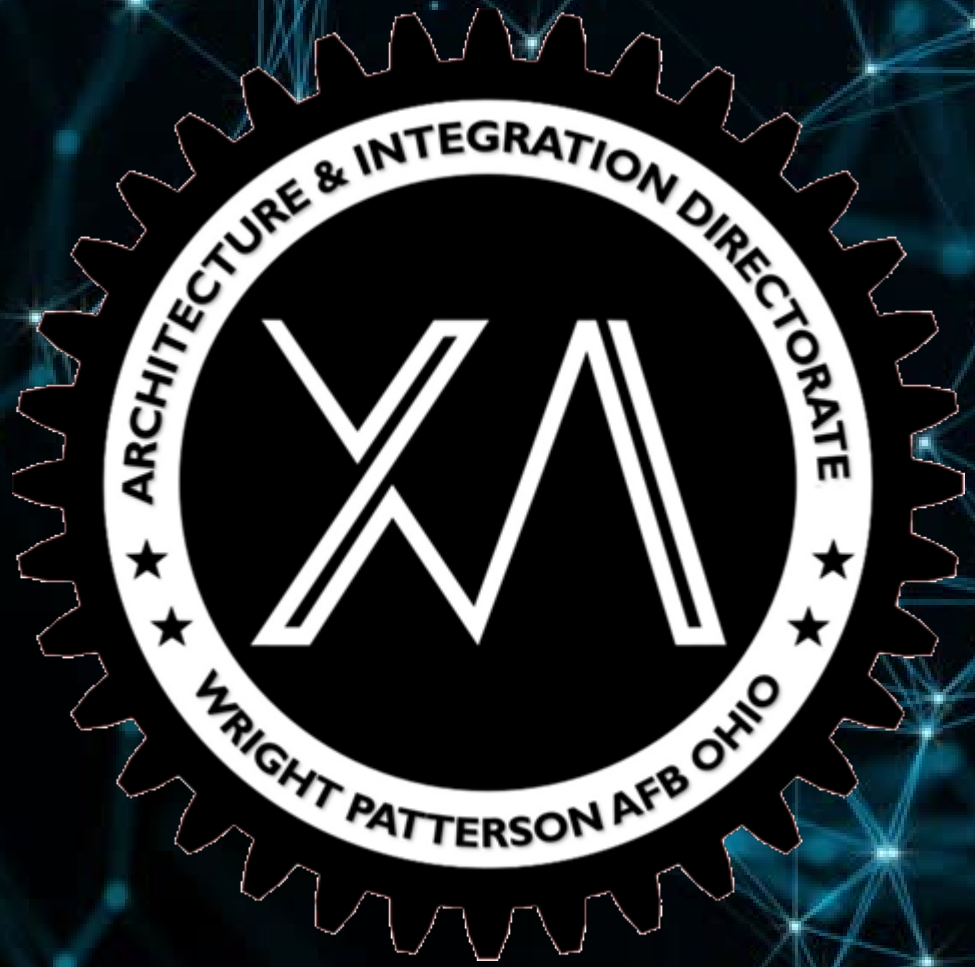
Architecture & Integration Directorate



Digital Engineering Shift and Simulation Vision: Common Synthetic Environment

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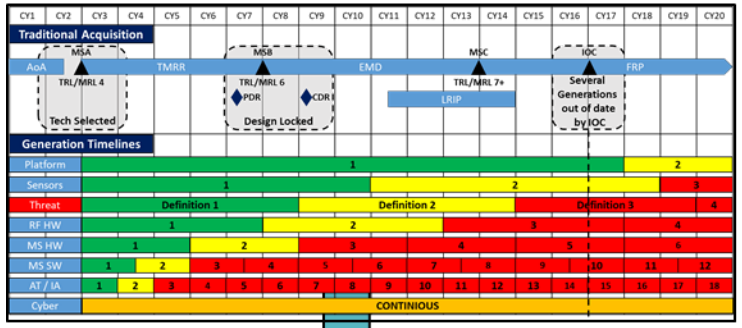
Agenda

