

Joint Mission Environment Test Capability (JMETC)



**Briefing for:
The DAU Community**

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JMETC PM
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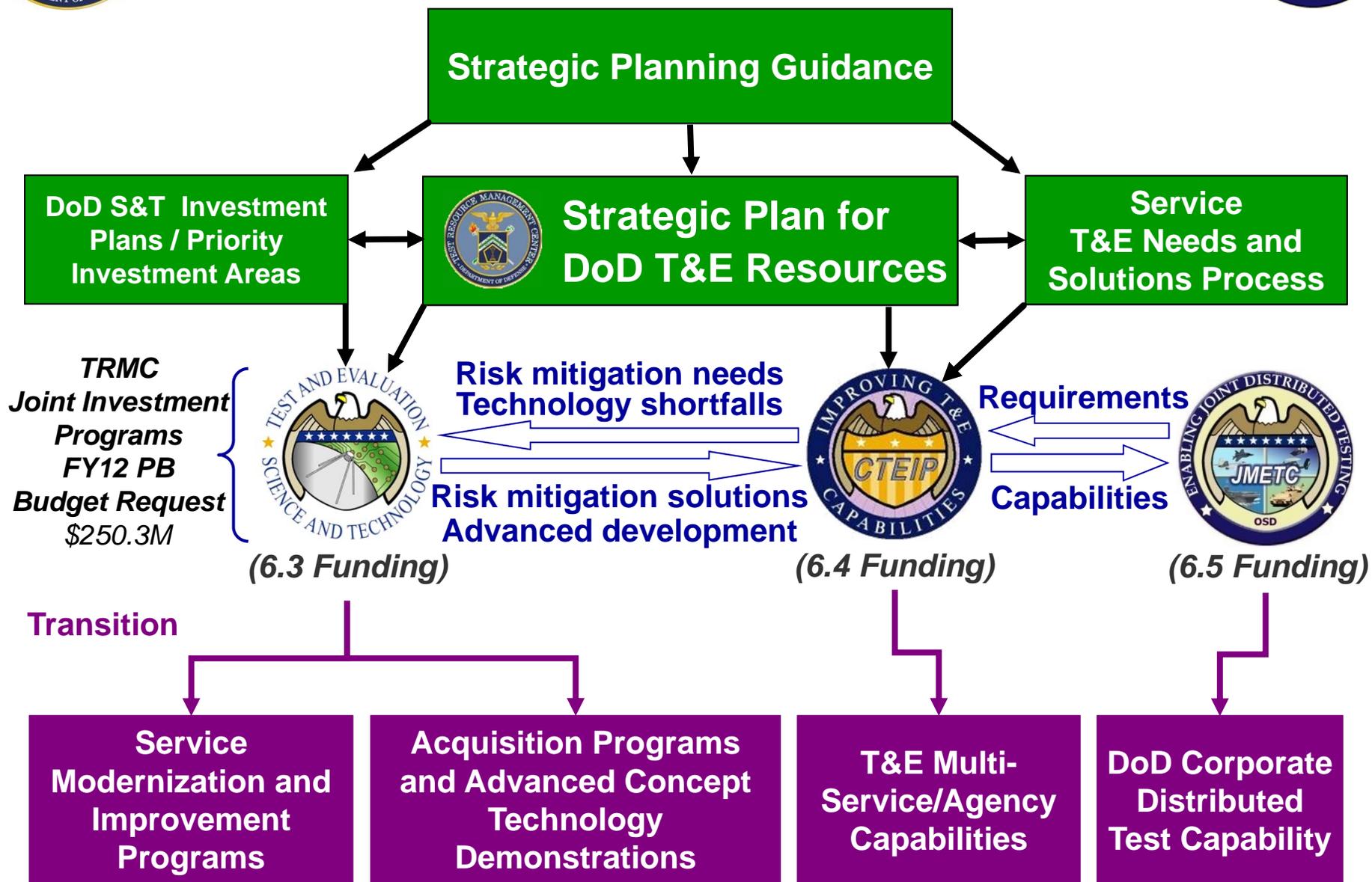
Agenda



- **TRMC and JMETC**
- **Distributed Testing**
- **JMETC**
- **JMETC-Supported Events**
- **Cyber T&E**
- **Summary**

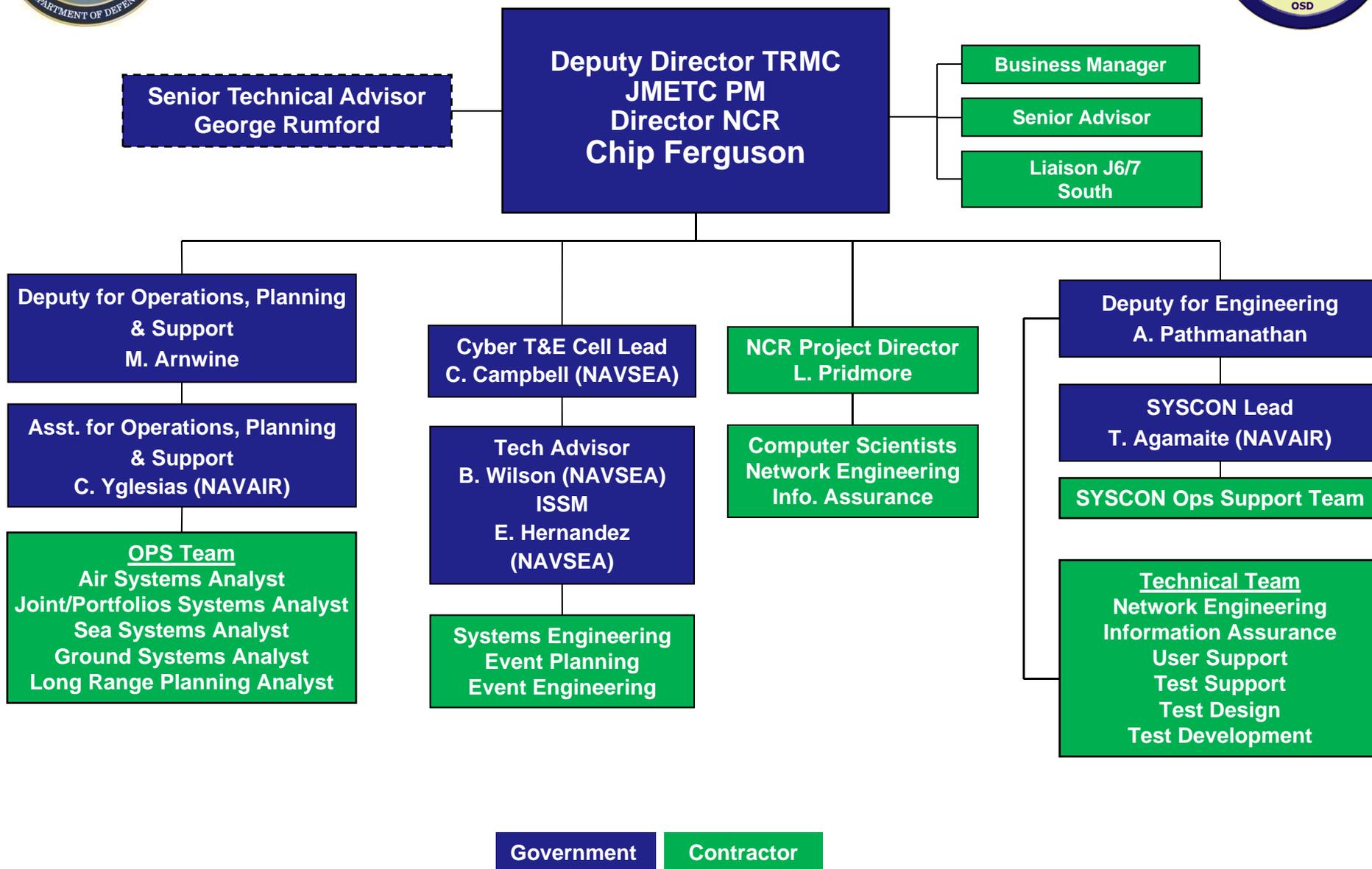


The TRMC "Blueprint": Putting Test Capabilities on the DoD Map





JMETC Organization





What is Distributed Testing?

