Coalition Battle Management Language Industry Task Team

“Overview”

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Coalition Battle Management Language (C-BML)

The C-BML Standard is being developed by SISO as a set of specifications to facilitate the

*standardized exchange*

of military information such as:

*orders, plans, reports and requests*

among

*Command and Control, Simulation and Autonomous Systems.*
Coalition Battle Management Language (C-BML)

*Common Interface*: for exchange of military information (e.g. orders, reports and requests) among C2, simulation and autonomous/robotic systems.

*Expressiveness*: of all relevant actions (or events) to be performed (or reported) by real, simulated or robotic forces. Intended to generate complex orders such as: Air Tasking Order (ATO), 5-paragraph Operations Order (OPORD) and other tactical messages.

*Unambiguous and Parsable*: mathematical representation that allows for automated processing.
Coalition Battle Management Language (C-BML)

**Common Interface:**

for exchange of military information (e.g. orders, reports, simulation and autonomous)

**Expressiveness:**

of all relevant actions (or events) to be performed by real, simulated or robotic forces. Intended to generate complex orders such as: Air Tasking Order (ATO), 5-paragraph Operations Order (OPORD) and other tactical messages.

**Unambiguous and Parsable:**

mathematical representation that allows for automated processing.
Define, schedule and exchange Orders according to 5W rules

Exchange Reports on:
- Status and Location of friendly forces (CR POS)
- Enemy units discovered (CR OBS)
- Logistics

*Provided by the French MoD
C-BML Industry Task Team

Introduction: What is C-BML?

C-BML Example Expression (1/2)

```xml
<Order>
  <Task>
    <AirTask>
      <TaskeeWho>
        <UnitID>CA-UAV</UnitID>
      </TaskeeWho>
    </AirTask>
    <What>
      <WhatCode>CLARSP</WhatCode>
    </What>
  </Task>
  <Where>
    <WhereID>14010000784100000427</WhereID>
    ... 
    GENCOORDINATE
    ...
    <WhereLocation>
      <GDC>
        <Latitude>40.062195</Latitude>
        <Longitude>47.57694</Longitude>
        <ElevationAGL>3000.0</ElevationAGL>
      </GDC>
    </WhereLocation>
    ...
  </Where>
</Order>
```
C-BML Example Expression (2/2)

```xml
<StartWhen>
  <WhenTime>
    <StartTimeQualifier>AT</StartTimeQualifier>
    <DateTime>20091022141229.359</DateTime>
  </WhenTime>
</StartWhen>

<AffectedWho><UnitID>OMF195-B12</UnitID>  </AffectedWho>
  <TaskID>14099999000000000019</TaskID>
</AirTask>
</Task>
<OrderIssuedWhen>20091022141443.000</OrderIssuedWhen>
<OrderID>14099999000000000030</OrderID>
<TaskerWho> <UnitID> 1-HBCT </UnitID> </TaskerWho>
...
<TaskOrganization> <UnitID> CA-UAV </UnitID> </TaskOrganization>
</Order>
```
C-BML Industry Task Team

Introduction: Why C-BML?

C2-Simulation-Autonomous Systems Interoperability

Supports key military areas of interest:
- Force Readiness;
- Support for Operations; and
- Future Capabilities Development

Provides the following benefits:
- Enhanced realism & overall effectiveness;
- Decreased cost & workload; and
- Reduced preparation and response times
What are the main consequences of not having C-BML?

