

# Joint Mission Environment Test Capability (JMETC)



Briefing for:

**NDIA National Test and Evaluation Conference**

February 27, 2008



# Agenda



- Interoperability/NR KPP Test Requirement
- Program Overview
- FY07 Accomplishments
- FY08 Plan
- Concluding Remarks



# Interoperability / Net-Ready KPP Testing Requirement



*"It is expected any resultant materiel solution will be verified through testing conducted in the expected joint operational environment to demonstrate joint interoperability and, when appropriate, net-readiness"*

CJCSI 3170.01F, dated 1 May 2007

- DoD Policy requires Joint interoperability and net-readiness testing during acquisition
- Interoperability and Net-Ready KPP testing requires testing interactions of multiple systems at the same time
  - Systems or their representations are not all co-located
  - Need to test early and throughout system development process
- Transition to the GIG to realize Net-Centric Warfare will increase the requirement for interoperability and, thus, increase the need for distributed testing



# *Interoperability, Net Ready Testing Challenges*



- No “live” system available to test early in acquisition process
- Other systems needed to test interoperability/NR are in various stages of development
- Existing (legacy) systems needed for test are often unavailable due to real world commitments or too expensive to be made available
- Available “live” systems and system representations are scattered across the country on ranges, in integration laboratories, in simulations, and in other forms
- Difficult, time-consuming, and expensive to plan and execute distributed test events
  - Networks require time-consuming security agreements to be coordinated
  - Instrumentation data definitions differ from laboratory to laboratory
  - Lack of universal tools complicates test integration
  - Distributed test events require engineering each and every time



# What is JMETC?



- A **corporate** approach for linking distributed facilities
  - Enables customers to efficiently evaluate their warfighting capabilities in a joint context
  - Provides compatibility between test and training
- A core, reusable, and easily reconfigurable infrastructure
  - Consists of the following products:
    - Persistent connectivity
    - Middleware
    - Standard interface definitions and software algorithms
    - Distributed test support tools
    - Data management solutions
    - Reuse repository
- Provides customer support team for JMETC products and distributed testing



# JMETC Will Provide Infrastructure Capability for:



- Testing across full spectrum of acquisition process
  - Developmental Test, Operational Test
  - Interoperability Certification
  - Net-Ready KPP compliance
- Joint mission portfolio testing
- Evaluation of warfighting capabilities in joint mission environment
- Conduct of live, virtual or constructive testing
- Conduct of joint testing and training