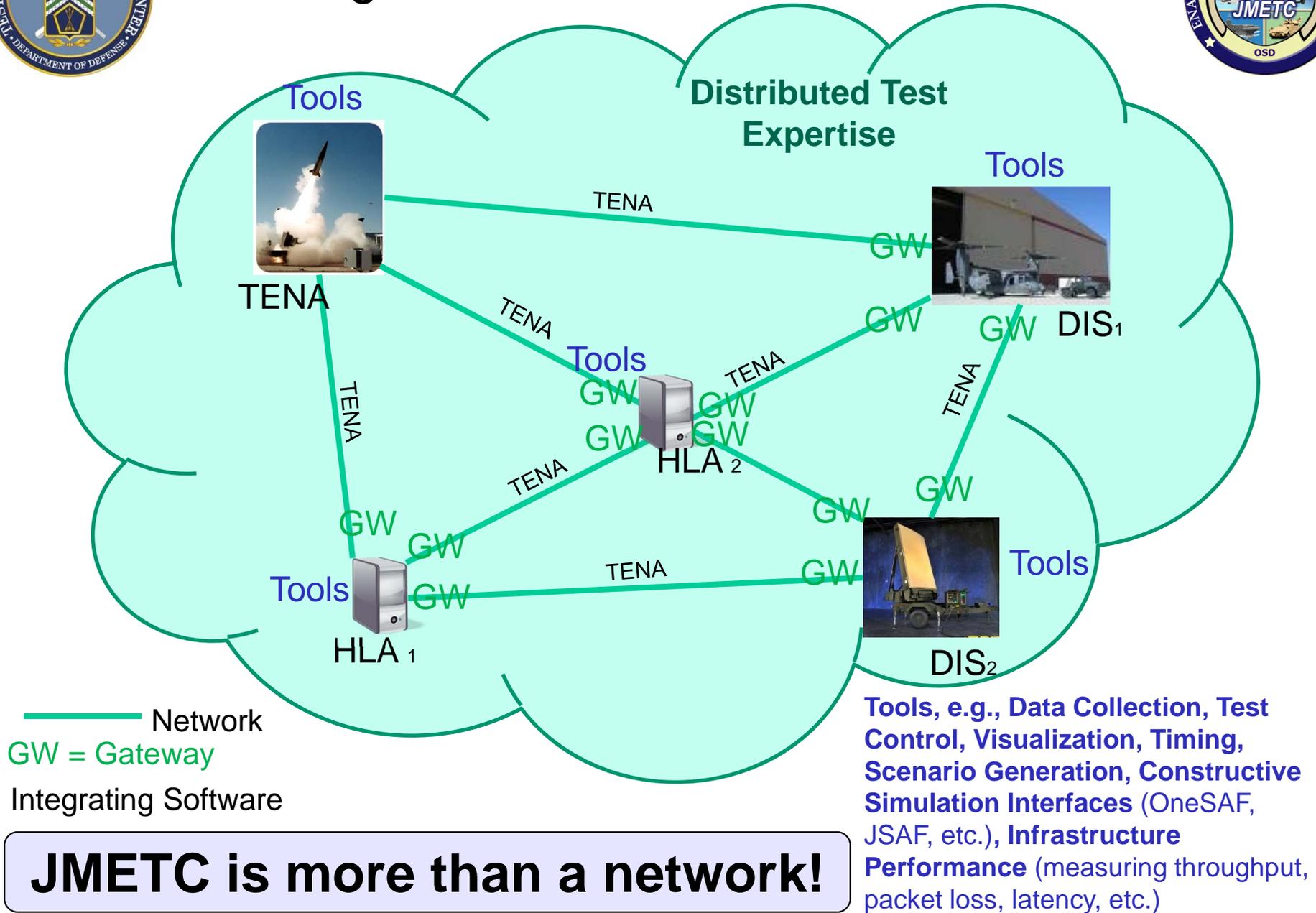


A process, preferably persistent and continuous, for linking various geographically separated live, virtual, and constructive sites and capabilities together in a distributed environment, for use across the acquisition life cycle, to support and conduct the Test and Evaluation (T&E) of a system or systems-of-systems in a Joint and cyberspace environment.

**A new way of thinking for many in the
Test and Evaluation Community**



Providing the Distributed Test Infrastructure



JMETC is more than a network!



Why Consider Distributed Test?



- Is there a requirement to exchange data within your system or within a system-of-systems (SoS)?
- Do you have a requirement/need to address SoS interoperability issues early in the acquisition process?
- Do you have adequate numbers of systems under test for live testing?
- Do you have adequate numbers of, or the resources for, the “supporting cast” (supporting systems, C4ISR assets, etc.) for live testing?
- Do you have adequate threat types, fidelity, and density in realistic numbers at realistic ranges for live testing?

Have you addressed DASD(DT&E) TEMP Check List, Item 14, JMETC as a Resource for Distributed Test?



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

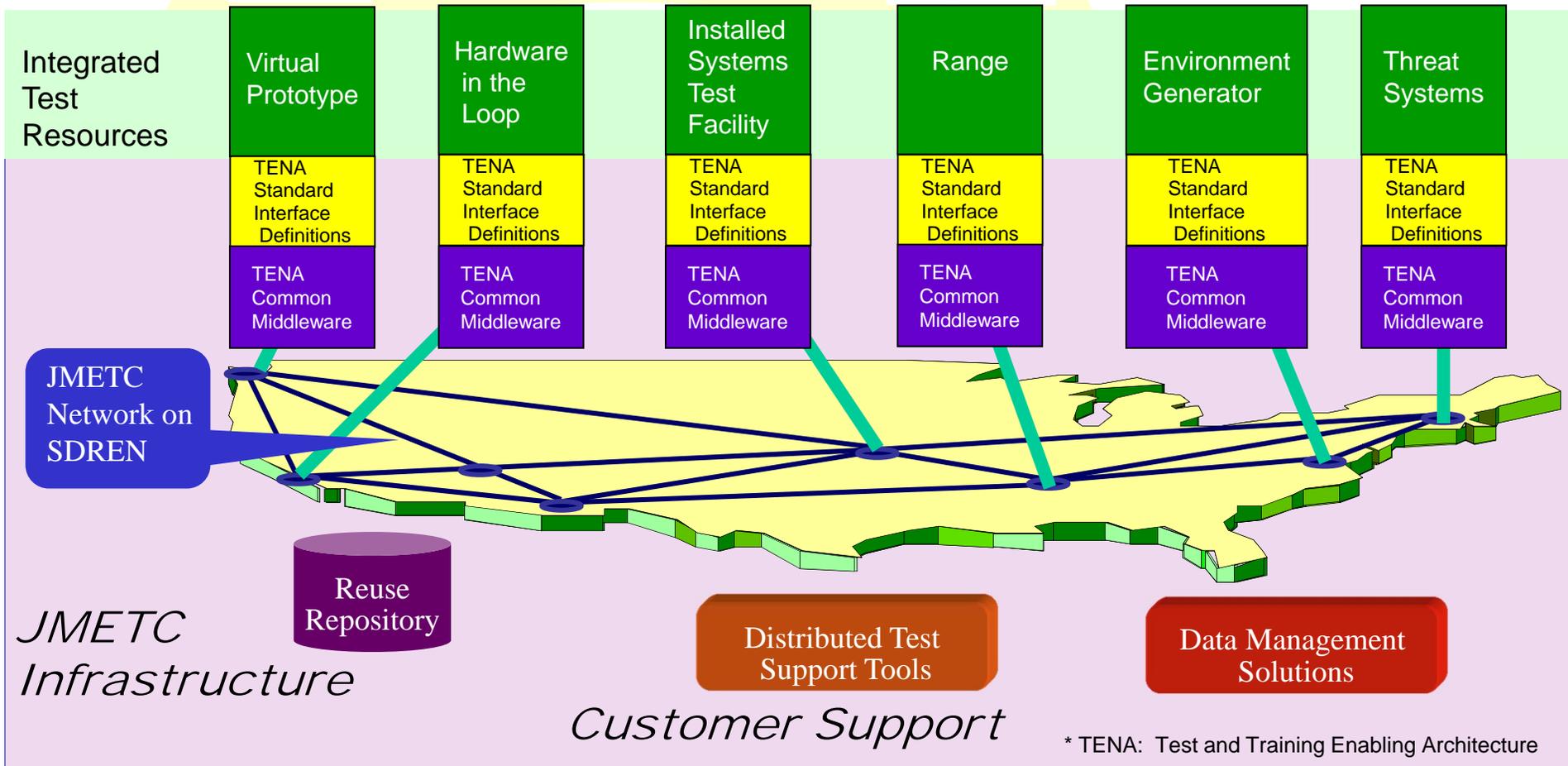
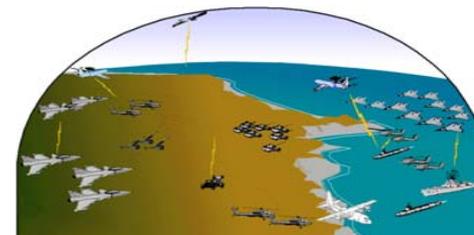


