

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**

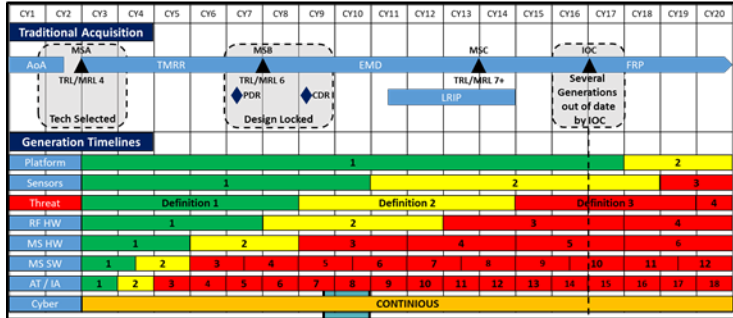


“As is” Simulator Landscape

- ‡ **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



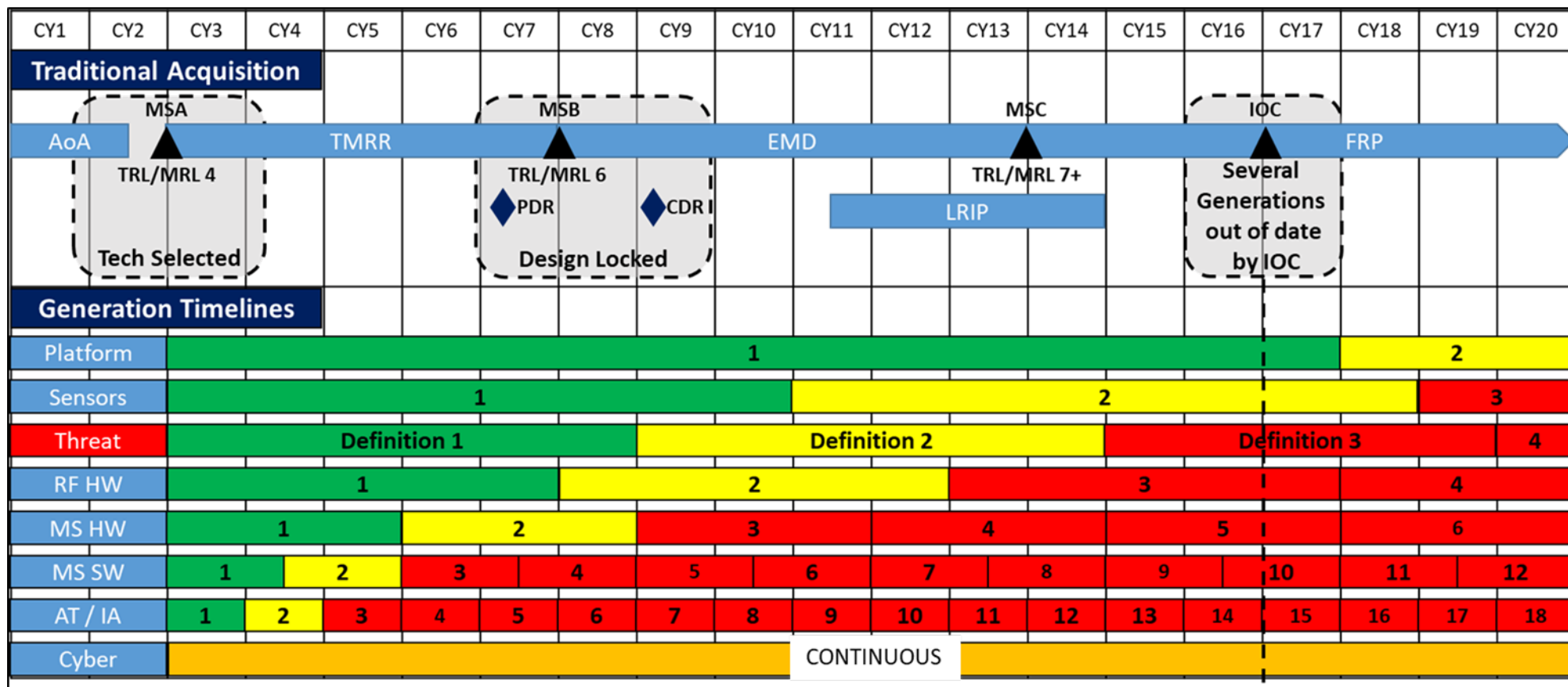
- † **Rapid & repeatable fielding & training of operational capability**
- † **Open System Interfaces**
- † **Modern Network Technology + SW architectures**
- † **Flexible onramps for maturing technology**
 - † **COTS incorporation**
 - † **DevSecOps development + containerized SW approach**
 - † **Multi-Level 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



