

JOINT MISSION ENVIRONMENT TEST CAPABILITY (JMETC)



USER HANDBOOK DECEMBER 2009

APPROVED BY:

Marty Arrwine
Deputy for Operations
Joint Mission Environment Test Capability

Ryan Norman
Deputy for Systems Engineering
Joint Mission Environment Test Capability

Chip Ferguson
Program Manager
Joint Mission Environment Test Capability

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FOREWORD

The Joint Mission Environment Test Capability (JMETC) is a corporate approach for linking distributed facilities that will enable test and evaluation (T&E) and acquisition community customers to evaluate new and legacy systems and capabilities in a Joint context. The JMETC Program originated with the 2005 Program Decision Memorandum II directing the stand-up of the JMETC Program under the Under Secretary of Defense (Acquisition, Technology, and Logistics [AT&L]). AT&L assigned responsibility for execution to the Director, Test Resource Management Center (TRMC). The JMETC Program Management Office stood up in October 2006 in Crystal City, Virginia. In addition to the cost and time savings, a standout benefit of the JMETC program to the T&E and acquisition communities is in providing readily available, persistent connectivity with standing network security agreements.

This updated edition of the JMETC User's Handbook was developed to provide information and guidance for JMETC customers on how to use the JMETC Program to plan for, prepare, and execute support for live, virtual, and constructive distributed test events and capabilities. The focus of this handbook is to provide a working knowledge of the JMETC program, customer responsibilities, and "How to use JMETC". The intended audience for this handbook is at the worker level. While other interested parties may find the User's Handbook a useful source of information on the JMETC program, the goal is to provide support and guidance for the customer's action officers and technical staff who will be responsible for implementing JMETC tools, processes, and infrastructure into their respective sites, locations, and activities.

I welcome your comments and feedback to this handbook and encourage users to forward their inputs to the JMETC Program Office via jmetc-feedback@jmetc.org. I also encourage potential customers to contact us so we can begin early coordination to meet their infrastructure requirements for program test planning and event support.

Chip Ferguson
JMETC Program Manager

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1.0 PROGRAM INTRODUCTION

The Joint Mission Environment Test Capability (JMETC) provides the necessary test infrastructure for conducting Joint distributed test events by cost-effectively integrating live, virtual, and constructive (LVC) test resources configured to support the users' specific needs for each event.

1.1 Program Background

In December 2005, the Department of Defense (DoD) directed the development of the JMETC program under the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD [AT&L]); with responsibility for execution assigned to the Director, Test Resource Management Center (TRMC). In October 2006, the JMETC Program Management Office was established under the TRMC, conducting its stand-up event, a distributed test involving all Services and the United States (US) Joint Forces Command (JFCOM), in 2007.

1.2 Program Mission

The JMETC mission is to provide a persistent capability for linking distributed facilities enabling DoD customers to develop and test warfighting capabilities in a Joint context.

To accomplish this mission, the JMETC program will:

- Maintain a core reconfigurable foundation that enables the rapid integration of LVC resources
- Develop products that not only provide readily available connectivity over existing DoD networks, but also standard data transport solutions, tools and utilities for planning and conducting distributed integrations, as well as a reuse repository
- Provide both on-site and help desk customer support for use of the JMETC infrastructure to integrate LVC resources

1.3 Program Description

JMETC is the DoD corporate approach for providing a persistent infrastructure linking LVC test resources and facilities into a Joint distributed environment (Figure 1). The JMETC program provides its customers a dedicated support team to assist with JMETC products and the conduct of distributed testing. The JMETC persistent infrastructure consists of the six primary products listed below and discussed later in this document:

1. Persistent Connectivity
2. Standard Interface Definitions and Software Algorithms
3. Middleware
4. Distributed Test Support Tools
5. Data Management Solutions
6. Reuse Repository

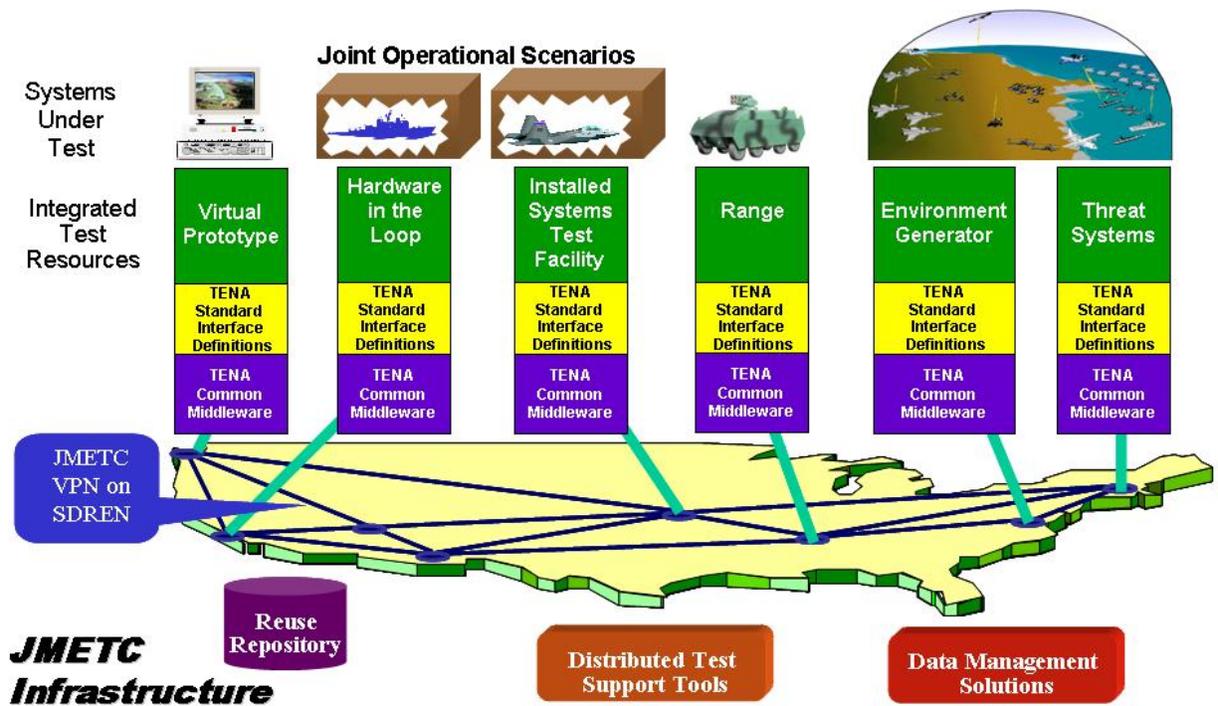


Figure 1. JMETC Infrastructure

The systems under test, depicted in the top row along with the test environment and threat systems, are represented by virtual simulations, Hardware-In-the-Loop (HITL) facilities, constructive simulations, and live systems (green). These individual capabilities were never intended to communicate with each other. JMETC provides the means for these resources to communicate by providing standard interface definitions (a common language)(yellow), middleware (to control dataflow across the network)(purple), and test support tools (brown). Network connectivity is provided by the Secure Defense Research and Engineering Network (SDREN)(blue). Access to the Test and Training Enabling Architecture (TENA) products, test tools, and lessons learned is provided by the Reuse Repository (purple). Data management solutions (red) provide access to distributed data.

1.4 The Value

JMETC provides a DoD-wide capability for the Test and Evaluation (T&E) of a weapons system in a Joint context for Developmental and Operational Testing, Interoperability Certification, Net-ready Key Performance Parameter (KPP) compliance testing, and Joint Mission Capability Portfolio testing.

JMETC saves T&E customers time and money, while providing the clear benefit of technical risk reduction. JMETC's unique total package capability allows the T&E customer to minimize the technical risk associated with planning an event by providing a persistent distributed test infrastructure. JMETC support includes: experienced and highly skilled distributed T&E experts who are forward deployed for distributed planning and operations; a modern, tested, and reliable network already in place; and data exchange methodologies and solutions that have already been tested, proven, and put into practice. JMETC actively captures customers' needs and requirements on a continuous basis and steers test capabilities modernization efforts to improve distributed test capabilities. JMETC is the distributed T&E community's enterprise-level focal point for collecting and maintaining lessons learned about distributed testing, facilitating reuse of resources and improving the DoD distributed test capability.

JMETC further enables a Joint test and training capability through the use of the Test and Training Enabling Architecture (TENA), which provides commonality and compatibility between JMETC and the Joint National Training Capability (JNTC). JMETC reduces the cost and time to plan and prepare for distributed Joint testing, largely due to standing network security agreements, common integration software for linking sites, and accredited test tools for distributed testing.

1.5 Relationship Within the Test Resource Management Center

Responsibility for the management of JMETC was assigned to the TRMC by USD (AT&L). As part of its charter, the TRMC plans for and assesses the capabilities of the Major Range and Test Facility Base (MRTFB) to provide adequate testing in support of development, acquisition, fielding, and sustainment of defense systems. It also maintains awareness of other T&E facilities and resources, within and outside the Department, and their impact on DoD requirements.

In addition to the JMETC Program, the TRMC also administers the Central Test and Evaluation Investment Program (CTEIP) and the Test and Evaluation / Science and Technology (T&E/S&T) Program (Figure 2).