JMETC Enables Distributed Testing



Joint Operational Scenarios

Systems Under Test

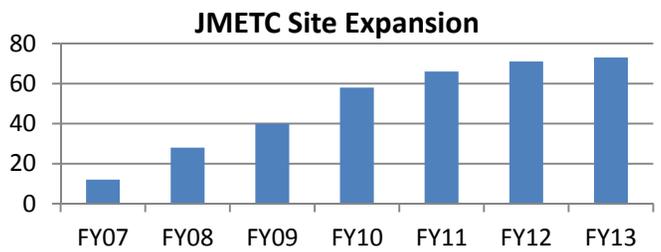
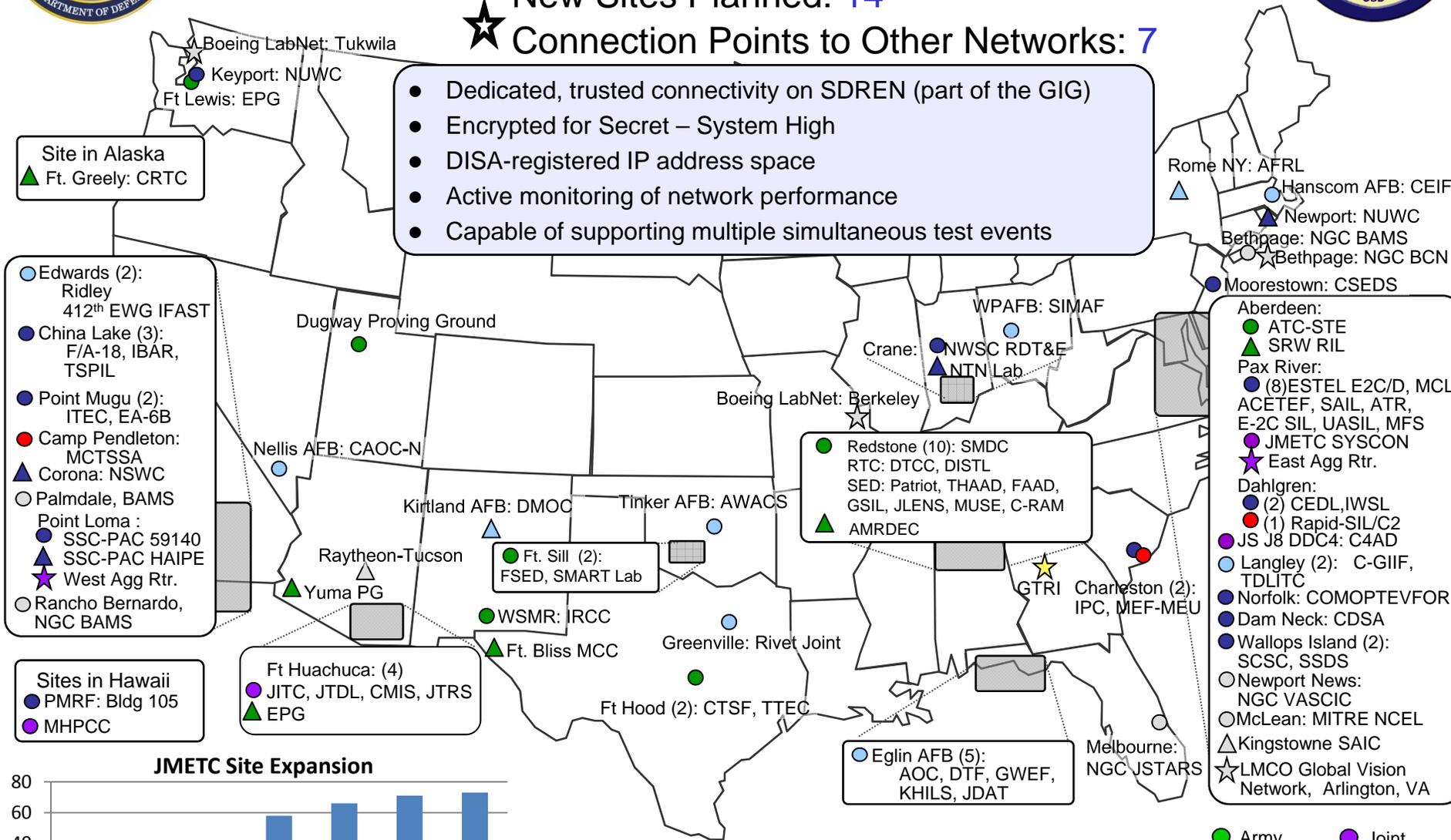




JMETC Connectivity

- Functional Sites: 72
- ▲ New Sites Planned: 14
- ★ Connection Points to Other Networks: 7

- Dedicated, trusted connectivity on SDREN (part of the GIG)
- Encrypted for Secret – System High
- DISA-registered IP address space
- Active monitoring of network performance
- Capable of supporting multiple simultaneous test events



