

# Test Resource Management Center

## Joint Mission Environment Test Capability (JMETC)



Briefing for:

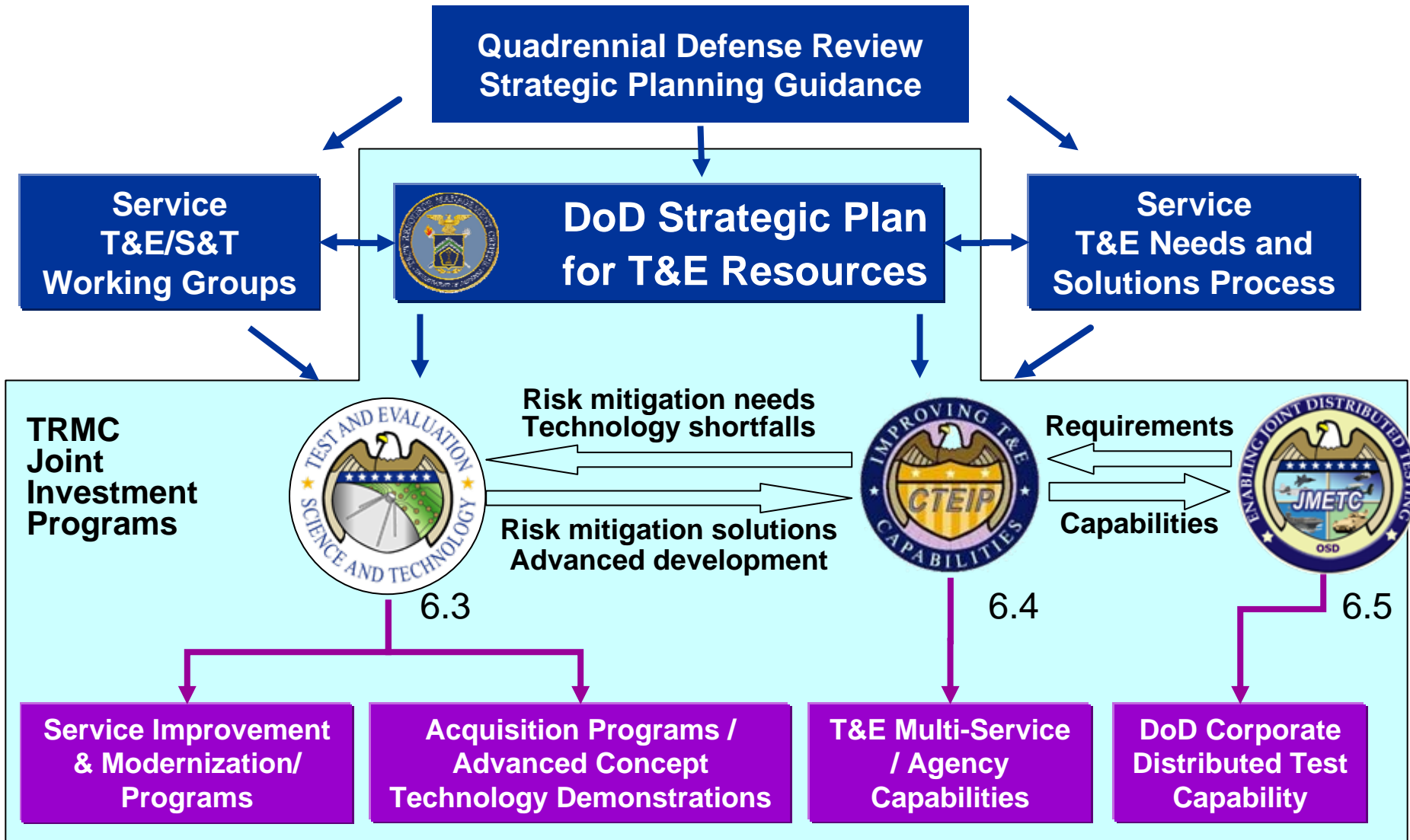
**National Defense Industrial Association  
11th Annual Systems Engineering Conference**

October 20-23, 2008



# Relationship within TRMC

## Synergy through Aligned Investment





# TRMC Investment Programs Overview



## T&E/S&T



- Established in FY2002
- Develops technologies required to test future warfighting capabilities
- 6.3 RDT&E funds
- ~\$65M / year
- 7 current focus areas
  - Directed Energy
  - Hypersonics
  - **Net-Centric Systems**
  - Unmanned Systems
  - Non-intrusive Instruments
  - Spectrum Efficiencies
- 112 current projects

## CTEIP



- Established in FY1991
- Develops or improves test capabilities that have multi-Service utility
- 6.4 RDT&E funds
- ~\$140M / year
- 52 current projects
  - 27 projects developing core Joint capabilities
    - 2 projects improving interoperability test cap.
  - 9 projects improving threat representations used in testing
  - 16 projects addressing near-term OT shortfalls

## JMETC



- Established in FY2007
- Provides corporate infrastructure for distributed Joint testing
- 6.5 RDT&E funds
- ~\$10M / year
- 26 current sites
  - Expanding to 36 sites
- Maintains
  - Network connections
  - Security agreements
  - Integration software
  - Interface definitions
  - Distributed test tools
  - Reuse repository