- "As is" Training Simulator Landscape
- Need: Modern Tools & Approach
- CSTE concept: Applying Modern, Best-Known Practices
- Business Case
  - Reprogrammability (Continuous Integration / Continuous Deployment)
  - Interoperability (Open and defined interfaces and architectures)
- CSTE Consortium (capture)
- Summary
- AFLCMC/XA POCs

"As is" Simulator Landscape

- **Current simulator architecture is federated: does not support the number of entities, compute power and representative capabilities needed for high end, Multi-Domain training**
- **Current tech cycle timelines are untenable; do not outpace the threat**
- **Solutions designed during/after platform development, while linked to a specific platform and/or company**
- **Subsequent integration of capabilities inhibit operations, performance (issues with latency/distributed operations/etc.), and upgradeability**

Need: Modern Tools & Approach



Short tech cycles

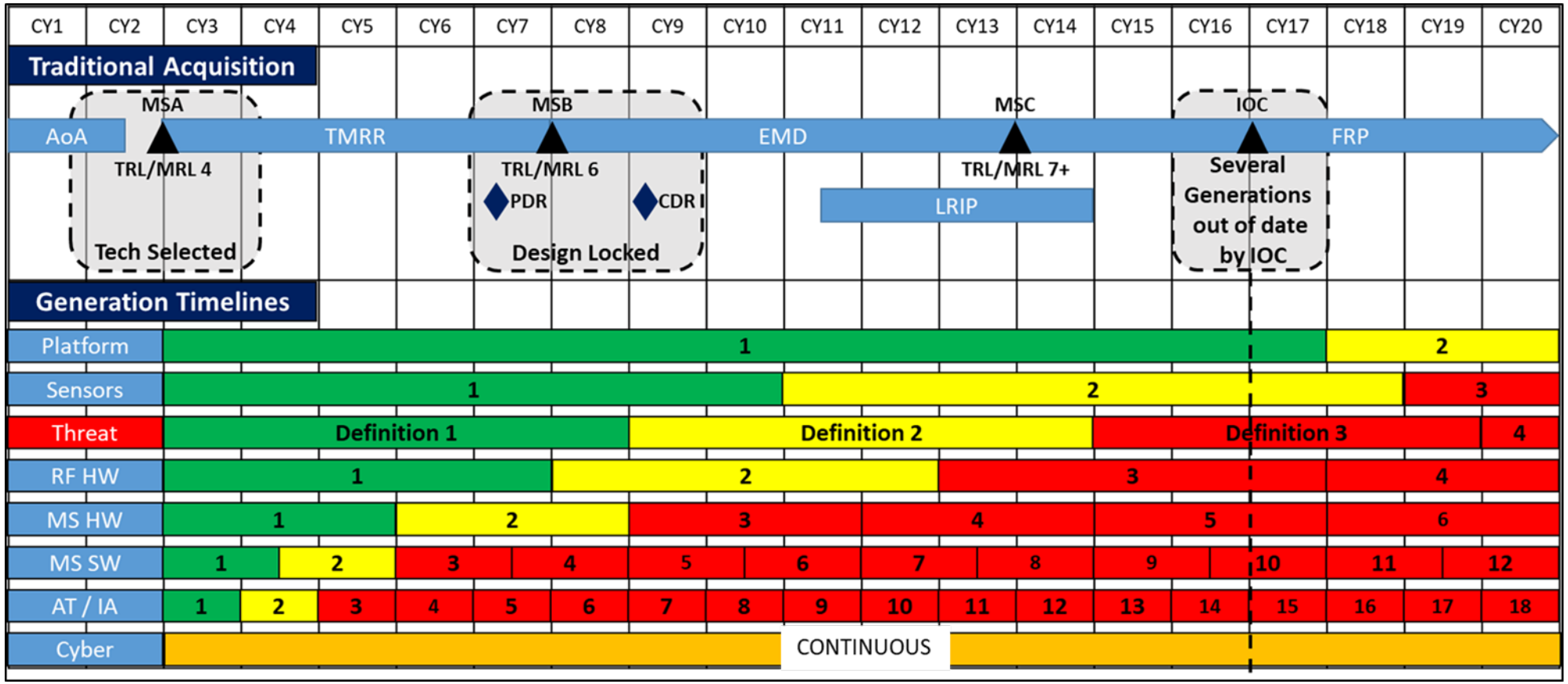
Advanced threat

- **Rapid & repeatable fielding & training of operational capability**
- **Open System Interfaces**
- **Modern Network Technology + SW architectures**
- **Flexible onramps for maturing technology**
  - **COTS incorporation**
  - **DevSecOps development + containerized SW approach**
  - **Multi-Level Security Solutions**
- **Exploit technology cycles**
- **Leverage industrial base**
- **Concurrency with Mission Systems**

What can we build and how fast can we build it?