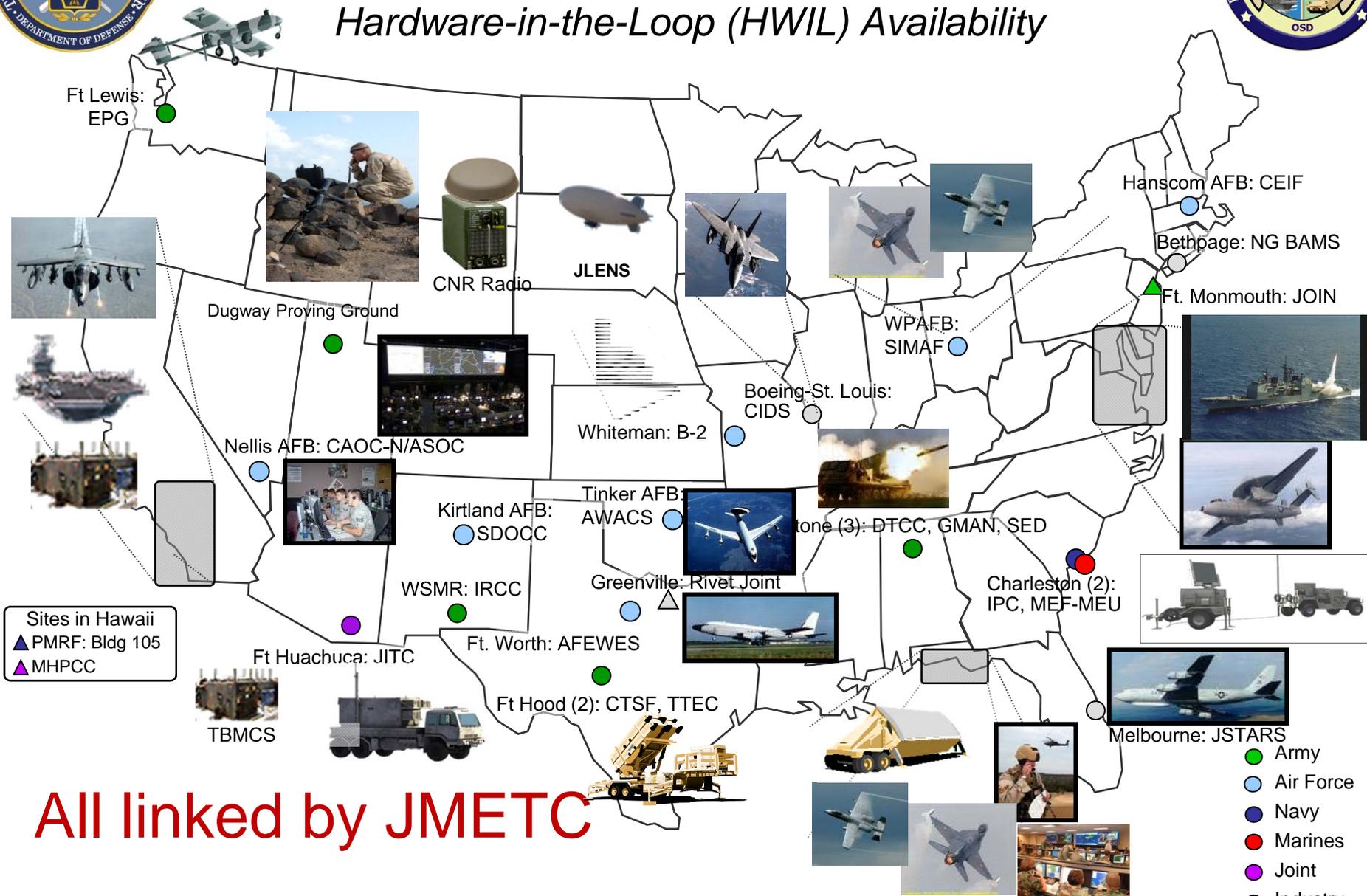
As of 13 June 2013

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



How a Test Planner Views JMETC

Hardware-in-the-Loop (HWIL) Availability

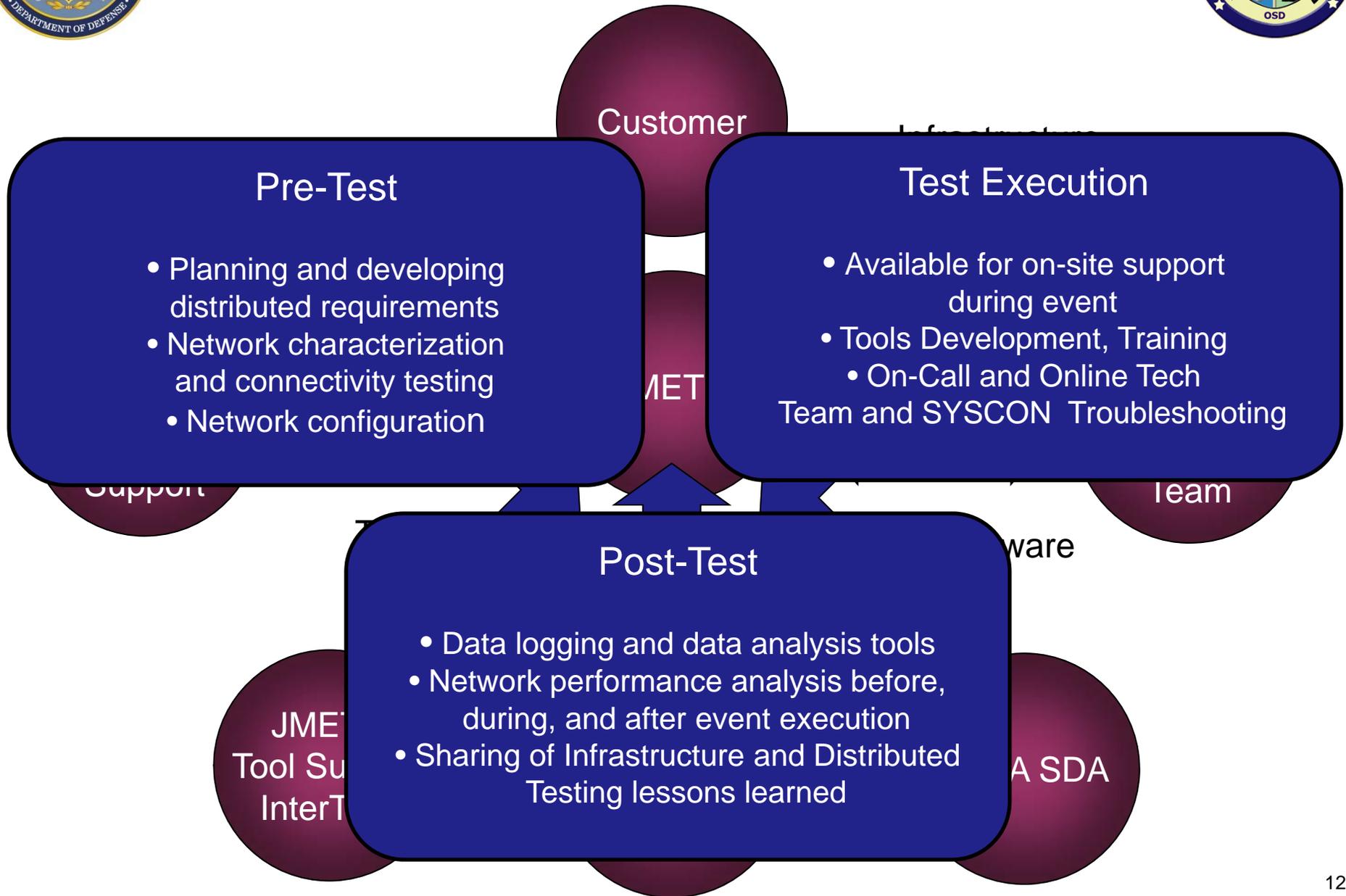


All linked by JMETC



You Worry About the Test...

JMETC Worries About the Infrastructure



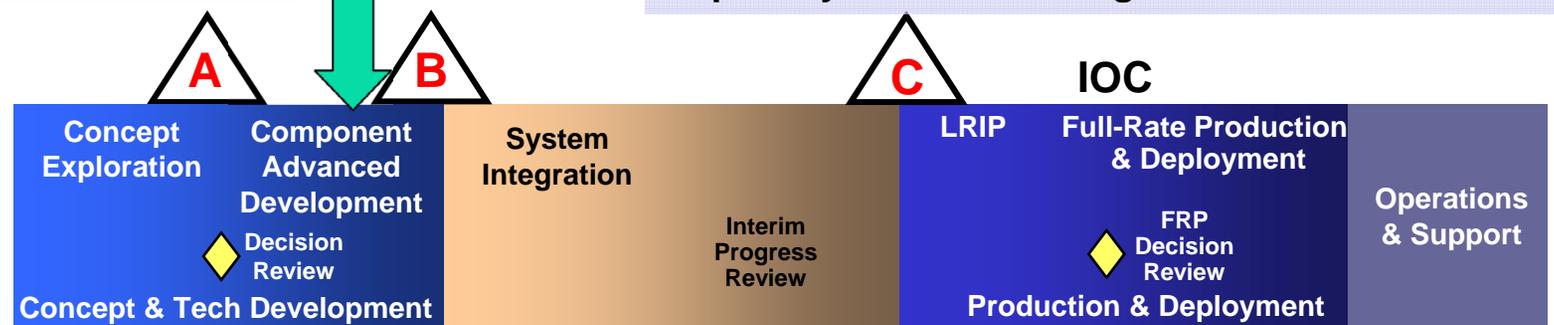


The Future of Distributed Testing: Test-Fix-Test SHIFT LEFT



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

Outline Distributed Testing and JMETC requirements in TEMP



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



Major FY12 Events Supported



<u>Customer</u>	<u>Event</u>	<u>Execution Dates</u>	<u>Onsite Support</u>
Joint	JITC Joint Interoperability Tests JIT 12 - 1,2,3,4,5 (Continuous)	Oct 2011 - Sep 2012	Yes
Air Force	Air Force Systems Interoperability Test (AFSIT)	Oct 2011 - Sep 2012	-
Navy	Accelerated Mid-Term Interoperability Improvement Program (AMIIP)	Oct 2011 - Jun 2012	Yes
Navy	TRITON	Oct 2011 - Sep 2012	Yes
Air Force	AGILE Fire Phase V	Nov 2011 - Feb 2012	Multiple
InterTEC	InterTEC Cyber Event	Nov 2011	Multiple
Joint	JIAMDO Correlation/De-correlation Interoperability Test (C/DIT) Coalition and U.S. only	Jan - Dec 2012	Multiple
Joint	Vengeance	Jan - Sep 2012	Yes
Navy	NAVAIR Integrated Warfighting Capabilities (IWC)	Mar - Aug 2012	Yes
Air Force	B1-B FIDL Interoperability Test	April - May 2012	-
Army	Distributed Common Ground System- Army (DCGS-A)	Apr 2012	-
Air Force	B-52 Combat Network Communications Technology (CONNECT)	Jun - Aug 2012	-
Joint	Joint Track Manager Concept - Demonstration (JTMC-D)	Jul - Nov 2012	Yes
Air Force	AGILE Fire Phase VI	Jun - Sep 2012	Multiple
Navy	Joint Distributed IRCM Ground test System(JDIGS)	Jun - Sep 2012	-
Joint	JIAMDO Joint Tactical Air Picture (JTAP)	Jun - Dec 2012	Multiple
Navy	Aegis Performance Assessment Verification (PAV)	Jul - Sep 2012	Yes