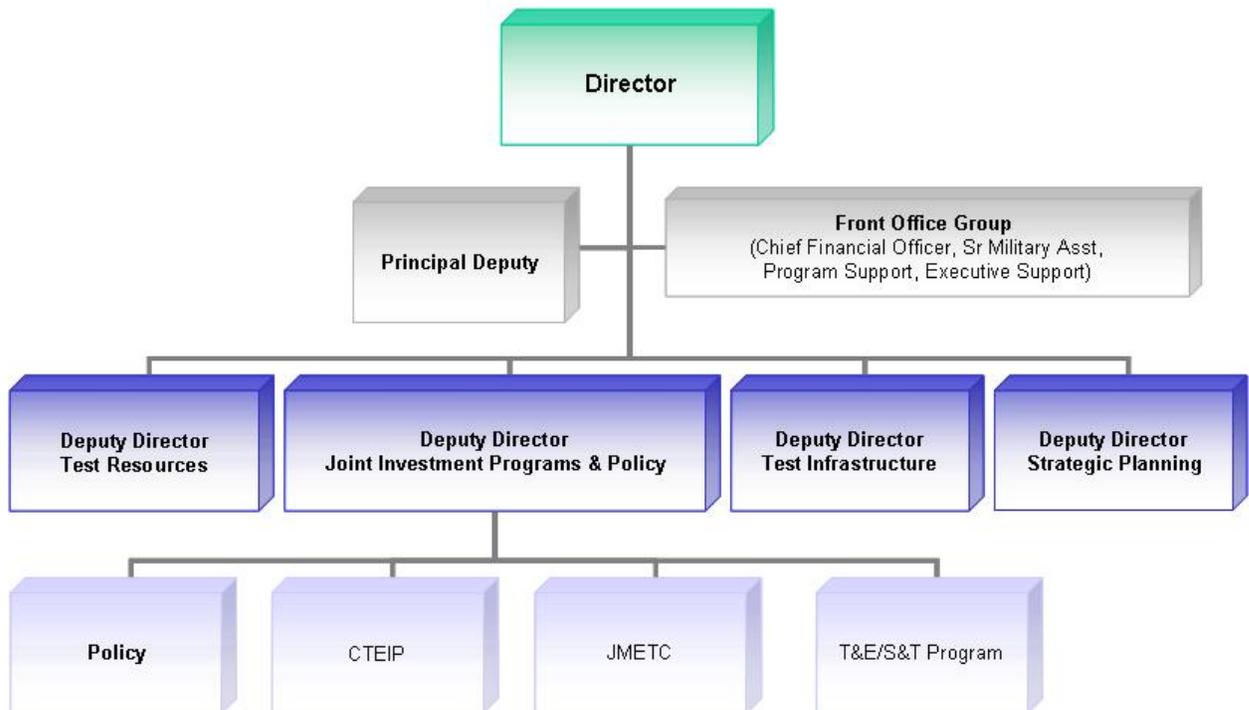


Figure 2. TRMC Organization

Established in 1990, CTEIP sponsors the development of high-priority T&E capabilities that addresses Joint and multi-Service requirements. A Budget Area 4 program (formerly known as 6.4), CTEIP uses a corporate investment approach to satisfy Service and Defense Agency T&E needs, maximize opportunities for Joint efforts, and avoid unwarranted duplication of test

capabilities. The T&E/S&T program was established in 2002 by the DoD to develop new test technologies to address emerging T&E needs, as well as to expedite the transition of new technologies from the laboratory environment to the test community. The T&E/S&T Program is a Budget Area 3 (formerly known as 6.3) advanced technology development program that advances and prototypes new technologies from DoD Service laboratories, Industry, and academia so they can be incorporated into new test capabilities required for testing future weapon systems.

Under CTEIP, the Interoperability Test and Evaluation Capability (InterTEC) project is developing an integrated test tool suite for Joint Net-Readiness KPP testing, Interoperability Certification, and Joint Mission Thread testing. InterTEC provides a corporate test solution, integrated with TENA, for scalable and extensible interoperability testing, by integrating various distributed laboratories and test assets in a operationally-relevant test environment with representative warfighting capabilities.

1.6 JMETC Program Office

The JMETC Program Office, located in Arlington, Virginia, consists of three sections: Deputy for Operations, Planning, and Support (DOPS); Systems Engineering (SE); and Resource and Policy Analysis (RPA). The DOPS team identifies potential customers, determines whether JMETC can meet requirements for the customers' events, and assists the customer in distributed test planning from T&E strategy through event planning, focusing on the test infrastructure requirements. The SE team works alongside the DOPS team in support of addressing the technical issues for the infrastructure requirements. The SE team will take primary JMETC responsibility for the customer from test event preparation through event execution and analysis. The JMETC Program Office assigns dedicated representatives from the DOPS and SE sections to assist customers with the planning, preparation, and execution of the infrastructure for their distributed test event. The JMETC RPA team manages the program budget, long range planning, and any related policy input. The RPA team assists in the development of the JMETC Support Plan for each customer that outlines roles, responsibilities, and resources. Potential customers can begin coordinating for JMETC support by contacting the JMETC Program Office directly (Section 5.0 JMETC Points of Contact), or by attending the next JMETC Users Group Meeting (Section 1.8.3 JMETC Users Group).

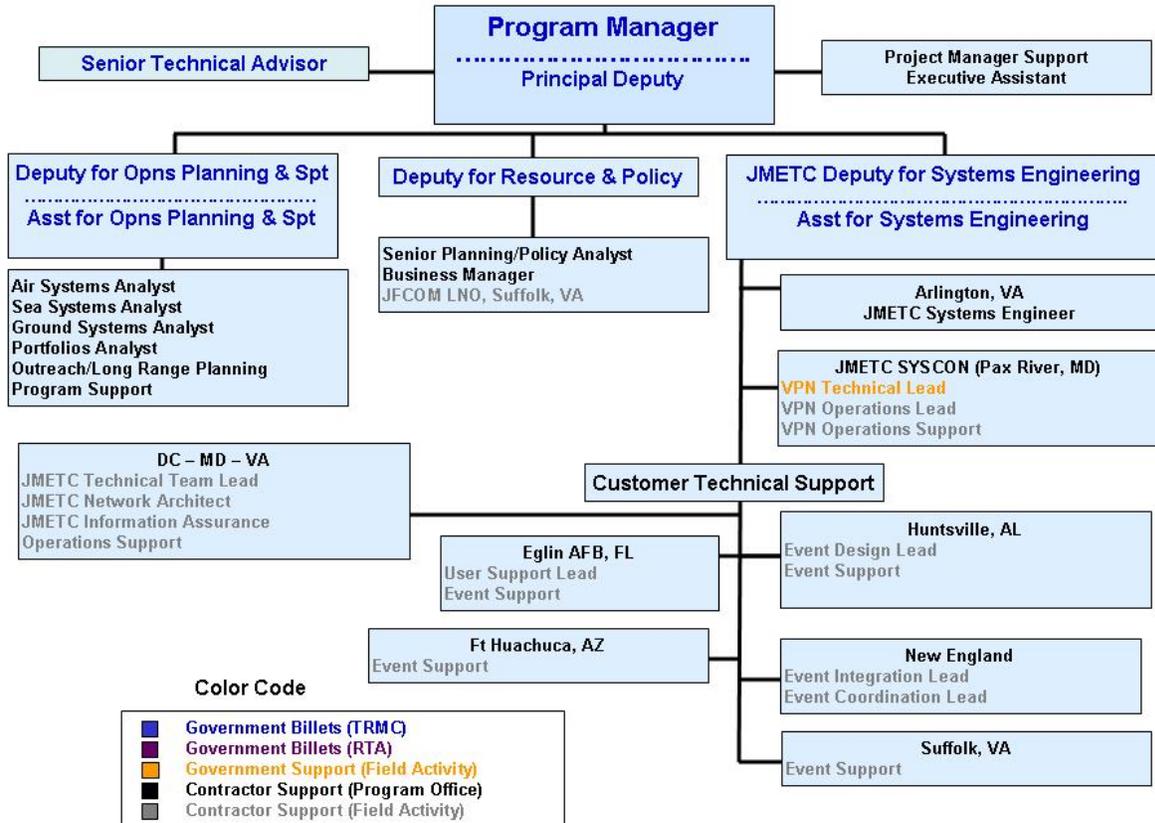


Figure 3. JMETC Program Office Organization

1.7 JMETC Customers

JMETC is designed to support a wide variety of DoD T&E and Acquisition customers. Principal customers include:

Acquisition Program Management Office and the Portfolio Manager

The Acquisition Program Management Office (PMO) and the Portfolio Manager are JMETC’s primary customers. Their requirements are drivers in determining the level of JMETC infrastructure support and distributed LVC assistance. These customers should incorporate JMETC into the test planning process as an integrated solution for the PMO’s distributed test requirements. This includes making JMETC support part of the program’s Test Evaluation Master Plan (TEMP). JMETC will provide assistance with developing distributed LVC infrastructure requirements in test planning and the TEMP. JMETC will also provide, within funding and time constraints, training and tutorials as requested by these customers. The plan for this support will be captured in the JMETC Program Support Plan (PSP). Further responsibilities for the PMO and Portfolio Manager can be found in Section 3.1 (Customer Responsibilities, Acquisition Program Management Office and the Portfolio Manager) in this Handbook.

Test Agents

For the purposes of this Handbook, Test Agents are organizations designated by a PMO to lead event planning and execution. Many of the identified PMO responsibilities may also apply to a Test Agent. JMETC will coordinate with Test Agents to identify JMETC support requirements as early as possible, similar to its coordination with the PMO. Further responsibilities for the Test Agent can be found in Section 3.2 (Test Agents) in this Handbook.

Resource Owners

Resource Owners include ranges and other organizations across the DoD and Industry that own LVC capabilities used to test warfighting capabilities. Responsibilities for the Resource Owners differ somewhat from PMOs and Test Agents. A Resource Owner provides required system representation for distributed Joint test events, and provides for their own facility security certification. To include the JMETC infrastructure as part of a Resources Owner's location or site, the Resource Owner will need to coordinate with the JMETC Program Office to complete any security certification process not already accomplished, receive TENA training as required, and install gateways (Distributed Interactive Simulation [DIS] and High Level Architecture [HLA]) as required. Other requirements will include allocation of test resources for set-up, check-out, event rehearsal, and performance tests during test events. Further responsibilities for the Resource Owners can be found in Section 3.3 (Resource Owners) in this Handbook.

