

Joint Mission Environment Test Capability (JMETC)



Distributed Testing for Cyber Security

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Agenda



- **JMETC Overview**
- **JMETC Networks**
- **National Cyber Range (NCR)**
- **Additional Cyber Initiatives**



The JMETC Mission



JMETC provides the ***persistent and robust infrastructure (network, integration software, tools, reuse repository) and technical expertise*** to integrate Live, Virtual, and Constructive systems for test and evaluation in a Joint Systems-of-Systems and Cyber environment



JMETC Benefits Acquisition Programs, Testers, & Evaluators



- Enables early verification that systems work in a Joint Environment
 - Test whether systems work well together
- Supports all aspects of testing
 - Rapid acquisition, Prototyping, Developmental Test, Operational Test, Interoperability Certification, Net-Ready Key Performance Parameters testing, Joint Mission Capability Portfolio testing, **Cybersecurity Testing**
- Helps find problems early in acquisition – when they are less costly to fix
 - JMETC Customers have run as many as 20 independent test runs in a day and fixed interoperability issues overnight
- Reduces acquisition time and cost
 - Readily-available, persistent connectivity with standing network security agreements
 - Common integration software for linking sites
 - Accredited test tools for distributed testing
- Support to Acquisition Programs
 - Expertise to integrate distributed test facilities

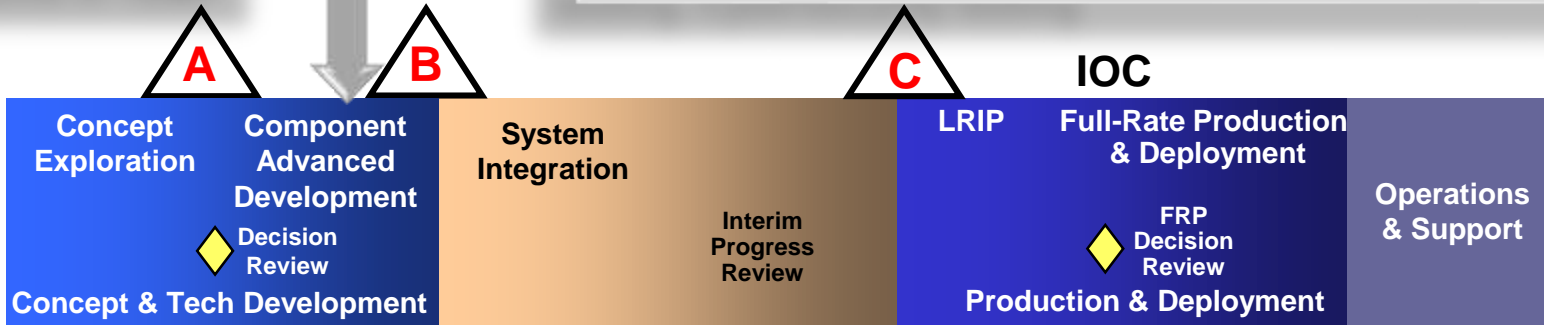
JMETC is identified in TEMPs as the distributed infrastructure to be used to conduct Joint testing



The Future of Distributed Testing: SHIFT LEFT

Outline Distributed Testing and JMETC requirements in TEMP

Rapid Acquisition, Developmental Test, Operational Test, Interoperability Certification, Net-Ready Key Performance Parameters testing, Joint Mission Capability Portfolio testing, Cybersecurity testing



Pre-Systems Acquisition

Systems Acquisition
(Engineering & manufacturing development, demonstration, LRIP & production)

Sustainment

Enables early verification that systems work stand alone and in a Joint Environment

Helps find problems early in acquisition – when they are less costly to fix

Creates robust environment for common prototype analysis

Provides subject matter expertise to integrate distributed facilities

JMETC enables continuous testing across the acquisition life cycle

JMETC reduces acquisition time and cost

By Providing

- Readily-available, persistent connectivity
- Standing network security agreements
- Common interoperability software for integrating test assets
- Certified test tools for distributed testing



JMETC Now Has Two Networks



JMETC SECRETEN Network (JSN)

- Runs on SECRET R&E Network (SDREN)
- Persistent availability
- SECRET Collateral
- IA Agreements good for 3 years
- 76 sites

