



Chemical And Biological Defense Modeling and Simulation S&T Support to MDAP Thrust (CBD M&S S&T Support to MDAP)

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“You must understand the real world, in order to model it”



Topics

- Purpose
- Background
- Problem Statement
- Goals and Milestones
- Challenges and Opportunities



Thrust Area Purpose

- ***To develop and transition supporting CB M&S for MDAP, and acquisition programs using M&S or M&S programs developing capabilities in support of acquisition***
 - What does this mean?
 - What is the scope of the Thrust Area?



Background

- Terminology
- Common and Cross-cutting Services, Tools, Data
- M&S is a tool
- Live, Virtual, Constructive
- Multi-resolution Environment



Terminology

- **Live**
 - “A simulation involving real people operating real systems.”
- **Virtual**
 - “A simulation involving real people operating simulated systems. Virtual simulations inject Human-In-The-Loop in a central role by exercising motor control skills (e.g., flying an airplane), decision skills (e.g., committing fire control resources to action), or communication skills (e.g., as members of a C4I team).”
- **Constructive**
 - “A simulation involving simulated people operating simulated systems. Real people stimulate (e.g., make inputs) to such simulations, but are not involved in determining the outcomes.”

Reference: DoD Modeling and Simulation (M&S) Glossary, Jan. 98



Terminology (continued)

- **M&S Interoperability**

- The ability of a model or simulation to provide services to and accept services from other models and simulations, and to use the services so exchanged to enable them to operate effectively together.

Reference: DoD Directive 5000.59, "DoD Modeling and Simulation (M&S) Management," January 4, 1994

Reference: DoD 5000.59-P, "Modeling and Simulation Master Plan," October 1995

Terminology (continued)



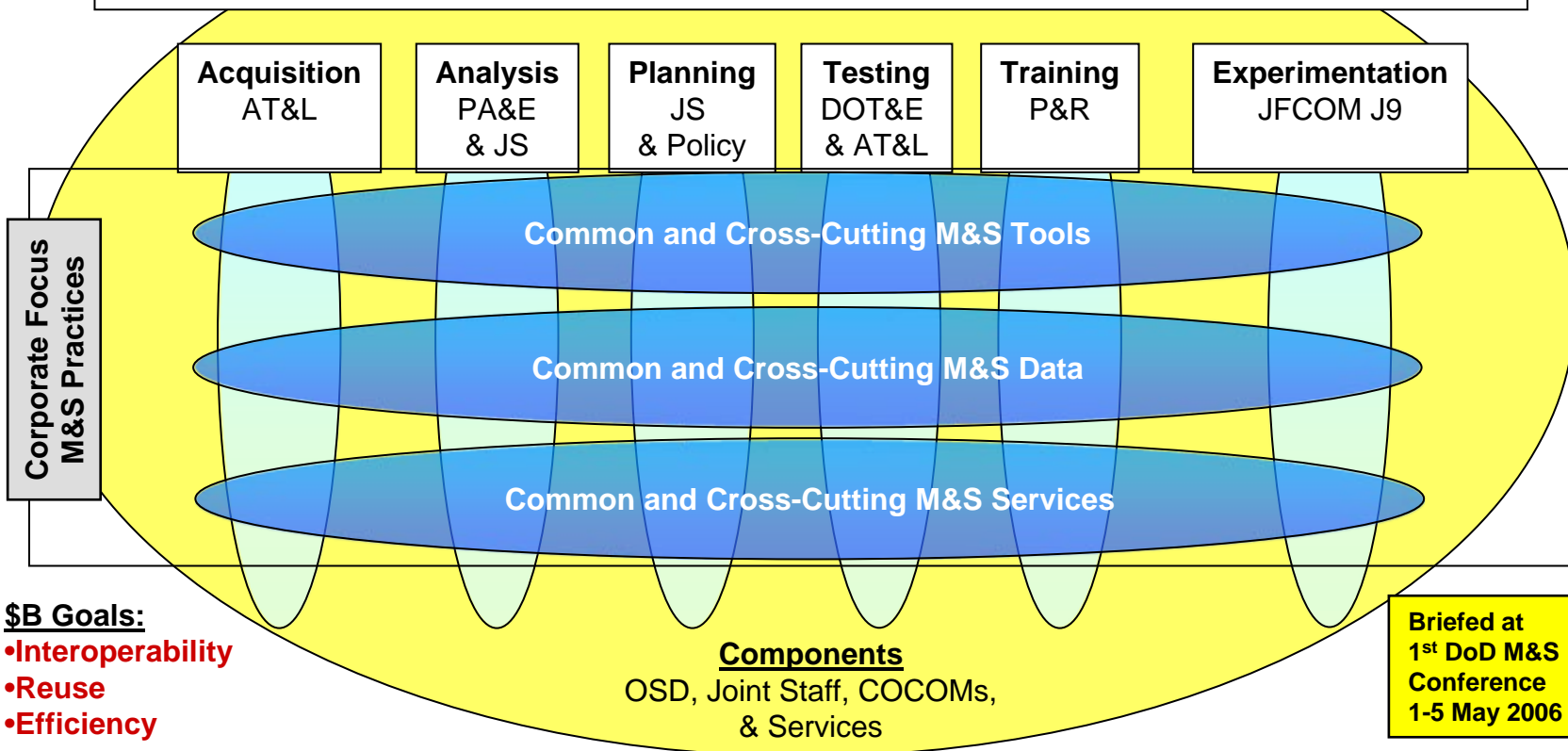
- Distributed Simulation
 - Linking together of independent, geographically separate simulations or simulators
 - Tremendous potential for helping ensure combat readiness, especially for combined or joint combat operations
 - Can involve multiple types of military simulations (i.e., live, virtual and constructive)
 - Linking different simulations and simulators depends on a network architecture
 - Allows data and information to be sent, received and used in a consistent manner
 - **Issues during distributed simulation events**
 - **standardized databases, real-time versus faster- or slower-than-real-time simulations, and the accuracy or validity of the underlying models upon which the simulation is based**