# JMETC Overview

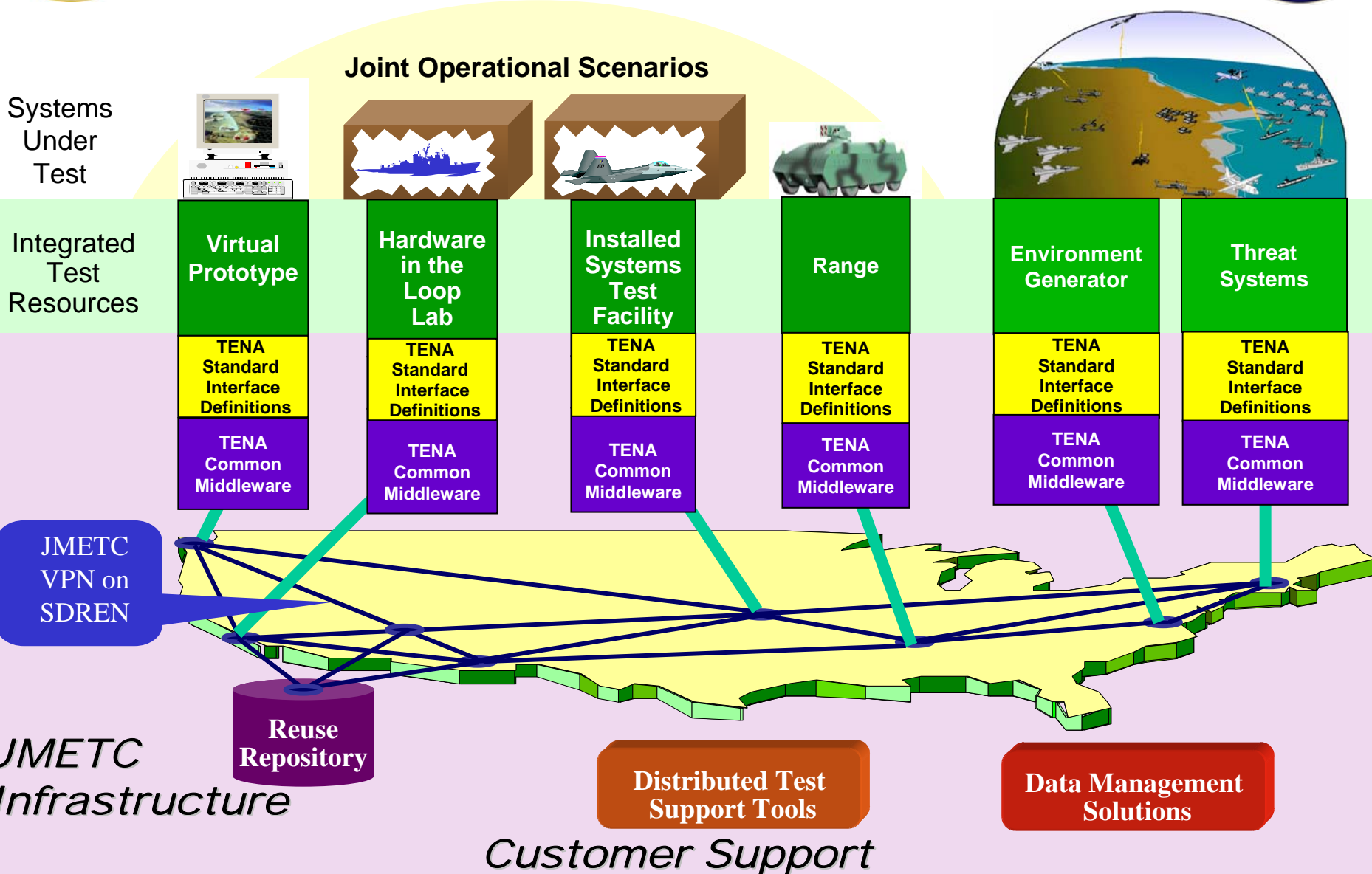


- JMETC provides the infrastructure for testing in a Joint environment
  - System Engineering and Design, DT, OT, Interoperability Certification, Net-Ready KPP compliance testing, Joint Mission Capability Portfolio assessments, etc.
- Time and cost savings
  - Readily-available, persistent connectivity with standing network security agreements
- Increased capability/connectivity
  - Enables more robust testing earlier in the acquisition process
  - Provides common, certified tools to streamline integration process
  - Establishes test capability aligned with JNTC (test and training)
- Being built based on customer requirements

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



# JMETC Enables Distributed Testing





# 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: Here and Now



- **Uses the Secure Defense Research & Engineering Network (SDREN) for connectivity**
  - 29 sites currently on-line
- **Uses Test & Training Enabling Architecture (TENA)**
  - Gateways to link to existing DIS and HLA simulations
- **Incorporates InterTEC test tools**
- **Uses the JNTC-sponsored Network Aggregator to link together other networks**
- **Being expanded based on customer requirements**
- **Holding JMETC Users Group meetings to discuss emerging requirements and technical solutions**
  - Seeking the “best of breed” solutions across the community



