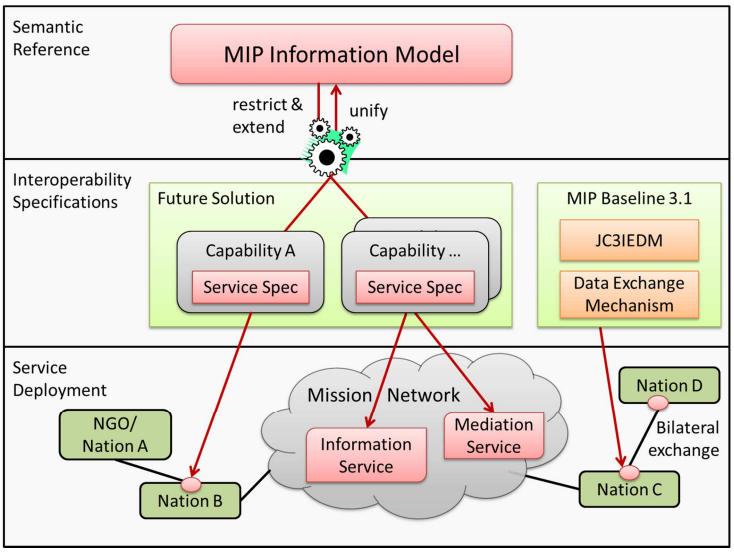
MIP Information Model

The Multilateral Interoperability Programme (MIP), a military standardization body comprising 28 member nations and NATO, aims in this brochure to explain to a non-technical audience what the MIP Information Model (MIM) is, how it helps achieve Command and Control interoperability and how it relates to the JC3IEDM.

What is the MIP Information Model?

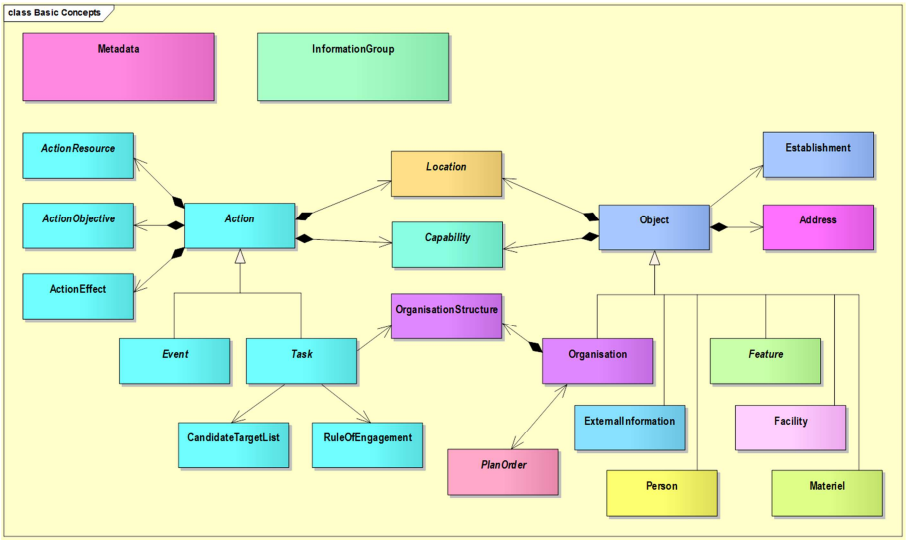
The MIP Information Model (MIM) provides a common vocabulary for the Command and Control (C2) domain. More formally, the MIM is a semantic model for C2 information exchange. Its development is driven by the needs of the warfighters and its scope is defined by military information exchange requirements for multiple echelons in joint/combined response operations. The MIM embodies all the operational concepts of the JC3IEDM. Based on a few basic notions, such as «objects», «actions», and «meta data», the model provides semantically rich taxonomies of militarily relevant concepts. The MIM will allow the generation of diverse exchange specifications thus allowing its reuse across systems, interfaces and Communities of Interest.



The MIM is part of MIP's capability-based and service-oriented approach towards a future interoperability solution. The MIM is considered a common vocabulary, a «semantic reference», for the C2 domain from which different modular interoperability specifications can be derived.

Unlike the JC3IEDM, which is an integral part of the MIP Baseline 3.1 specification, the MIM is separate from an interoperability specification, as can be seen in the diagram above. While the JC3IEDM defines a database schema that specifies the interface that systems must implement, the MIM describes operational concepts.

Selected subsets of the MIM will be included in the various modular interoperability specifications currently under development by MIP, referred to as «Capability Packages», which combine both the data structures and the details of the exchange mechanism. These «Capability Packages» will offer services that can be used in multiple ways, such as for bilateral nation-to-nation and nation-to-NGO information exchange, or for information and mediation services as part of a coalition mission network.



