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Multilateral Interoperability Programme Advancements in MIP Baseline 3

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EXTENDED ABSTRACT

Semantic interoperability of command and control information systems (C2ISs) plays an important role when it comes to combined and joint missions. In the *Multilateral Interoperability Programme* (*MIP*, see [2]), 26 nations and institutions define a common interface for distributed, heterogeneous C2ISs.

A core feature of the MIP Solution is the *Joint Command, Control, and Consultation Information Exchange Data Model* (*JC3IEDM*, see [1]), which is developed in close cooperation with the NATO Data Administration Group (NDAG). The JC3IEDM provides the basis for information exchange and specifies the semantics of militarily relevant objects, actions, etc., as well as the semantics of their relationships in an unambiguous way.

In addition to the data model, the MIP also defines information exchange procedures to support interoperability among heterogeneous C2IS. The MIP *Data Exchange Mechanism* (*DEM*) supports the partial replication of operational data depending on their affiliation to a particular *Operational Information Group* (*OIG*) and the distribution rules of that group.

The MIP Community improves its solution continually to meet new operational requirements (e.g., the exchange of plans and orders according to STANAG 2014) and to respond to the lessons learned in preceding interoperability demonstrations (e.g., during the MIP technical and operational tests). About every two years, these changes result in a revised set of specifications. For the forthcoming MIP Baseline 3, draft specifications will be available in spring 2007. They will feature the JC3IEDM 3.1, which has been extended significantly to cover, e.g., new requirements from navy and air force. Moreover, the MIP has revised its DEM to simplify the publish-subscribe mechanism and to make it more robust and less bandwidth-consuming.

In the paper, we provide an overview of the Multilateral Interoperability Programme. The focus of our work will be on the major advancements of the JC3IEDM 3.1 and the DEM of MIP Baseline 3.

The FKIE Research Institute for Communication, Information Processing, and Ergonomics is actively involved in the development of the MIP Solution. The authors are members of various working parties (WP), including the DEM WP, Plans & Orders WP, and XML WP (see [3]). For MIP Block 3, FKIE develops a reference test system that allows checking the conformance of C2 information systems with regard to the MIP specifications in an automatic way.

OUTLINE

1. Introduction

    a. Overview of the Multilateral Interoperability Programme:
    Objectives of MIP, organization, timeline, guide to specifications, objectives of baseline 3

    b. Table of contents

2. The JC3IEDM 3.1

    a. Overview: High-level description of the JC3IEDM

    b. Presentation of changes grouped by operational requirements:
    ATO, CBRN, maritime warfare, plans & orders, etc.

    c. … cont'd …

3. The MIP Data Exchange Mechanism

    a. Overview:
    Publish-subscribe mechanism, Operational Information Groups (OIGs), referential integrity/semantic completeness

    b. Detailed discussion on:
    Protocol stack, management of contract information, flow control, synchronization, error handling

4. Summary and Outlook

5. References

REFERENCES

[1] Multilateral Interoperability Programme (MIP): *The Joint C3 Information Exchange Data Model (JC3IEDM Main). Edition 3.0*. http://www.mip-site.org, Dec. 2005.

[2] Michael Gerz: *Integration of the MIP Command and Control Information Exchange Data Model into National Systems.* 10th ICCRTS, McLean, Virginia, June 2005.

[3] Michael Gerz, Francisco Loaiza, Erik Chaum: *An Object-Oriented XML Schema for the MIP Joint, Command, Control, and Consultation Information Exchange Data Model.* 2006 CCRTS, San Diego, CA, June 2006.