1.8 JMETC Governance

There are several bodies that contribute to the governance of the JMETC program and its activities. Each provides an appropriate level of Service, T&E community and customer input to JMETC (Figure 4).

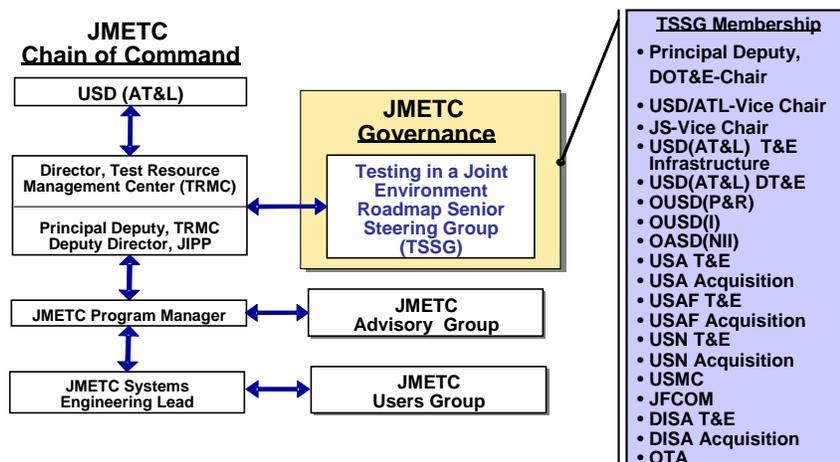


Figure 4. JMETC Leadership & Governance

1.8.1. Testing in Joint Environment Senior Steering Group (TSSG)

The TSSG is a Flag/Senior Executive Service-level body that provides senior leader oversight of the implementation of the DoD's Testing in a Joint Environment Roadmap, and provides a forum in which to collaborate on other Department and Component T&E related efforts. The TSSG will harmonize efforts to conduct adequate and timely T&E in a realistic Joint mission environment and to facilitate informed decisions across the acquisition lifecycle. The TSSG:

- Focuses on Testing in a Joint Environment Roadmap implementation
- Provides direction, defines objectives, prioritizes initiatives
- Reviews and guides the development of Joint T&E policies
- Schedules Semi-Annual Meetings

1.8.2. JMETC Advisory Group

The JMETC Advisory Group membership mirrors the TSSG and consists of GS-15/O-6 level representatives from each of the TSSG member organizations. Since the JMETC Advisory Group is comprised of the TSSG principals' action officers, they provide direct feedback of JMETC Advisory Group activities and deliberations to the individual TSSG member. The JMETC Program Manager's intent is to resolve issues at the JMETC Advisory Group whenever possible. The JMETC Advisory Group:

- Focuses on overall program planning, direction, and investment priorities
- Assists in identifying customers and priorities and advises JMETC Program Manager
- Facilitates collaboration with Services
- Advises JMETC Program Manager on modernization and investment solutions
- Schedules Quarterly Meetings

1.8.3. JMETC Users Group

The JMETC program relies heavily on the collaboration of the Services, JFCOM, and other T&E agencies to build an infrastructure relevant to current and future requirements. In order to facilitate and formalize this exchange process, the JMETC Program Office instituted the JMETC Users Group. The group is composed of representatives from acquisition program offices, technical experts, and ranges and sites that are potential users of JMETC infrastructure and products. It's focus is on technical requirements and solutions. The Users Group makes recommendations to resolve JMETC technical issues and improve integration capabilities, to include connectivity and modernization issues, middleware and object model requirements and change coordination. The JMETC Users Group also provides a direct link for customers entering the JMETC support/planning process, and outlines customer support requirements. In addition, the JMETC Users Group performs the important function of consolidating T&E community requirements, making recommendations to improve JMETC processes and procedures, and advising the T&E community on TENA priorities prior to TENA Architectural Management Team (AMT) meetings.

The JMETC Users Group provides a forum for:

- Network and security agreements technical exchange, issue identification, and solution recommendations
- Software tools technical exchange, issues identification, and solution recommendations
- Facilitating the JMETC Tools and Utilities "Best of Breed" process
- Reuse repository requirements, issue identification, and solution recommendations
- Data solutions technical exchange

- Schedules quarterly meetings; dates are posted on the JMETC web site: www.jmetc.org

1.8.4. TENA Architecture Management Team (AMT)

The TENA AMT is a technical forum providing an open dialogue between users and TENA developers to understand current issues and agree on solutions. It provides more insight to current capabilities and on emerging technical challenges; it also discusses a common approach to satisfying requirements.

The TENA AMT process is used to identify issues, vet concerns, debate potential solutions, and agree on a way forward with active participation from all stakeholders to ensure:

- TENA is maintained according to consensus of its users
- TENA's design and improvements are driven from the TENA AMT exchange
- Current improvements to the next release of TENA are a direct result from input (vote) by TENA AMT members
- Industry has an opportunity to actively participate in TENA management
- Schedules quarterly meeting to coincide with the JMETC Users Group meetings; dates are posted on the TENA website: www.tena-sda.org.

2.0 JMETC PRODUCTS AND SERVICES

JMETC consists of a core, reconfigurable infrastructure with associated products and customer support that enables the rapid integration of LVC resources to link systems and facilities needed to conduct Joint testing. JMETC products provide readily-available connectivity over existing DoD networks, standard data transport solutions, tools and utilities for planning and conducting distributed integrations. The JMETC connectivity is persistent and readily-available for all customers. The JMETC program office has structured itself to provide both on-site and on-line help desk customer support. JMETC's distributed LVC expertise and continual customer support during event planning, preparation, and execution will ensure the ease of use and successful application of the JMETC infrastructure and tools, as well as provide JMETC an opportunity to identify test infrastructure integration issues and potential improvements.

2.1. JMETC Products

The following six products form the foundation of JMETC infrastructure. Each is being developed and matured in coordination with the Services, JFCOM, test programs, and other T&E agencies. The following paragraphs describe the products and the basic development approach to obtain them. Each of these products will be refined as the capability and user requirements within the Joint infrastructure matures. More information on currently available JMETC products and the status of future products can be found at www.jmetc.org.

2.1.1. Persistent Connectivity

With reference to the JMETC infrastructure, persistent connectivity means that the components and approvals needed to access a site's capabilities are in place, verified, and available to use, to include network equipment, security agreements, Authority to Operate (ATO), Authority to Connect (ATC), firewall/access control configurations, site-specific documentation, and core network monitoring and performance verification devices, appliances, and software applications. The JMETC network is configured for real-time, dedicated, secure exchange of data (voice, imagery, tactical messages, instrumentation and test control data, simulation information, etc.) over existing DoD data transport capabilities. The most basic product for any distributed test infrastructure, the JMETC connectivity solution "persists" from one test event to the next, rather than be dismantled and reconstructed for each event. This persistency of connectivity allows test customers to leverage an available test infrastructure integration solution and avoid the time and cost to repeatedly process connection agreements and reconnect equipment. More importantly, JMETC network persistency means that the JMETC customer can focus on their specific test objectives, rather than be concerned about the set-up and operation a unique LVC test environment.

Current capability: JMETC uses the Secure Defense Research Engineering Network (SDREN) as its current secure data transport solution between test facilities. The SDREN is managed by the High Performance Computing Modernization Office (HPCMO) under OSD AT&L and is the primary designated Research and Development (RD) T&E network for the Department. Since the JMETC network operates on top of the SDREN, it is often colloquially referred to as the JMETC "Virtual Private Network (VPN)" to distinguish that the JMETC network uses existing transport solutions and is not a separate array of fibers. The most current listing of sites and site descriptions can be found at www.jmetc.org. Sites are added by JMETC based on customer

requirements and potential for reuse. Alternatively, a site may pay for its own connection to the JMETC network. In addition to establishing new sites, the JMETC network can peer to other DoD networks at the same level of classification, including JFCOM's Joint Training and Experimentation Network (JTEN) used by the training community, through a network aggregation router. The aggregation router, originally sponsored by JFCOM/JNTC, is located at Patuxent River Naval Air Station (NAS). More detailed information on JMETC Connectivity can be found in the JMETC Connectivity Guide available at www.jmetc.org.

Future capability: With the core connectivity solution already in place, future improvements are focused on expansion, flexibility, and performance improvements. JMETC sites continue to be added as customer requirements evolve. Moreover, the JMETC Program is investigating the development of a "Mobile Node Capability" which will give customers further agility to quickly and more cost-effectively connect a site that is expected to be used infrequently. A second aggregation router on the west coast is being considered to improve performance and fault tolerance when connecting to sites on other DoD networks. In addition, JMETC is working with CTEIP to explore improving multi-level security solutions to better support test integrations that need to exchange data at different classification levels. JMETC customers can expect updates to that effort via the JMETC Users Group or go to www.jmetc.org.

