BML Operations Order and Geospatial Representations

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Briefing Agenda

- Part 1: BML Operations Order Schema

- Part 2: Geospatial Representation in JC3IEDM
BML – What is it?

BML is the unambiguous language used to:

- Command and control forces and equipment conducting military operations
- Provide for situational awareness and a shared, common operational understanding of these operations
- BML is being developed as a standard representation of digitized C2 information for executable plans, orders, requests and reports

BML – Four Basic Principles

- BML must minimize ambiguity
- BML must enable the full expression of a commander’s intent
- BML must use the existing C4I data representations when possible (C2IEDM/JC3IEDM)
- BML – must allow all elements to communicate information pertaining to themselves, their mission and their environment in order to create situational awareness and a shared, common operational picture
### Army Operations Order

- **Doctrinal Reference**
  - FM 5-0 Army Planning and Orders Production
  - Appendix G – Plans and Orders
- **OPORD/WARNO/FRAGO:**
  - 5 Primary Paragraphs + Other Supporting Info
  - **Format:**
    - Header
    - Task Organization
    - Situation
    - Mission
    - Execution
    - Service Support
    - Command and Signal
    - Annexes
5 W’s – What

5 W’s – When
Situation Paragraph

Mission Paragraph
GeoSpatial Representation in JC3IEDM

Some Background

• BTRA BC – US Army ERDC ATO managed by TEC
  ➢ Objective is to bring actionable geospatial information into the hands of the Warfighter
  ➢ S/W and Framework to transform volumes of data produced by terrain teams and sensors into information products and tactical decision aids for a deeper understanding of the battlefield.

• GeoBML is an extension of BML into the domain of actionable geospatial information.
  ➢ It provides the semantic and syntactic bridge between the highly specialized domain of terrain reasoning and analysis and the immediate needs of the operational Warfighter.
  ➢ Representation to facilitate putting tailored, high fidelity knowledge into the hands of the Commander and his staff.
**Tactical Spatial Object**

- **Tactical Spatial Object (TSO):**
  - An object developed with topographic support systems/applications that directly supports the planning and execution of tactical military operations.
  - Provides the specific set of geospatial information necessary to support the decision maker
  - Contains relationships to specific military operations, missions and tasks and may also have distinct relationships to various types and echelons of military organizations.

- **Classification:**
  - Tier 1 – Foundation Product
  - Tier 2 – Mission or Task specific
  - Tier 3 – Represent a Command Decision

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**TSO Tiers**

- **Tier 1** – Represent military value of terrain/weather based on doctrine (OAKOC). Computed without mission specific info (i.e., independent of METT-TC. Examples include Maneuver Network, Cover & Concealment, Choke Points.

- **Tier 2** – Derived from foundational data. Candidate products associated with specific missions and tasks by unit type & echelon and require METT-TC. Examples include ABF Positions, Battle Positions, Engagement Areas.

- **Tier 3** – Increasing mission and task focused. Chosen from candidate Tier 2’s and represent a command decision. Contain operational attributes and are associated with a specific plan/order. Can have an associated Graphical Control Measure (GCM).
Representing TSOs to Warfighter

- Provide access to via C2 Operational Database (i.e., C2IEDM/JC3IEDM)
  - Data Replication via DEM
  - Tying Plan/Order directly to TSO
- Tier 1 & Tier 2 TSOs too large and complex to store in Operational Database – store reference with associated attributes/metadata.
- Store TSO Product itself in SDE database as it is designed for storage Geographic data.

Initial Implementation – C2IEDM

- Control Feature Object
- Separate set of attributes for Tier 1 and Tier 2/3.
Reference Table

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSOUniqueID</td>
<td>A unique identifier used to reference the TSO reference instance</td>
</tr>
<tr>
<td>RefNum</td>
<td>A reference number used to identify the specific type of TSO</td>
</tr>
<tr>
<td>GeographicArea</td>
<td>List of lat/lon coordinates defining the polygon that the TSO falls within</td>
</tr>
<tr>
<td>Version</td>
<td>Represents TSO Engine version used to generate this reference</td>
</tr>
<tr>
<td>CreationTime</td>
<td>Represents the date/time the TSO was created</td>
</tr>
<tr>
<td>ExpirationTime</td>
<td>Represents the date/time the TSO expires</td>
</tr>
<tr>
<td>Description</td>
<td>Human readable text string describing the TSO</td>
</tr>
<tr>
<td>StoredLocation</td>
<td>Provides the path to the SDE container/workspace w/o credentials</td>
</tr>
<tr>
<td>DataSetName</td>
<td>SDE TableName and/or FeatureClass (1 or more)</td>
</tr>
<tr>
<td>DataSetDesc</td>
<td>Text String describing each DataSetName (1 or more)</td>
</tr>
<tr>
<td>POC-Info</td>
<td>TSO POC info: Organization, Name, Address &amp; Phone</td>
</tr>
<tr>
<td>ConfidenceFactor</td>
<td>A measure of the goodness of the TSO (methodology TBD)</td>
</tr>
<tr>
<td>SecurityClass</td>
<td>Identification of the security classification for the TSO product</td>
</tr>
<tr>
<td>Keywords</td>
<td>Set of 0 or more keywords associated with TSO used for Discovery</td>
</tr>
</tbody>
</table>
TSO Core Attributes (con’t)