1. Development and maintenance of proprietary interfaces
2. High level of effort for integration of system of systems involving proprietary interfaces
3. High level of effort for multi-national training and experimentation activities
4. High lead-times associated with development, integration and testing activities
5. Reliance on human interactors (e.g. swivel chair)
Logical Data Model = Vocabulary + Grammar + Ontology

Phase 1: Vocabulary and preliminary work for Phase 2 grammar

Phase 2: Syntax/Grammar, IEM specification & preliminary ontology for phase 3

Phase 3: Battle Management Ontology

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C-BML Industry Task Team
C-BML Product Overview
C-BML Industry Task Team
C-BML SDF

C-BML Standard Development Framework

Reference Architecture – Message Framework

- Requirements
  - Reference Architecture
  - Normative Specifications
  - Specification Guidance
  - Reference Implementation

Phase 1
- Vocabulary
  - Control Measure
    - Unit
  - TaskOrg
  - Task
  - Action
  - Timing
  - Event
  - Location

Phase 2
- Syntax
  - C-BML Grammar
    - Production Rules
    - Vocabulary

Phase 3
- Semantics
  - Business Rules
    - Domain BRs
    - Info Exchange BRs

TRANSPORT MESSAGE
- Transport Envelope
  - Header
  - C-BML Message
    - Metadata
    - C-BML Content

Content Specification
- Security Classification
- Distribution
- Reference Description
- Originator
- Appraisal
- Validity
- Message ID

Routing Information
- TimeStamp
- Transport
- Payload Encoding
- Payload Size
- Content Type
## C-BML Standard Development Framework

### Overview

The C-BML SDF

- Defines a comprehensive model for requirements, domain-specific information products, information exchange interactions and service components.
- Separates normative and guidance documents.
- Provides a set of examples and usage guidance documents for technology-independent and technology-specific utilization.
C-BML Industry Task Team
C-BML Timeline


Phase 1
- Initial Vocabulary
- Preliminary Grammar

Phase 2
- Revised Vocabulary
- Grammar Product
- Message Framework
- Initial Ontology Product

Phase 3
- Revised Grammar
- Revised Message Framework
- C-BML Ontology Product
Strong theoretical foundation for Phase 1 Product thanks to involvement from academia.
CITT main goal is to help fast-track Phase 2 Development to meet Sept 2013 milestone.
Current Government Interest in C-BML

NATO MSG-085 Standardization for C2-Simulation Interoperation

Australia – Australian Army
Belgian – Belgian MoD
Canada – Defence R&D Canada
Denmark – Danish MoD
France – French MoD
Germany – German Army
Great Britain – UK DSTL

Netherlands – TNO, Dutch Army
Norway – FFI
Spain – Spanish MoD
Sweden – FMV
Turkey – Turkish Navy
USA – AMSO, JC&W
C-BML Industry Task Team

Involvement from both Government and Industry!

NCOIC M&S Functional Team
- Company
- Company
- Company
- Company

SISO C-BML Product Development Group
- Company
- Company
- Company
- Company

C-BML Use-cases & other Requirements
C-BML Reference Architecture
C-BML Revised Vocabulary & Grammar
C-BML Information Exchange Specification

NATO MSG-085
NCOIC Mission Statement

“The NCOIC is an international organization for accelerating the global implementation of network centric principles and systems-to improve information sharing among various communities of interest for the betterment of their productivity, interactivity, safety, and security.”

• NCOIC has produced a set of technical products that answer current needs for the C-BML Phase 2 Standard Development Activity.

• NCOIC industry members are experienced in applying these products toward solving real interoperability problems.

• NCOIC has formed a M&S functional team and therefore are interested in Net-Centric/M&S interoperability issues.

• NCOIC and SISO have an agreement in place to foster collaboration between the two organizations.
C-BML Industry Task Team

Leverage NCOIC Frameworks & Tools with current C-BML Foundation

NCOIC/SISO CITT

Netcentric Attributes, Measurement and Tools
- NetCentric Assessment Tool (NCAT®)
- Systems, Capabilities, Operations, Programs and Enterprises Model (SCOPE™)

Technical Deliverables

Interoperability Frameworks and Guidance
- NCOIC® Interoperability Framework (NIF®)
- Net Centric Services Framework (NCSF)
- Net-Centric Information Framework (NCIF)
- Mobile Networking (MNO and MNE)
- Baseline Approach for a Standards Management Framework

Netcentric Patterns
- Operational
- Capability
- Technical

C-BML Use-cases & other Requirements
C-BML Reference Architecture
C-BML Revised Vocabulary & Grammar
C-BML Information Exchange Specification

NATO MSG-085
The aim of the Coalition Battle Management Language (C-BML) Industry Task Team (CITT) is to accelerate the SISO C-BML Phase 2 standard development activity through industry participation:

• to review the standard at regular intervals;
• to provide industry requirements, use-cases, recommendations and other inputs to the SISO C-BML Product Development Group (PDG);
• to identify, contribute to* and evaluate preliminary C-BML phase 2 software solutions.