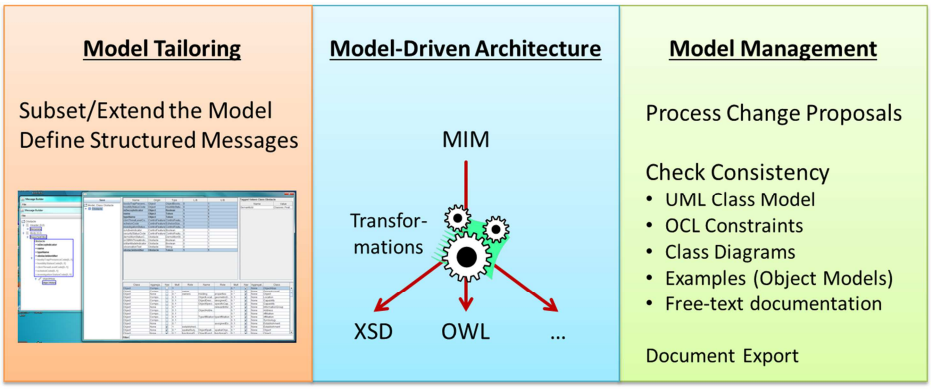
The MIM can be considered as a toolbox: by following a tool-supported process, traceability from the service specifications back to the MIM is guaranteed. With the MIM as a common semantic reference in the background, we can ensure that information exchanged by the resulting services will be consistent and composeable. The ability to couple services when needed is a significant improvement to the traditional way of defining individual messages/ services.

MIP has designed the MIM with regard to readability, modularity, semantic strictness, and model consistency. The result of more than four years of development, it represents a valuable contribution to the service design for future mission networks, to the data modelling efforts within NATO, and to specific communities and organisations within and related to the C2 domain.

The MIM employs state-of-the-art modelling techniques and tools based on open standards and industry best practices. The model is platform-independent meaning it is not tied to a specific exchange technology. As such, it supports the Model-Driven Architecture (MDA) approach which facilitates the efficient development of data exchange schemas while, at the same time, easing communication between and among operational subject matter experts and system engineers.

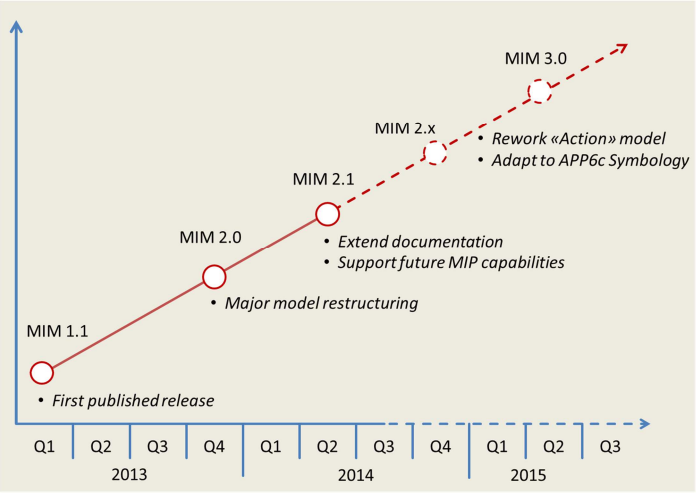
How can we apply the MIP Information Model?

The MIM is complemented with a comprehensive suite of software tools that make the adoption and adaptation of the MIM as easy as possible. In order to customize the MIM for a specific capability or service, a dedicated tool allows defining a subset of the MIM, which is structurally compliant with the overall model. MDA is supported by a library of model transformations that allow deriving platform-specific models from the MIM automatically. Standard representations for «XML Schema Definition» (XSD) and «Web Ontology Language» (OWL) will be ready by the end of 2013. MIM aims at a consistent information model and so, to ensure that all pieces of the puzzle fit together, tools have been developed for model management. All tools are built on top of Sparx Enterprise Architect, the UML modelling tool used for MIM. The tools, continuously enhanced by an active group of developers, are written in Java and available as open source software for MIP members and interested parties.



What is the MIM roadmap? Is it a NATO STANAG?

The MIP considers data modelling as a continuous and agile process that must quickly respond to new operational requirements as soon as they occur. At the same time, standardization requires stable releases. As a result, MIP plans a 12 to 18 month timeframe between any major releases of the MIM, with minor and critical operational updates released when needed.



In January 2013, MIP officially announced the MIP Information Model on its public website and made it available to other Communities of Interest. Since then, many significant improvements have been made and a new version 2.0 will be released by the end of 2013. A minor update (version 2.1) with extended documentation and support for additional MIP capabilities is scheduled for summer 2014. Future releases see major improvements to the representation of actions and events and will feature a simplified mapping of data elements to the latest APP-6 symbology standard.

In parallel, MIP is going to initiate a new cover STANAG for the MIM that is similar to NATO STANAG 5525 (which refers to the JC3IEDM). MIP is also seeking to add the MIM to the NATO Interoperability Standards and Profiles (NISP) and the FMN Interoperability Standards Profile as the semantic reference model on which specifications should be based.

How can I access the MIM and contribute to its development?

Access to the MIM and tools is available on request, at the discretion of MIP to COIs, organisations and individuals. Interested parties are to request access from the MIM Custodian by email at the following address: michael.gerz@fkie.fraunhofer.de. Interested Parties must not share access to MIM or details about MIM with third parties without the express permission of MIP. Third parties should rather be directed to apply for their own access.

Interested parties with access to the MIM repository are explicitly expected to provide official feedback regarding the model. Feedback can be given via the MIM mailing list (see http://lsec.ca/mailman/listinfo/ipt4-mim_lsec.ca for details). Alternatively, please send your comments and suggestions to the MIM custodian.