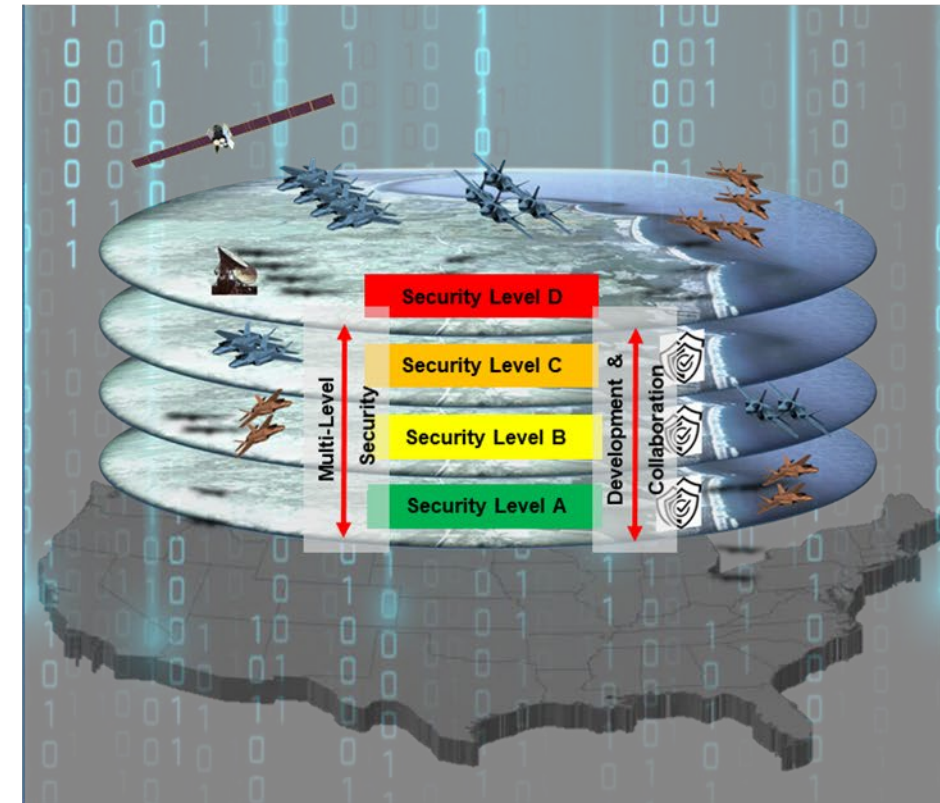
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CSTE Concept

CSTE Vision:

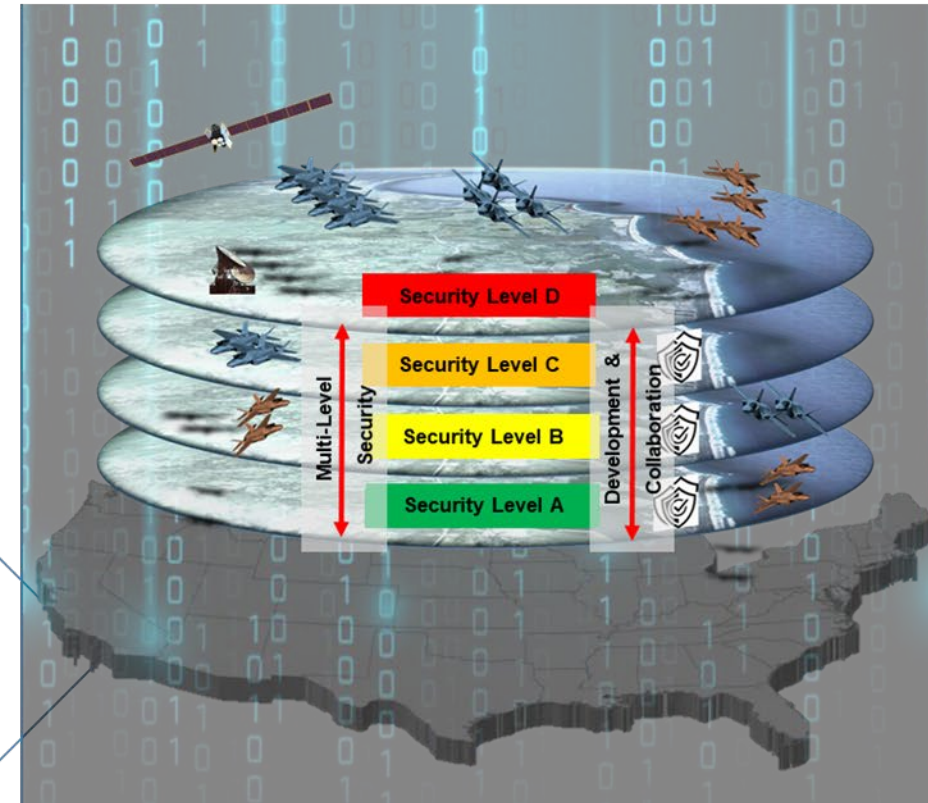
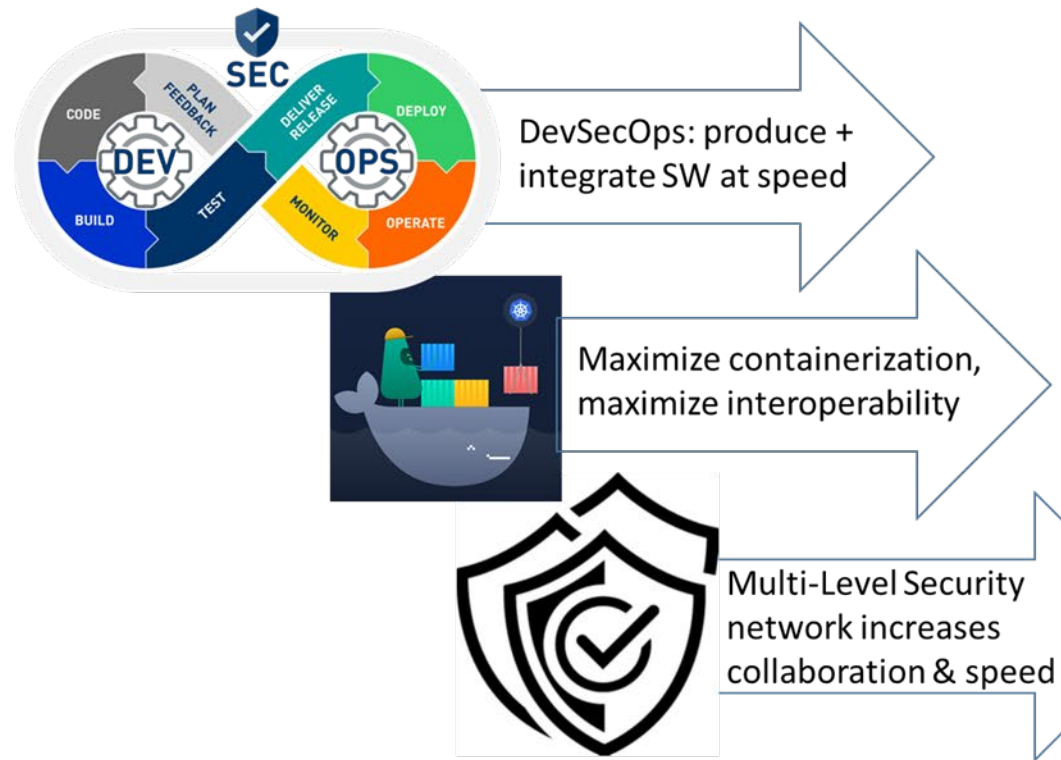
- † **Common environment that is “platform agnostic” – built with common and accepted standards to maximize integration with future/existing products**
 - † **Support Multi-Domain Operations**
