Using the Defense M&S Catalog to Support Systems Engineering

Modeling & Simulation Coordination Office

Office of the Assistant Secretary of Defense

for Research & Engineering

- **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"

Department of Defense
Net-Centric Data Strategy

May 9, 2003

Prepared by:
Department of Defense
Chief Information Officer (CIO)

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

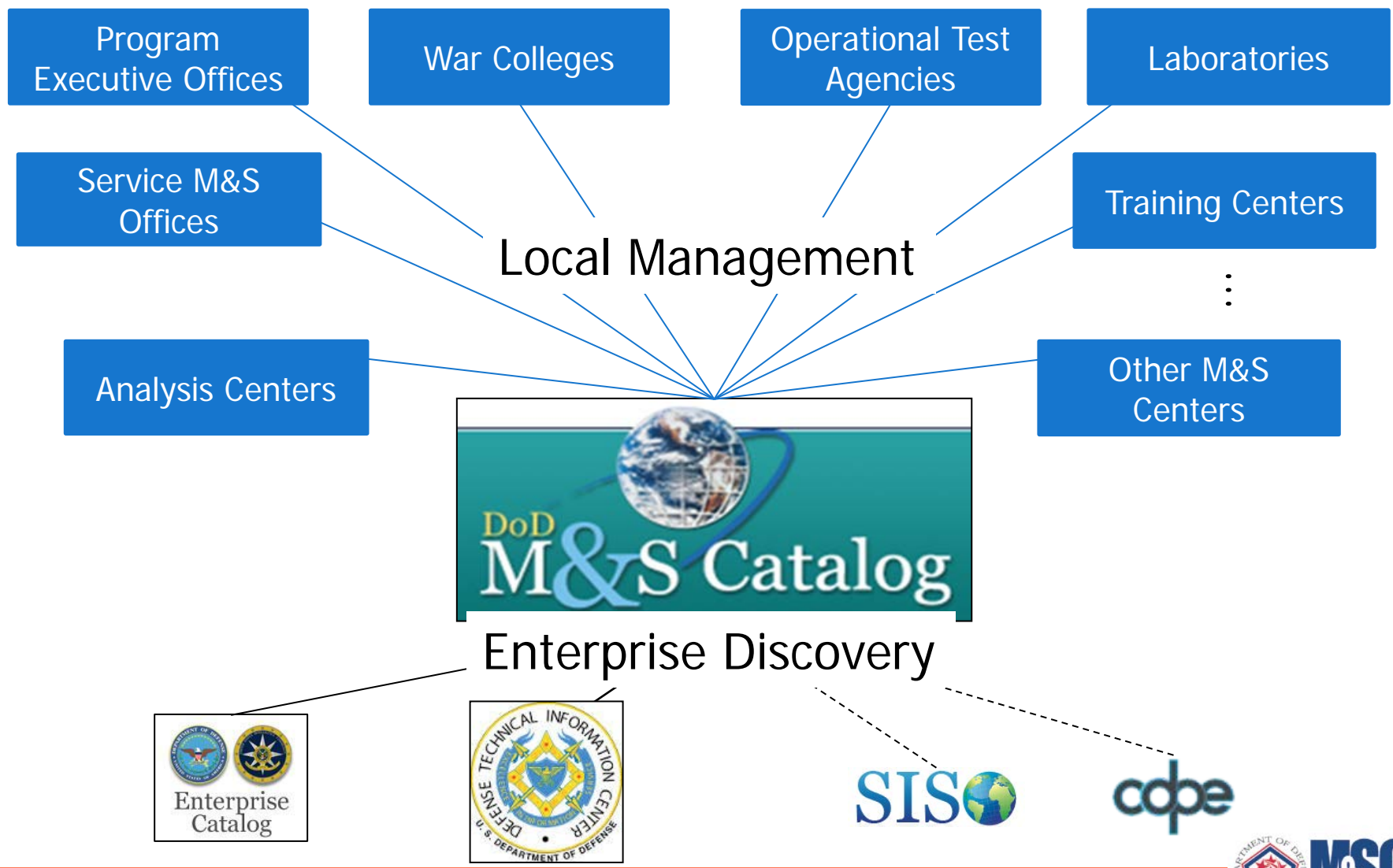 - Integral GOTS metadata tool assists metacard creation