# JMETC: Here and Now



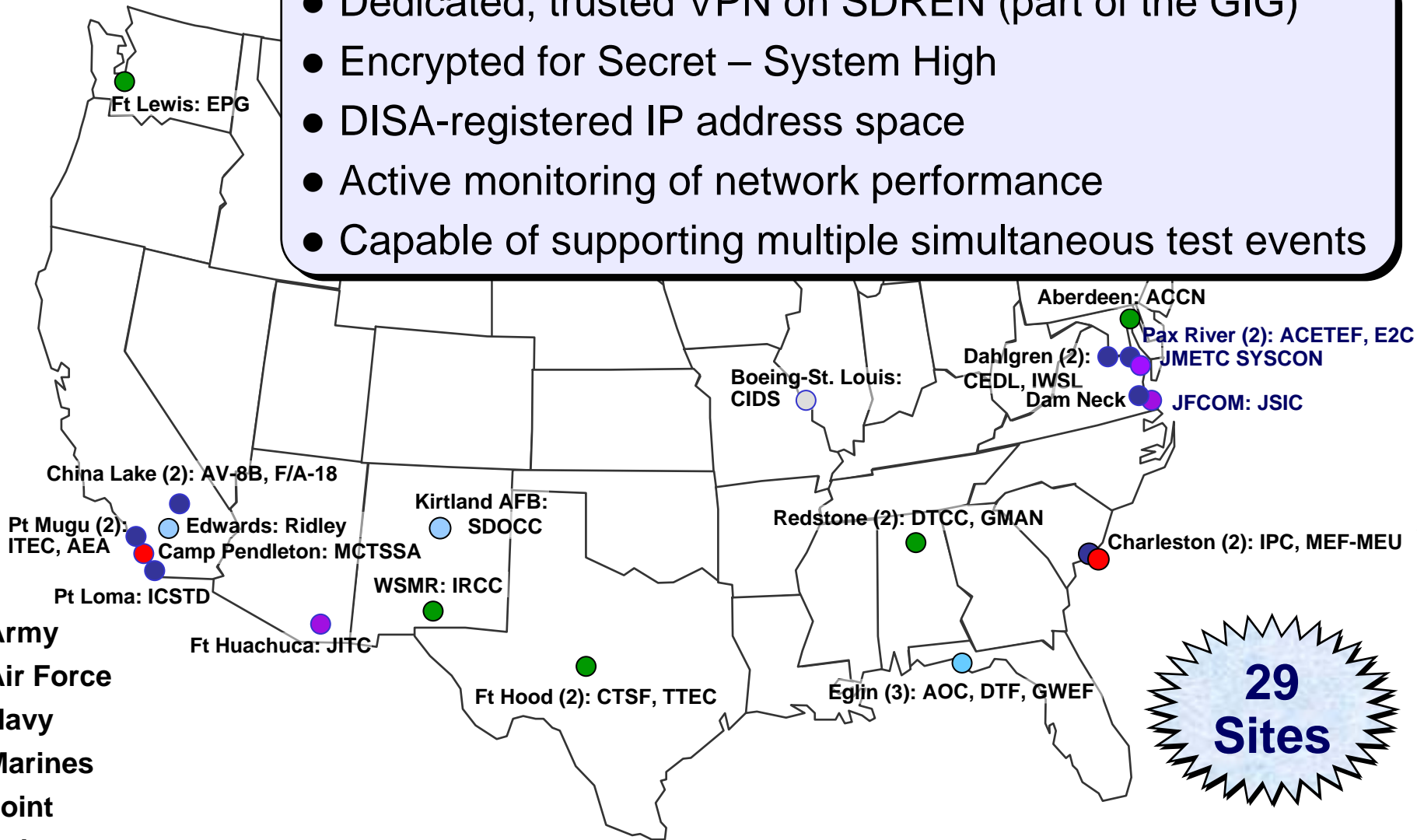
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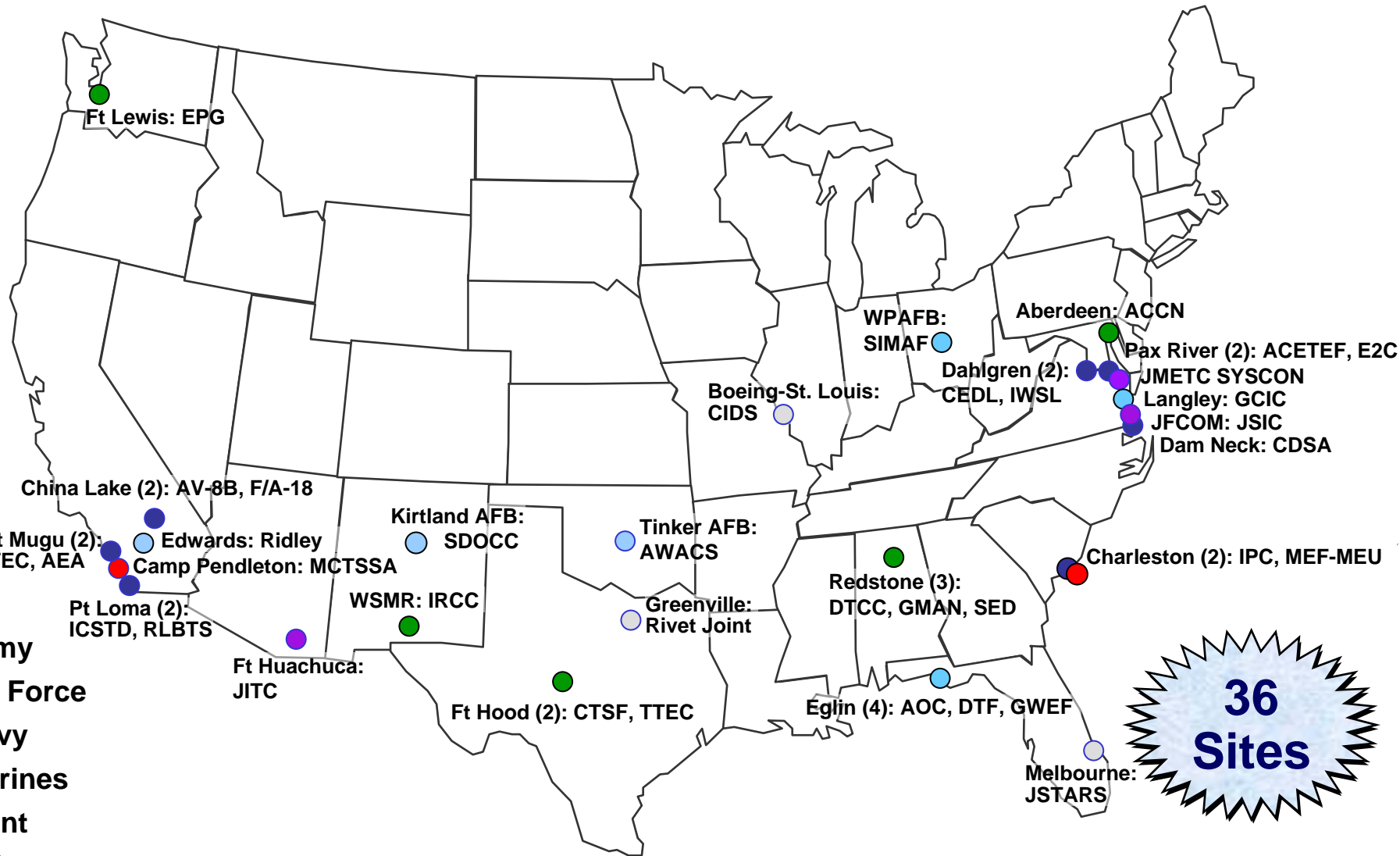
# Current JMETC Connectivity

- Dedicated, trusted VPN 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





# Planned JMETC Connectivity (at end of October)



**36 Sites**



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# JMETC Uses TENA to Integrate Sites

## (Can gateway to existing DIS and HLA simulations)



- **TENA is:**

- Developed, upgraded, and sustained by CTEIP and JNTC
- Middleware that provides a single, universal data exchange solution
- Common for test and for training (core standard in JMETC and JNTC)
- Available for download at [www.tena-sda.org](http://www.tena-sda.org) for free

- **TENA provides:**

- Interoperability among range systems, hardware-in-the-loop laboratories, and simulations in a quick, cost-efficient manner
- A capability to rapidly and reliably develop LVC integrations
- A set of community-agreed object models that define the data elements used in LVC integrations – maximizes reuse from event to event
- An auto-code generator to drastically reduce TENA incorporation time

- **Next version of TENA (version 6.0) will:**

- Provide advanced data filtering (only data of interest sent over the wire)
- Improve fault tolerance and embedded diagnostics
- Currently being beta-tested for a formal release later this year