Accelerating Change

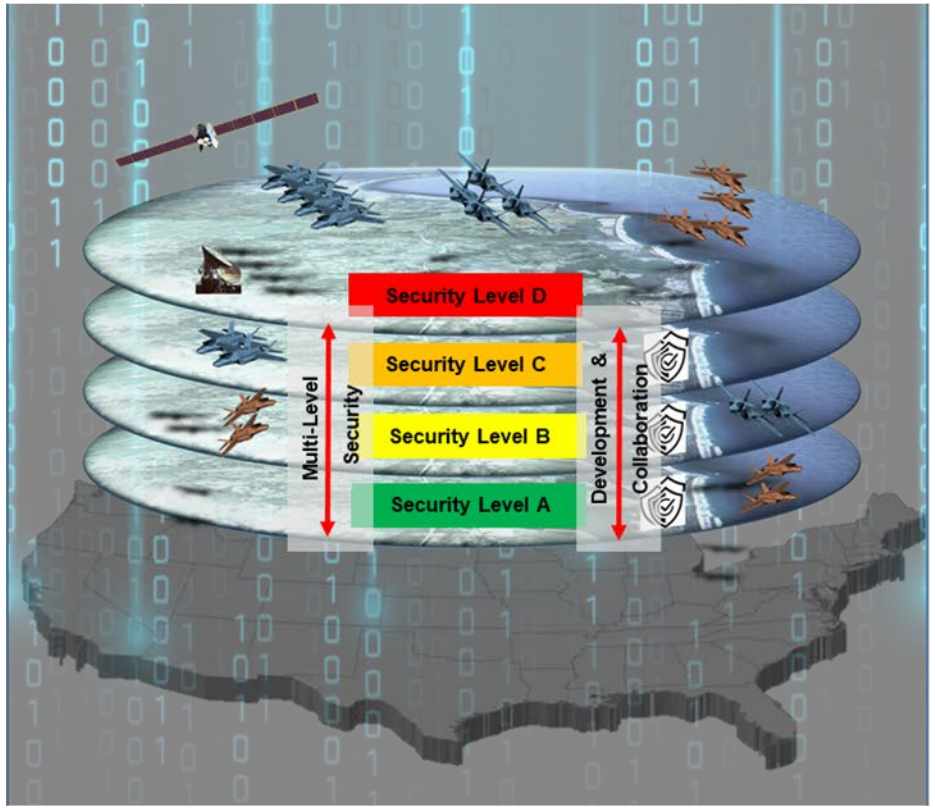
Breaking into tech cycles



CSTE Concept

CSTE Vision:

- Common environment that is “platform agnostic” – built with common and accepted standards to maximize integration with future/existing products
  - Support Multi-Domain Operations
- Explore distributed capabilities via cloud-based architectures – training from disparate locations at a given level of fidelity
- Cloud-native SW architectures utilizing high power computing – maximize numbers of entities/interactions per second
- Support scalable fidelity – employ the appropriate fidelity to maximize performance given the nature of the exercise
- Multiple levels of security – users see only what they are cleared to see



