

Utilizing Force Management Service (FMS) to Support Realistic Training

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ABSTRACT

The Joint Staff (JS) J7 Environment Architecture Division (EAD) is developing modular simulation services known as the Joint Training Tools (JTT) to reside within the Joint Training Synthetic Environment (JTSE). The JTSE will be a cloud based, web-enabled, enterprise environment that will provide scalable, on-demand modular simulations services designed to provide operationally relevant training for globally integrated operations. Order of Battle (OOB) and force management are critical components of military planning. Most military simulations incorporate OOB, but do not include aspect of force management. JTSE JTT Joint Training Data Services (JTDS) has enhanced OOB data with Force Management Service (FMS) data that includes detailed Global Force Management Implementation Guidance (GFMIG) information. GFMIG informational enables force assignments reflecting real-world constraints and incorporates aspects of force management with respect to capabilities, ready to load information, assignment, apportionment, and allocation. FMS allows users to create exercise-specific apportionment of units. When a trainee requests a force for a task, the force is requested based upon capability as signified by the GFMIG categories or types. Specified troops are apportioned and ready to load information and other attributes are reviewed prior to allocation. This gives the trainee insight into the reality of planning a campaign or maneuver with realistic force constraints. This paper will describe FMS attributes and how they can be used to influence battlefield situations and training.

ABOUT THE AUTHORS

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INTRODUCTION

Joint Staff (JS) J7 has developed a Force Management Service (FMS) as part of its Joint Training Tools (JTT) architecture. The FMS joins the Joint Training Data Services (JTDS) tool suite featuring Order of Battle Services (OBS) used by the Joint Live, Virtual, and Constructive (JLVC) federated simulations. JLVC and other military simulations incorporate OBS output to provide force structure initialization of simulation ready, entity level data that is validated by Service authorities and correlated for simulation use. Few simulations include aspects of force management, which is key in Military Planning (Santacroce, 2013)). “Military planning consists of joint strategic planning with its three subsets: security cooperation planning, force planning, and joint operation planning” (JP-1, 2013). “Joint operation planning integrates military actions and capabilities with those of other instruments of national power in time, space, and purpose in unified action to achieve the Joint Force Commanders (JFC’s) objectives” (JP-5, 2011). Planners can use JTT to integrate military actions and capabilities in time, space, and purpose to satisfy training objectives in synthetically created JLVC operational environments.

The Combatant Commander (CCDR) trains his/her staffs on the aspects of Global Force Management (GFM). Force planners create Courses of Action (COAs) based upon force allocations, availability, and readiness of forces needed to accomplish a Concept of Operations (CONOPS), and how to phase these forces into the Operational environment to meet desired training objectives (Campaign Planning/Operational Art Primer, 2007). This paper will discuss general concepts in how force management can be integrated into campaign planning training via FMS and how utilizing FMS can influence the training environment.

Current Use of Order of Battle (OOB)

Data managers and simulation staff maintain OOB repositories that contain hierarchies of units, which are represented within various simulations. When a trainee designs a COA for simulation use, military units may be selected from OOB repositories without considering the force planning process criteria or implications. These criteria may include readiness levels to perform required military operations, identification of capabilities that are not always obvious, and taking into account the standard GFM process of assignment, apportionment, or allocation. In reality, a Combatant Commander (CCDR) may desire a unit with specific capabilities as indicated by the Global Force Management Implementation Guidance (GFMIG), but the units with that GFMIG may not be available, or may not be ready in time for the specific task. By iterating through the force planning process, trainees learn how to navigate through training situations in order to mitigate risk to future real-world operations.

Force Planning with Global Force Management (GFM) Techniques

Joint Operation Planning (JOP) includes force planning actions such as mobilization, deployment, employment, sustainment, redeployment, and demobilization of forces. These actions are affected by GFM processes (Santacroce, 2013). GFM is an important part of the Joint Operation Planning Process (JOPP) and has the following goals (Santacroce, 2013):

- Account for forces and capabilities committed to ongoing operations and constantly changing unit availability.
- Identify the most appropriate and responsive force or capability that best meets the CCMD requirement.
- Identify risk associated with sourcing recommendations.