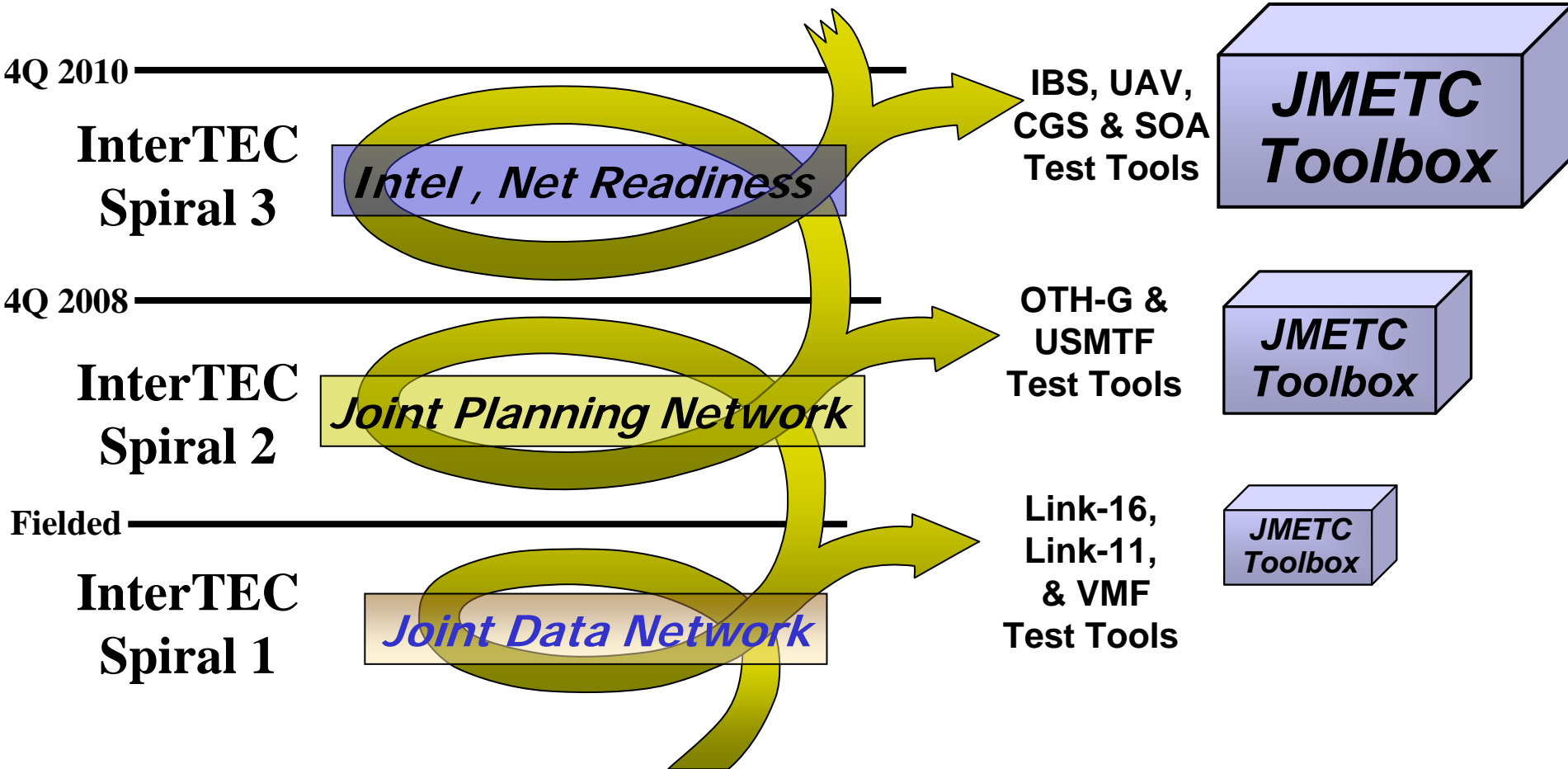
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# InterTEC Integration with JMETC Inextricably Intertwined



- JMETC supports InterTEC during their spiral development
- InterTEC expands JMETC toolbox with certified C4ISR Test Tools