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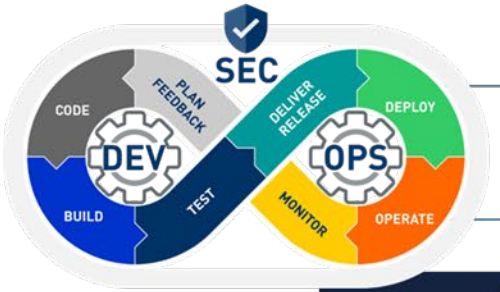
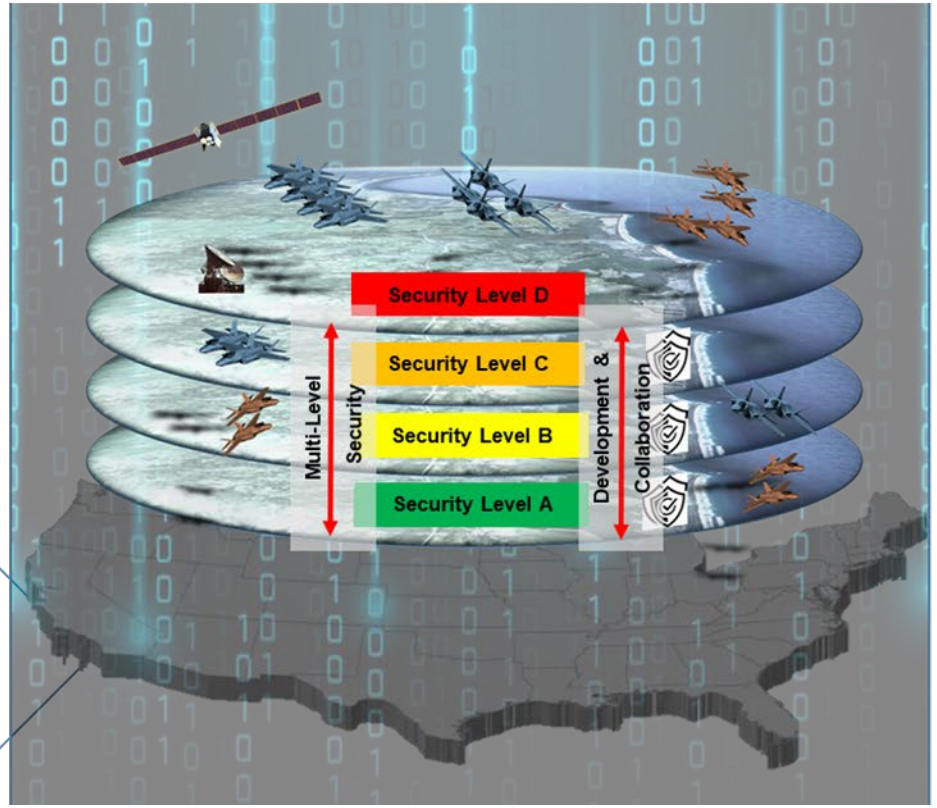
Applying Modern Tools to the Environment



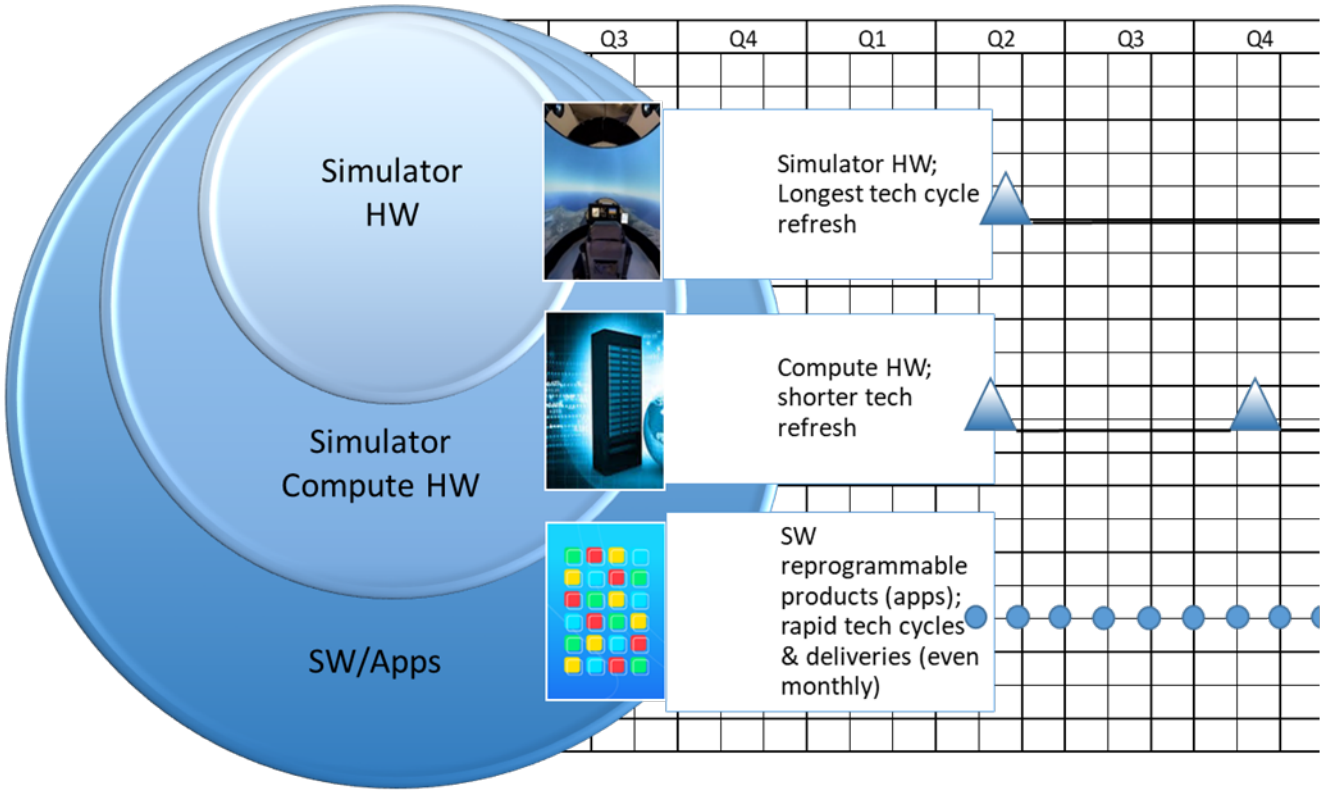
DevSecOps: produce + integrate SW at speed