- TSO Specific Metadata
  - Provide further descriptive information not included in core attributes
  - 0 or more number of attribute/value pairs
  - TSO Type Unique.
  - Defined by TSO Engine Developers

JC3IEDM Reference Table

<table>
<thead>
<tr>
<th>REFERENCE</th>
<th>TSO Core Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CreationTimeStamp</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td></td>
<td>StoredLocation</td>
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<tr>
<td></td>
<td>DataSetDisplayName</td>
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<td>DataSetName</td>
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<td>CreationTimeStamp</td>
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<tr>
<td></td>
<td>ExpirationTimeStamp</td>
</tr>
<tr>
<td></td>
<td>Version</td>
</tr>
</tbody>
</table>

| reference-id  | CreationTimeStamp |
| reference-approval-datetime | Description |
| reference-content-category-code | StoredLocation |
| reference-creation-datetime | DataSetDisplayName |
| reference-description-text | DataSetName |
| reference-electronic-source-text | CreationTimeStamp |
| reference-file-size-quantity | ExpirationTimeStamp |
| reference-format-text | Version |
| reference-language-code | |
| reference-lifecycle-code | |
| reference-medium-type-code | |
| reference-originator-text | |
| reference-physical-size-text | |
| reference-primary-location-text | |
| reference-publication-datetime | |
| reference-releasability-text | |
| reference-short-title-text | |
| reference-title-text | |
| reference-transmittal-type-code | |
| reference-validity-period-begin-datetime | |
| reference-validity-period-end-datetime | |
| reference-verification-code | |
| reference-version-text | |
| security-classification-id | |
New JC3IEDM Tables – For TSOs

- TSOUniqueID
- RefNum
- ConfidenceFactor

REFERENCE
- reference-id
- reference-approval-datetime
- reference-content-category-code

TSO
- tso-id

TSONAME
- tso-unique-id
- tso-reference-number
- tso-confidence-factor

TSO-SPECIFIC-ATTRIBUTE
- tso-id
- tso-specific-attribute-ix
- tso-specific-attribute-name
- tso-specific-attribute-value

Metadata Attribute
- Metadata Value

Geographic Area

REFERENCE
- reference-id

OBJECT-ITEM-REFERENCE-ASSOCIATION
- object-item-id
- reference-id

OBJECT-ITEM
- object-item-id
- object-item-category-code

FEATURE
- feature-id
- feature-category-code

CONTROL-FEATURE
- control-feature-id
- control-feature-category-code

OBJECT-ITEM-REFERENCE-ASSOCIATION
- object-item-id
- reference-id

LOCATION
- location-id
- location-category-code

POINT
- point-id

ABSOLUTE-POINT
- absolute-point-id

GEOGRAPHIC-POINT
- geographic-point-id
- geographic-point-latitude-coordinate
- geographic-point-longitude-coordinate
- geographic-point-latitude-precision-code
- geographic-point-longitude-precision-code

VERTICAL-DISTANCE
- vertical-distance-id
- vertical-distance-reference-code
- vertical-distance-dimension
- vertical-distance-precision-code
- vertical-distance-datum-text

LINE
- line-id

LINE-POINT
- line-id

OBJECT-ITEM-LOCATION
- object-item-id
- location-id
POC Information

- Point-of-Contact information about originator or creator of TSO.
- Spread across 3 JC3IEDM tables

<table>
<thead>
<tr>
<th>TSO Core Attribute</th>
<th>JC3IEDM Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Table</td>
</tr>
<tr>
<td>POCOrganization</td>
<td>OBJECT-ITEM</td>
</tr>
<tr>
<td>POCName</td>
<td>OBJECT-ITEM</td>
</tr>
<tr>
<td>POCAddress</td>
<td>PHYSICAL-ADDRESS</td>
</tr>
<tr>
<td></td>
<td>PHYSICAL-ADDRESS</td>
</tr>
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<td></td>
<td>PHYSICAL-ADDRESS</td>
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<tr>
<td></td>
<td>PHYSICAL-ADDRESS</td>
</tr>
<tr>
<td>POCPhone</td>
<td>ELECTRONIC-ADDRESS</td>
</tr>
</tbody>
</table>

Security Classification

- security-classification-id field in Reference table provides association to Security-Classification table.
Associated Plan/Order

Questions ?