JMETC Responsibilities: Once integrated into an event or location, the JMETC team will assume responsibilities for developing, managing, and executing various aspects of the persistent connectivity. While specific responsibilities will be coordinated with the customer, in general the JMETC team will:

- Facilitate the establishment and persistency of each JMETC site. This includes assisting but not authoring the site's ATO with its local Designated Accrediting Authority (DAA), ATC to the SDREN, and accompanying HPCMO paperwork. Please see Section 4.3.1 (Selecting and Installing JMETC Sites) and the JMETC Connectivity Guide for more information
- Aid in the maintenance of the necessary Security Agreements needed to connect to the JMETC VPN once a site is connected. Please see Section 4.3 (JMETC Network Use and Management) and the JMETC Connectivity Guide for more detail
- Monitor JMETC VPN usage to ensure each site's persistent connectivity to include:
 - Verifying performance of JMETC VPN meets HPCMO Service Level Agreements
 - Analysis and reporting of JMETC infrastructure performance post-event
- Assist in the troubleshooting of any data transport problems encountered. This includes:
 - Operation of a JMETC Help Desk
 - Proactive troubleshooting of the Wide Area Network and local infrastructure to properly diagnose the root cause
 - Issue resolution and confirmation that the problem has been resolved
- Administer JMETC Users Group Network Track
 - Technical exchange among JMETC connectivity users and experts in the community
 - Forum for sharing best practices, identifying connectivity issues, and recommending solutions
- Plan for future sites on VPN (Section 4.3.1 Selecting and Installing JMETC Sites)

These steps enable a site to be persistent for use in any test utilizing JMETC connectivity without any additional security paperwork, such as an event-specific Memorandum of Agreement (MOA), being required. However, many sites have enabled additional measures of Information Assurance, such as firewalls, that can deny data delivery from one JMETC site to another. Therefore, it is recommended that the test event lead coordinates with the JMETC Tech Support Team and the JMETC System Control (SYSCON) prior to the test event to ensure data delivery.

2.1.2. Standard Interface Definitions and Software Algorithms

To achieve interoperability among multiple facilities and test resources, it is necessary to exchange commonly accepted definitions of the data and use the same core algorithms to process the data or remotely control distributed systems. JMETC achieves this goal through the usage of both standard interface definitions and standard software algorithms. The JMETC standard interface definitions are a collection of community-approved object models that describe the data elements (also called attributes) available to be exchanged among systems and available software algorithms to be used in data exchanges between systems (e.g., Platform, Radar, Time-Space-Position Information [TSPI], Engagement Messages, etc.). The TENA Standard Object Models enable semantic interoperability among range resource applications by providing a standard "language" that all range resource applications use to communicate. For the JMETC customer, this provides a standard data definition set so sites and applications can communicate about the entities in the Joint distributed test in a meaningful way. The TENA object model also encodes other information necessary for the operation of range resources, such as health status of test applications and performance metrics (number of data packets sent, received, etc.). The commonality of object models allows test sites/resources to exchange data in formats consistent with their own instrumentation and resources and provides a common language used in data exchanges between systems. JMETC will verify proper use and function of the TENA Standard Object Models in JMETC integrations. If the customer needs to exchange data that is not already defined in the existing standard object models, a customer-unique object model can be created to meet specific mission requirements. The TENA Standard Object Models are available from the TENA Object Model Repository, at <http://www.tena-sda.org>.

Current capability:

| Object Model Name | Version | Purpose or Contents |
|-------------------|---------|---|
| TSPI | 4.0 | Position, velocity, acceleration, and orientation information for an entity, including conversion algorithms for position in many commonly used coordinate systems (Geocentric, Geodetic, Local Spherical Tangent Plane, and Local Tangent Plane East-North-Up). Supports Global Positioning System (GPS) time, Coordinated Universal Time (UTC) time, and Unix time. |
| Platform | 3.1 | Describes all core attributes for an entity, including type, affiliation, identification (call sign, tail number, etc.), camouflage, etc. The Platform object also includes the TSPI object to describe the position, velocity, acceleration, and orientation of the platform. |

| | | |
|-------------------------------------|-----|--|
| Application Management Object (AMO) | 1.0 | Describes the health status and application specific information useful for test control and post-test analysis. |
| Radar | 2.0 | Describes the attributes for a radar system, including radar type, antenna, mode, beam, etc. |
| GPS | 2.0 | Describes the attributes for a GPS system, including code, satellite information, receiver status, correction mode, etc. |
| Engagement | 3.1 | Describes weapon effects and damage types |
| Simulation Time Management | 1.0 | Provides a capability to control artificial time among different simulations |

Future capability:

| Object Model Name | Version | Improvements or New Features |
|----------------------|---------|---|
| TSPI | 5.0 | Improvement: Additional capabilities include conversions not only for position but also for velocity and acceleration |
| Platform | 5.0 | Improvement: Optimized for less bandwidth |
| AMO | 2.0 | Improvement: Includes additional diagnostic data made available with TENA Middleware 6.0. |
| Measurand | 1.1 | New standard: Describes data streams or raw sensor data |
| Weather | 1.0 | New standard: Describes weather data relevant to a position |
| Tactical Message Set | 1.0 | New standard: Provides a capability to distribute a tactical message across a distributed test environment |

JMETC Responsibility: JMETC will present the LVC data standard needs of the acquisition and T&E communities at TENA AMT meetings and to CTEIP as a whole. Note that this does not preclude the acquisition or T&E communities from actively engaging in the standards definition process first-hand through the TENA AMT meetings. Also, JMETC will work with the TENA Software Development Activity (SDA) to:

- Provide Help Desk customer support for standard interface or algorithm development and usage
- Answer technical questions regarding standard interface or algorithm implementation
- Troubleshoot problems
- Perform trend analysis in order to recommend formulation of new standards
- Fix bugs and provide software patches to the user community on object model implementations
- Verify proper use/function of object models in JMETC integrations

2.1.3. Middleware

Middleware is the universal data exchange software used by range systems, hardware-in-the-loop (HITL) labs, and simulations to send and receive data. For the customer it provides a common functionality (data distribution, filtering, etc.) to exchange data/information between systems on the JMETC network. It provides a means of assuring that test sites with different data formats, structures, sampling rates, and so forth will be able to communicate meaningfully with each

other. In an analysis of alternatives study of LVC integration capabilities, JMETC selected TENA for the infrastructure's data exchange software. The most important factor in the consideration was the capability of TENA to integrate live systems with virtual and constructive systems. TENA based middleware provides the necessary control of data flowing across the network, and also maintains compatibility with JFCOM's JNTC and the training community.

The TENA SDA manages sustainment and future development responsibilities for TENA for both the test and training communities. The TENA SDA manages:

- Upgrades to TENA middleware
- Upgrades to TENA-related tools and utilities
- Distribution of TENA middleware
- Technical support to TENA users, including on-line help desk and TENA training
- New middleware requirements from the Services as well as the T&E communities
- Feedback provided by TENA users
- Results/observations from test and training events

The TENA SDA is also responsible for the TENA AMT (See Section 1.8.4 TENA Architecture Management Team).

Current capability: Currently, JMETC uses TENA Middleware 5.2.2 to provide core functionality data exchange among range systems, HITL labs, and simulations with rapid and reliable development of LVC integrations (for more information, refer to the JMETC VPN Connectivity Guide or go to: www.tena-sda.org or www.jmetc.org).

Future capability: JMETC is in the process of upgrading its capabilities to support the latest version of the TENA Middleware 6.0 (also known as TENA Middleware Release 6.0). The TENA Middleware 6.0 has substantial new features and improvements over previous versions. Key improvements include new middleware capabilities to enhance data distribution and optimize network usage; new event management capabilities to improve reliability and enhance system troubleshooting; and meta-model and object model improvements to better define data and remove ambiguities. Further specifics can be found on the web at www.tena-sda.org.

In the near term, JMETC will support the parallel usage of both TENA 5.2.2 and TENA 6.0 on its infrastructure. To benefit from the advantages of TENA 6.0, JMETC customers are encouraged to upgrade their capabilities, and it is recommend they use the TENA Integrated Development Environment (TIDE) tool that greatly simplifies the effort to upgrade to TENA 6.0. Additionally, JMETC is willing to assist interested users as part of its overall program budget in the upgrade of capabilities to support a native TENA application. Users interested in TENA training, system design or code reviews, code development, or any other activity that is needed to aid in native TENA migration should contact JMETC at jmetc-feedback@jmetc.org.

JMETC Responsibilities: JMETC will represent the LVC integration needs of the acquisition and T&E communities, vetted through the JMETC Advisory and JMETC Users Groups, at TENA AMT meetings and to CTEIP with respect to TENA developments. Also, through the TENA SDA, JMETC will:

- Provide customers TENA software (download from www.tena-sda.org at no cost)

- Provide JMETC Help Desk customer support for TENA to include:
 - Answering technical questions
 - Troubleshooting problems
 - Performing trend analysis
- Beta-test new TENA Middleware Releases to verify adequacy
- Fix bugs and provide software patches to the user community on request
- Facilitate TENA Hands-On Training classes
- Verify the proper use and function of TENA middleware in JMETC integrations

2.1.4. Distributed Test Support Tools

JMETC Distributed Test Support Tools, or JMETC Tools for short, are a collection of common software applications that help test managers plan, prepare, monitor, execute and analyze distributed LVC test activities. For the customer, the tools provide a common suite of easy-to-use, reliable, and supported tools to ensure successful LVC integration and test execution. JMETC utilizes a “Best of Breed” process to establish a common baseline of tools and to ensure that the best tools in the community are utilized to address specific test requirements. By providing a common baseline of distributed test support tools, JMETC reduces a single program’s need to develop and sustain tools which are universally useful across the test community. Additionally, a common baseline of tools improves coordination and reduces event planning and preparation time by allowing customers to capitalize on similar efforts and programs already completed.

Current capability: JMETC leverages the tools developed by InterTEC under the CTEIP program (Section 1.5 Relationship with the Test Resource Management Center). Thus, the InterTEC tool suite is a very important component of the collection of JMETC Tools. JMETC has additional tools not developed by InterTEC that it uses to support its test customers. The following are examples of the Distributed Test Support Tools used by JMETC as they would apply to planning and executing a test event. This list is intended to be used as a representative sample only and is by no means complete. It should be noted that many of the JMETC Tools will have multiple uses and have application across various aspects of the entire test process. For an update on the complete list of current tools provided by JMETC, or information on the JMETC Tool categories, go to www.jmetc.org to visit the JMETC Tools Repository hosted as part of the JMETC Repository.