Maximize containerization, maximize interoperability

Multi-Level Security network increases collaboration & speed



SW Re-programmability



- **Government and Industry partnership to build ecosystem**
- **CSTE Procurement:**
  - **Sim HW; long tech refresh cycle**
  - **Compute HW; shorter tech refresh cycle**
  - **Capability upgrades via SW; rapid tech refresh cycle**
- **Rapid updates, breaking the tech cycle; deliver product at speed**
- **Continue upgradeability through lifecycle; compete apps/ integration with minimized hardware updates**

Common environment – built with the best products America has to offer

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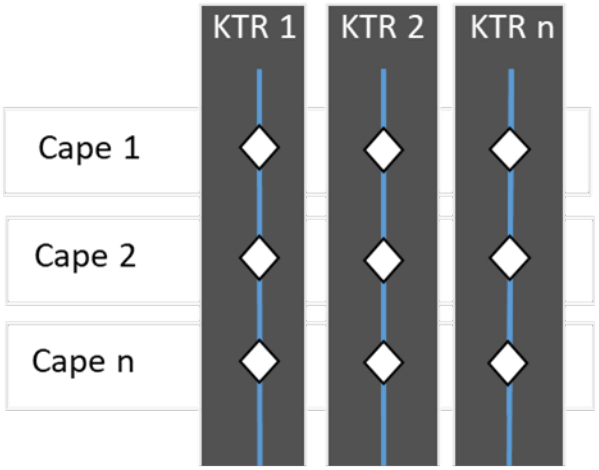
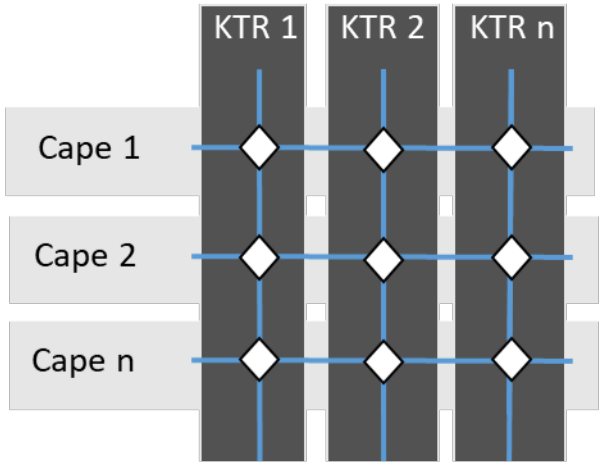
Maximized Interoperability