Major FY13 Events

<u>Customer</u>	<u>Event</u>	<u>Execution Dates</u>	<u>Onsite Support</u>
Navy	Accelerated Mid-Term Interoperability Improvement Program (AMIIP)	Oct 2012 - Sep 2013	Yes
Joint	JITC Joint Interoperability Tests (JIT)	Oct 2012 - Sep 2013	Yes
Air Force	Air Force Systems Interoperability Test (AFSIT)	Oct 2012 - Sep 2013	-
Navy	TRITON	Oct 2011 - Sep 2012	Yes
Joint	Joint Track Manager Concept - Demonstration (JTMC-D)	Oct 2012 - Nov 2012	Yes
Joint	JIAMDO Correlation/De-correlation Interoperability Test (C/DIT) Coalition and U.S. only	Oct 2012 - Sep 2013	Multiple
Joint	JIAMDO Joint Tactical Air Picture (JTAP)	Oct 2012 - Dec 2012	Multiple
Air Force	AGILE Fire Phase VII	Jan 2013 - Mar 2013	Multiple
InterTEC	InterTEC Cyber Event (ICE) FY13	Oct 2013 – Feb 2013	Multiple
Navy	Virtual Rapid Prototyping Laboratory	Jan 2013 – Feb 2013	Yes
Joint	Red Flag	Jan 2013 – Mar 2013	Yes
Navy	Joint Distributed IRCM Ground test System(JDIGS)	Oct 2012 - Sep 2013	-
Air Force	AIM9x	Feb 2013	Yes
Marine Corp	G/ATOR	Feb 2013 – Apr 2013	Yes
Air Force	AGILE Fire Phase VIII	Jun 2013 - Sep 2013	Multiple



JMETC Customer Testing Initiatives



Apache Block III (AB3)

Nov 13 to Sep 14

- Block III is the Apache sustainment effort that provides required operational capabilities via insertion of mature technologies. The planned upgrades to 690 aircraft will result in Joint interoperability and improved aircraft performance.
- First implementation of Link-16 for Army Aviation
- JMETC provides distributed testing infrastructure for AB3 Joint Interoperability Certification and Link-16 risk reduction testing
 - Apache Lab: Boeing Mesa (Lab-Net)
 - JSTARS: Melbourne, FL
 - 46th TW: Eglin AFB, FL
 - JITC: Fort Huachuca, AZ



IMPACT—Efficiency

- Provides opportunity for early test for risk reduction
- Reduce cost by minimizing live fly where appropriate and do not have to bring all assets to the test site
- Rapidly scheduled and executed testing
- Allows near real time test-fix-test
- Planning meeting upcoming 30Apr to 1May13



JMETC Customer Testing Success

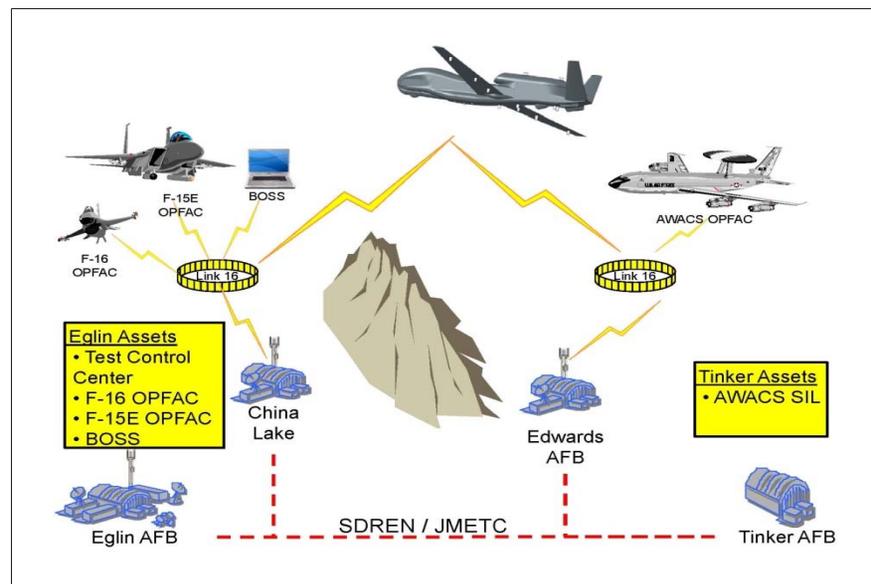


Battlefield Airborne Communication Node (BACN)

Joint Urgent Operational Need

August 13 – September 15, 2010

- Integration of BACN payload onto multiple platforms for solution to urgent in-theater need :
 - Combat requirement for beyond line-of-sight comm
 - Relay, bridge, and range extension for ground forces and supporting aircraft
- Distributed Testing in Fall 2010 included Live-fly , DT, and Operational Utility Evaluation



IMPACT

- Efficient integration of DT and OT
- Testing completed despite many of the required assets not being available on-site
- Distributed Testing saved “\$1.2M” (OTA)
- Urgent capability fielded-quickly!



JMETC Customer Testing Success



Correlation / Decorrelation Interoperability Test (C/DIT) Coalition Testing

FY 10 thru FY 13 (On-going)



IMPACT

- A Joint Integrated Air and Missile Defense Organization (JIAMDO/J8) Joint Distributed Engineering Plant (JDEP) sponsored event
- Assess correlation/de-correlation interoperability of STANAG 5516 Ed 4 and Mil-Std 6016D for the E-2C and E-3D.
- Assess STANAG 5602 Ed 3 interoperability between the US & UK platforms using their SIMPLE protocol communication devices
- Improved Coalition Interoperability
- US: HE2K (E2C), ESTEL, Pax River, MD
- UK: E3D (baseline UK04v10), RAF Waddington
- Demonstrated JMETC ability to connect to Coalition partners.



JITC Sponsored Joint Interoperability Test (JIT)



A Distributed Test Venue

FY 10 through FY 13 (On-going)

- Sponsored by the Joint Interoperability Test Command (JITC)
- JITC conducts interoperability assessments, standards conformance, and interoperability certification testing of joint tactical data links in HWIL and operationally realistic environments to validate the implementation of approved standards in a Joint environment.
- Typically 5 events per year



IMPACT

- Joint Interoperability
- FY 12 & 13 Systems Under Test: B-2B, PATRIOT, E3 AWACS, THAAD, E2 Hawkeye 2K, JSTARS, Advanced MANPADS, F-16 (40/50), E/A-18G, Aegis 5.3.9, Aegis 6.3.3, Aegis 7.1.3, AEGIS 7.1R.1, Aegis BMD 4.0.1, Aegis BMD 4.0.2, ROBE, MH-60R, Rivet Joint SIS (MSCS), JTACS, FAAD C2, BCS-F, MCE, LCS-1, MCE, UAS ERMP



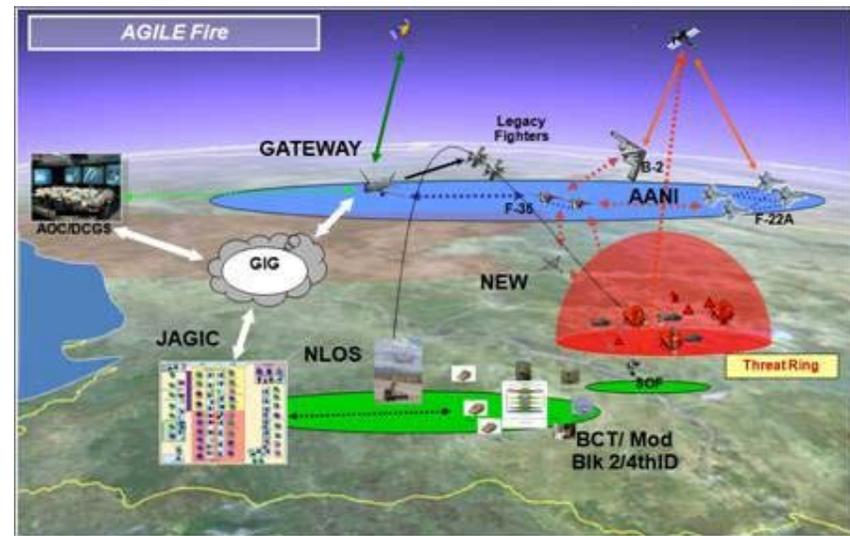
SIMAF Sponsored Air-to-Ground Integrated Layer Exploration (AGILE)