Event Planning: Event Planning tools support the planning and assembling of complex test and training events by enabling range personnel to collaborate using modern digital communication technologies such as audio, video, and instant messaging. The tools also provide a capability to enable remote collaboration between personnel at each range in the execution to support event planning. These tools support such areas as developing event mission capabilities, event objective and support capabilities definition, high-level and detailed scenario development, and resource needs determination.

Examples of these tools include:

- *Interface Verification Tool (IVT)*. Used to test network access and performance before an event. Specifically, IVT is designed to support integration testing of TENA applications.

IVT uses the standard TENA object model or event specific object models and is used extensively in the checkout of the JMETC network.

- *C3 Driver*. C3 driver is an integrated collection of Army Test and Evaluation Command (ATEC) tools. It provides a capability for end-to-end, systems-of-systems event and exercise planning, monitoring, execution and control. C3 Driver capabilities include data collection, reduction, analysis, display and storage.

Event Management: Event Management tools support distributed test activities during actual event execution. These include event initialization, range resource control and monitoring, scenario execution, data capture and archival, event management and monitoring and ongoing event assessment.

Examples of these tools include:

- *SIMDIS 9.3*. SIMDIS is a visualization and analysis application that provides a two and three dimensional interactive, graphical, and video display of live and post processed simulation, as well as test and operational data.
- *TENA-DIS Gateway 3.0*. An application to convert legacy DIS application data to TENA.
- *Starship II Test Command & Control Suite*. Starship II enables a user to compose informational views of the distributed environment consisting of thousands of participants reporting their state and threshold notifications. All this information is integrated into temporal, geographical, and tabular views to help form an overview of the distributed test environment called the Common Test Picture.
- *TENA Video Distribution System (TVDS)*. TVDS enables real-time video distribution, display and control of any type of digital video stream.

Network Management: Network Management tools support event setup and test (to include network configuration), event management and monitoring, and event rehearsal.

Examples of these tools include:

- *NutTCP 6.1.2*. NutTCP is a network performance measurement tool. JMETC uses this tool to verify Transmission Control Protocol (TCP)/User Datagram Protocol (UDP) throughput, latency, and packet loss over the wide-area network and across local-area networks at test sites.
- *Wireshark 1.0.5*. Network protocol analyzer to analyze Internet Protocol packet traffic.
- *SDREN Active Measurement Program (SAMP)*. A collection of sensors collected at all JMETC sites used to gather network characteristics such as latency, TCP throughput and the percentage of packets dropped.

Event Analysis: Event analysis tools provide a capability to select and retrieve execution data sets from the event data archive. These tools provide a capability to store analysis and results to the event data archive and event repository. These tools also support quick-look reports/hot wash generation, collected data consolidation, post processing and data reduction, event report generation/after action report, execution/take home package creation, as well as the documentation, distribution, and archival of lessons learned in the event repository.

Examples of these tools include:

- *Joint Interoperability Modular Evaluation System (JIMES)*. JIMES stores test data for near real-time and post event analysis. JIMES is also used to support Joint certification testing of Tactical Digital Information Link 11/11B/16 interfaces.
- *Reflect*. Reflect can replay either selected pieces or an entire event for analysis or further testing.

Future capability: JMETC will continue to utilize the Best of Breed process to identify and incorporate candidate tools into JMETC Tools. JMETC is also in the process of building the JMETC Tools Suite. The JMETC Tools Suite is a rack-mounted computer that will be installed at all JMETC sites. The JMETC Tools Suite will be available for each site to leverage in its test activities. For an update on future Tool availability go to www.jmetc.org.

JMETC Responsibilities: JMETC will present the LVC integration needs of the acquisition and T&E communities, vetted through the JMETC Advisory and User Groups, to CTEIP and the Services to establish support tool requirements and capabilities. JMETC will not develop tools but will aid in sustaining Joint requirements in JMETC Best of Breed Tools that cannot be sustained by the tool owner. Other specific JMETC responsibilities include the following:

- Gather user requirements for software tools to improve planning, preparing, conducting, and analyzing of LVC test environments
- Assess existing software tools developed by CTEIP projects, such as InterTEC, JNTC, the Services, or other government organizations that address common LVC integration requirements within the JMETC Best of Breed Tools process
- Verify proper use and functionality of JMETC Tools in LVC integrations
- Ensure adequate customer support, to include documentation and active Help Desk support, for all JMETC Best of Breed Tools
- Provide JMETC Tool software updates to the user community either directly or indirectly via the JMETC Tools Repository, hosted as part of the JMETC Repository at www.jmetc.org
- Ensure Tool Owners maintain and support JMETC Tools or utilize the Best of Breed process to identify alternative tools that are properly supported

2.1.5. Data Management Solutions

JMETC defines Data Management Solutions as a suite of solutions provide capability across all disciplines related to managing data. Data Management includes, but is not limited to, data collection, archiving, reduction, analysis, mining, storage, continuity of operations, and permissions management. For the customer, this suite of tools provides a comprehensive capability for treating data as the invaluable resource that it is. Data Management solutions provide a rapid and efficient method of retrieving data from distributed test sites for analysis and evaluation of test results. CTEIP conducted an assessment of T&E data management requirements with the goal of providing a DoD T&E enterprise solution. Based on the JMETC Users Group input, JMETC will adopt and advocate those proposed data management solutions. In the meantime, JMETC will participate in and represent LVC integration interests in CTEIP data management assessments and developments, and will keep customers informed of the latest solutions through the JMETC Users Group.

Current capability:

- InterTEC Data Management tools including:
 - JIMES: Government-off-the-Shelf (GOTS), Joint Interoperability Test Command (JITC)-certified real-time and post-test Data Analysis Suite
 - Reflect: GOTS TENA Data Logger and Playback Tool that utilizes automation to support any possible TENA object model without writing additional lines of code

Future capability:

- CTEIP-developed Data Management Solutions

JMETC Responsibility: JMETC, in concert with the Services via the JMETC Advisory and User Groups, will gather and prioritize acquisition program data management requirements to assist in developing proposals for CTEIP and Service funding for data management solutions, to include:

- Quick retrieval of Joint scenario and other important pre-event information and plans
- Common initialization information so Joint test events can be reliably repeated
- “Logically Centralized,” permission managed, single access point to physically disparate data storage facilities
- Real-time data mining during test events to provide immediate insight of on-going Joint testing
- Correlation of distributed data recorded at multiple locations during a distributed Joint test event
- Distributed, relational data collection, in lieu of traditional “data loggers”
- Capture of "temporal" understanding of collected information, allowing analysts to understand the total state of the Joint mission infrastructure at any moment in time

2.1.6. Reuse Repository

The JMETC Reuse Repository is an online collaborative environment with relevant JMETC and distributed event information. The Reuse Repository is structured to give the user community easy access to general program information, Questions and Answers (Q&A), lessons learned, opportunities for distributed test event collaboration, and insight into the capabilities JMETC and other JMETC users. This includes JMETC information, Help Desk access, an anthology of sites on the JMETC infrastructure, information on past events, customer information, the latest middleware, software, documentation, test-event lessons learned, metadata, and web-enabled collaboration services. Assuming adequate permissions, the Reuse Repository will provide access to past distributed activities. Additionally, JMETC provides each of its users the capability of hosting its own spaces on the Reuse Repository to facilitate collaboration for specific events, tools, or sites. For the customer, the Reuse Repository provides a central location for assistance in planning and executing infrastructure for distributed Joint test events. It also reduces event planning time by providing customers a “one-stop shop” for existing and available LVC capabilities and lessons learned from previous integrations, allowing test and training programs to leverage the success of similar efforts and events. Planners will not have to “re-learn” old lessons for each event. Operators, testers, and the acquisition community will have access to a readily-available library of lessons learned.

In establishing a Reuse Repository, JMETC will support the customer with a web portal and its content. Portal content may include JMETC Program Support Plans (PSPs), test planning or collaboration information, or any other required documents or data products. JMETC will depend on test resource owners for the test resource anthology. JMETC will provide space on the JMETC server for this documentation or a link to the test resource owner's server for their documentation.

Current capability: The initial version of Reuse Repository is operational and accessible via <https://www.jmetc.org>. TRMC provides single log-on capabilities so anyone with a valid JMETC or TENA user account can access the JMETC Reuse Repository.

Future capability:

JMETC will continue to develop periodic updates to the Reuse Repository in order to provide the best possible support to our customers. The JMETC Program Office is looking for customer input to increase the Repository's functionality, ease of use, and utility. If you have recommendations, updates, or suggestions on the Reuse Repository, please contact JMETC by sending an email to jmetc-feedback@jmetc.org or by creating a JMETC Help Desk case (see Section 2.2 JMETC Help Desk for more details). Alternatively, requirements for the Reuse Repository or any other JMETC product area can be brought to the JMETC Users Group.

JMETC Responsibilities: JMETC will maintain and administer the Reuse Repository to include:

- Providing access to the latest program information
- Maintaining an up-to-date list of Frequently Asked Questions (FAQs) and Lessons Learned
- Providing a forum for community collaboration
- Enabling creation of User Spaces to meet customer requirements
- Answering technical questions
- Administrative tasks related to the Reuse Repository

2.2. JMETC Help Desk

The JMETC Help Desk is part of the Reuse Repository on-line web portal and provides assistance for the use of JMETC products, including connectivity (i.e., the JMETC VPN) and tools. The purpose of the JMETC Help Desk is to track any general issues, questions, or new requirement requests for the JMETC program. The TENA Help Desk supports answering questions and troubleshooting problems directly related to the TENA Middleware, TENA support tools, and standard TENA object models. TENA Help Desk cases are used to augment release notes to dynamically track fixes, improvements, and known issues associated with TENA. For the customer, these help desks will:

- Answer questions and provide guidance (i.e., how to install TENA software)
- Dynamically track fixes, improvements, questions, and known issues
- Allow users to review and comment on all reported Help Desk Cases

Current Capabilities: The JMETC Help Desk and TENA Help Desk are available via the JMETC Reuse Repository (www.jmetc.org). Users must have a valid JMETC or TENA account to access any of the Help Desks.