***Used whenever you need to link resources together to conduct a distributed test event***



# JMETC Enables Distributed Testing



## Joint Operational Scenarios

Systems Under Test



Integrated Test Resources

**Virtual Prototype**

TENA Standard Interface Definitions

TENA Common Middleware

**Hardware in the Loop Lab**

TENA Standard Interface Definitions

TENA Common Middleware

**Installed Systems Test Facility**

TENA Standard Interface Definitions

TENA Common Middleware

**Range**

TENA Standard Interface Definitions

TENA Common Middleware

**Environment Generator**

TENA Standard Interface Definitions

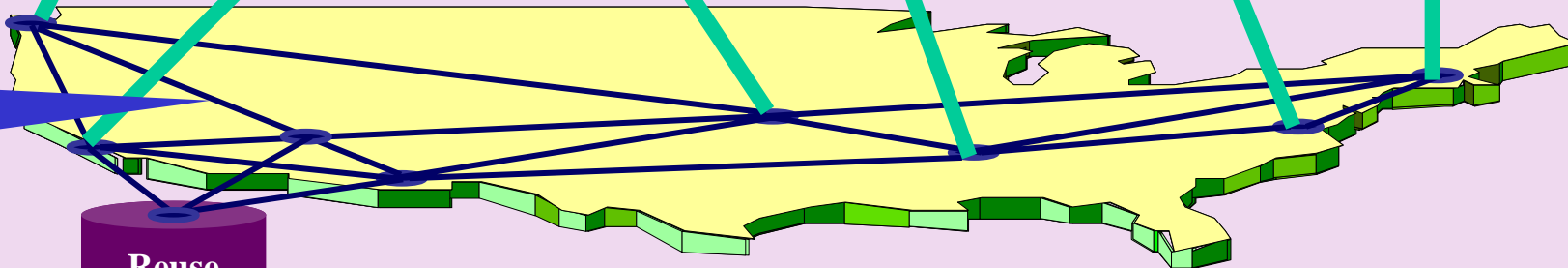
TENA Common Middleware

**Threat Systems**

TENA Standard Interface Definitions

TENA Common Middleware

JMETC VPN on SDREN



Reuse Repository

Distributed Test Support Tools

Data Management Solutions

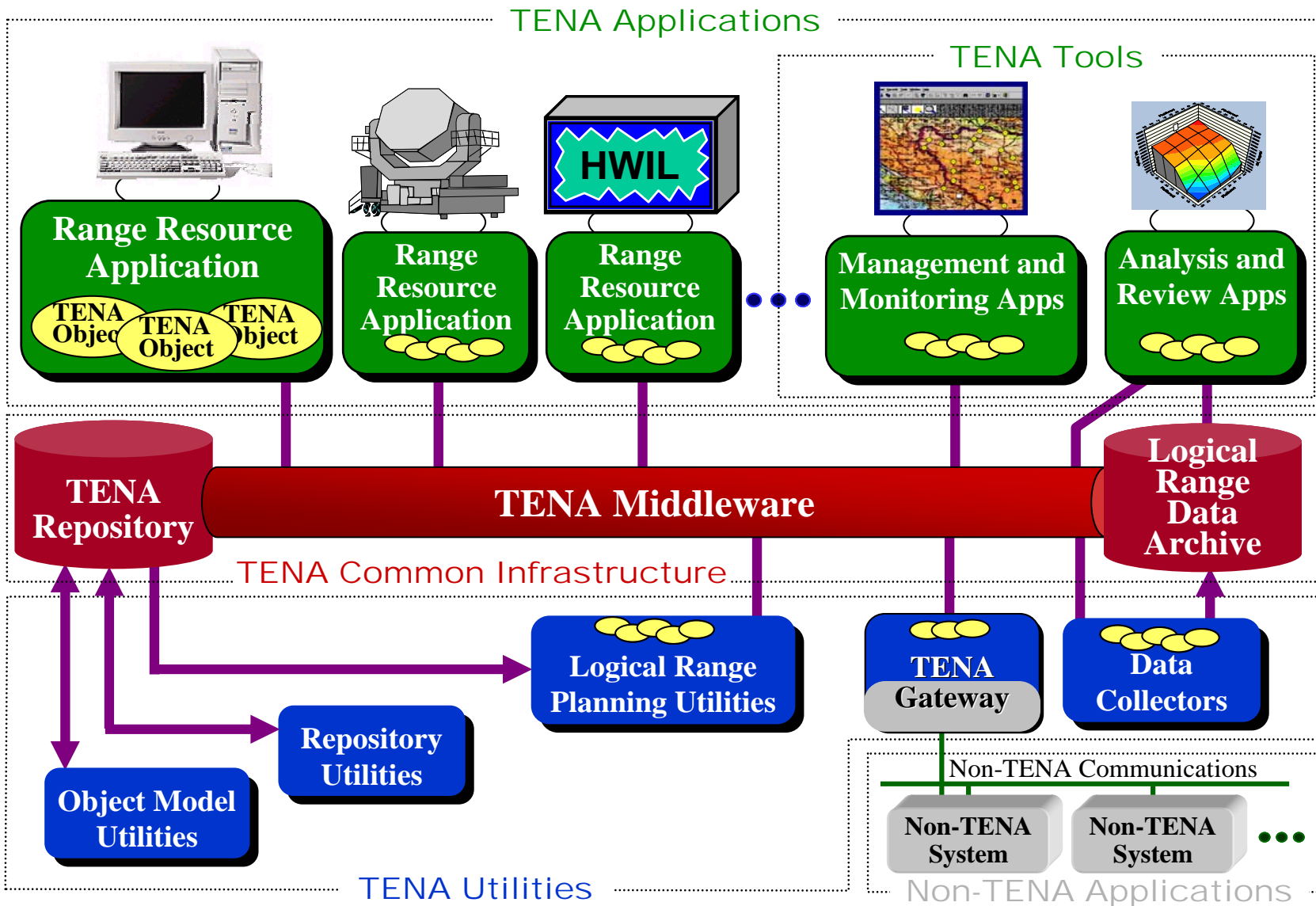
JMETC Infrastructure

Customer Support





# TENA Architecture Overview







# JMETC Leadership & Governance



## JMETC

### Chain of Command

**Honorable John Young**  
USD(AT&L)



**Dr. John B. Foulkes**  
Director, Test Resource Management Center (TRMC)

**Richard L. Lockhart**  
Principle Deputy, TRMC  
Deputy Director, JIPP



**Chip Ferguson**  
JMETC Program Manager



**George Rumford**  
Systems Engineering Lead  
(Acting)

## JMETC

### Governance

**Testing in a Joint Environment  
Roadmap Senior Steering Group**

- Senior DoD Leaders
- Charter signed 26 Oct 07



**JMETC Advisory Group**

- Service/Agency reps
- Regularly held meetings
  - Plans, needs, requirements
  - Priorities

**JMETC Users Group**

- Technical representatives of customers and test resource owners
- Three meetings held in Jun 07, Oct 07, and Jan 08
- 200 participants last meeting
- Next meeting May 08