A Distributed Test Venue

FY 07 through FY 13 (On-going)

- Sponsored by the Simulation and Analysis Facility (SIMAF), USAF Air Systems Command (WPAFB, OH)
- Distributed venue for selected initiatives to explore Joint airspace integration procedures and data exchange requirements within and between Air and Ground domains to execute Joint Fires
- Provides bi-annual robust integrated LVC environment for capturing data based on project requirements
- JMETC provides infrastructure and technical support for all AGILE events
 - Only JMETC sites are used
 - 12-15 sites each cycle
- AGILE VII: 25-29 March, 2013



IMPACT

- T&E Efficiencies
- Since FY 12 & 13, programs Included: Network Enabled Weapon (SDB II); Common Aviation Command and Control System (CAC2S); Counter Rocket, Artillery, and Mortar (CRAM); Friendly Force Tracker (FFT); Joint Air-to-Ground Integration Cell (JAGIC)
- AGILE VI (Sept 2012) included 13 Initiatives and four operationally realistic mission threads



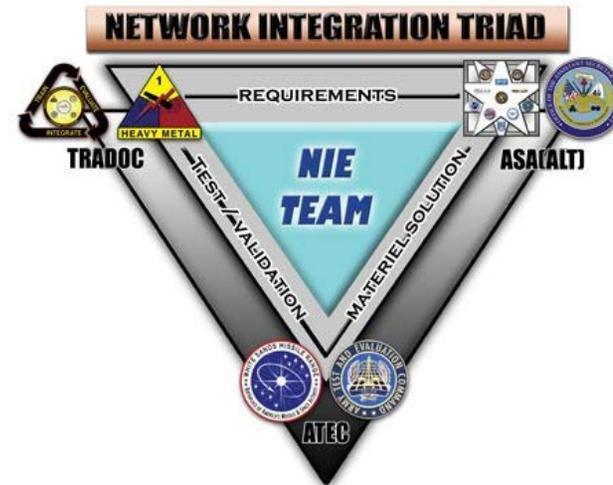
Distributed Test Planning Initiative



Army Network Integration Event (NIE)

FY 14 Planning

- An Integration and Test event of a collection of 41 systems, each at various ACAT stages, intended to deliver a formal Brigade Capability Set (CS) of communications tools, hardware, software and techniques
- The CS provides a range of support from the static Tactical Operations Center (TOC) to the dismounted Soldier, through the full range of Army operations, and includes an integrated voice and data capability throughout the entire Brigade Combat Team formation



IMPACT

- JMETC will enable NIE's to have access to Joint LVC assets and will consider Coalition requirements to support system of systems interoperability testing
- Enables the use of their systems in a training and early user continuous Test – Fix – Test cycle
- Planning for distributed test in 14-1



Cyber



Cyber T&E



- Test and Evaluation must accurately and affordably measure cyberspace effectiveness and vulnerabilities of DoD systems.
- DASD(DT&E) with TRMC and JMETC are addressing requirements for building **Cyberspace T&E Process, Methodology, Infrastructure, and Workforce.**

**JMETC has embarked on the Cyber T&E mission in
FY13**



Cyber T&E Mission in FY13



- **Current activities include:**
 - **Implementing the TRMC Cyber T&E strategy**
 - **Operationalizing the National Cyber Range (NCR) for the Test and Training communities**
 - **Partnership with DOT&E, TSMO, JIOR**
 - **Regional Service Delivery Points**
 - **InterTEC Cyber Events (ICE)**
 - **Developing Cyber T&E Use Cases**
 - **Cyber Range Interoperability Standards (CRIS)**
 - **Cyber T&E Support Cell**
 - **Cyber T&E Investments**
 - **Cyber QRT**



ICE Capability Progression



• ICE FY10

- First connection of JIOR and JMETC
- SUT not participating in mission
- “Effect” of cyber attack artificially passed into mission environment
- Both networks at same classification
- Hacker-grade threat



• ICE FY12

- Tactical/C2 data flow took place between JIOR and JMETC
- SUT participated in mission execution
- Attack impacts immediately flow to mission
- Both networks at same classification
- Hacker-grade threat



• ICE FY13

- Tactical/C2 data flow between JIOR and JMETC
- SUT participates in mission execution
- Active CND
- Attack impacts immediately flow to mission
- Both networks at same classification
- Hacker-grade threat



ICE 2013

Systems Overview (SV-1)

- Blue Forces reside on JMETC
- Threat Team contained within JIOR
- AOC “System Under Attack” managed interactions with Blue Forces and Threat Team

System Key:
 Live
 Virtual
 Constructive
 Instrumentation

Network Key:
 ▲ JMETC
 ● Joint IO Range

MIT, Lincoln Labs
 - LARIAT

ITEC, Point Mugu
 TCC
 - JSAF
 - OneSAF
 - NRO ASSET
 - JIMES/JANETT/NECM
 - - Starship

AWL, China Lake
 - F/A-18E/F, EA-18G
 - PRC-117
 - NEWCIM
 - C3Driver
 - JIMES / JANETT

SIMAF, WP AFB
 - EAAGLES (F-16s)
 - JIMES/JANETT

ACETEF, PAX
 - JIMM
 - JIMES/JANETT

MFS, PAX
 -EA-18G
 - THGW
 - NEWCIM
 - JIMES/JANETT

ESTEL, PAX
 -E-2C
 - SSEGW
 - JIMES/JANETT

TSMO, Redstone Arsenal
 - Cyber Threat

MCTSSA, Camp Pendleton
 JTAC / BN / RGT / DIV FC & DASC
 - StrikeLink, TLDHS
 - AFATDS x 4
 -C3Driver
 -JIMES / JANETT

JITC, Fort Huachuca
 -Backup TCC
 -JIMES/JANETT

RJ, Greenville
 - RC-135
 - SSEGW
 - JIMES/JANETT

DTF, Eglin AFB
 F-15, F-16, E-3, E-8
 -JRE, MTCD
 -EAAGLES
 - C3Driver
 -JIMES/JANETT

AOC, Eglin AFB
 JAOC / TACC
 - TBMCS, GCCS-J, JRE
 -JADOCs, TPG, CNDSP
 - PTT, LARIAT
 -JIMES
 - C3Driver

JIMM	Joint Integrated Mission Model
JSAF	Joint Semi Automated Forces
OneSAF	One Semi Automated Forces
EAAGLES	Extensible Architecture for Analysis and Generation of Linked Simulations
LARIAT	Lincoln Adaptable Real-time Information Assurance Testbed
NEWCIM	Net-Enabled Weapon Controller Interface Module
NRO ASSET	National Reconnaissance Office Automated Scriptor Simulator Exercise Trainer
PTT	Part-Task Trainer

BN / BCT / DIV FSE	Battalion / Brigade Combat Team / Division Fire Support Element
BN / RGT / DIV FC	Battalion / Regiment / Division Fire Cell
DASC	Direct Air Support Center
JAOC/TACC	Joint Air Operations Center / Tactical Air Coordination Center
JTAC	Joint Terminal Attack Controller

TCC	Test Control Center
ACETEF	Air Combat Environment Test and Evaluation Facility
AWL	Advanced Weapons Laboratory
DTF	Datalinks Test Facility
ESTEL	E-2C Systems Test and Evaluation Laboratory
ITEC	Interoperability T&E Center at Sea Range
GTRI	Georgia Tech Research Institute
JITC	Joint Interoperability Test Command
MCTSSA	Manned Flight Simulator
MFS	Marine Corps Tactical Systems Support Activity
SIMAF	Simulation and Analysis Facility
TSMO	Threat System Management Office

AFATDS	Advanced Field Artillery Tactical Data System
GCCS-J	Global Command and Control System – Joint
JADOCs	Joint Automated Deep Operations Coordination System
PRC-117	Tactical Radio
TBMCS	Theater Battle Management Core System
TLDHS	Target Location, Designation, and Hand-off System
TPG	Target Package Generator
JRE / MTCD	Joint Range Extension / Multi TADIL Converter Daemon
RJ	Rivet Joint



The Cyber T&E Support Cell



- DOT&E, TRMC, and TSMO have stepped in to help fill gaps in Cyber T&E shortfalls by establishing *The Cyber T&E Support Cell*
- This cell is expected to work in conjunction with JIOR but focus on cyber T&E infrastructure, common services, and capabilities
- Two Primary Functions
 - T&E event planning and execution
 - Infrastructure development and fielding