- † **Explore distributed capabilities via cloud-based architectures – training from disparate locations at 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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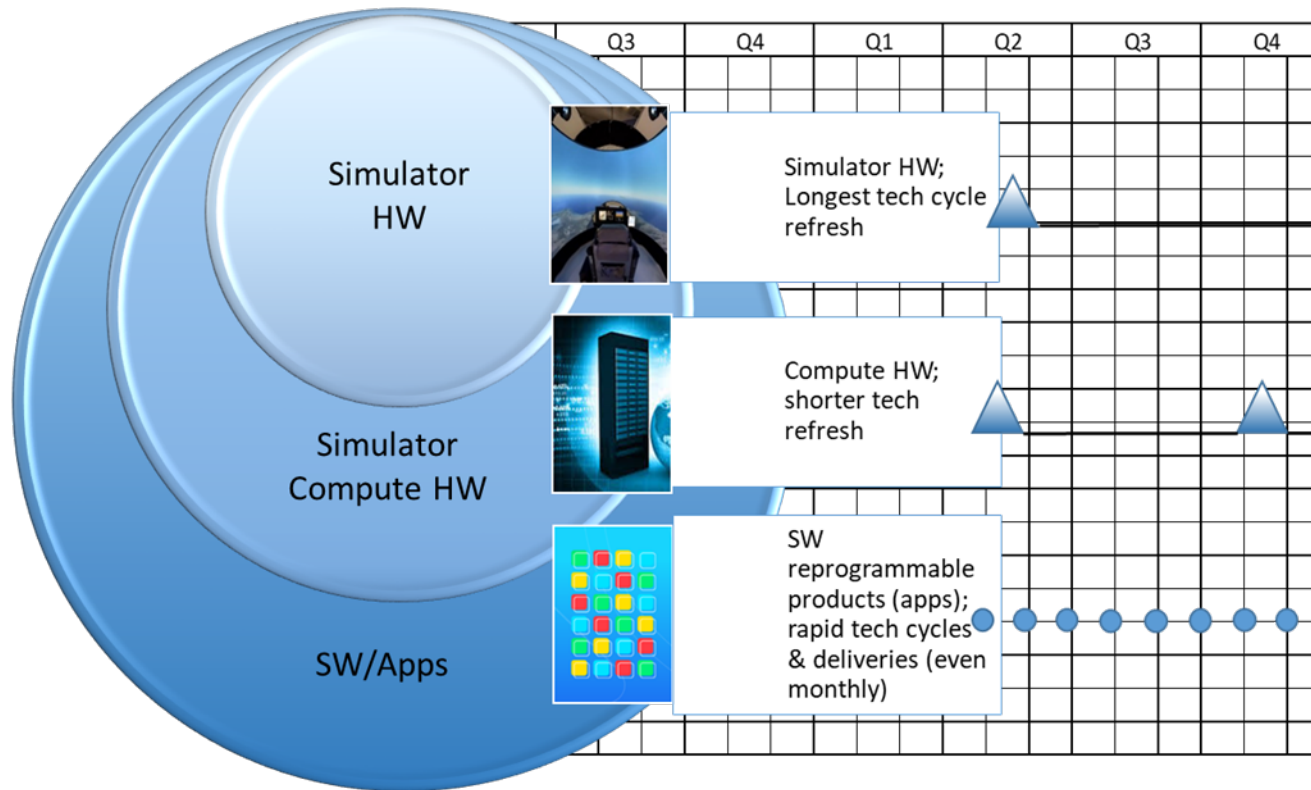