# JMETC Accomplishments – FY07

## Summary



- Supported two major distributed test events
  - Integral Fire 07
  - InterTEC Spiral 2 Build 1
- Stood up the JMETC VPN on the SDREN
  - Established 8 locations on the JMETC VPN available for future use
    - Pax River, C2TF (@ Eglin), GWEF (@ Eglin), White Sands, Redstone, China Lake, Pt. Mugu, and JITC
- Initiated collaboration with the Training community
  - Used the JNTC-sponsored network aggregator in Integral Fire 07
  - Supported the JFCOM LVC Architecture Roadmap Study
- Established JMETC Advisory Group and JMETC Users Group
- Conducted a DoD Distributed Test Infrastructure Assessment
  - Approved by the Joint Capabilities Board (JCB)



# Integral Fire 07 Test Event



## – Integral Fire 07 Description:

- A combined, distributed test event conducted in August 07 supporting the following three customers:
  - JFCOM JSIC JCAS Assessment
  - JTEM Methodology Assessment
  - USAF Warplan-Warfighter Forwarder (WWF)

## – JMETC Responsibilities:

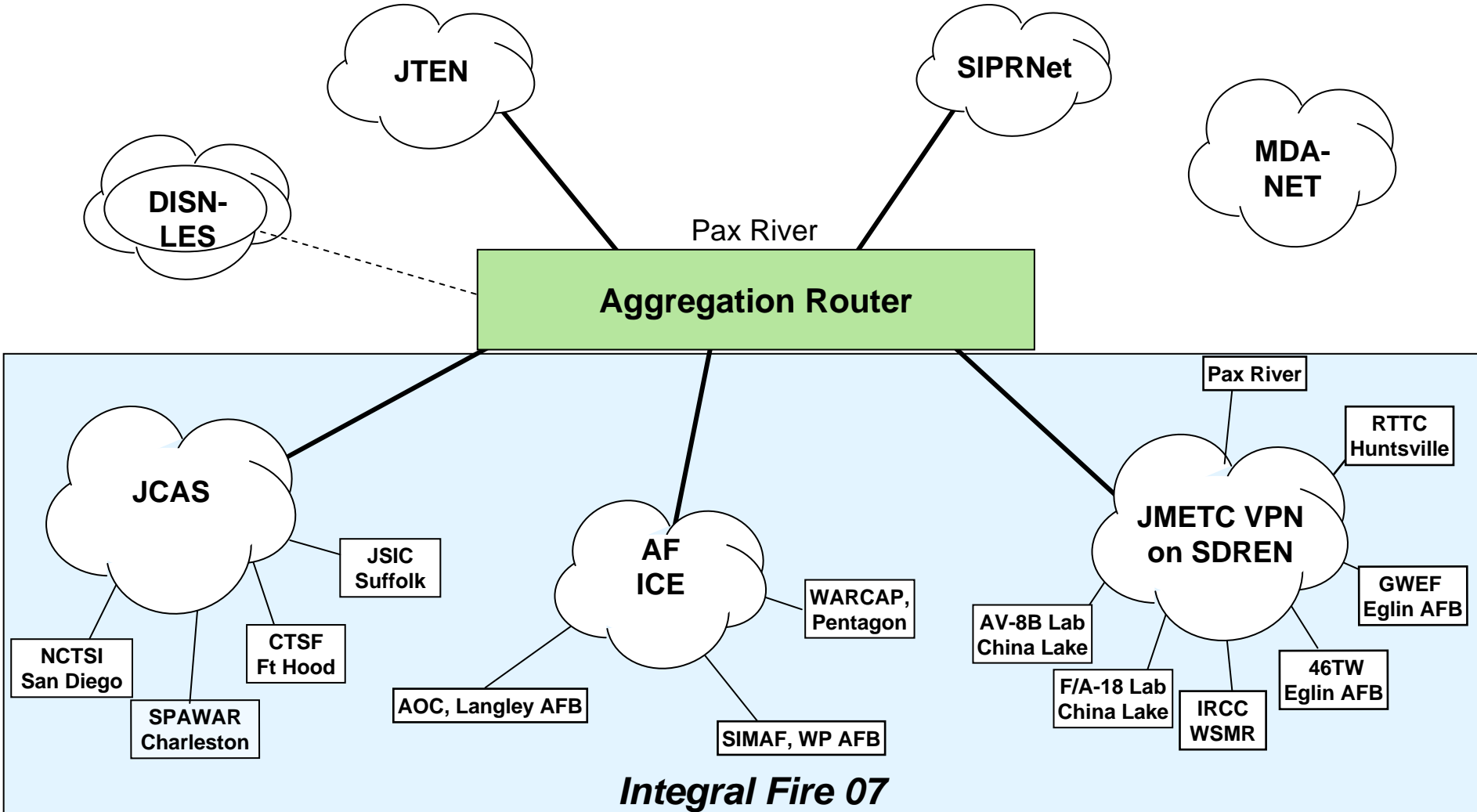
- Overall lead for creating the distributed test Infrastructure including JMETC VPN (5 locations)
- Connect three enclaves (total of 15 locations) using the JFCOM aggregator router
- Conduct systems integration, site surveys, and dry runs
- Oversee operation of the network and data flow among all sites during the event