The New M&S Framework



- Organized by Communities
- DoD M&S coordination structured to support the Communities

1/2 -Star M&S Steering Committee (M&S SC) provides governance.
 DMSO transitions to M&S Coordination Office (M&S CO)-- supports the M&S IPT and SC.





Traditional Modeling and Simulation

Aggregation



Detail

Level

Use

Campaign

- Force Effectiveness
- Force Survivability
- Campaign Outcomes

Mission

- Mission Effectiveness/Lethality
- Survivability
- Mission Outcomes

Engagement

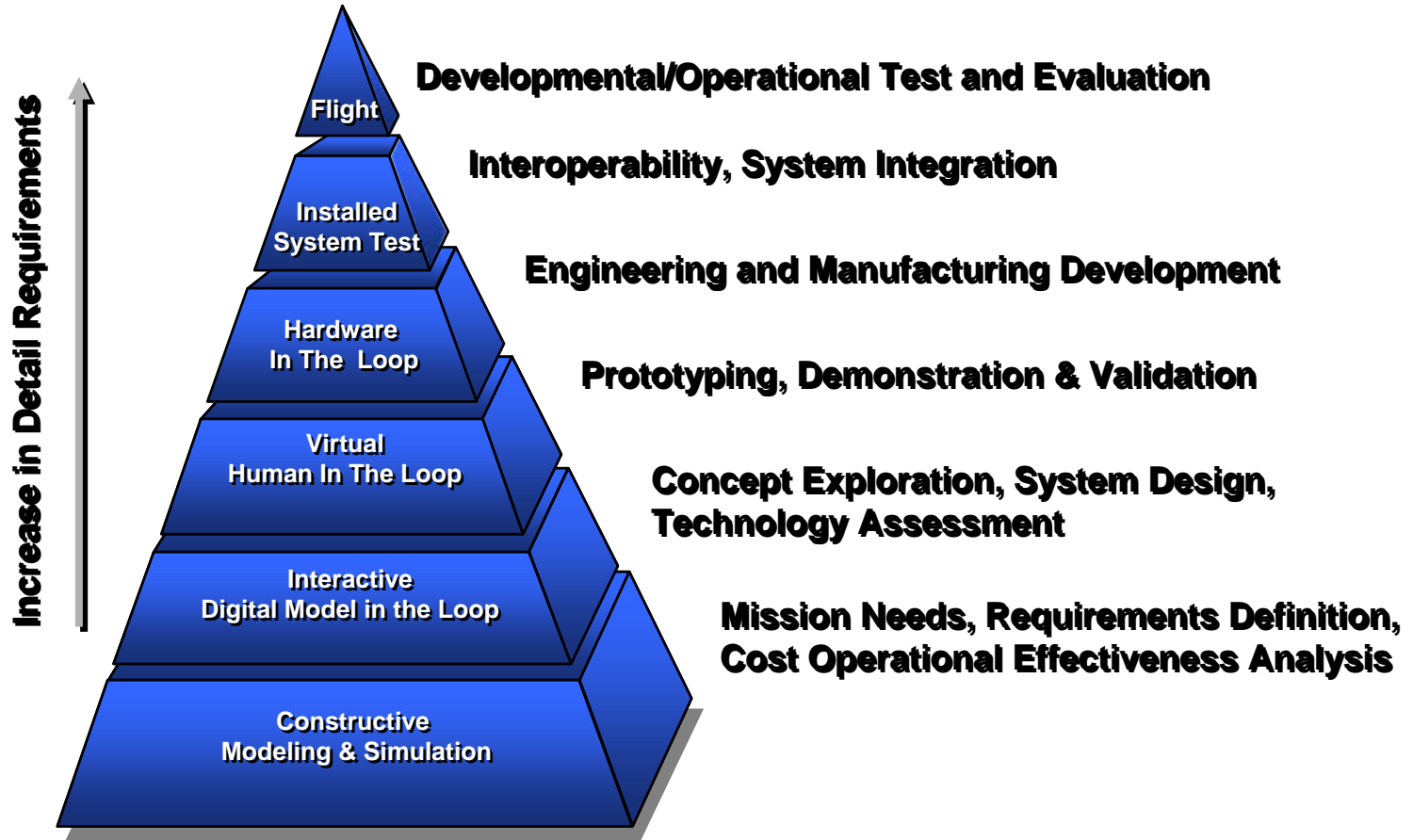
- System effectiveness
- Vehicle capabilities