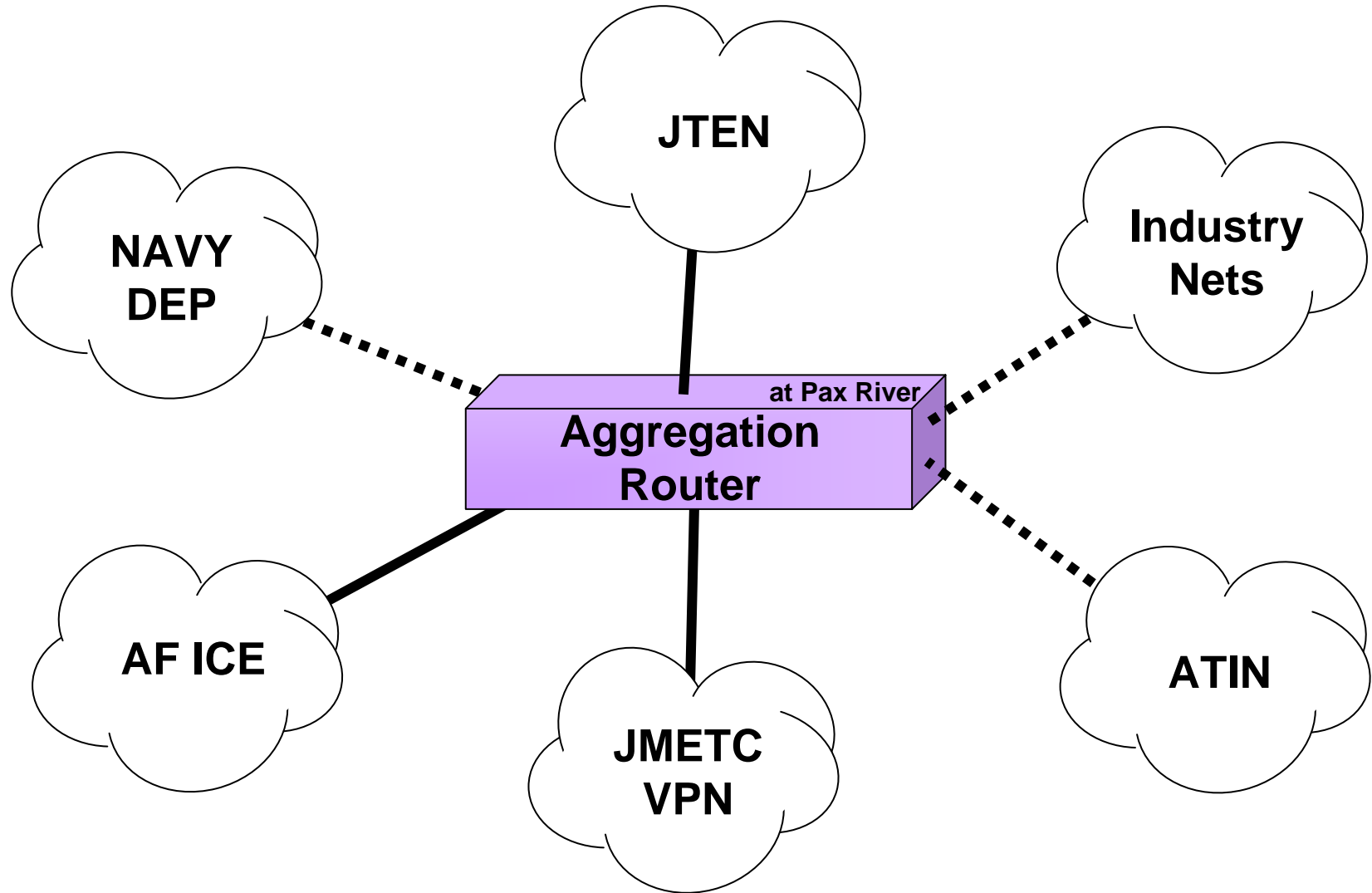
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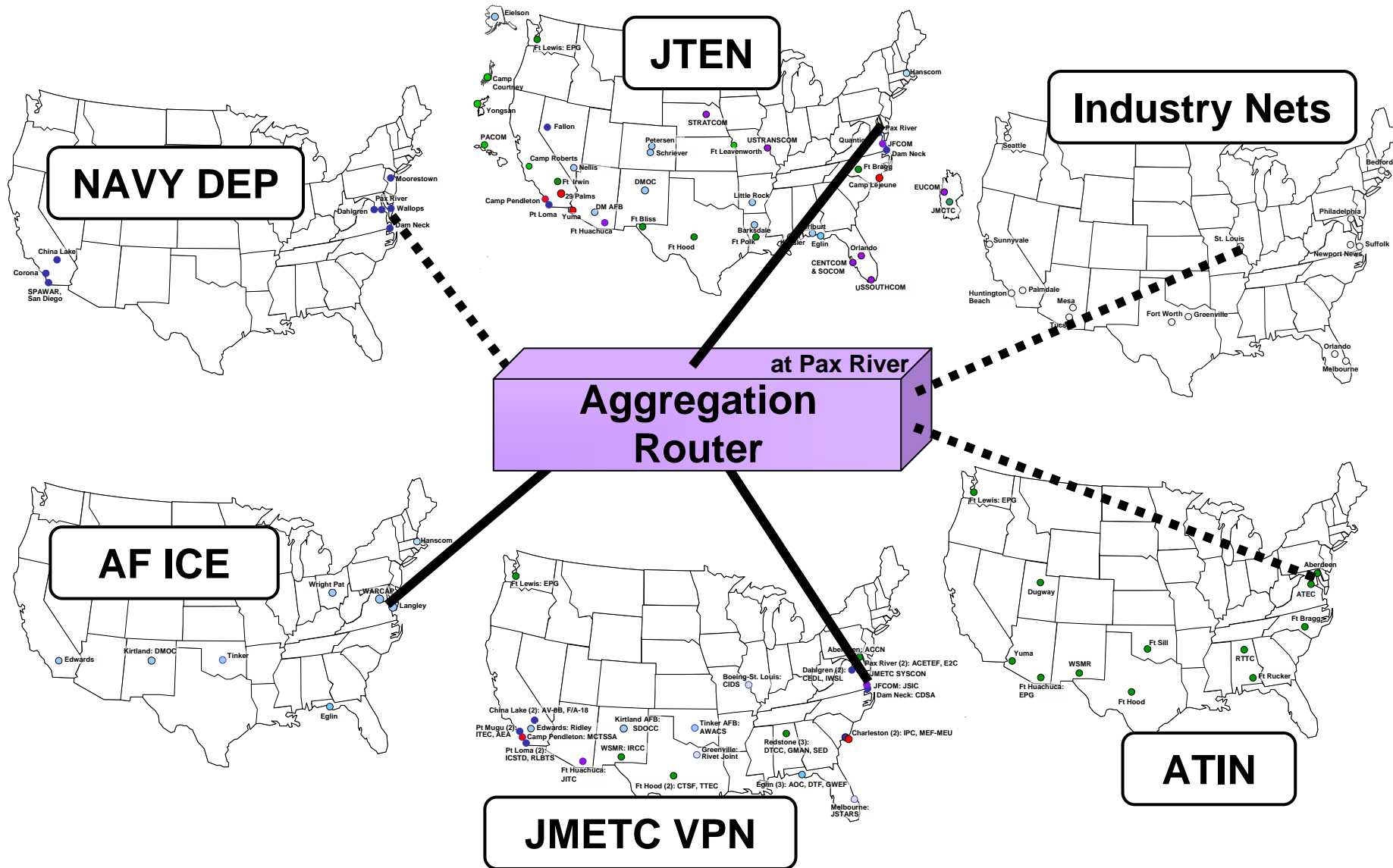