- Improve ability to win multiple overlapping conflicts.
- Improve responsiveness to unforeseen contingencies.
- Provide predictability for rotational force requirements.

While these are an important part of the JOPP, they are not typically simulated during training. FMS is the beginning of a system that implements some of the GFM techniques to aid in preparation of an event and to enable training in JOPP. Utilizing GFM can highlight the following effects of real world planning situations:

- Strategic level guidance on force assignment and allocation.
- Visibility of types of forces available.
- Readiness dates not being soon enough.
- Time for forces and their equipment to get to their destination.
- Alternatives when there is an inability to get desired type of unit.
- Global priorities.

The GFM process is used during both deliberate and Crisis Action Planning (CAP) (Santacroce, 2013). By utilizing GFM, the trainee can learn not only aspects of campaign planning, strategy, and operations, but also gain insights into availability of Military force capabilities (CJCS Guide, 2010; FM 3-22, 2013; Santacroce, 2013).

FMS was built to support GFM processes such as assignment, apportionment, and allocation (Santacroce, 2013; JP-5, 2011) (Figure 1).

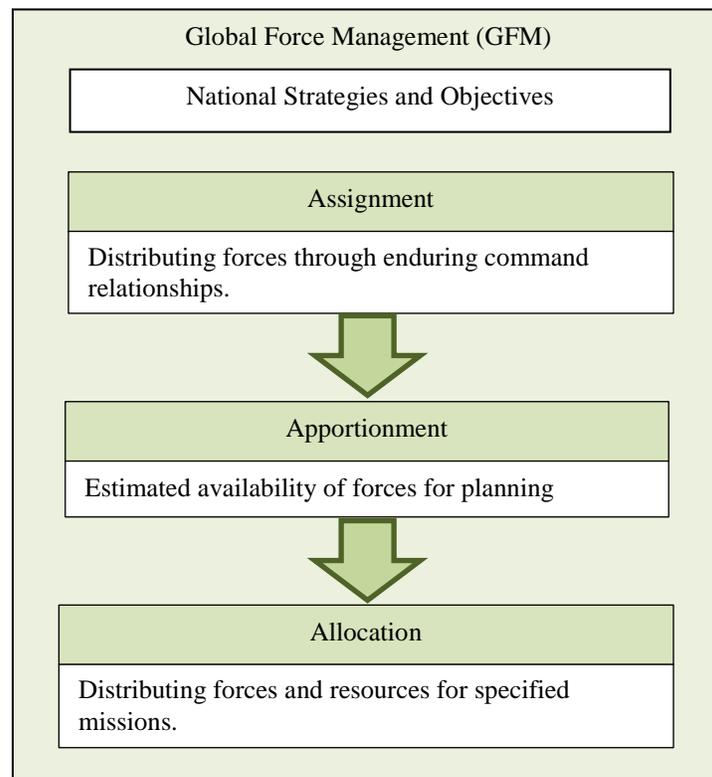


Figure 1. GFM Processes

FMS has an OOB incorporating data such as assignment, availability, readiness status, GFMIG types, Military Standard (MS) 2525C symbols, and physical characteristics for deployment (e.g., weight, size, cube, draft) to allow the user to make apportionment and allocation requests and decisions.