Engineering

- Sub-system definition
- Integration of sub-systems
- System performance



M&S Support Capability





CBRN Multi-resolution Environment

Far Field

Mid Field

Near Field

Internal

Atmospheric

Global

Meso

Local

Micro

Interactions in Boundary Areas

Surface

Interactions in Boundary Areas

Water

Large Open Bodies of Water

Lake and River

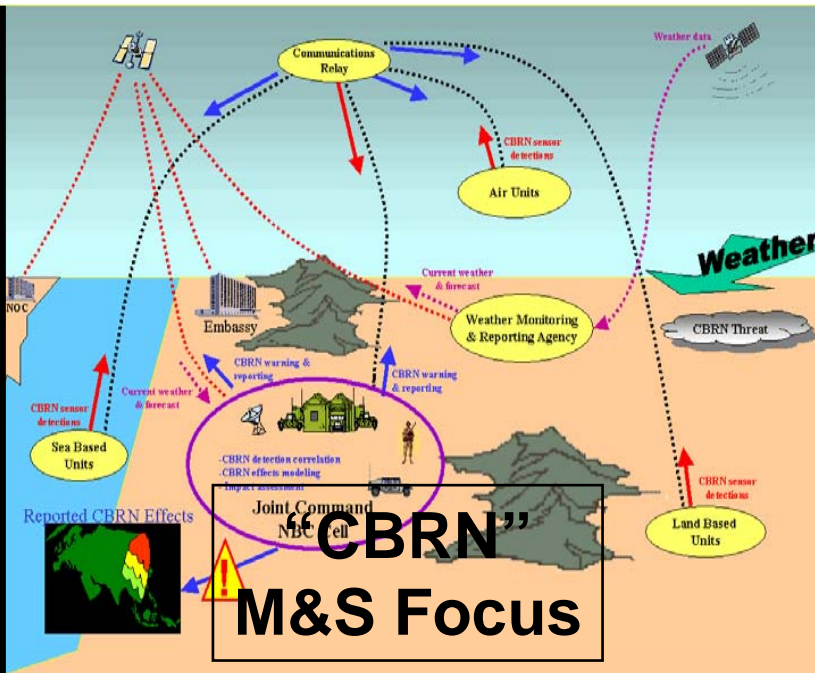
Near Water Intake

Internal Water Distribution

Virtual Environment



Common Elements?