# Network Aggregation Bridging Networks



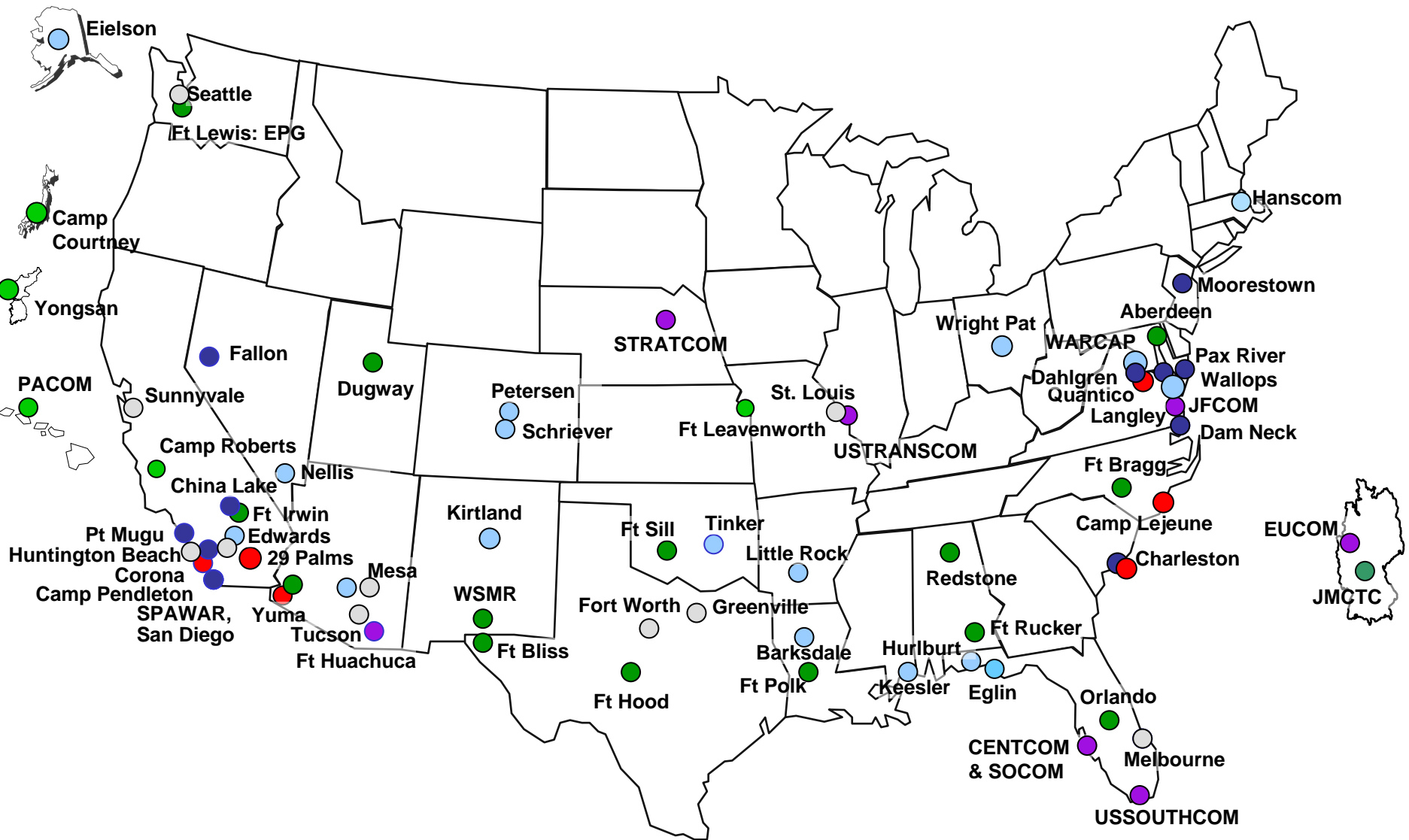


# Network Aggregation Bridging Networks





# Available Sites from Integration of Test and Training Networks





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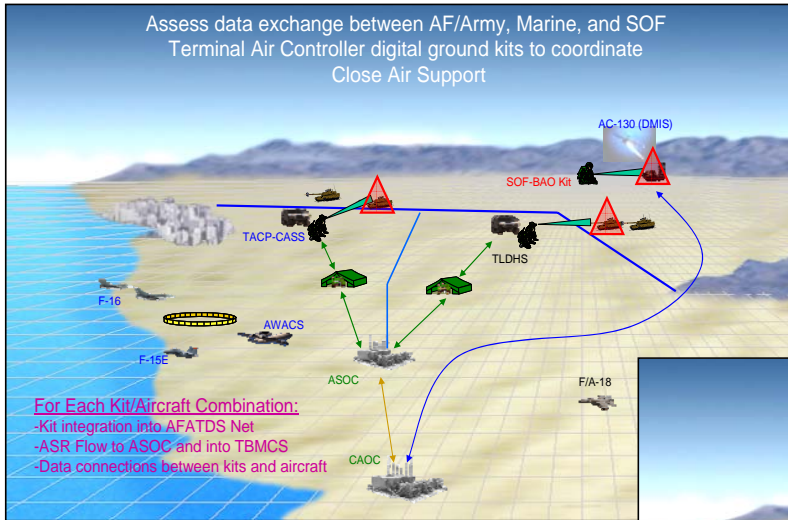




# Customer-driven Expansion JMETC Infrastructure Established in FY07



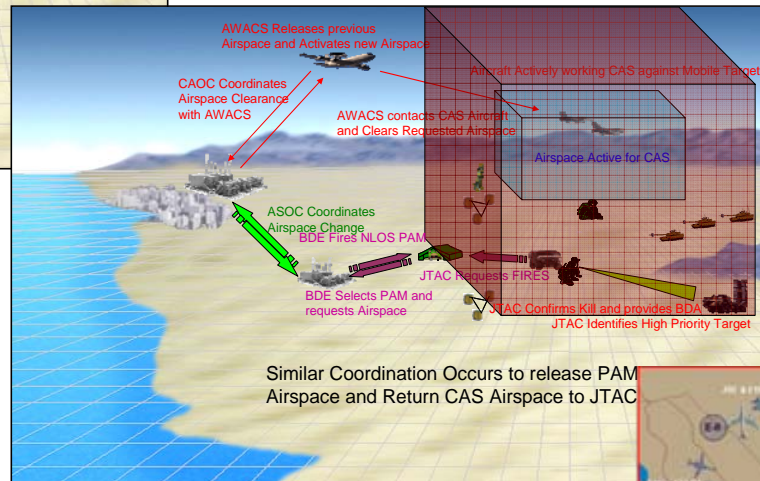
## Integral Fire 07



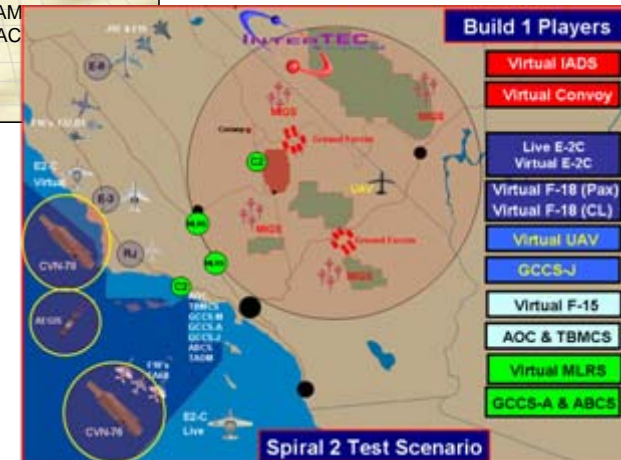
	JMETC VPN Sites	# of Times Sites have been Reused
JMETC VPN at End of FY07	8	8