The planner can create sides and add countries to the appropriate sides for the event. Countries added to the friendly side are supported by the Request for Forces (RFF) process, while those added to the enemy or neutral sides are

excluded. For the friendly side, an assignment table is maintained that lists the units by GFMIG types. When an event is planned, a planner requests an apportionment table be initialized with assignment information and apportioned forces for planning. The planner can then edit the apportionment table and move units to different Combatant Commands (CCMDs), or even create a new fictitious CCMD and move units into that CCMD. This creates a minimum set of forces for each CCMD to support strategic goals of the CCDR. Units not assigned to a CCMD are listed as Service Retained. A strategic policy can be created and used to determine how the apportionment table is initialized for the training event. This models how strategic guidance can affect the forces available. By including force planning services, aspects of strategic planning and its impact on deliberate planning and CAP becomes apparent to CCDRs (Sweeney, 2016). With FMS, campaign planning can include all phases of campaign planning, to include the initial shaping phase (Shape (Phase 0)), which encourages comprehensive planning to achieve a particular end state.

Information that can be edited or changed by the planner to create specific starting conditions for training events include:

- CCMD – Combatant Command is a unified or specified command with a broad continuing mission under a single commander established and designated by the President, through the Secretary of Defense and with the advice and assistance of the Chairman of the Joint Chiefs of Staff (CJCS). Examples of specified CCMDs would be composed of units from a single Military Department that has a broad continuing mission.
- Notional Command – A CCMD created and populated with units for use in a specific simulation event.
- Garrison – A body of troops stationed at a particular location.
- Location – Latitude and longitude coordinates specifying a position on Earth.
- Unit Status – indicates status of a unit as one of the following: allocated, available, fractured, inactivated, not deployable, not mobilized, and organizing.
- Readiness Value – The ability of military forces to fight and meet the demands of assigned missions. FMS enables selection from following enumerations: 0-10 days, 11-90 days, 91-150 days, and > 150 days.
- Parent Unit Apportionment Values – indicates the CCMD to which the parent unit is allocated.

To enable ease of use, FMS has various user panels. These panels are selectable to allow the user to view the data in the most logical fashion that best supports the specific task the user is trying complete. Views of the data include the following:

- View units according to OOB Unit Tree Hierarchy to understand the unit structure.
- View units on a map to see their current location.
- View by GFMIG categories and type to understand the types of units available.
- View panels in special configurations to facilitate review and update of apportionment table information.

A GFMIG type indicates the type of the force, which gives some indication to its capabilities. By enabling view by GFMIG categories and types, units can be identified according to their force type rather than by hierarchy to enable easier review of base capabilities available. For example, GFMIG types might identify a unit as an Armor Brigade Combat Team, a Combat Aviation Brigade, a Field Artillery Brigade, an Infantry Brigade Combat Team, or a Fighter Squadron. The GFMIG type of unit indicates some capabilities/abilities of the unit. The GFMIG view supports better visibility of the force types available. GFMIG types are indicated both by title and by MS2525C symbols. Examples include combat, combat service support, combat support, headquarters, and preposition forces within a Service. More specialized GFMIG type codes are assigned within each of the Service categories as individual GFMIG types.

During a campaign planning event for CAP, COAs require units with the correct capability to perform specific tasks. The CCMD first uses units assigned to it, but sometimes the unit with the appropriate capabilities may not be available. The CCDR can then utilize an RFF to request units according to GFMIG types. The request is sent to the FMS, which will select units that have the GFMIG type. The RFF may also include using information narrowing the selection based upon the unit readiness and/or location. By utilizing the RFF process and requesting by GFMIG, the user is requesting units according to expected capabilities based upon the GFMIG type of the unit.

Readiness value is an indicator of availability for planning force deployments (Santacroce, 2013) and affects force flow into theater. A list of forces meeting the needs of the request are sent back to the planner to satisfy the objectives of the overarching operational plan. Currently, FMS has been tested and is used by the Training Environment Manager (TEM), a force and movement visualization tool. When the units meeting the GFMIG requests are sent to the TEM,

the TEM user can review the list and decide which forces are to be used (or not used). Forces accepted for use by the CCDR are allocated to the CCMD in accordance for the Chairman of the Joint Staff's guidance. To provide a more realistic picture, sometimes a GFMIG requested is not available and the planner may need to review the COA for different alternatives if the unavailable unit is a necessary component.

