in test, training, exercise and operational environments
 - Sharing with non-traditional partners becoming more common
- Consider growth (Requires ebb and flow)
- Security/Cyber/Data Protection
- Consider enterprise approach (data/cyber/cloud/security/C2)
- Continue evolving towards multi-band/resilient network capability
- Explore new interference protection/tolerance criteria/standards
- Continue to explore new technologies/R&D investments now
- New Policies, Strategies, Regulations & Treaties are a must
- Consider new Tools/Automation, Mediation & Enforcement



INNOVATION!

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Conclusions

- **DoD at the forefront transforming spectrum future**
 - Operationalizing the spectrum
- **Need your help to think outside the box**
- **Open to new innovative ideas**
- **Partnerships and collaborations are key**
 - Across DoD
 - Across Feds
 - Across industry
 - Across academia



Thank You



Questions?

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