2.3. Customer Support

In addition to the available online Help Desks, JMETC employs a dedicated Customer Support Team with extensive expertise in the JMETC infrastructure and distributed LVC testing in general. To ensure a successful test, the JMETC Program Office will assign dedicated personnel to each customer to assist with planning, preparation, integration, and execution of infrastructure requirements for the distributed LVC test event. This support enables the customer to focus resources on their specific test requirements and not on establishing an overarching persistent infrastructure. Additionally, JMETC is prepared to provide new customers with assistance in answering questions and guidance on solutions for distributed LVC testing. Interested parties and potential customers need only contact the JMETC Program Office or send an email to jmetc-feedback@jmetc.org to begin the coordination process. More detail on each JMETC customer support category is found below.

2.3.1 Operations Planning & Support

The JMETC team is available to support and advise a customer beginning in the early phase of test planning development and would like to be invited to participate in the working/planning process. JMETC will provide technical expertise on LVC distributed testing using JMETC infrastructure to support:

- Test Evaluation Master Plan (TEMP) development
- Test Evaluation Strategy development
- Test Evaluation Working Group meetings
- Distributed test event planning

JMETC will also assist the customer in identifying current JMETC capabilities needed to support Joint test integration events in the use of Distributed Test Support Tools and the Reuse Repository. Early coordination with JMETC will ensure the program-level test planning provides efficient use of the JMETC infrastructure and captures the requirement(s) for JMETC support.

A document to be used for detailing specific JMETC support responsibilities and Customer requirements and responsibilities is the JMETC Program Support Plan (PSP). The JMETC PSP is a program level mutual agreement between the JMETC Program and the customer that includes agreements on procedures, requirements, commitments and cost sharing. A more detailed agreement for specific event support, the JMETC Event Support Plan (ESP), outlines specific areas of JMETC support, customer responsibilities to include sites and test resources to be integrated. For further information on the JMETC Support Plan and the JMETC Event Support Plan, refer to Section 4.2 (Developing a JMETC Program Support Plan).

2.3.2. Customer Technical Support

JMETC employs a geographically distributed Technical Support Team to provide direct customer support to test planning and execution activities. The JMETC Technical Support Team provides assistance to requesting customers by helping to identify solutions to customer requirements and assisting in both on-site event preparation and event execution. For example, JMETC will support the customer during event planning by providing tools for planning, technical support for network requirements and operations, integration of software, Help Desk functions, training on the JMETC Tools suite, and network performance analysis. Requests for assistance from the JMETC Technical Support Team should be directed to the JMETC Program Office or by sending an email to jmetc-feedback@jmetc.org.

2.3.3 Product Support

The JMETC Distributed Test Support Tools will be supported throughout each respective component's life cycle. The Reuse Repository provides the initial access point for support of JMETC infrastructure products. From there, users will be able to download software, read available user documentation, or access the Help Desk for specific JMETC Tools. Additionally, more hands-on support of JMETC Tools is available through the JMETC Technical Support Team. JMETC is committed to training its users in the operation of any tool part of the JMETC Distributed Test Support Tool Suite.

2.3.4 Customer Satisfaction

The JMETC Program Office is strongly committed to implementing a continuous process for improving a customer's satisfaction for all JMETC products and services. Direct customer feedback is the cornerstone to our ability to implement process improvements. As such, customer event planners, managers, and leader interviews will be conducted within two weeks of the conclusion of an event. The customer interview sheet (Appendix B) will be used for the interviews. In turn, the products of this feedback will be used to ensure reliable and consistent JMETC product and service quality is put into effect.

3.0 CUSTOMER RESPONSIBILITIES

The most important aspect for gaining JMETC support is to contact the JMETC Program Office early to begin coordination. Contacting the Program Office is as simple as finding the right contact on the JMETC Reuse Repository or by sending an email to jmetc-feedback@jmetc.org. JMETC actively supports three customer roles: Customer PMO, Test Agent, and Resource Owner. Each of these customer roles, combined with their associated staffs, have specific responsibilities in the T&E process and JMETC will support each with the appropriate level of assistance and recommendations.

3.1. Acquisition Customer Program Management Office and the Portfolio Manager

The Acquisition Customer PMO has the overall responsibility for Test Planning and Execution. JMETC will maintain a support role to the Customer PMO. As such, the Acquisition Customer PMO should ensure the Program staff contacts JMETC to begin Program-Level Test Planning Support (refer to Section 4.1.1 Program-Level Test Planning Support). Critical to this aspect of customer responsibility will be the development of the program's Joint distributed test infrastructure requirements. These requirements will be the driver in determining the level of JMETC infrastructure support and distributed LVC assistance. As a minimum, the Customer PMO should coordinate with JMETC to:

- Incorporate JMETC into the test planning process as an integration solution for the program's Joint distributed testing. The end result should be the inclusion of JMETC support into the Test Evaluation Master Plan (TEMP). JMETC will provide assistance with developing distributed LVC infrastructure requirements in test planning and the TEMP
- Include JMETC in Test Evaluation Working Groups and other appropriate program forums
- Identify JMETC technical support requirements. JMETC can provide training and tutorials as requested but JMETC will need to know the products for which the Customer PMO will require training. Also, the JMETC Program Office will need to know what support is needed for event planning, preparation, and execution
- Coordinate with JMETC Program Management Office on JMETC Program Support Plan (PSP) development. The PSP is a mutual agreement between the customer and the JMETC program that includes agreements on procedures and responsibilities, customer requirements, sites and test resources to be integrated, cost sharing, etc. JMETC will take the lead in producing this document. For more detailed information on developing the PSP, refer to Section 4.2 (Developing a JMETC Program Support Plan)
- Identify test event requirements and obtain agreement for resource needs at system and site level for integration
- Authorize JMETC to work directly with Resource Owners to develop technical integration support requirements and solutions

3.2. Test Agents

Test Agents, as defined by JMETC, are organizations designated by a Customer PMO to lead event planning and execution. As such, many of the identified Customer PMO responsibilities may also apply to a Test Agent. The most important responsibility is to contact the JMETC

Program Office early to begin identifying and coordinating support requirements. When coordinating with JMETC, customer responsibilities specific to a Test Agent include:

- Identifying JMETC support requirements as early as possible
- Including JMETC in the event planning, set-up, rehearsal, and execution of the distributed event
- Facilitating JMETC involvement with other test sites/resources
- Including JMETC in planning conferences and meetings

3.3. Resource Owners

JMETC considers “Resource Owner” customers to include capabilities (systems representations whether live, virtual, or constructive) owned across the DoD and in Industry used to test warfighting capabilities. Example Resource Owners include sites, labs, ranges, and sponsors of capabilities designed to be deployed to any number of facilities. Responsibilities for Resource Owners differ somewhat from Customer PMOs and Test Agents. A Resource Owner provides required system representation for distributed Joint test events, and provides for their own facility security certification. However, to include the JMETC infrastructure as part of their location or site, a Resource Owner should coordinate early with the JMETC Program Office to:

- Complete the Information Assurance certification process as-required
- Download TENA software and receive TENA training as required
- Install gateways to legacy data transport architectures, such as DIS and HLA, as required
- Support development of test planning documentation
- Provide test resources for set-up, check-out, and event rehearsal
- Control test resources and verify/troubleshoot performance during test events

3.4. Charge Policy

As the JMETC Program matures, we expect to grow in terms of customers and JMETC sites. Eventually, we expect that the cost to sustain the infrastructure and support customers will exceed our budget. At that time, JMETC will need additional funding source(s). One potential alternative for additional funding would be to treat JMETC as a Major Range and Test Facility Base (MRTFB)-like capability and create a formal customer charge policy. The JMETC Program is currently investigating alternatives for additional funding, which, once developed, will be vetted through the JMETC Advisory Group and the TSSG. JMETC will also discuss these plans with current JMETC customers (acquisition programs) and the JMETC Users Group.

The JMETC program uses its funding to:

- Build, maintain, upgrade, and operate all facets of persistent JMETC Connectivity
- Identify TENA middleware requirements
- Identify, develop, and maintain TENA standard interface definition requirements
- Develop and execute the JMETC Best-of-Breed process to select Distributed Test Support Tools
- Fund development and maintenance of the JMETC Reuse Repository
- Fund the sustainment of tools and Data Management Solutions in the JMETC Tool Box developed by CTEIP
- Provide expertise of the JMETC Technical Support Team to support customer activities
- Fund program overhead, facilities, equipment, and operating costs

JMETC employs relatively few government personnel in key positions to provide direction and management to a contractor team that provides technical and administrative support.

4.0 HOW TO USE JMETC

This section will provide the customer with guidance and procedures on how to use JMETC to support their distributed LVC test requirements. Specifically there are step-by-step instructions for what the customer and JMETC will do for:

- JMETC distributed test planning support
- Developing a JMETC PSP or ESP
- Adding JMETC sites
- Event execution, analysis, and lessons learned

4.1 JMETC Distributed Test Planning Support

JMETC provides technical expertise to assist the customer in the use of JMETC products and distributed testing at two basic levels. First, JMETC will provide expertise and recommendations for overall program-level distributed test structure development. This will include assisting the customer with developing high-level distributed test requirements and ultimately assisting to translate those requirements into specific representation (site) requirements. JMETC will also assist in documenting distributed test event plans in the TEMP. Secondly, JMETC will provide assistance for individual Joint distributed test events (i.e., Net-Ready KPP certification test event for a specific acquisition program). This assistance will include event planning, preparation, and execution.