## – JMETC Significant Accomplishments:

- Stood up and successfully demonstrated the JMETC VPN within 90 days
- Successfully used the Aggregation Router to link three enclaves
- Supported three customers conducting tests using the same network in the same time frame



# Network Aggregation Bridging Networks





# InterTEC Spiral 2, Build 1 Test Event (FY07)



- Interoperability T&E Capability (InterTEC) Description:
  - OSD-sponsored, Navy-led project under the Central T&E Investment Program (CTEIP)
  - Purpose is to develop an accredited test capability to conduct joint interoperability certification and joint mission thread testing
  
- Spiral 2, Build 1 Objectives:
  - Developing and assessing tools to test joint threads
  - Assessing the C2 messages sent from sensors to shooters through command and control systems (GCCS-J, GCCS-M, GCCS-A, and TBMCS)
  
- JMETC Responsibilities:
  - Overall lead for creating the Infrastructure integrating 6 locations
  - Conduct systems integration, site surveys, and dry runs in preparation for the event
  - Oversee operation of the network and data flow among all sites during the event
  
- JMETC Significant accomplishments
  - Established the new locations on the JMETC VPN within 90 days
  - Demonstrated re-use (three locations from Integral Fire 07 test)
  - Successfully used the Aggregation Router



# FY 08 Plan



- Event Support
  - SIAP Risk Reduction (March 08)
    - Risk reduction test for a planned Oct 08 event
  - InterTEC Spiral 2, Build 2 (June 08)
    - Test OTH-G messages using a Joint Fires Scenario
    - Integrating 12 locations
    - Includes **CVN-21** participation
  - **FCS** Combined Test Organization / JTEM Test Event (July 08)
    - Test the JTEM Methods and Processes
    - Experiment and test of the infrastructure needed to evaluate joint functionality of FCS
  - InterTEC Systems Acceptance Test (August 08)
    - JITC acceptance test of InterTEC tools
- Collaboration with Training Community
  - Common distributed test and training infrastructure requirements
  - JFCOM-led LVC Architecture Roadmap Study
  - Demonstration of JTEN and JMETC VPN peering capabilities
- Support Other JMETC-related Activities
  - M&S Steering Committee
  - Distributed Test Infrastructure Studies
- Publish the JMETC Program Plan