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

Program Executive Offices

War Colleges

Operational Test Agencies

Laboratories

Service M&S Offices

Training Centers

Local Management

Analysis Centers

Other M&S Centers

DoD M&S Catalog

Enterprise Discovery

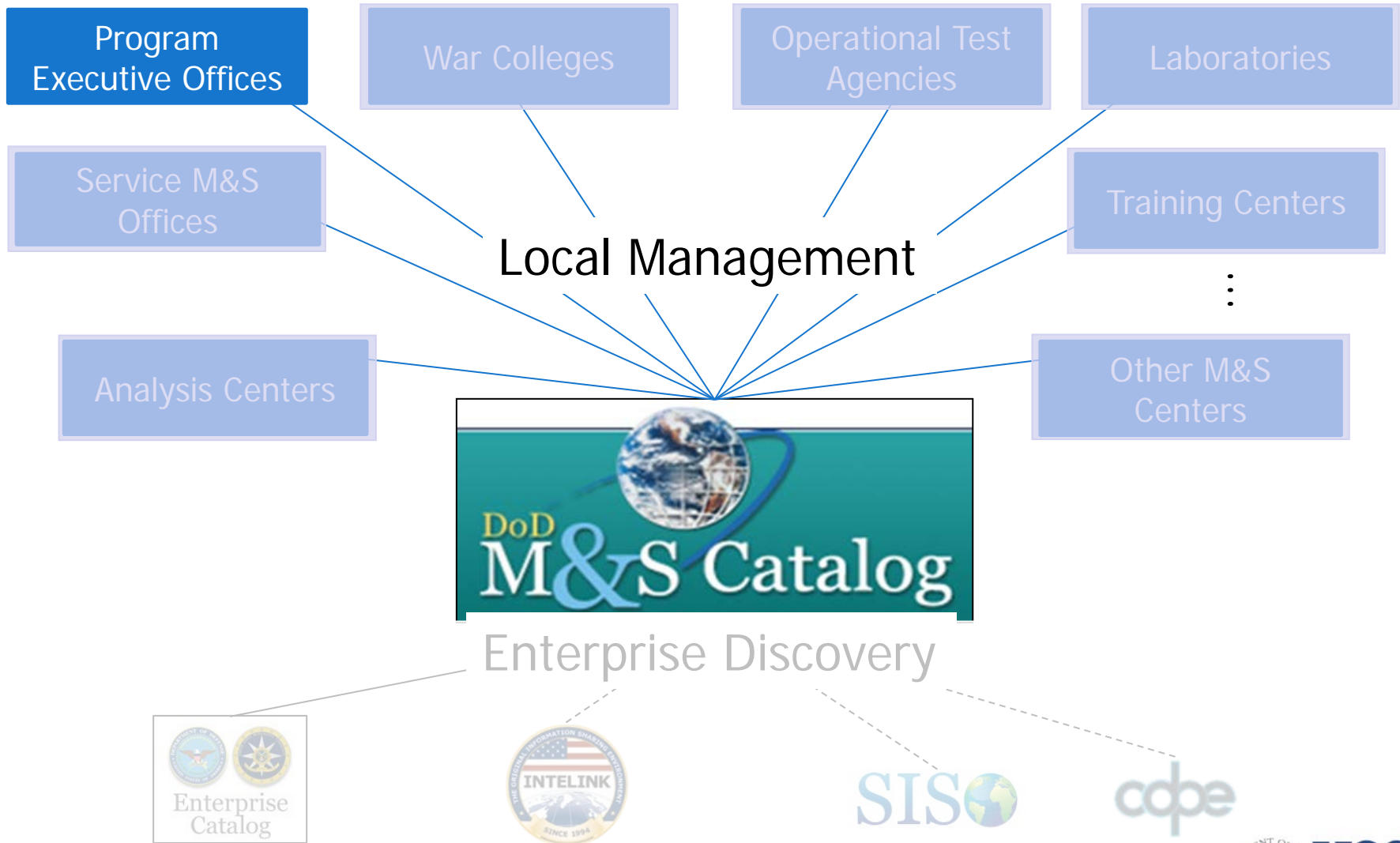Enterprise Catalog

SISO

cdpe

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

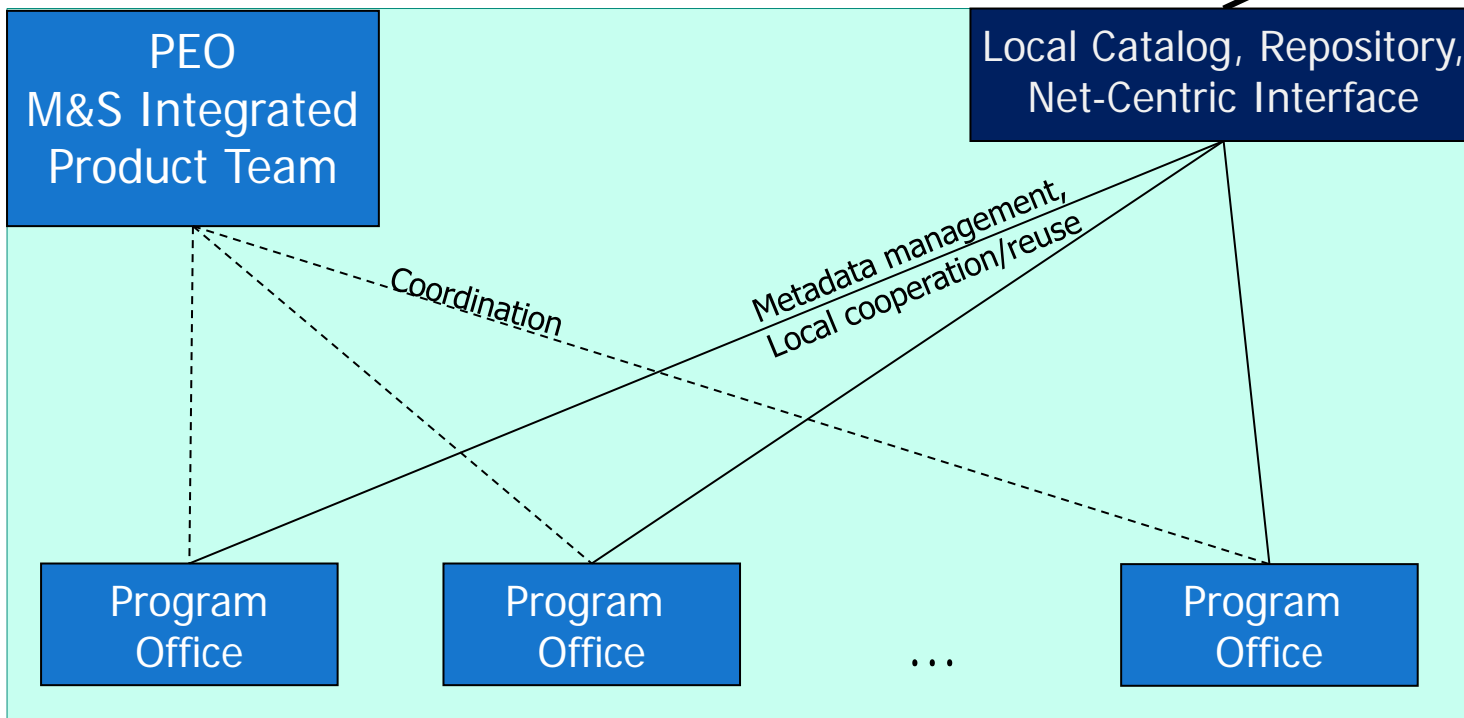# Local Management Example: Program Executive Office (PEO)

Program Executive Offices

War Colleges

Operational Test Agencies

Laboratories

Service M&S Offices

Training Centers

Local Management

Analysis Centers

Other M&S Centers

DoD M&S Catalog

Enterprise Discovery

Enterprise Catalog

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Key elements

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

DoD **M&S Catalog**

Publication

| PEO M&S Integrated Product Team | Local Catalog, Repository, Net-Centric Interface |

Coordination

Metadata management, Local cooperation/reuse

| Program Office | Program Office | … | Program Office |

■ **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

Modeling and Simulation (M&S)
Community of Interest (COI)
Discovery Metadata Specification
(MSC-DMS)

Version 1.5

July 12, 2012

Department of Defense (DoD)
Modeling and Simulation Coordination Office (M&S CO)

Keywords: Accessibility, Cataloging, Discovery, Interoperability,
Metadata, Modeling and Simulation, Reuse, Understandability, Visibility

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- **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