In partnership between JIOR, DOT&E and TRMC the next-generation Cyber Range architecture is being developed and prototyped – with a focus on cyber T&E infrastructure needs



Cyber T&E Support Cell



- Funded by TRMC/JMETC, DOT&E, TSMO
- Functions
 - Cyber T&E Planning for Events
 - Cyber T&E Roadmap
 - Regional Service Delivery Point (RSDP) oversight of development and certification
 - NCR Certification at TS/SCI/SAP/SAR
 - Cyber Alignment – JMETC, CTEIP, T&E/S&T
 - Support to DOT&E
 - Support to TSMO



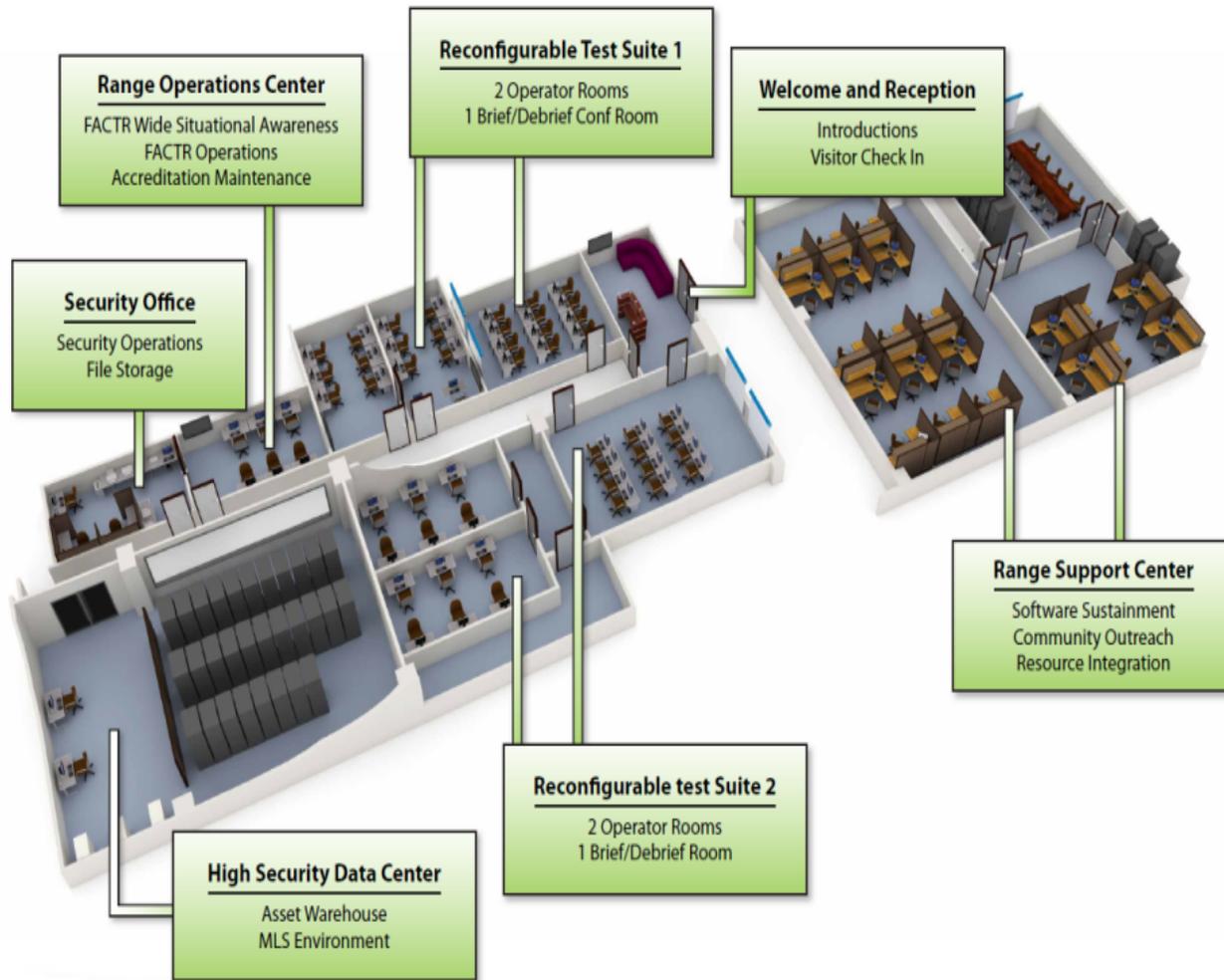
National Cyber Range Orlando, FL



- Goal
 - Create a secure, self-contained facility that can rapidly emulate the complexity of defense & commercial networks, allowing for cost-effective and timely testing
- Current Status
 - Transitioned program to the Test Resource Management Center in October '12
 - Working Certification and Accreditation for TS/SCI/SAP/SAR
 - Operationalize the Range
 - Open invitation for Range Overview May 2, 2013 at the facility or via telecon
- Range Features
 - Simple experiment design tools
 - Automated range build-out capability
 - Automated range sanitization
 - Supports simultaneous testing at multiple security levels



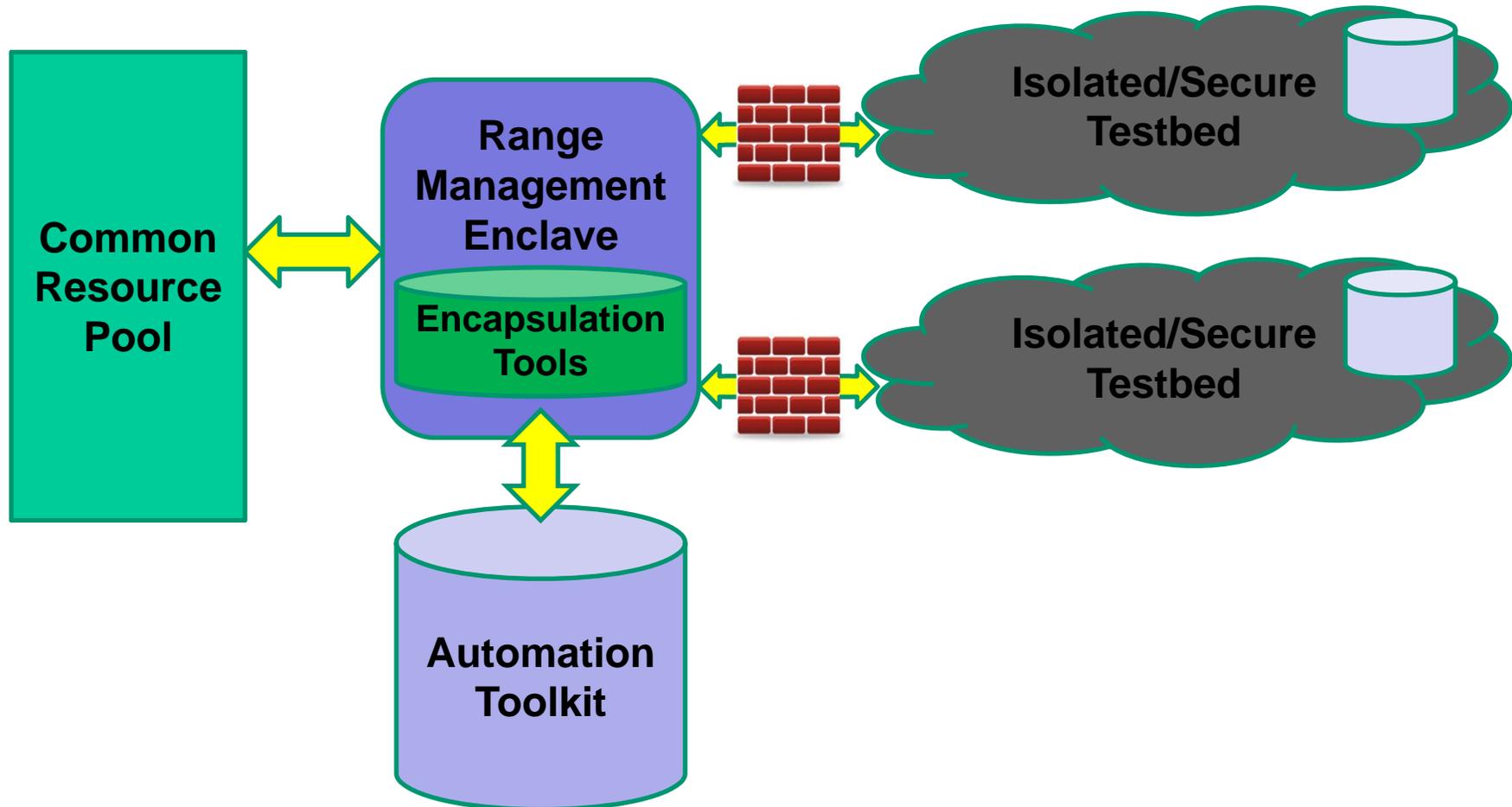
Facility



- Fully accredited SCIF
- Remote access only via JIOR connection
- Two independent test suites
- “System High” data center, 200+ servers, 10K+ VMs
- Unclassified Range Support Center