While planning strategy for combat, a CCDR may not know what types of and how many support units are needed. JTT enables users to send a list of combat units to the Campaign Planning Assistant (CPA) tool of the Logistics Planning Services (LPS) suite to find out what types of support units are needed. The user can then review the list of support units needed, then request the support units from FMS.

Time Phased Flow Deployment Data (TPFDD) describes when movement occurs for forces, non-unit cargo, personnel data, and the operation plan, operation order, or ongoing rotation of force. TPFDD data aides the campaign planner in determining when troops are likely to arrive in theater. Planners must contend with units that may not be able to get to the theater in time for the military event, subsequently planners may want to change the COA or request different units. After units have been allocated, information regarding the allocation is sent to the TEM. This information includes deployment mode, ready to load date, and equipment information. This additional data is utilized if the user requests information similar to TPFDD (CJCS Guide, 2015; Santacroce, 2013).

The training audience will not always be able to get the exact units requested. In turn, FMS can return a unit with the same GFMIG type if one is available, and the planner then decides to either use the unit returned by FMS, or change the plan so that the unobtainable unit will not be required. This adds realistic constraints to exercise planning and simulation, and forces the training audience to think and plan differently when an initial plan does not work as intended.

This new method of managing forces for an event enables planning by GFMIG, which indicate capabilities, and a more realistic planning for use of forces in an event (Reed, 2016). The trainee may look specifically at the tasks to be performed and the units that have the specific GFMIG type that indicates capabilities needed to complete the task. This methodology also enables trainees to look at sourcing across multiple Lines of Operations (LOOs) and to understand prioritizing COA needs before requesting specific GFMIG types. Utilizing GFM requires that trainees look at the big picture with respect to utilizing current forces and who can be committed to an operation based upon current availability, readiness, and load balancing with other operations.

Verification and Validation

FMS has undergone limited integration and functional testing at JS J7. Testing consisted of utilizing the FMS Graphic User Interfaces (GUIs) to create apportionment tables, sides, and to update information a planner might use in preparation for a developer test event. A training user would not see FMS GUI's, but would only work on force structure through the TEM. FMS was then integrated with the TEM through web service Application Programming Interfaces (APIs). FMS tested APIs that enable obtaining the following for training:

- **Domains:** get operational battle domains such as air, ground, etc.
- **Services:** get a list of services recognized by the US Department of Defense (DoD) (Joint, Army, etc.).
- **CCMDs:** get a list of Combatant Commands used by FMS.
- **Countries:** get a list of countries defined in FMS.
- **Garrisons:** get a list of garrisons defined in FMS.
- **GFMIG Types:** get a list of GFMIG types used to organize forces for planning and execution purposes.
- **GFMIG Type Categories:** get a list of GFMIG force element type categories used to organize GFMIG types for planning and execution purposes.
- **Units:** get list of units in the repository.
- **Unit Types:** get a list of unit types that are in a human readable and understandable format.
- **Apportionment Table:** get a list of apportionment tables created in the repository for different events. For each apportionment table, the following APIs can be called:
 - **Sides:** get sides associated with a specified apportionment table.
 - **CCMDs:** get a list of combatant command used in the apportionment table.
 - **GFMIG Types:** get list of GFMIG types and availability for the apportionment table.
 - **Unit Types:** get unit types for the specified apportionment table.

- **Units:** get list of units for the specified apportionment table.
- **Allocate:** this is used for RFF to request FMS to locate units that match the allocation request. Units are specified as GFMIG types.
- **Deallocate Units:** deallocate units identified in the request.

During developer integration test events, TEM successfully accessed and imported apportionment tables and other types of information from FMS through the API, and was able to successfully utilize RFF to allocate units to mission tasks. The process was interactive, and all occurred at the TEM, thus the user did not need to log out of the TEM to utilize the FMS process.

DISCLAIMER

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