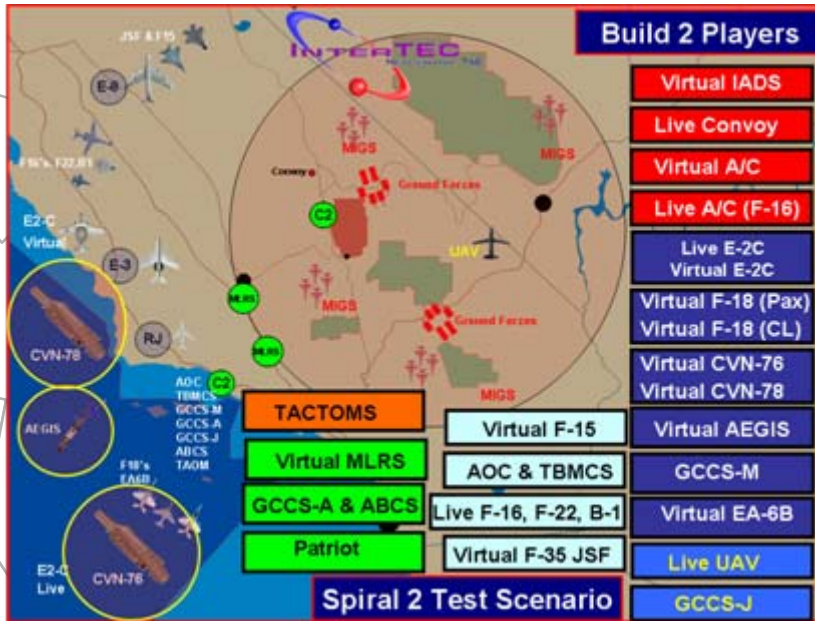




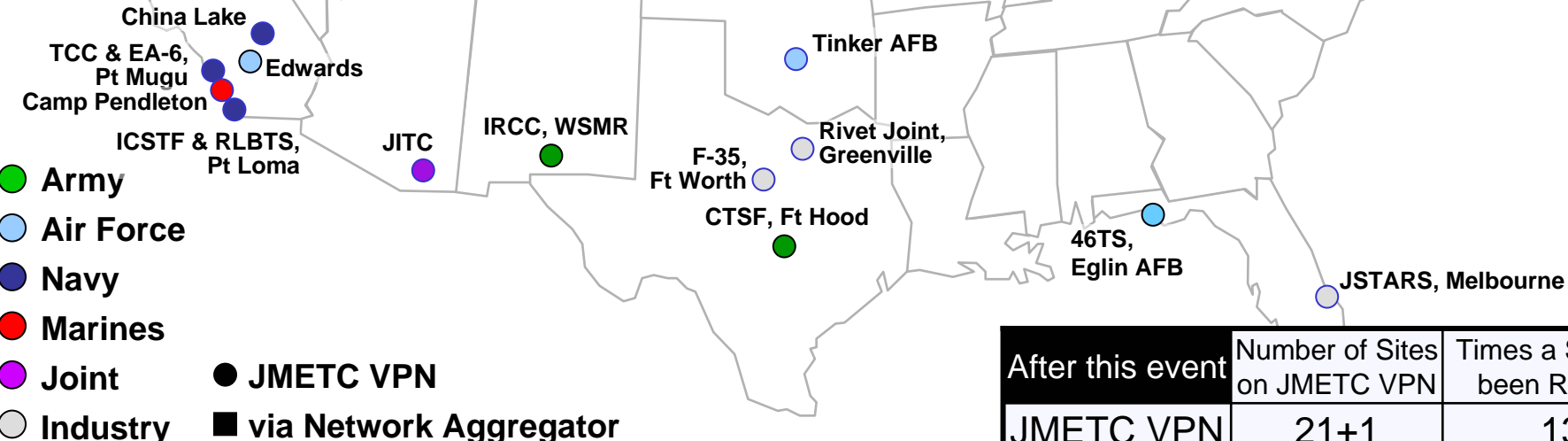
# InterTEC Spiral 2 Build 2 JMETC VPN (Jun 16-27, 2008)



AWACS, Seattle



For this event: 19 sites  
18 VPN and 1 via Network Agg

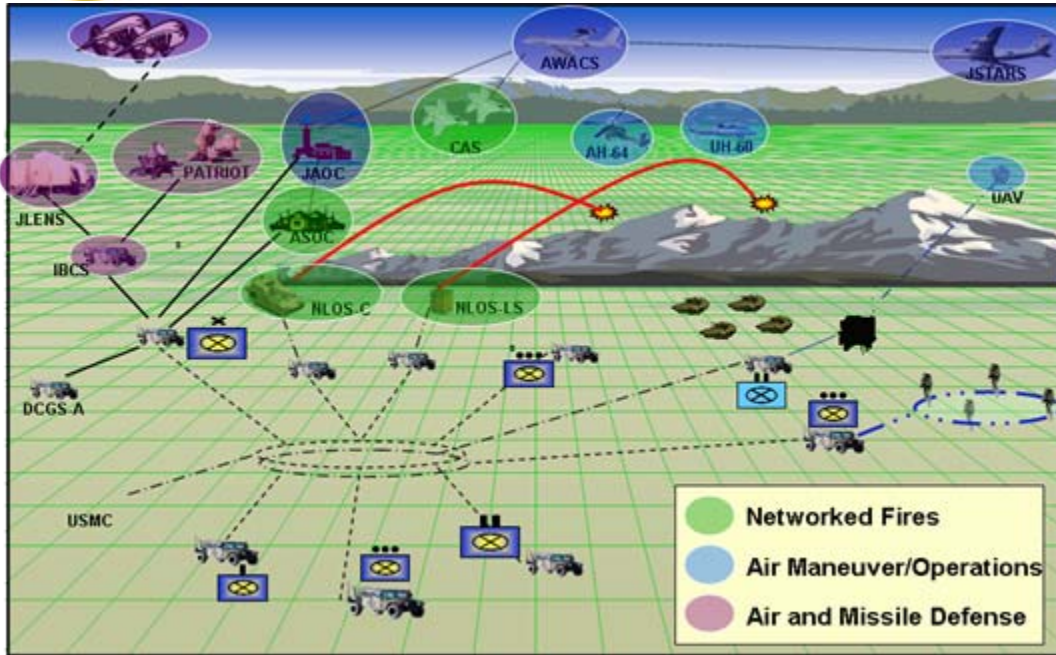


| After this event | Number of Sites on JMETC VPN | Times a Site has been Reused |
|------------------|------------------------------|------------------------------|
| JMETC VPN        | 21+1                         | 13                           |