### Customers Supported

- JFCOM JSIC
  - NLOS-NEW / JTEM
  - WWF
  - InterTEC Spiral 2
- Established 8 sites and achieved 8 instances of reuse of sites during FY07
  - Used the JNTC-sponsored Network Aggregator to get to sites on JFCOM JCAS & AF-ICE networks



### InterTEC Spiral 2 Build 1





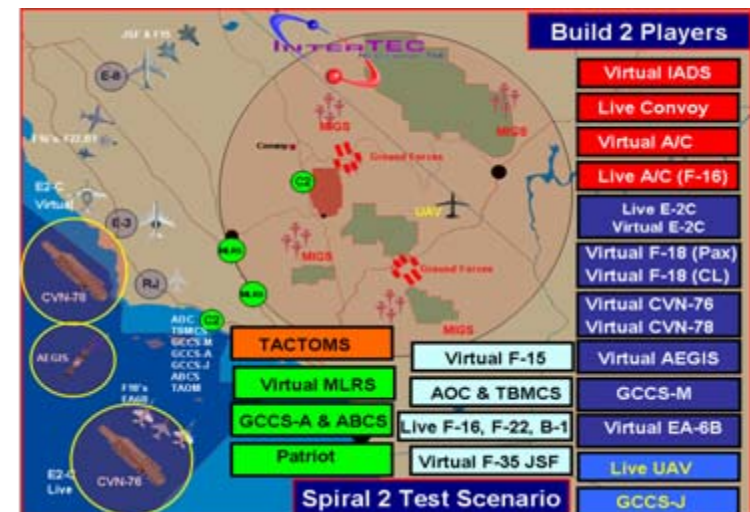


# Customer-driven Expansion InterTEC Spiral 2 System Integration Test



- Assessing test tools that collect & analyze C2 messages sent from sensors to shooters through command & control systems (GCCS-J, GCCS-M, GCCS-A, and TBMCS)
- Spiral 2 includes...
  - Support for more protocols:
    - Over-the-Horizon-Gold (OTH-G)
    - U.S. Message Text Format (USMTF)
  - More industry laboratories
  - New synthetic battlespace environments
    - Common Reference Scenario (CRS)
    - Joint Semi-Automated Forces (JSAF)
  - A mobile C4ISR test capability
- **Customer Requirement: 22 sites**
- **JMETC Solution:**
  - Add 15 sites to the JMETC VPN
  - Reuse 4 existing sites on the JMETC VPN
  - Link in 3 sites via the Network Aggregator

	JMETC VPN Sites	# of Times Sites have been Reused
JMETC VPN at End of FY07	8	8
InterTEC Spiral 2 Sys Integration Test	+ 15	+ 4
<b>JMETC VPN Status after InterTEC SIT</b>	<b>23</b>	<b>12</b>



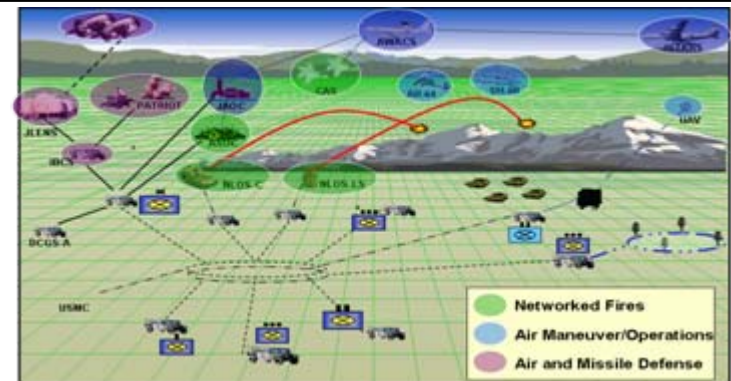


# Customer-driven Expansion Joint Battlespace Dynamic Deconfliction



- Assess effectiveness and suitability of JTEM Capability Test Methodology (CTM) processes
- Examine FCS test technologies needed to test in a Joint environment in support of FCS Milestone C activities
- **Customer Requirement:** 16 sites
- **JMETC Solution:**
  - Add 6 sites to the JMETC VPN
  - Reuse 6 existing sites on the JMETC VPN
  - Link in 4 sites via the Network Aggregator

	JMETC VPN Sites	# of Times Sites have been Reused
JMETC VPN at End of FY07	8	8
InterTEC Spiral 2 Sys Integration Test	+ 15	+ 4
<b>Joint Battlespace Dynamic Deconflict.</b>	<b>+ 6</b>	<b>+ 6</b>
<b>JMETC VPN Status after JBD2</b>	<b>29</b>	<b>18</b>





# Customer-driven Expansion InterTEC Spiral 2 System Acceptance Test



- Accredit the test tools that collect & analyze C2 messages sent from sensors to shooters through command & control systems (GCCS-J, GCCS-M, GCCS-A, and TBMCS)
- Spiral 2 System Acceptance Test
  - Conducted by JITC personnel to accredit the tools to be used for Interoperability Certification Testing for the Joint Staff J6
- **Customer Requirement: 26 sites**
- **JMETC Solution:**
  - Add 4 sites to the JMETC VPN
  - Reuse 19 existing sites on the JMETC VPN
  - Link in 3 sites via the Network Aggregator

	JMETC VPN Sites	# of Times Sites have been Reused
JMETC VPN at End of FY07	8	8
InterTEC Spiral 2 Sys Integration Test	+ 15	+ 4
Joint Battlespace Dynamic Deconflict.	+ 6	+ 6
InterTEC Spiral 2 Sys Accept. Test	+ 4	+ 19
<b>JMETC VPN Status after InterTEC SAT</b>	<b>33</b>	<b>37</b>