JMETC MILS Network (JMN)

- Requires security agreements for each event
- Multiple Independent Levels of Security Architecture
- Certified by DIA and supports higher levels of classification
- Supports cyber events
- Supports Coalition
- Supports Non-Routable IP addresses
- Capable of supporting multiple simultaneous events and multiple levels of security

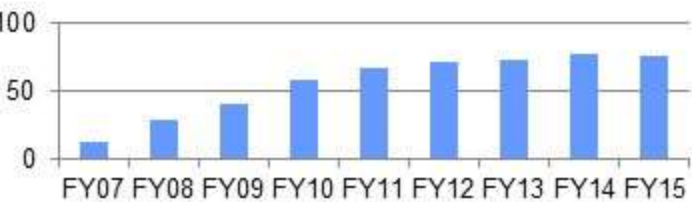
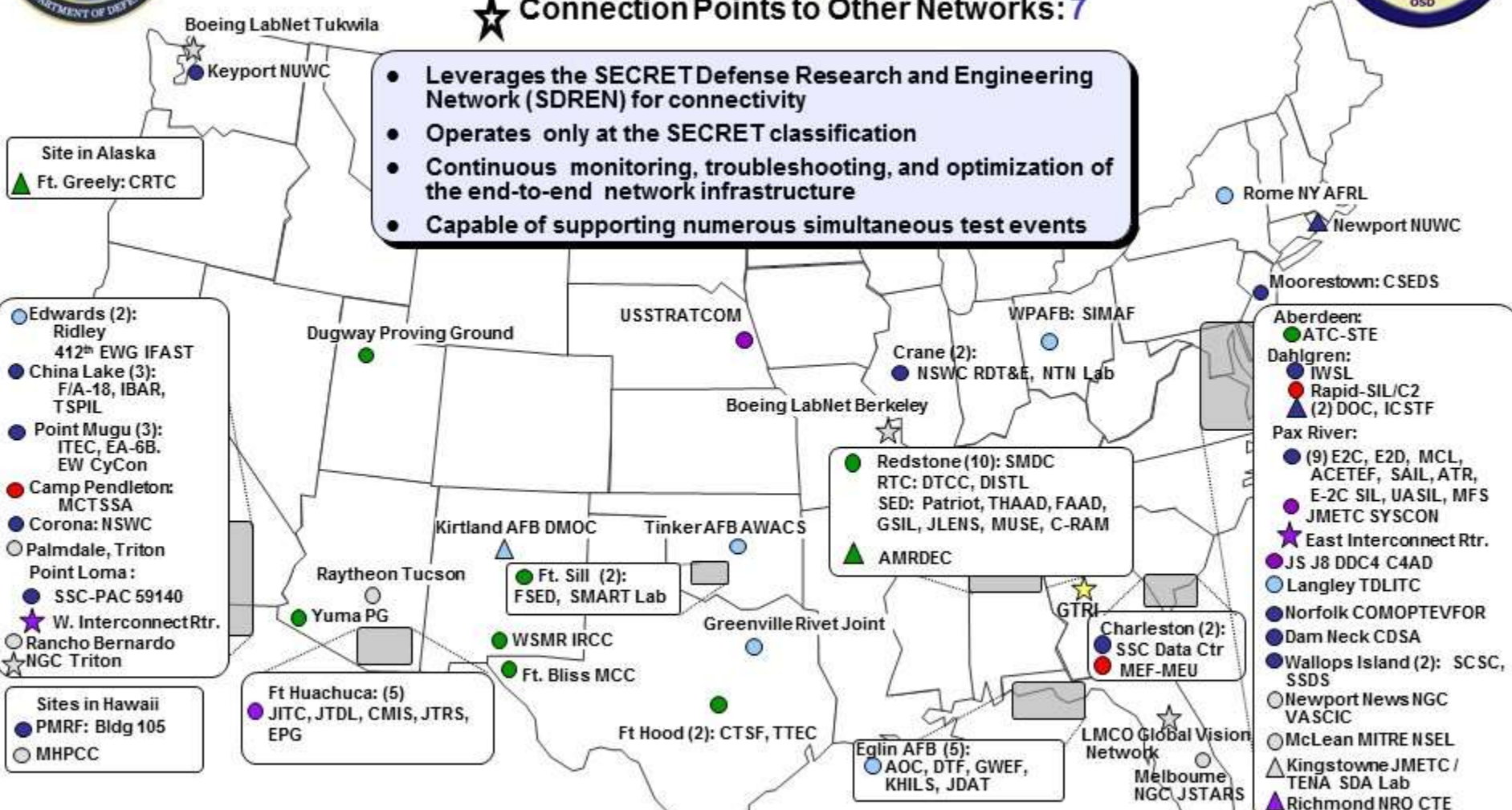