# Joint Battlespace Dyn. Decon (FCS & JTEM) JMETC VPN (Jul 28-Aug 1, 2008)



**For this event: 9 sites**  
**7 VPN and 2 via Network Agg**

SOSIL, □  
Huntington Beach

IRCC, WSMR

RTTC,  
Huntsville

46TS & GWEF,  
Eglin AFB

SIMAF,  
WPAFB

Aberdeen

Pax River

JSIC

SPAWAR, Charleston

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

- JMETC VPN
- via Network Aggregator

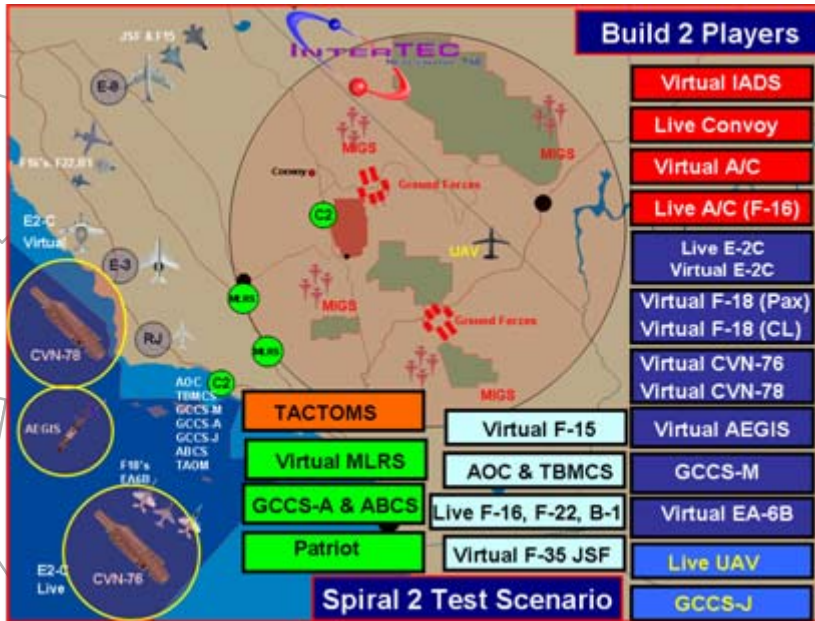
| After this event | Number of Sites on JMETC VPN | Times a Site has been Reused |
|------------------|------------------------------|------------------------------|
| JMETC VPN        | 23+2                         | 19                           |



# InterTEC System Acceptance Test JMETC VPN (Aug 18-29, 2008)



**For this event: 19 sites**  
**18 VPN and 1 via Network Agg**



AWACS, Seattle

China Lake  
TCC & EA-6, Pt Mugu  
Camp Pendleton  
ICSTF & RLBTS, Pt Loma

JITC

IRCC, WSMR

F-35, Ft Worth

CTSF, Ft Hood

Tinker AFB

Rivet Joint, Greenville

46TS, Eglin AFB

JSTARS, Melbourne

Pax River  
Dahlgren  
JSIC  
Newport News  
Dam Neck

- Army
- Air Force
- Navy
- Marines
- Joint
- Industry
- JMETC VPN
- via Network Aggregator

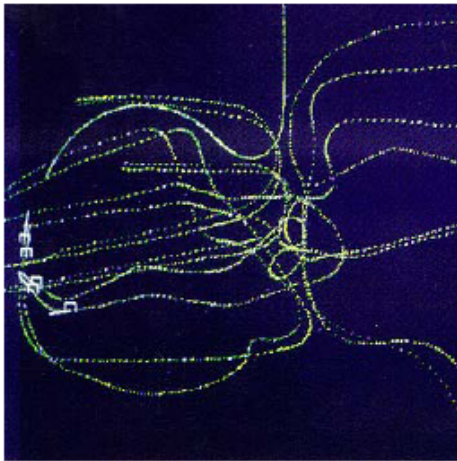
| After this event | Number of Sites on JMETC VPN | Times a Site has been Reused |
|------------------|------------------------------|------------------------------|
| JMETC VPN        | 23+2                         | 39                           |



