Using the Defense M&S Catalog to Support Systems Engineering

Modeling & Simulation Coordination Office
Office of the Assistant Secretary of Defense for Research & Engineering
Topics

- Defense M&S Catalog Background
  - Origin
  - Purpose and Content
  - Role of Discovery Metadata
- Recent Upgrades
- Concept of Operations
  - Local Management
  - Enterprise Discovery
Origin of Catalogs

- What are these catalogs, and where do they come from?
- DoD Net-Centric Data Strategy
  - Make data available to “authorized but unanticipated users”
  - Exploit information more effectively
  - Use resources more efficiently
  - Enable *discovery and reuse*
  - Make data “visible, understandable, accessible”
- Net-Centric Data Strategy defines three mechanisms to store data and information about data (metadata)
  - Registries: structural metadata, or data format
  - Catalogs: discovery metadata, or data meaning
  - Shared Spaces: data products
- Communities of Interest “will establish and maintain catalogs”
Purpose and Content of Catalogs

- Catalog purpose and contents
  - Supports discovery and reuse
  - Contains discovery metadata cards (metacards) describing particular M&S data products
    - Product name (e.g., BRAWLER, a model)
    - Developer/owner
    - Classification
    - Geospatial/temporal applicability
    - Description
    - Many detailed optional descriptive elements

- No specialty knowledge of metadata or metadata specs required to search the M&S Catalog or publish metacards to it
- Automated tools do it for you
The Role of Discovery Metadata

- Provides common, semantically defined description of data
- Simplifies search, discovery, and understanding of data
- MSC-DMS
  - Modeling & Simulation Community of Interest Discovery Metadata Specification
  - “Extension” of DDMS (Defense Discovery Metadata Specification)
  - Provides M&S-specific metadata (e.g., VV&A status)
  - The “language” of the M&S Catalog
- M&S Catalog contributors not required to know DDMS or MSC-DMS
  - Integral GOTS metadata tool assists metacard creation
Recent Catalog Upgrades

- Complete hardware refresh
  - New servers
- Complete software refresh
  - COTS cataloging software
  - GOTS metacard manager, net-centric interface
- Migration to .mil domain
  - Complies with Defense Information Assurance Certification and Accreditation Process (DIACAP)
- Initial Operating Capability (IOC): November 2013
- Final Operating Capability (FOC): December 2014
- New concept of operations
  - Local Management, Enterprise Discovery
- User-created/managed metadata records
M&S Catalog Concept of Operations

Local Management

Program Executive Offices
War Colleges
Operational Test Agencies
Service M&S Offices
Laboratories
Training Centers
Other M&S Centers

Enterprise Discovery

DoD M&S Catalog

Enterprise Catalog
SISO
cape

Cleared for public release (Distribution A) Case No. 14-S-1999
Concept of Operations

Local Management

- Performed by M&S centers
  - Budgetary incentive to reduce costs thru reuse
  - Savings thru reuse in one program area redirected to others
- Enabled by GOTS metacard manager, net-centric interface
- Functions Performed
  - Creating M&S assets (models, data, etc.)
  - Creating metadata cards
  - Cataloging local assets and metacards
  - Maintaining M&S configuration management
  - Benefiting from local discovery/reuse
  - Publishing to M&S Catalog
    - Selectable, under local control

Enterprise Discovery

- Performed thru M&S Catalog
- Functions Performed
  - Creating metadata cards
  - Providing simple, intuitive, enterprise-wide search of assets from
    - Contributing M&S centers
    - Federated DoD catalogs, repositories
  - Providing certified, accredited redundant storage of contributors' records
Local Management Example:
Program Executive Office (PEO)

- Program Executive Offices
- War Colleges
- Operational Test Agencies
- Laboratories
- Training Centers
- Other M&S Centers

Local Management

Enterprise Discovery

DoD M&S Catalog

Enterprise Catalog

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Example PEO Internal M&S Implementation

Key elements

- Local Catalog, Repository, Interface
- M&S Integrated Product Team

Publication

PEO M&S Integrated Product Team

Local Catalog, Repository, Net-Centric Interface

Program Office

Program Office

... Program Office

Coordination

Metadata management, Local cooperation/reuse
EMBR: GOTS Local Catalog, Repository, Net-Centric Interface

**EMBR**
- “Enterprise Metacard Builder Resource”
- Creates Metacard
- Form Based Entry
- Collaborative Tool
- Publishing Tool for M&S Catalog
- Enables Local Control

**Updated metadata specification**
- MSC-DMS
- Integration of Metadata Standards with DoD & Intelligence Community

[https://embr.msco.mil](https://embr.msco.mil)
Local Management Example: Benefits

- **PEO-wide visibility into**
  - Which program offices in PEO use same or similar M&S assets
  - What dependencies exist on external M&S assets
  - What architectures and technical standards are used
  - What M&S assets are used in aggregations, e.g., HLA federates
  - What relationships exist within families of M&S assets, e.g., multiple simulations of the same physical system used for different purposes
  - What M&S assets are regularly re-used

- **Example Result**
  - Cost avoidance: Integrated Product Team (IPT) discovered program offices paying separately for identical dataset

- **Enterprise benefit**
  - Improved currency of M&S Catalog records
Conclusion

- M&S Catalog enables
  - Effective exploitation of information
  - Efficient use of resources
  - Discovery and reuse

- To become a Catalog contributor: MSCatalogHelpDesk@MSCatalog.msco.mil