JMETC SECRET Network (JSN)



- Functional Sites: 76
- △ New Sites Planned: 9
- ★ Connection Points to Other Networks: 7

- Leverages the SECRET Defense Research and Engineering Network (SDREN) for connectivity
- Operates only at the SECRET classification
- Continuous monitoring, troubleshooting, and optimization of the end-to-end network infrastructure
- Capable of supporting numerous simultaneous test events



As of 14 Jan 2015

- Army
- Air Force
- Navy
- Marines
- Joint
- Industry
- Academia



JMETC MILS Network (JMN)



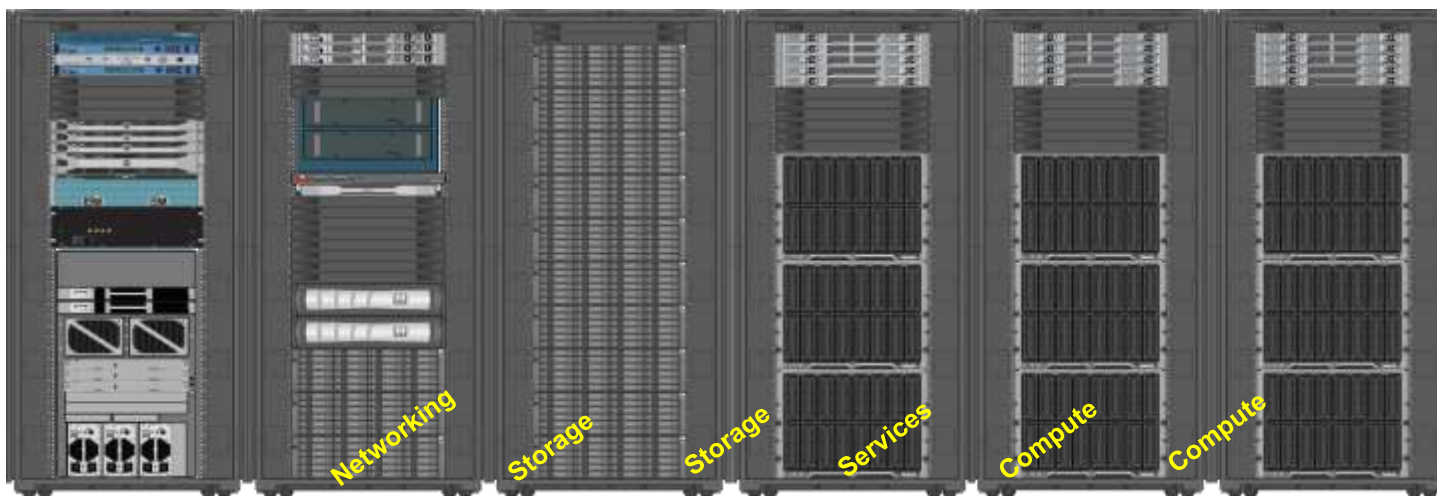
- Uses the Defense Research and Engineering Network (DREN)
- Currently 5 functional sites, 8 planned, and growing
- Uses a Pico Service Delivery Point (PSDP) for connectivity
- Regional Service Delivery Points (RSDP) a core component of the JMN – next slide
- Supported by a Network Operations Support Center (NOSC)
 - Network Management
 - Event Support planning and execution
 - Management and provisioning of Regional Service Delivery Points
- Cannot be accessed from the JSN



Regional Service Delivery Points (RSDPs)



- Will provide connectivity, computing power, and storage
- Resides and accessible **ONLY on the JMN**
- Certified by DIA and supports higher levels of classification
- Capable of supporting cyber testing
- Capable of conventional networking test; e.g., scalability testing