As-is approach federates systems



Common interfaces / Data schemas create interoperability; break down silos



- **CSTE Ecosystem to create interoperable capabilities; HW and Applications**
- **Utilizing common interfaces facilitates best of breed approach; creates interoperability across platforms, domains, etc.**
- **Collaborative interface development maximizes interoperability and maintains IP**

Potential Capture Opportunities

- Network Topologies and architectures
- MLS – for hardware
- MLS – for entity data exchanges during run time
- CSTE Consortium
  - Data structures/taxima
  - Incorporate Cyber, MLS and modern COTs target hardware
  - Open interfaces documented and tested

CSTE Consortium

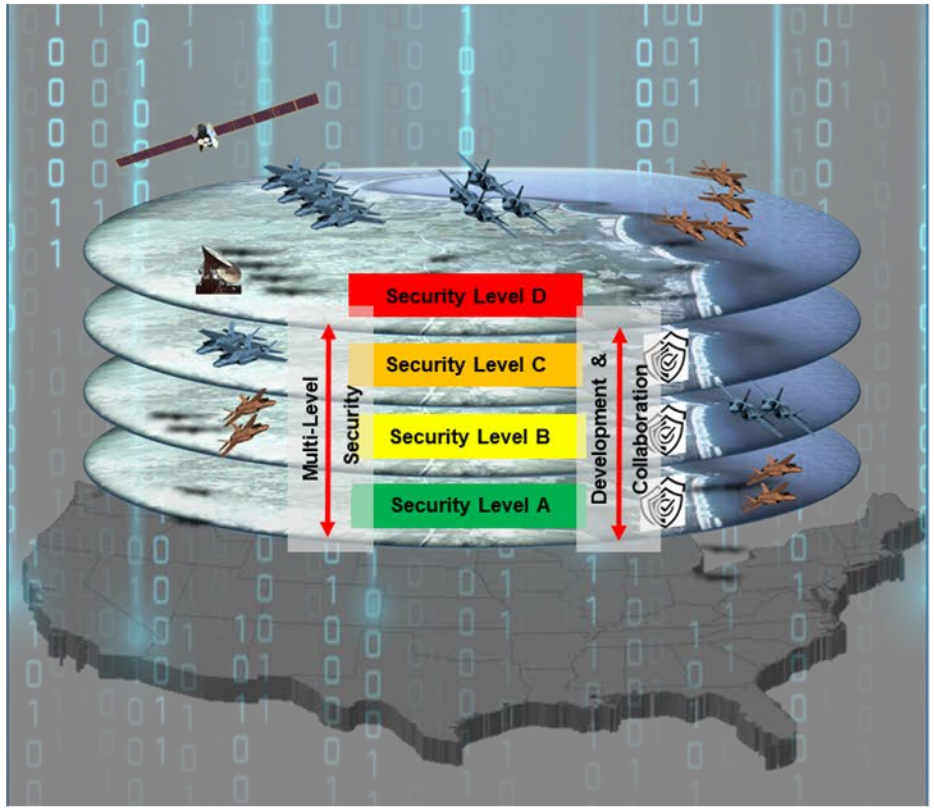
- Consortium to build CSTE ecosystem allows industry to inform interface definition; focus on building applications that increase capability through innovation
- Continue upgradeability through lifecycle; compete apps/integration with minimized hardware updates
- Maximize agility in acquisition approach – identify best of breed capabilities
- Applies modern SW development processes/architectures, and capabilities to maximize performance; utilizes collaboration to maximize interoperability while maintaining IP
- DevSecOps at various security levels and SW Development Kits

Gov't/Industry Collaboration creates ecosystem to break down silos and move at speed

Summary – Key Takeaways

- **Emerging technology amplifies inability to train how we fight**
- **Solution must be <u>scalable</u> and <u>interoperable</u>**
  - **SW and acquisition approaches tailored to support**
- **Open systems & modern SW approach required**
  - **Address shrinking tech cycles**
- **Consortium approach to Achieve:**

  “The best America has to offer”



What can we build and how fast can we build it?

How to Contact CSTE

- **CSTE PM - Kevin McFarland**
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