4.1.1 Program-level Test Planning Support

The JMETC team is available to support and advise the customer beginning in the early phase of test planning development and would like to be invited to participate in the working/planning process. JMETC will provide technical expertise on LVC distributed testing using JMETC infrastructure to support:

- TEMP development
- Test Evaluation Strategy development
- Test Evaluation Working Group meetings
- Distributed test event planning

JMETC will also assist the customer in identifying current JMETC capabilities needed to support Joint test integration events in the use of Distributed Test Support Tools and the Reuse Repository. Early coordination with JMETC will ensure the program-level test planning provides efficient use of the JMETC infrastructure and captures the requirement(s) for JMETC support.

JMETC Will: When requested to participate in the program-level test planning process, JMETC will:

- Provide a JMETC overview and technical briefs directly to the customer and at various test planning sessions (Technical Expert Working Group [TEWG], etc.)
- Participate in distributed event preparation meetings and test readiness reviews
- Provide expertise, recommendations, solutions to challenges and lessons learned on distributed LVC testing
- Assist in incorporating JMETC into Test Evaluation Strategy (TES) and TEMP
- Review program/system documents

- Write the JMETC Program Support Plan (PSP), drafting the document to include connectivity requirements, required products with changes/modifications, timelines, mitigation plan, and agreements for JMETC support.
- Coordinate and publish final PSP

Customer Should: To assist the JMETC Program Office in providing the best possible support, the customer should:

- Identify LVC testing requirements to include specific event requirements
- Identify any infrastructure challenges
- Identify any JMETC site/system assistance required
- Review and concur on JSP

Outcome: The desired outcome for JMETC support to program-level test planning is:

- JMETC incorporated in TEMP (as appropriate)
- Identified and approved distributed LVC events
- Approved PSP is published
- Successful event planning and execution

4.1.2 Individual Test Event Support

JMETC is available to support the customer during event planning and preparation phase. The Customer PMO should ensure JMETC is invited as an active participant during the planning phase(s) of the test event, and that detailed support requirements are developed for event execution.

JMETC Will: When requested to provide support for individual test events, JMETC will:

- Assist in distributed test planning and use of JMETC Infrastructure
 - Help desk support
 - On-site support
 - Host user collaboration spaces as part of the JMETC Reuse Repository
- Provide training on JMETC tools and products
- Assist in using the JMETC infrastructure
- Provide support for event planning, rehearsals, and “dry runs”
- Where appropriate, assist the Program in adding a site to the JMETC infrastructure (Section 4.3 JMETC Network Use and Management)
- Troubleshoot and verify JMETC infrastructure performance

Customer Should:

- Provide test planning documentation
- Invite JMETC to planning meetings, rehearsals, and “dry runs”

Outcome: The desired outcome for JMETC individual test event support is:

- JMETC Infrastructure in place and ready to support test event
- Successful event execution

4.2 Developing a JMETC Program Support Plan

The JMETC PSP is a mutual and broad level agreement between the customer and the JMETC Program Management Office that includes agreements on procedures and responsibilities, and customer requirements and cost sharing. For the customer it identifies distributed LVC requirements, support, and actions to which the customer and the JMETC Program Management Office will adhere. The PSP is meant to be flexible. It is updated as the customer's long-term requirements for JMETC continue to mature and develop. JMETC will write the PSP. The document is approved and signed by the JMETC PM and the customer. The more detailed JMETC ESP is intended to supplement the JSP for specific test events. The ESP will outline detailed areas of JMETC support, customer responsibilities to include sites and test resources to be integrated, technical support, JMETC tools and products to be provided and used, etc. The ESP is intended to be valid for only thru the final execution phase of a particular event.

4.2.1 JMETC Program Support Plan Outline

The following is a notional PSP outline. Differing customers will have differing degrees of PSP fidelity as well as additional issues and topics requiring coordination and agreement.

1.0 Background

- Purpose
- JMETC and Program Descriptions
- Program Timeline and Milestones
- Background Documents – TEMP (draft or milestone), Implementation Support Plan (ISP), Capability Development Document (CDD), Capability Provisioning Document (CPD), etc.

2.0 Primary POCs

- Customer
- JMETC

3.0 Customer Requirements

- Purpose
- Test Architecture
- Distributed Test Requirements

4.0 Customer Responsibilities

5.0 JMETC Support Responsibilities

- JMETC products required
- Program support and milestones to facilitate JMETC support
- Connectivity

6.0 Dependencies

- Issues, limitations and other programs that would affect integration and testing schedule

7.0 Risk Assessment

- Risk assessment and mitigation strategies

8.0 Funding Responsibility

- For both the customer and JMETC (Section 3.4 Charge Policy)

4.2.2 JMETC Event Support Plan Outline

The following is a notional ESP outline. Differing customers will have differing degrees of ESP fidelity as well as technical issues and topics requiring coordination and agreement.

1.0 Background

- Purpose
- JMETC and Event Description
- Event Timeline and Milestones
- Background Documents (Test Plan, Planning Documents, etc.)

2.0 Primary POCs

3.0 Event Requirements

- Event Description
- Test Architecture and “peering”/bridging/gateway requirements
- Distributed Test Requirements
 - Sites
- Products: JMETC products required, new or unique product requirements
 - Middleware, Test Support Tools, etc

4.0 Customer Responsibilities

- Event support
- Milestones to facilitate JMETC support
- Post event feedback to JMETC

5.0 JMETC Responsibilities

- General Support
- JMETC Infrastructure support
 - On site support

6.0 Dependencies

- Issues, limitations and other events that would affect infrastructure and testing schedule

7.0 Risk Assessment

- Risk assessment and mitigation strategies

8.0 Funding Responsibility

- For both the customer and JMETC (Section 3.4 Charge Policy)

4.3 JMETC Network Use and Management

The JMETC Program Office oversees the functioning and use of the persistent JMETC connectivity.

JMETC sites are encouraged to use their connectivity as frequently as possible to maximize the benefit of persistent connectivity. During major testing events, the JMETC network shall be available to the event for the dates and times specified. However, all testing should be coordinated with JMETC to ensure network support as the support team is only staffed outside normal operating hours when explicitly requested. Sites on the JMETC network can perform unrelated tests for dates and times other than during events by coordinating with JMETC. During the build-up to an event, the sites are encouraged to use the JMETC network for risk reduction between sites involved in the major test. These risk reduction events should also be coordinated with JMETC. For further details on the use of and management of the JMETC network, please refer to the JMETC Connectivity Guide.

4.3.1 Selecting and Installing JMETC Sites

The JMETC Program handles requests for connection to the JMETC network. The process for requesting new sites is outlined in the JMETC Connectivity Guide. Sites funded by the JMETC Program Office must address a valid customer requirement and show potential for reuse. Alternatively, a site may opt to fund its own connectivity to the JMETC network. Details of the connection process are described in the JMETC Connectivity Guide. Refer to Figure 5 below for a presentation of current and future JMETC sites. The number of current JMETC sites is constantly growing to meet the changing nature of customer requirements. For the most current information on JMETC connectivity, go to the JMETC Reuse Repository at <https://www.jmetc.org>.

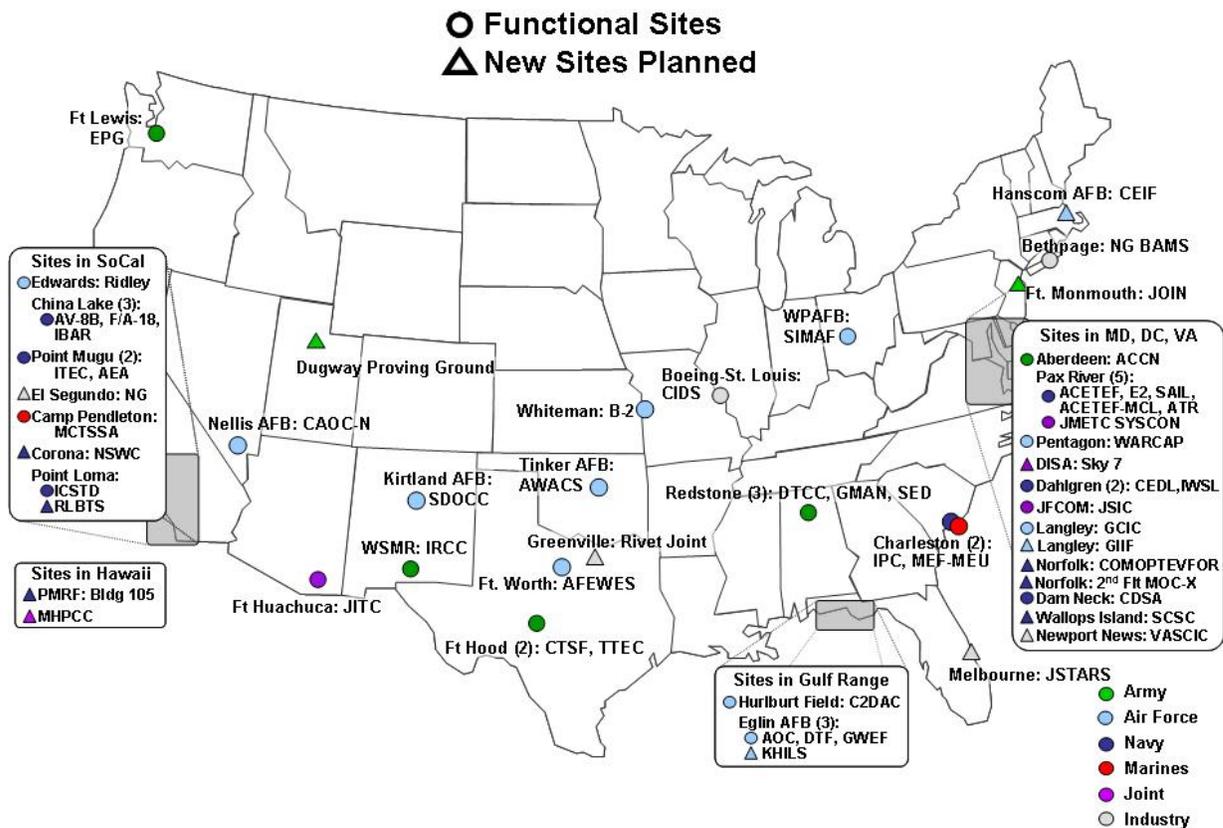


Figure 5. JMETC Sites
(For the most current map and description of active sites, go to the JMETC web site at www.jmetc.org)

4.4 Event Execution, Analysis, and Lessons Learned

JMETC will remain in a support role during the Execution, Analysis and Lessons Learned phases of a distributed Joint test event. Specific roles and responsibilities are provided for each phase in the following sections.