Reconfigurable Range Concept



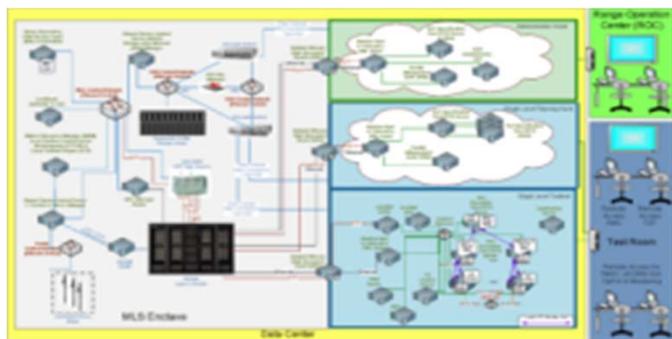
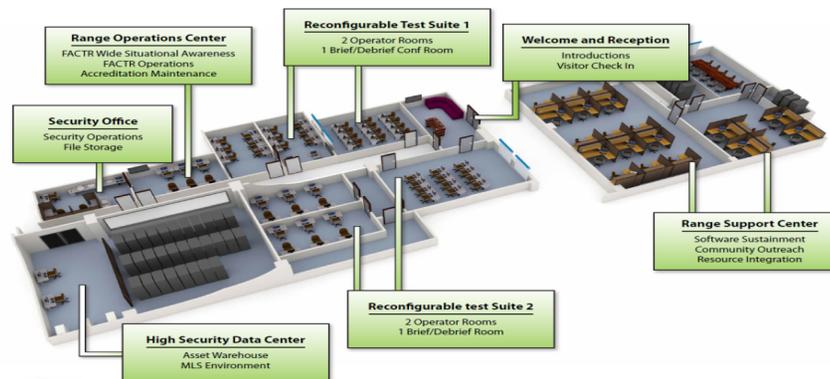
Partitions a common pool of resources into multiple independent testbeds



What is NCR ?



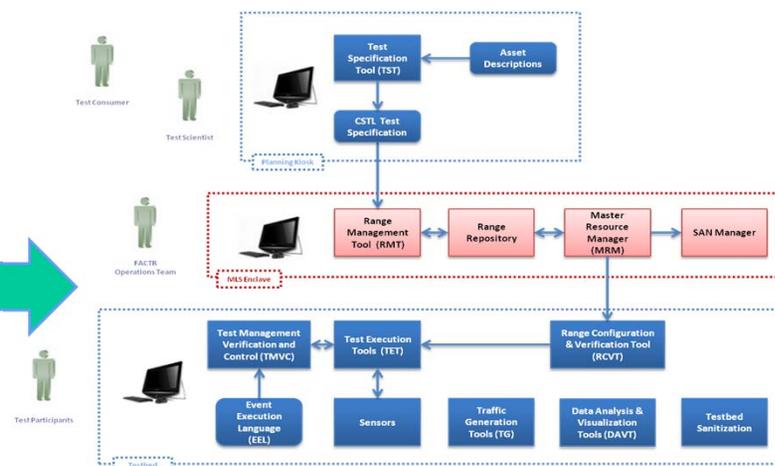
Computing
Assets/Facility



Encapsulation Architecture & Operational Procedures

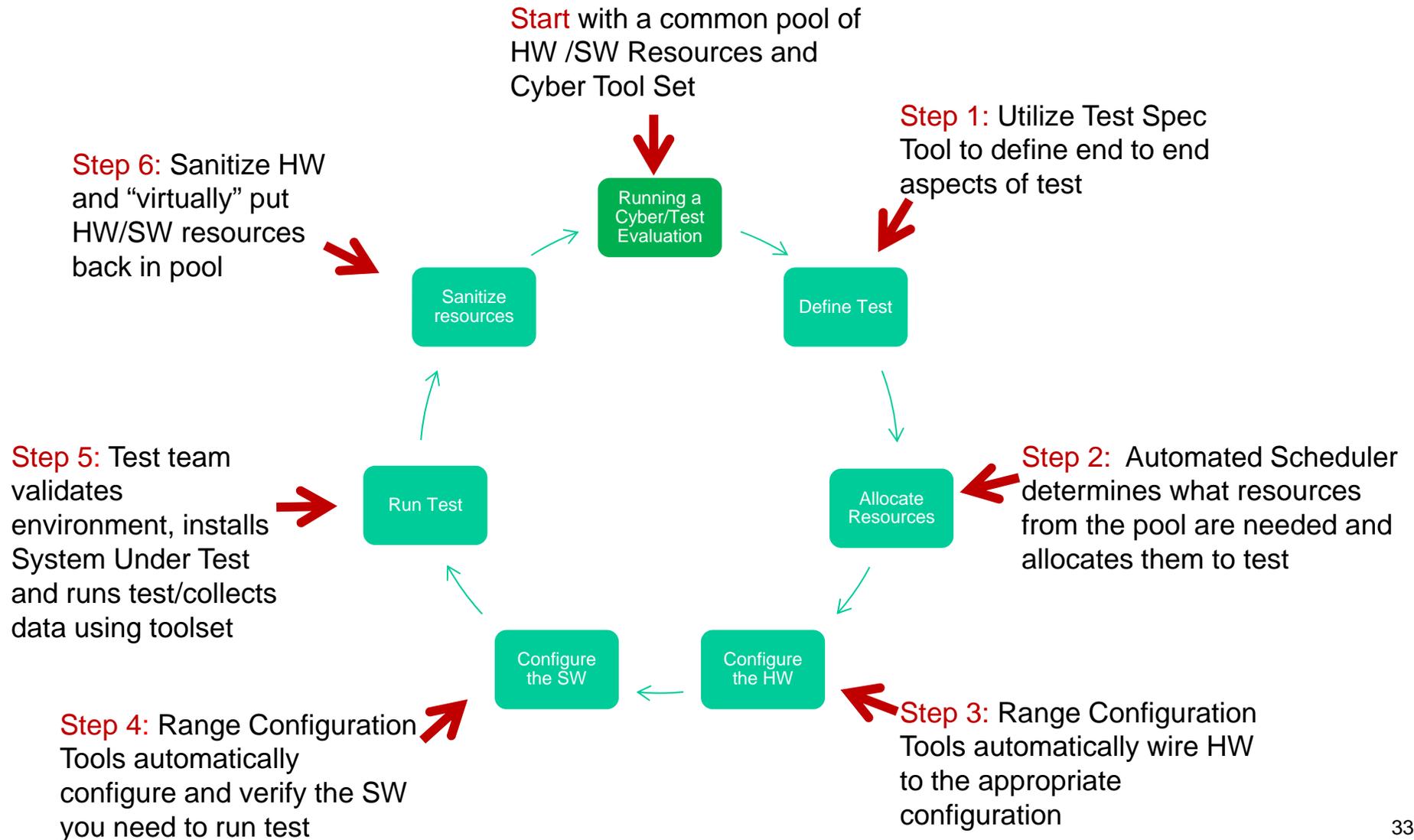


Integrated SW
Testing Toolsuite





NCR Automated Cyber Test Process





Summary



- Many sites and systems already connected
- Demonstrated efficiencies for interoperability and cyber test
- Robust capability – ability to execute multiple events simultaneously, across the spectrum of T&E and acquisition life cycle
- Multiple examples of JMETC value added for customers
- Provides Acquisition T&E programs flexible and efficient T&E at lower cost and technical risk
- JMETC offers support to develop our customer's distributed test requirements for interoperability and cyber testing

JMETC enables both Acquisition and T&E Communities to partner for a better product, faster, and at a lower cost!



JMETC Program Points of Contact



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Questions?