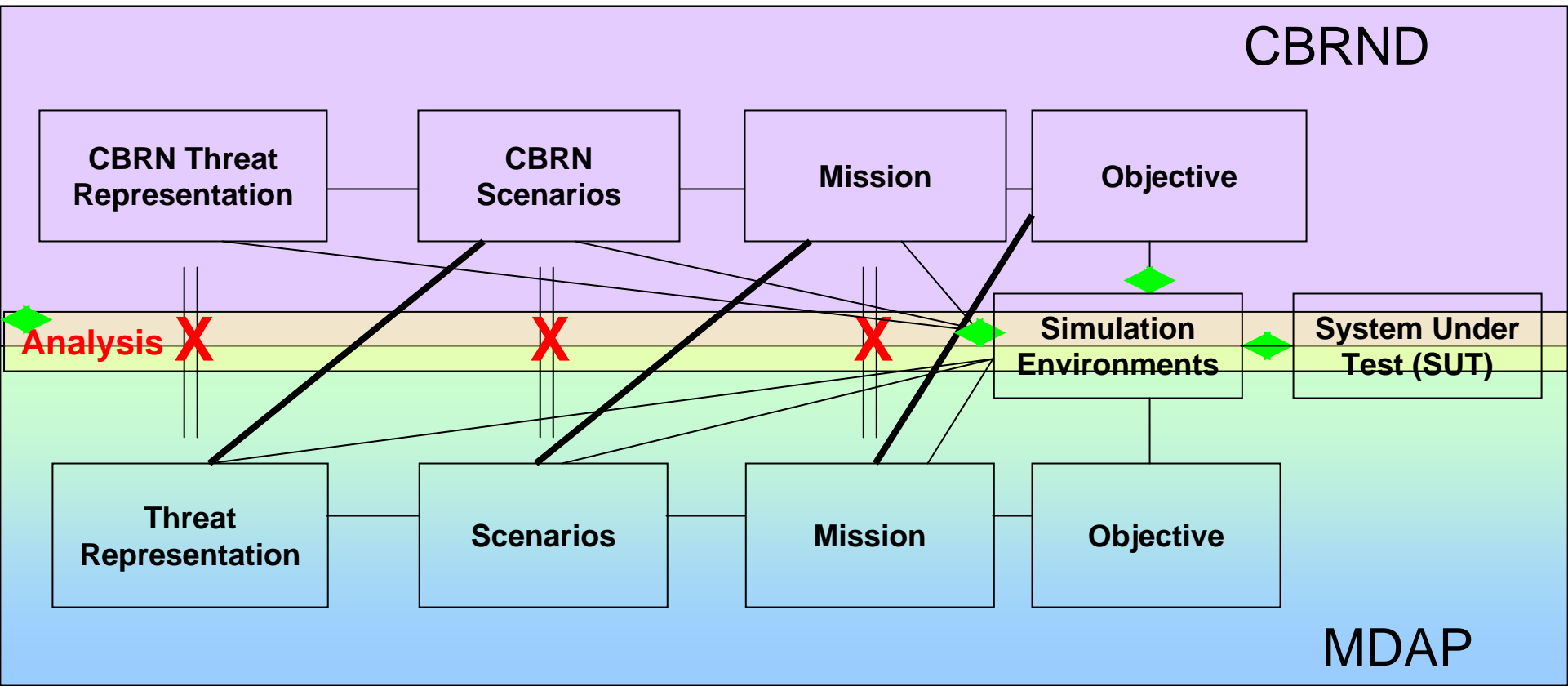


Live

Virtual

Constructive

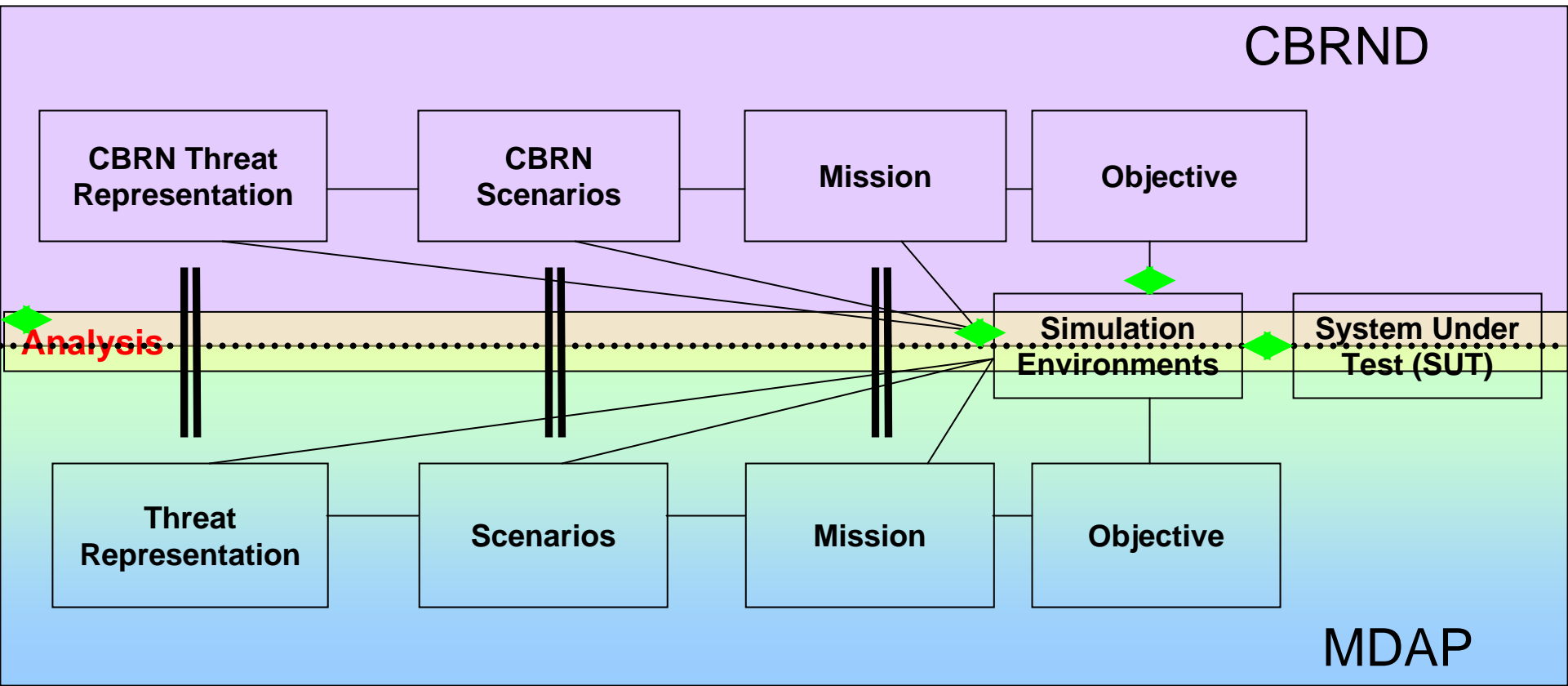
CBD M&S S&T MDAP Support Problem Statement (Current View)



◆ Potential CBD M&S S&T MDAP Support Areas

— Mapping of CBD Terms to MDAP Terms

CBD M&S S&T MDAP Support Problem Statement (Future View)



◆ Potential CBD M&S S&T MDAP Support Areas

— Mapping of CBD Terms to MDAP Terms

Major Goals and Milestones



- Near Term (FY07 – FY08)
 - Identify Acquisition Program CBD M&S S&T needs
 - Establish pilot S&T program with FCS
 - Establish collaboration activity between broader M&S and CBD M&S
 - Participate with Simulation Interoperability Standards Organization (SISO) Study Group (SG) on LVC Architecture Interoperability
 - Transition initial pilot program
- Mid Term (FY09 – FY11)
 - Identify additional Acquisition Program CBD M&S S&T needs
 - Establish common S&T areas among MDAPs
 - Transition program
- Far Term (FY12 & Beyond)
 - TBD (based on initial efforts)

Challenges and Opportunities



- The CBD M&S S&T MDAP Support Area will
 - Develop interoperability, and supporting analysis technology supporting CBD M&S and MDAP M&S
 - Established architecture or framework for analysis & technology trade-offs
 - Rapidly transition interoperability technology to MDAP
 - Leverage capabilities across DoD, collaboration with US government, universities, companies, foreign countries
 - Support the conduct of concept evaluations by depicting proposed concepts, promising technologies, doctrine, possible TTPs in a synthetic environment, and exercising them in appropriate scenarios.
 - Provide an authoritative and consistent representation of the CBRN environment



Questions?