# Single Integrated Air Picture (SIAP) – JCHE-5 JMETC VPN (1<sup>st</sup> Qtr FY2009)



## SIAP Attributes:

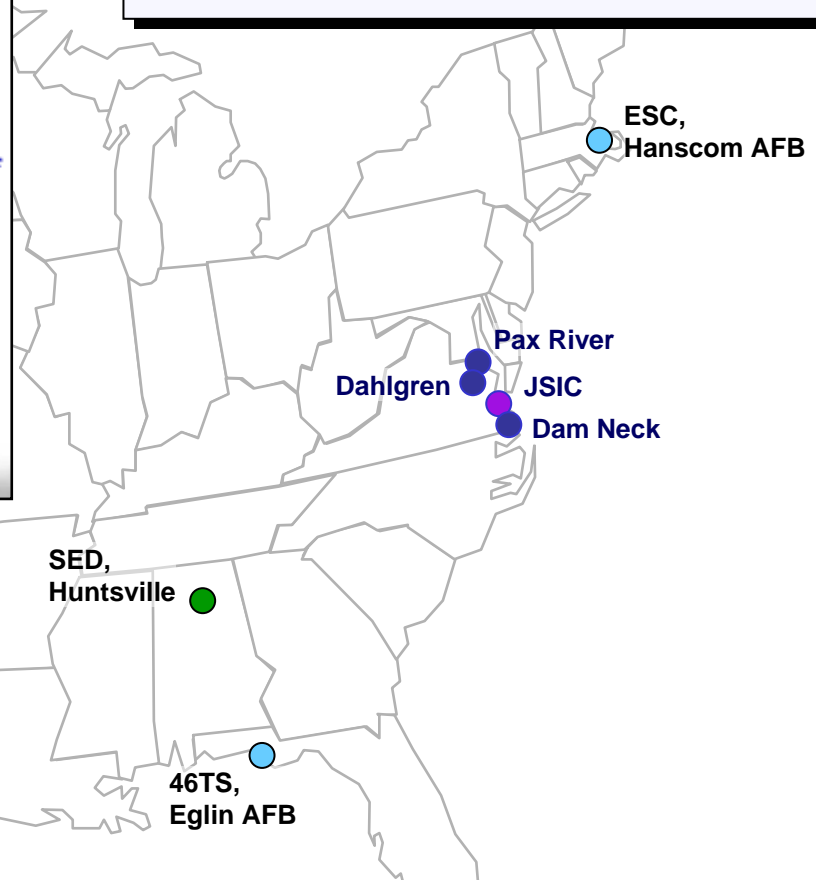


- Completeness\*
- Clarity\*
- Continuity\*
- Kinematic Accuracy\*\*
- ID Completeness\*
- ID Accuracy\*
- ID Clarity\*\*
- Commonality\*\*

\* JROC Approved Requirements

\*\* SIAP Measures Of Performance

For this event: 8 sites  
All 8 sites on the JMETC VPN



- Army
- Air Force
- Navy
- Marines
- Joint
- Industry
- JMETC VPN
- via Network Aggregator

| After this event | Number of Sites on JMETC VPN | Times a Site has been Reused |
|------------------|------------------------------|------------------------------|
| JMETC VPN        | 24+2                         | 46                           |



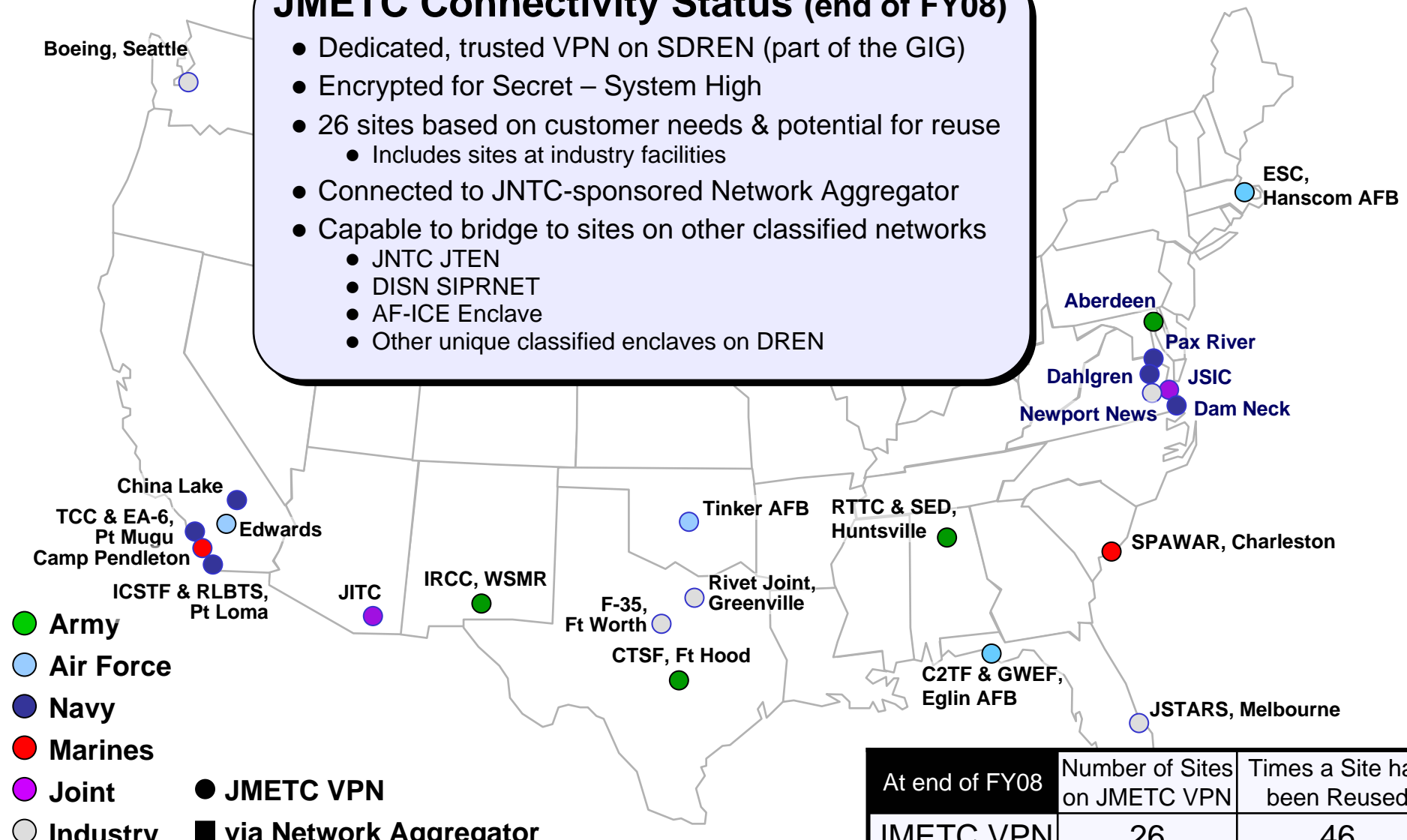


# Projected JMETC Connectivity (at end of FY08)



## JMETC Connectivity Status (end of FY08)

- Dedicated, trusted VPN on SDREN (part of the GIG)
- Encrypted for Secret – System High
- 26 sites based on customer needs & potential for reuse
  - Includes sites at industry facilities
- Connected to JNTC-sponsored Network Aggregator
- Capable to bridge to sites on other classified networks
  - JNTC JTEN
  - DISN SIPRNET
  - AF-ICE Enclave
  - Other unique classified enclaves on DREN



