JEMS

Joint Embedded Messaging System

Summary

- Translates simulation data for C2 workstations

- Controls the transmission and receipt of data from external systems

- Uses GUI editors to create and route messages

- Cross Domain Solution development provides data sharing across networks of different security classifications

- JEMS users include SMDC/ARSTRAT, Training and Doctrine Command (TRADOC), Joint Forces Command (JFCOM), and Central Command (CENTCOM)

JEMS enables communications between command and control, simulation, and other systems by translating and routing messages.

Joint Embedded Messaging System (JEMS) translates messages and protocols for command and control (C2), simulation, and other systems using an operator configurable application for input and output formats. JEMS provides interoperability solutions without software modifications in environments with dynamic requirements. Operators use JEMS Graphic User Interface (GUI) editors to establish translations and communication routes to support multiple high level protocol and hardware interfaces. JEMS is a solution to overcome the information exchange problems common in a mixed system environment and has been used in many experimentations, exercises, and technical demonstrations.

Joint Embedded Messaging System (JEMS) translates messages and protocols for command and control (C2), simulation, and other systems using an operator configurable application for input and output formats. JEMS is typically used to translate simulation-based information into tactical message formats and other simulation formats. JEMS provides interoperability solutions while not requiring software modifications for data compatibility between systems.

A JEMS operator interfaces with its Graphic User Interface (GUI) editors to establish translations and communication routes.

- The Message Editor is used to create text, binary, or mixed messages defined at the field, line, or group level with characteristics like length, delimiters, and content rules. Messages are created using a point-and-click interface and a completed definition is called a Message Specification.
- The Map Editor centralizes the translation between input and output message specifications. This editor provides graphical representation of translation logic and operations. The Map Editor uses more than twenty data conversion operators. They perform functions like transforming coordinates, generating unique track numbers, and completing mathematical calculations. The combination of input and output message specifications with associated translations is called a Map.
- The Communications Path Editor routes message specifications to defined recipients. Routes are data, protocol, and translation relationships between external systems. The External Systems can have the following characteristics: interface type, communication protocol, supported data formats, high level protocol, and classification. All the editors can be used during the operation of the system to affect changes without interruption of other translation activities.

The JEMS Input/Output (I/O) Component controls the transmission and receipt of data from external systems. JEMS can be configured with multiple I/O Components on separate computers to allow remote operations. In single machine operation, JEMS can test message routing for validity and accuracy before an exercise or operation takes place to ensure that the training event or operation is not hindered by message incompatibility issues.

SMDC/ARSTRAT is expanding JEMS to become a Cross Domain Solution (CDS), facilitating ally and multinational participation in exercises. This effort provides and ensures a secure, DoD accredited, interoperable and multi-level security solution to share data across networks of varying classifications. The connections between these networks prevent intentional infiltration of the network and unintentional loss of classified data. Each field in a message specification is individually classified and connections can not be made via the Map Editor to fields of differing classifications. All Maps are approved by the foreign disclosure officer and security officer. Classified data must be routed through a data converter to filter or change the data to the appropriate level. The JEMS CDS enables C2 and simulation systems to be interoperable and reduces the timelines for passing critical C2 information to and from coalition partners.

JEMS was used in U.S. Army Training and Doctrine Command experiments Omni Fusion and Earth, Wind, & Fire to translate and route simulation and C2 system messages. Joint Forces Command used JEMS in the Urban Resolve experiment to share C2 data between two networks. It also has been used to provide support to Third Army during the Lucky Warrior and Lucky Sentinel series of exercises and to the Joint Warfighting Center during exercises Lucky Warrior and Internal Look.

C2 systems and message formats are constantly evolving, creating potential interoperability problems between systems and organizations. JEMS is a flexible tool that solves interoperability issues at the operator level, not the software developer level.

JEMS Editors

Message Editor - Define message format and content

Communications Path Editor – Route messages to external systems and define required protocol translations

Map Editor – Define the relationship between input and output messages and define specific data transformation requirements

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