Address capacity & capability gaps



National Cyber Range (NCR)



National Cyber Range (NCR) Orlando, FL



- **Oversight:**

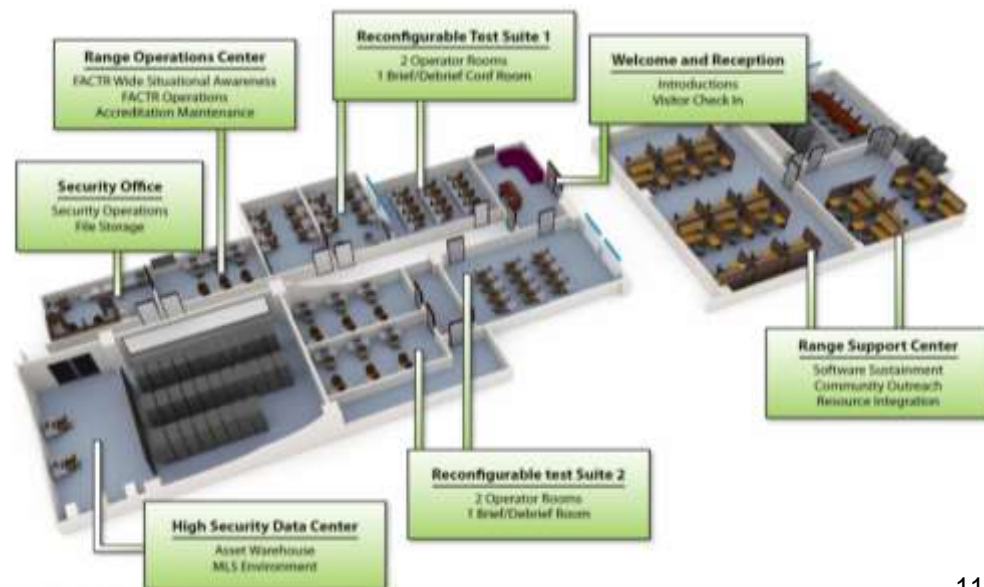
- Transitioned program from the Defense Advanced Research Projects Agency (DARPA) to the TRMC in October 2012
- TRMC charged with “operationalizing” the capabilities for use by the Test, Training, and Experimentation communities

- **Goal**

- Create a secure, controlled facility that can rapidly emulate the complexity of defense & commercial networks, allowing for cost-effective and timely testing in support of the full spectrum of Cyber activities

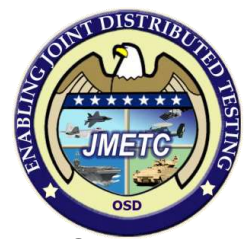
- **Range Features**

- Automated range build-out capability
- Automated range sanitization
- User friendly environment design and test planning tools
- Supports multiple concurrent tests events at varying classifications

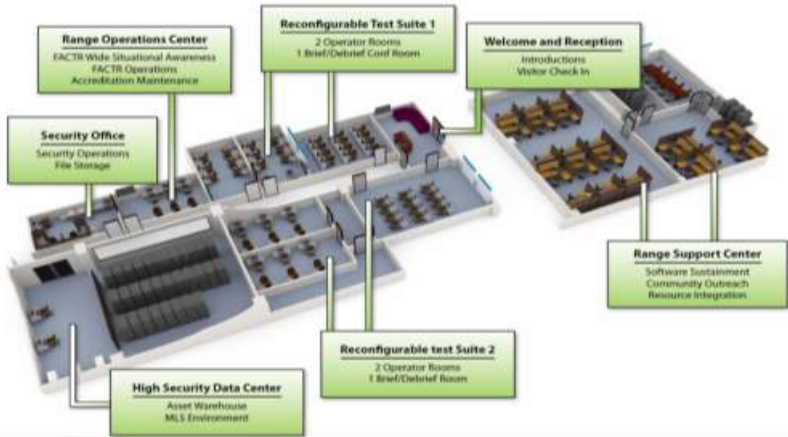




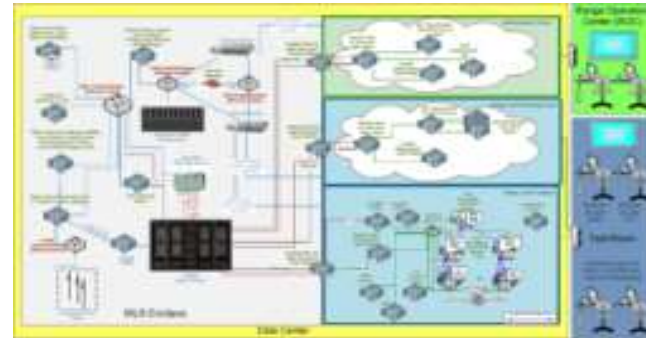
What is the NCR?