Applying Modern Tools to the Environment





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**

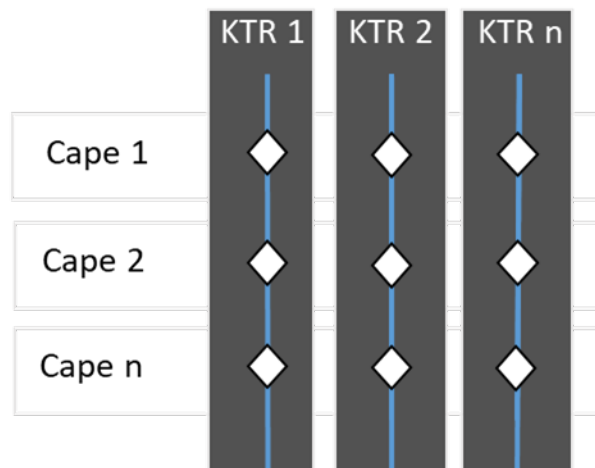
Common environment – built with the best products America has to offer

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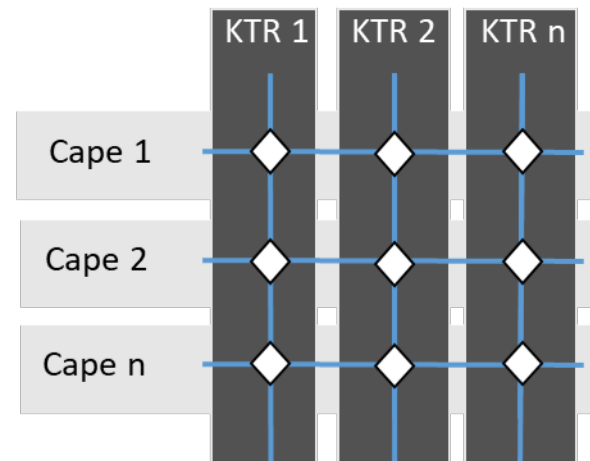


Maximized Interoperability

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

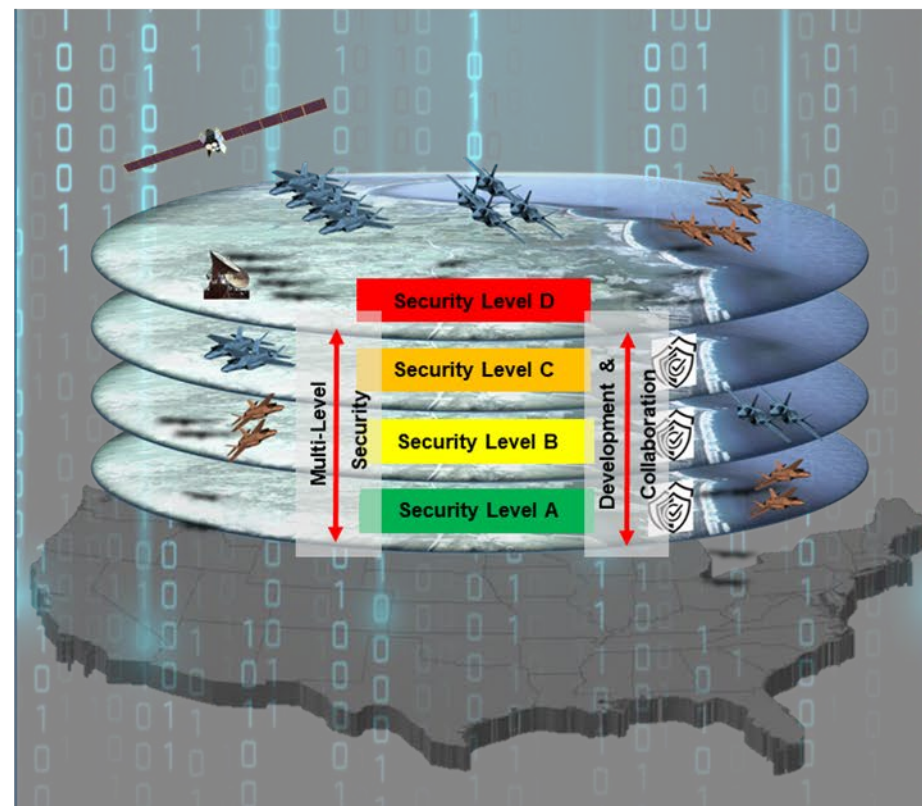
- † **Consortium to build CSTE ecosystem allows industry to inform interface definition; focus on building applications that increase capability through innovation**
- † **Continue upgradeability through lifecycle; compete apps/integration with minimized hardware updates**
- † **Maximize agility in acquisition 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 scalable and interoperable**
 - † **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?

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How to Contact CSTE

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