# Customer-driven Expansion Single Integrated Air Picture (SIAP)



- Conduct Developmental Test and Evaluation (DT&E) and the assessment of the performance of the “Integrated Architecture Behavior Model” (IABM)
- SIAP support includes...
  - Planning, preparing, and supporting the conduct of the fifth Joint Combined Hardware-in-the-Loop Event (JCHE-5)
  - Reducing the event risk by verifying the performance of the test tools among five JMETC VPN sites during planning phase
- **Customer Requirement: 5 sites**
- **JMETC Solution:**
  - Add 1 site to the JMETC VPN
  - Reuse 4 existing sites on the JMETC VPN

	JMETC VPN Sites	# of Times Sites have been Reused
JMETC VPN at End of FY07	8	8
InterTEC Spiral 2 Sys Integration Test	+ 15	+ 4
Joint Battlespace Dynamic Deconflict.	+ 6	+ 6
InterTEC Spiral 2 Sys Accept. Test	+ 4	+ 19
SIAP Risk Reduction	+ 0	+ 5
SIAP JCHE-5	+ 1	+ 4
<b>JMETC VPN Status after SIAP Support</b>	<b>34</b>	<b>46</b>



# Customer-driven Expansion Datalink Studies and Assessments



- Study potential improvements to Combat Air Forces Airborne Networking Enabling Concepts through the integration of FAST technology into Link-16 networks
  - FAST / Link-16 suitability
  - Message suitability
  - Latency and completeness
- **Customer Requirement: 7 sites**
- **JMETC Solution:**
  - Add 2 sites to the JMETC VPN
  - Reuse 5 existing sites on the JMETC VPN

	JMETC VPN Sites	# of Times Sites have been Reused
JMETC VPN at End of FY07	8	8
InterTEC Spiral 2 Sys Integration Test	+ 15	+ 4
Joint Battlespace Dynamic Deconflict.	+ 6	+ 6
InterTEC Spiral 2 Sys Accept. Test	+ 4	+ 19
SIAP	+ 1	+ 9
Datalink Studies	+ 2	+ 5
<b>JMETC VPN Status after DSA Support</b>	<b>36</b>	<b>51</b>





# Benefits of Reusing JMETC Sites



The number 51 (on the bottom right) is the number of times the customer was able to avoid:

- Acquiring network equipment
- Processing the security agreements
  - Obtaining authority to connect
  - Obtaining authority to operate
- Testing the equipment installation
- Testing the network configuration

**Customer time and dollars not spent on infrastructure by leveraging JMETC VPN sites**

	JMETC VPN Sites	# of Times Sites have been Reused
JMETC VPN at End of FY07	8	8
InterTEC Spiral 2 Sys Integration Test	+ 15	+ 4
Joint Battlespace Dynamic Deconflict.	+ 6	+ 6
InterTEC Spiral 2 Sys Accept. Test	+ 4	+ 19
SIAP	+ 1	+ 9
Datalink Studies	+ 2	+ 4
JMETC VPN at End of FY08	36	<b>51</b>





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# JMETC Users Group Meetings



- Identify core infrastructure requirements and use cases
- Discuss available solutions, tools, and techniques
- Identify, investigate, & resolve issues
- Identify opportunities to collaborate
- Share lessons learned

## **Users Group #01**

- 19-20 Jun 2007
- Dulles, VA
- ~140 participants
- Plenary session:
  - SIAP
  - JSF
  - FCS CTO
- Tracks:
  - User Requirements
  - Security
  - InterTEC Spiral 2
  - Networking

## **Users Group #02**

- 14-15 Aug 2007
- San Diego, CA
- ~150 participants
- Plenary session:
  - Navy DEP
- Tracks:
  - User Requirements
  - Distrib. Test Tools
  - Object Models
  - InterTEC Spiral 2
  - Networking

## **Users Group #03**

- 29-30 Jan 2008
- Portsmouth, VA
- ~200 participants
- Plenary briefs:
  - InterTEC Spiral 2
  - AF-ICE
  - JFCOM J84
- Tracks:
  - User Requirements
  - Distrib. Test Tools
  - Object Models
  - Networking

## **Users Group #04**

- 20-21 May 2008
- Charleston, SC
- ~135 participants
- Plenary session:
  - InterTEC Spiral 2
  - SPAWAR Systems Center-Charleston
- Tracks:
  - User Requirements
  - Distrib. Test Tools
  - Service-Oriented Architectures (SOAs)
  - Networking

## **Users Group #05**

- 9-10 Sep 2008
- Boston, MA
- ~176 participants
- Plenary session:
  - Dan Roth, AFFTC
  - Rick Cozby, FCS CTO
- Tracks:
  - User Requirements
  - Distrib. Test Tools
  - Service-Oriented Architectures (SOAs)
  - Networking



# JMETC Leadership & Governance



## JMETC Chain of Command

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



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

**Vacant**  
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 to discuss/review plans, common issues, needed studies, etc.

**JMETC Users Group**

- Technical representatives of customers and test resource owners
- Four meetings held to date
- ~150 participants/meeting



# Summary



- **JMETC supports the full spectrum of Joint testing and system development, supporting many customers in many different Joint mission threads**
  - Supporting/supported:, SIAP, FCS, WWF
  - Planning with: CVN-21, JSF, MMA, NECC, DD1000
- **JMETC is being built based on customer requirements**
  - JMETC support can be tailored to customer needs
- **JMETC is partnering with Service activities and leveraging existing capabilities**
- **JMETC is coordinating with JFCOM to bridge test and training capabilities**
- **JMETC Users Group provides an open forum to present emerging requirements as well as new technologies & capabilities**



# JMETC Program Points of Contact



**JMETC Program Manager:**

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**JMETC Lead Systems Engineer:**

**George Rumford**

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703-601-5233

**JMETC Operations, Planning  
Support:**

**Len Zimmermann**

**Skip Buchanan**

703-604-0350x142

**JMETC Program Office Contact:**

- E-mail: [jmetc-feedback@jmetc.org](mailto:jmetc-feedback@jmetc.org)
- Telephone: (703) 604-0350x134
- JMETC Website: [www.jmetc.org](http://www.jmetc.org)
- JMETC Help Desk: [www.jmetc.org](http://www.jmetc.org)

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