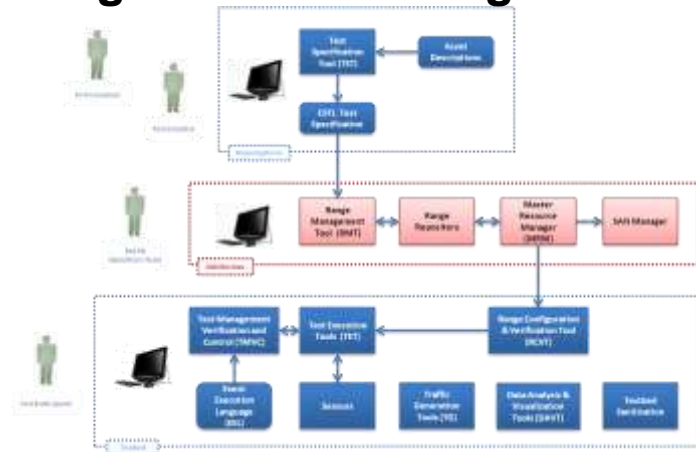
Computing Assets/Facility



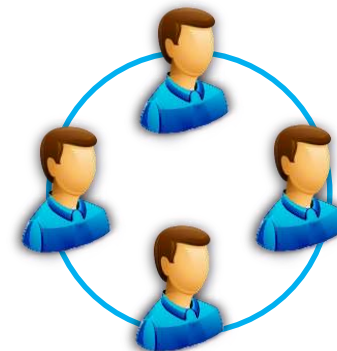
Encapsulation Architecture & Operational Procedures