| At end of FY08 | Number of Sites on JMETC VPN | Times a Site has been Reused |
|----------------|------------------------------|------------------------------|
| JMETC VPN      | 26                           | 46                           |



# In the First Year JMETC Has:



- Stood up the VPN
- Supported two major events
  - Four customers
  - Seven instances of site/security agreement reuse
- Aggregated three network enclaves
  - Leveraging Service established sites/security agreements when ever possible
- Begun event planning with four major acquisition programs
  - CVN-21, FCS, JSF, SIAP
  - Indicates that they each see value in JMETC
- Won the cooperative and collaborative support of the Services and Agencies
  - Our success is dependent on their future support
- Conducted the Distributed Test Infrastructure Study
  - Resulted in three gaps to be analyzed in three study tasks
    - Next slide



# Distributed Test Infrastructure Studies



- FY07 Distributed Test Infrastructure Assessment, approved by the JCB, resulted in need for three studies:
  - **Task 1: Transition from IPv4 to IPv6 at test facilities and laboratories**
    - Scope: What is the modernization schedule of each of the Services to IPv6 at their test facilities and laboratories?
  - **Task 2: Applicability of Service-Oriented Architectures (SOA) to Distributed Testing Infrastructure**
    - Scope: When will SOAs be suitable to support distributed testing data management requirements?
      - What are the benefits of modernizing instrumentation to use a SOA for testing?
      - What are the benefits of modernizing distributed test tools to use a SOA for testing?
  - **Task 3: Test Infrastructure Required for Warfighting Systems using the Global Information Grid (GIG)**
    - Scope: What future instrumentation, distributed test tools, connectivity, and data management capabilities will be needed to conduct distributed tests to verify warfighting capabilities (in CT, DT, OT, etc.) are operating correctly with the GIG?
- Studies to be completed by April FY09



# JMETC Program Points of Contact



## **JMETC Program Manager:**

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- Telephone: (703) 604-0350 ext. 0
- JMETC Website: [www.jmetc.org](http://www.jmetc.org) – under construction
- JMETC Help Desk: [www.jmetc.org](http://www.jmetc.org) – under construction

## **TENA Website: [www.tena-sda.org](http://www.tena-sda.org)**

- Links to JMETC, Help Desk, and products



# Backup





# Summary



- Provide for the full spectrum of Joint testing, supporting many customers in many different Joint mission threads
- Being built based on current customer requirements
  - CVN-21, SIAP, FCS, JSF, MMA, NECC, DD1000, WWF
- Partnering with Service and Agency activities
  - Leveraging existing capabilities
- Working with JFCOM to develop a joint, multi-use test and training network infrastructure

*The warfighter is the ultimate beneficiary with warfighting capabilities verified to work together*



# Background



- **March 2004** – SPG: “Joint Testing in Force Transformation”
  - Policy – *Developing and fielding joint force capabilities requires adequate, realistic test and evaluation in a joint operational context*
  - Direction – *DoD will provide new testing capabilities and institutionalize the evaluation of joint system effectiveness*
  - Action – *DOT&E lead development of a Roadmap to define changes to ensure that T&E is conducted in a joint environment and facilitates the fielding of joint capabilities*
- **November 2004** – DEPSECDEF approved Roadmap, validated SPG
- **December 2005** – Department directed stand-up of the Joint Mission Environment Test Capability (JMETC) Program Element under USD(AT&L)/ TRMC for execution
- **October 2006** – Establishment of JMETC Program Management Office in Crystal City, VA

***JMETC is <1.5 years old***



# JMETC Benefits



- Provides Department-wide capability for:
  - Evaluation of a weapon system in a joint context
  - DT, OT, Interoperability Certification, Net-Ready KPP compliance testing, Joint Mission Capability Portfolio testing, etc.
  - Effectively and efficiently linking distributed test facilities
  - More robust testing earlier in the acquisition process
  - Improved system interoperability
- Provides test capability aligned with JNTC
  - Both use TENA architecture to integrate resources
  - Enables joint test and training
- Reduces time and cost by providing
  - Readily available, persistent connectivity with standing network security agreements
  - Common integration software for linking sites
  - Distributed test planning support tools
- Provides distributed test expertise



*The warfighter is the ultimate beneficiary with warfighting capabilities verified to work together*