4.4.1 Event Execution

The customer is responsible for execution of their event. JMETC is in a support role as needed in accordance with the documented JMETC Event Support Plan. JMETC assistance can be in the form of on-site support or remote on-call technical assistance.

Customer Should:

- Report any issues that are potentially related to the performance of the distributed test infrastructure to JMETC
- Request “on-site” JMETC support, as required

JMETC Will:

- Support the customer, as requested in accordance with the documented JMETC Event Support Plan
- Monitor and troubleshoot JMETC infrastructure
- Verify and collect infrastructure performance data
- Collect, analyze, and report on JMETC infrastructure performance data
- Document JMETC products and infrastructure performance for “Lessons Learned” and eventual inclusion into the reuse repository

4.4.2 Data Analysis

The Customer will remain sole owner of all test event data and will conduct data reduction, analysis, and reporting as required by the Customer PMO. JMETC is not an Operational Test Authority (OTA) nor does it serve as the Test Agent. As such, JMETC does not perform any data analysis or conduct an evaluation of the system(s) under test.

Customer Should: Report any issues that are potentially related to the performance of the distributed test infrastructure to JMETC.

JMETC Will: Assess and report on JMETC infrastructure performance during the time periods the distributed test was conducted.

4.4.3 Lessons Learned

Incorporating Lessons Learned on distributed LVC infrastructure performance into the JMETC Reuse Repository is an important benefit for subsequent customers. The Reuse Repository provides customers with easy access to relevant JMETC and previous distributed event information.

Customer Should: Provide appropriate feedback on JMETC support and Infrastructure performance, effectiveness, and utility. Provide lessons learned on test scenario and mission environment to be incorporated into the Reuse Repository.

JMETC Will: Take appropriate corrective action, as required, and document appropriate information and recommendations on JMETC Infrastructure and distributed test environment into the Reuse Repository.

5.0 JMETC POINTS OF CONTACT

JMETC is here to support you and your program needs. We welcome your input and feedback. Contacting the JMETC Program Management Office is your first step to begin coordinating for support. General inquiries can be made by sending an email to jmetc-feedback@jmetc.org. Specific POCs are below:

Points of Contact:

| | |
|---|---|
| JMETC Program Manager: | Chip Ferguson Chip.Ferguson@osd.mil 703-601-5274 |
| JMETC Principal Deputy / Deputy for Resource, Policy, and Analysis | Bruce Bailey Bruce.Bailey@osd.mil 703-601-5208 |
| JMETC Senior Technical Advisor: | George Rumford George.Rumford@osd.mil 703-601-5233 |
| JMETC Deputy for Systems Engineering: | Ryan Norman Ryan.Norman@osd.mil 703-601-4277 |
| JMETC Deputy for Operations, Planning Support: | Marty Arnwine Martemas.Arnwine@osd.mil 703-601-5215 |
| JMETC Executive Assistant: | Natalie Apuzzo Natalie.Apuzzo.ctr@osd.mil 703-601-5280 |

To schedule a JMETC training session or more formal tutorial, contact the JMETC Program Office.

- JMETC Program Management Office Contact:
 - 1225 South Clark Street
 - Crystal Gateway 2, Suite 1200
 - Arlington, VA 22202-4382
 - Telephone: (703) 601-5280
 - JMETC Website: <https://www.jmetc.org>
 - JMETC Help Desk: <https://www.jmetc.org>
 - JMETC Feedback: jmetc-feedback@jmetc.org

APPENDIX A. ACRONYMS

ACRONYMS

| | |
|-----------|---|
| ACETEF | Air Combat Environment Test & Evaluation Facility |
| AFB | Air Force Base |
| AT&L | Acquisition, Technology, and Logistics |
| ATC | Authority to Connect |
| ATO | Authority to Operation |
| CDD | Configuration Definition Document |
| CPD | Capabilities Production Document |
| CPMO | Customer Program Management Office |
| CPU | Central Processing Unit |
| CTEIP | Central Test and Evaluation Investment Program |
| CVN-21 | Next Generation Nuclear Aircraft Carrier |
| DAA | Designated Approving Authority |
| DCARS | Digital Collection Analysis Review System |
| DISA | Defense Information Systems Agency |
| DISN-Core | Defense Information Systems Network – Core |
| DMS | Data Management Study |
| DT | Developmental Testing |
| FCS | Future Combat Systems |
| FFRDC | Federally Funded Research & Development Center |
| FY | Fiscal Year |
| GPS | Global Positioning System |
| HITL | Hardware-in-the-Loop |
| HPCMO | High Performance Computing Modernization Office |
| IA | Information Assurance |
| InterTEC | Interoperability Test & Evaluation Capability |
| ISP | Information Support Plan |
| ITEA | International Test & Evaluation Association |
| JRD3C | Joint Rapid Distributed Database Development Capability |
| JRSG | Joint Rapid Scenario Generation |
| JCAS | Joint Close Air Support |
| JDAS | Joint Data Archive System |
| JIMES | Joint Interoperability Modular Evaluation System |
| JIPP | Joint Investment Programs & Policy |
| JMETC | Joint Mission Environment Test Capability |
| JNTC | Joint National Training Capability |
| JSP | JMETC Support Plan |
| JTEM | Joint Test & Evaluation Methodology |
| JTEN | Joint Training and Experimentation Network |
| KPP | Key Performance Parameters |
| LVC | Live, Virtual, and Constructive |
| MRTFB | Major Range and Test Facility Base |
| NDIA | National Defense Industrial Association |

| | |
|----------|--|
| OSD | Office of the Secretary of Defense |
| OT | Operational Testing |
| PDM | Program Decision Memorandum |
| PM | Program Manager |
| SAG | Senior Advisory Group |
| SDA | Software Design Activity |
| SDREN | Secure Defense Research and Engineering Network |
| SDP | Service Delivery Point |
| SIAP | Single Integrated Air Picture |
| SIMDIS | Simulation Disposition |
| SLG | Senior Leadership Group |
| SPG | Strategic Planning Guidance |
| SSAA | System Security Authorization Agreement |
| SUT | System Under Test |
| T&E/S&T | Test and Evaluation/Science and Technology |
| TEMP | Test and Evaluation Master Plan |
| TENA | Test and Training Enabling Architecture |
| TENA AMT | TENA Architecture Management Team |
| TES | Test and Evaluation Strategy |
| TEWG | Test & Evaluation Working Group |
| T&E/S&T | Test & Evaluation/Science & Technology |
| TIDE | TENA Integrated Development Environment |
| TRMC | Test Resource Management Center |
| TSPI | Time-Space-Position Information |
| TSSG | Testing in a Joint Environment Roadmap Senior Steering Group |
| USD | Office of the Undersecretary of Defense |
| USJFCOM | U.S. Joint Forces Command |
| V&V | Verification & Validation |
| VPN | Virtual Private Network |
| WSMR | White Sands Missile Range |
| | |

Appendix B. JMETC Customer Assessment Form

| CUSTOMER ASSESSMENT JMETC's PERFORMANCE | | | |
|--|--|-----------------------|--|
| Date: | | Program Event: | |
| Program: | | Completed by: | |
| Customer Contact: | Name: Position: Email: Address: Telephone: | | |
| Performance Item | Rating * | Comments | |
| *5 = Excellent 4 = Good 3 = Satisfactory Less than 3 = Unsatisfactory N/A = Not Applicable | | | |
| 1. <u>Responsiveness to Needs</u> (Did JMETC personnel respond to new direction or trouble shooting quickly and efficiently? Were the results of the problem resolution process at least satisfactory?) | | | |
| 2. <u>Schedule Performance</u> (Were JMETC actions executed according to the schedule laid out during the planning phase? Were any schedule slips attributable to JMETC?) | | | |
| 3. <u>Cost Performance</u> (Did JMETC have to ask for additional funding even though there was no (or very little) change in requirements?) | | | |
| 4. <u>Staff Quality</u> (Were JMETC personnel knowledgeable, competent, and timely in their support?) | | | |
| 5. <u>Event Planning</u> (Did JMETC provide significantly helpful support to your development of your event requirements?) | | | |

| | | |
|--|--|--|
| <p>6. <u>Event Execution</u> (Did JMETC provide significantly helpful support to the execution of your test event? E.g., VPN access, help desk, troubleshooting etc.)</p> | | |
| <p>7. <u>Overall Rating</u></p> | | |
| <p>8. How would the customer answer the question: “What should JMETC change to do a better job?”</p> | | |
| <p>9. How would the customer answer the question: “If you had to do it over again, would you team with the JMETC Program?”</p> | | |
| <p>10. Were there interactions with JMETC, or any attribute of JMETC’s performance, which were particularly noteworthy?</p> | | |
| <p>11. Would you recommend JMETC to other government agencies needing distributed test support? (Why/Why Not)</p> | | |
| <p>12. What can the JMETC Program do to help you and/or your programs succeed during the next 12 to 24 months? (Consider technical, management, personnel or other support that might be needed for successfully accomplishing your program T&E objectives.)</p> | | |
| <p>13. Would you like to add any additional comments about the JMETC products and/or services?</p> | | |