Integrated SW Testing Toolsuite

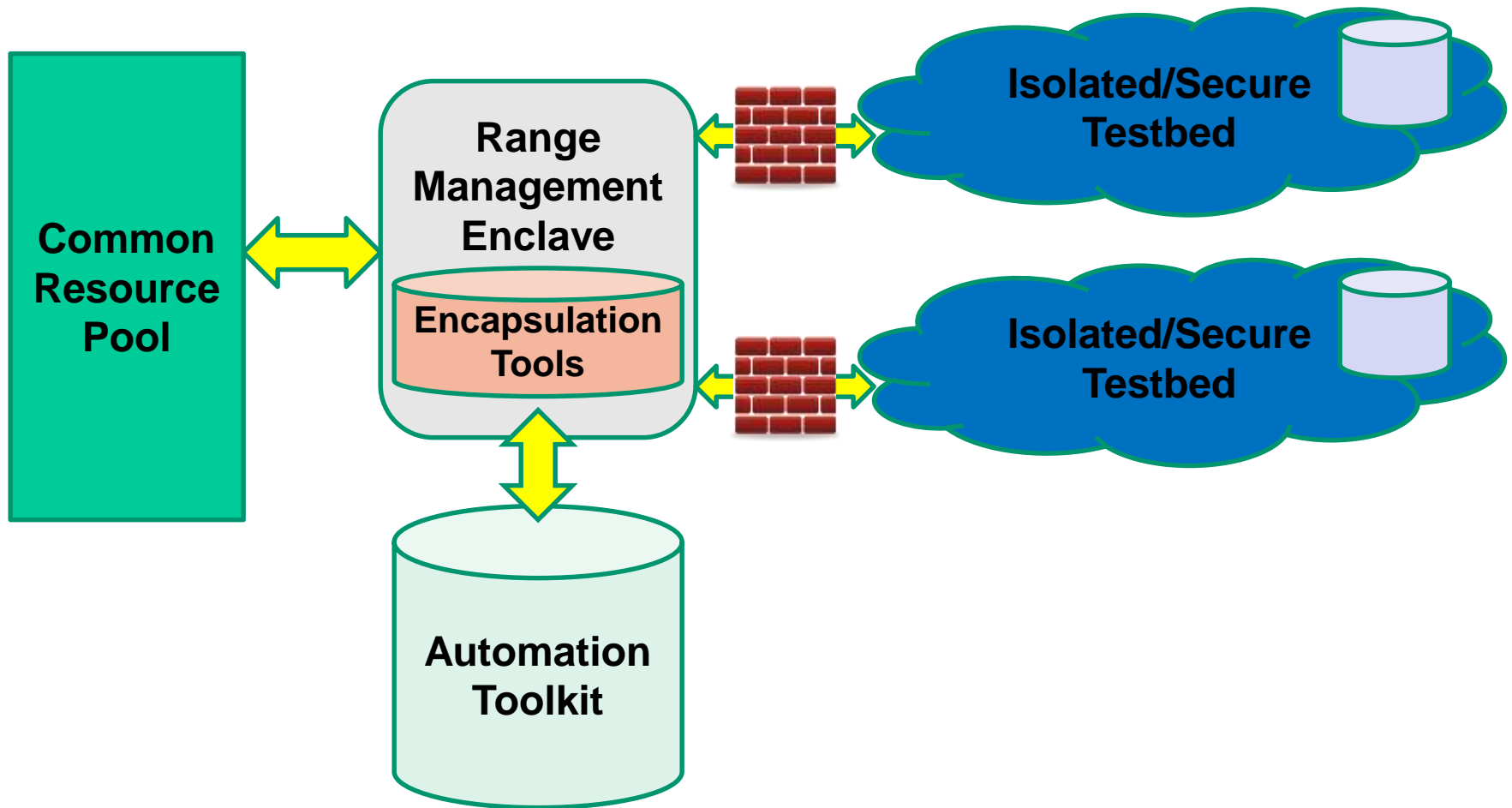


Cyber Test Team





Reconfigurable Range Concept



Partitions a common pool of resources into multiple independent testbeds



NCR Test Team

- Flexible Model
 - End to end test support
 - You give us a test specification or asset list and we give you a configured or empty testbed
- Other services
 - Cyber and testing SME
 - Develop threat vectors
 - Custom traffic generation
 - Custom sensors and visualization
 - Integrate custom devices or software assets
 - Custom data analysis
- Easily incorporate distributed event resources
 - Remote red/blue teams
 - Specialty or kinetic assets
 - Additional computing resources





Why Distributed Testing with NCR



- Provides a cyber testing environment to leverage from your site (without the investment of building and maintaining)
- Leverage the library of existing emulations and capabilities
 - Red/Gray/Blue Models
- Utilize live malware
- Enable remote red team
- Leverage large scale complex emulations
- Operate from your home base



Additional Cyber Initiatives



Cyber Range Interoperability Standards (CRIS)



- TRMC sponsored WG supported by MIT Lincoln Laboratories
 - Government, Industry and Academia
- Cyber Ranges have been independently developed
 - Tools
 - Processes
 - Architectures
 - Underlying Technologies
 - Lexicon
- Result is stovepipe solutions that are difficult to integrate
 - Limited scalability
 - Increased cost and schedule
- **Goal: Identify key interoperability gaps and recommend solutions/approaches**

Enable Interoperability through Standardization



JMETC Program Points of Contact



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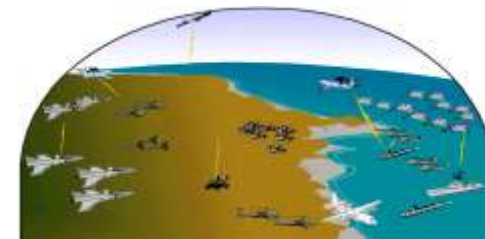
Questions?



JMETC Distributed Test Architecture

Joint Operational Scenarios

Systems Under Test



Integrated Test Resources

Virtual Prototype

Hardware in the Loop

Installed Systems Test Facility

Range

Environment Generator

Threat Systems

TENA Standard Interface Definitions

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TENA Common Middleware

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JMETC Infrastructure on SDREN

Reuse Repository

Distributed Test Support Tools

* TENA: Test and Training Enabling Architecture