*subject to legal advice.
1. Drafts set of C-BML products

2. Products Reviewed by NCOIC M&S FT

3. Provides feedback

4. Are inputs for next iteration

C-BML Industry Task Team (CITT)

- Industry Requirements
- Change Requests
- Other Inputs

SISO C-BML PDG

- C-BML Reference Architecture
- C-BML Vocab & Grammar
- C-BML Use-cases & Reqs
- C-BML IEM Spec.
Industry represents one of primary sets of C-BML stakeholders

1. Industry likely will be answering Requests for Proposal that will reference the C-BML standard.

2. Industry already has built existing systems that will need to be adapted, modified or bridged to C-BML technologies.

3. Industry will design, build, integrate and test future systems that produce, consume, parse and generate functionality and behaviours based on the C-BML standard.
CITT keeps industry in the loop during iterative process

1. Reviews C-BML phase 2 standard at regular intervals

2. Provides input/recommendations/change requests + their industry requirements.

3. Contributes* to a functional open-source C-BML Phase 2 Reference Implementation for a C-BML messaging software solution for test & evaluation purposes.
   - Initially shared within CITT
   - Ultimately for Public Release

*subject to legal advice.
C-BML Industry Task Team

Deliverables & Schedule

1. Deliverables
   A. Mission-Thread based use-cases
   B. Reference Message Sets
   C. C-BML Requirements Document
   D. C-BML Model (Content, Services & Transport)

2. Schedule
   A. 6-8 Week Iterations Cycles
   B. Add new use-case at each iteration
   C. Update UML Model (UPDM ?)

*Sparx System Enterprise Architect UML Tool
C-BML Industry Task Team
Current Involvement

ARL
The University of Texas at Austin

MBDA
MISSILE SYSTEMS

Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING

MITRE

Infinite Dimensions

NADS

Isdefe

EMIRAJE SYSTEMS

Pegasus
RESEARCH & TECHNOLOGIES

THALES
# C-BML Industry Task Team

## Current Involvement

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<th>Organization</th>
<th>Activity</th>
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| PEGASUS, THALES, ISDEFE          | CITT Leadership  
                                      | CITT Secretarial duties                     |
| ISDEFE, MBDA, PEGASUS           | Message Metadata Analysis                     |
| CAPGEMINI                        | Transport Message Metadata Analysis           |
| CAPGEMINI, EMIRAJE, NADS         | C-BML Services / Messaging Infrastructure      |
| ARLUT, MITRE                    | Call-For-Fire Use-Case Example, Message Interaction Protocol |
1. Activity kicked-off on 31 May 2012

2. Regular Meetings
   - Bi-weekly telecons: Every 2\textsuperscript{nd}, 4\textsuperscript{th} Monday of each month
   - 1\textsuperscript{st} CITT Workshop held in Paris 21-22 June 2012
   - 2\textsuperscript{nd} CITT Workshop scheduled for Orlando FL 14 Sept 2012

3. Need more industry participation to reach critical mass

4. Workplan and Schedule
   - Still finalizing based on participation
Conclusions

C-BML Phase 1 Standard is in balloting process.

However, C-BML Phase 2 Standard likely will be specified in future RFP since it addresses content and transport.

CITT has been formed to assist in Phase 2 Standard development:
- Provide requirements for and feedback on C-BML products
- Ensure usability and applicability of employment of C-BML Standard

CITT members will gain knowledge and experience in using C-BML

CITT activity has been kicked-off and has commenced work.

Increased participation in CITT is required to meet aggressive C-BML standard development schedule.
For more information:

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