

## MULTILATERAL INTEROPERABILITY PROGRAMME (MIP)



### MIP4 Information Exchange Specification (MIP4-IES)

#### File Exchange Pattern

##### 09 October 2020

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# 1 Overview

This document defines the MIP4-IES File exchange pattern, according to use cases described in the *MIP4-IES Exchange Mechanism Overview* [REF-MIP-02]. While based on a generic exchange pattern, it has been tailored to meet the information exchange needs of the MIP4 Community of Interest (CoI).

## 2 Scope

The scope of this document includes a technical specification of the MIP4-IES File exchange pattern, design constraints and implementation details. It is intended for technical users that are developing, consuming or providing this service. The contents of this document focus solely on the service and not on the information content. The specification of the information content is provided in the *MIP4-IES Information Definition Overview* [REF-MIP-07].

### 2.1 Note on non-normative examples

The examples in this document are non-normative and they are intended to illustrate the purpose of the concept or the functionality being described. The normative technical details in the document will take precedence over these non-normative examples. The actual implementation shall be based on the normative technical details and technical artifacts.

### 3 References

For any references in this document to a MIP4-IES source (REF-MIP-##), refer to section 2.3 in the *MIP4-IES Overview* [REF-MIP-01].

For any references in this document to a MIP4-IES Exchange Mechanism external source (REF-EM-##), refer to section 3.1 in the *MIP4-IES Exchange Mechanism Overview* [REF-MIP-02].

For any references in this document to a MIP4-IES Exchange Mechanism XML artifact (ART-EM-##), refer to section 3.3 in the *MIP4-IES Exchange Mechanism Overview* [REF-MIP-02].

## 4 Technical Artifacts

The following artifacts are required to implement the MIP4-IES File exchange pattern:

Artifact Reference	Artifact Name
ART-EM-01	Common.xsd
ART-EM-07	Base.xsd

## 5 File Exchange Pattern

The File Exchange Pattern is defined as the ability to store bulk information in a single File for the purpose of exchanging information between systems or sharing data between Users. This exchange method supports the following use cases:

- a) System Initialization;
- b) System Recovery;
- c) Offline Archive.



## 6 Implementation

The MIP4-IES File specification consists of an XML Document definition in which MIP4-IES information content (refer to the *MIP4-IES Information Definition Overview* [REF-MIP-07]) can be inserted and saved to a single file. The XML Document shall support the inclusion of metadata to facilitate the preservation of the context from which the MIP4-IES information originated. Besides the inclusion of document metadata, the MIP4-IES document element shall be loosely typed (xsd:any but “lax” processing) and include MIP4-IES data objects along with anonymous payloads or extensions to the MIP4-IES data objects. In order to achieve this, the MIP4-IES File Exchange pattern is based entirely on the generic capability of WSMP. The WSMP Specification defines a wsmp:WSMPMsg element, that is used as the root element of the file. Since it is the same element as in other Message Exchange Patterns, it contains Metadata at the file level, and allows the usage of operations.

### 6.1 Namespaces

The following namespaces are used in this document:

Prefix	Namespace	Source
wsmp	urn:nato:stanag:5644:wsmp:1:3	Web Service Messaging Profile

### 6.2 Message Container

Refer to section ‘Cross-pattern Requirements’ in *MIP4-IES Exchange Mechanism Overview* [REF-MIP-02].

### 6.3 Examples

The following are non-normative examples of a [File Data].

#### Sample - File with metadata and a single MIP4-IES object

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns7:WSMPMsg xmlns:ns3="http://docs.oasis-open.org/wsn/b-2"

xmlns:ns51="https://mip-interop.org/data/v4.3/BattlespaceConcept/Object/Actor/Organisation/Unit"
    xmlns:ns7="urn:nato:stanag:5644:wsmp:1:3"
    xmlns:ns13="https://mip-interop.org/data/v4.3/BattlespaceConcept"
    xmlns:ns11="https://mip-interop.org/data/v4.3/Base"
    xmlns:ns16="https://mip-interop.org/data/v4.3/Concept"
    xmlns:ns14="https://mip-interop.org/data/v4.3/BattlespaceConcept/Location"
    xmlns:ns18="https://mip-interop.org/data/v4.3/Concept/Metadata"
    xmlns:ns47="https://mip-interop.org/data/v4.3/StaffConcept/Overlay"
    xmlns:ns37="https://mip-interop.org/data/v4.3/BattlespaceConcept/Affiliation"
```

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```

xmlns:ns20="https://mip-interop.org/data/v4.3/StaffConcept"
xmlns:ns23="https://mip-interop.org/data/v4.3/BattlespaceConcept/Object"

xmlns:ns27="https://mip-interop.org/data/v4.3/BattlespaceConcept/Object/Actor/Organisation">
  <ns7:Update>
    <ns2:Data ns2:Dialect="https://mip-interop.org/data/v4.3/Dialect">
      <base:Context xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xmlns:affiliation="https://mip-interop.org/data/v4.3/BattlespaceConcept/Affiliation"
  xmlns:base="https://mip-interop.org/data/v4.3/Base"
  xmlns:battlespaceconcept="https://mip-interop.org/data/v4.3/BattlespaceConcept"

xmlns:battlespaceconceptmetadata="https://mip-interop.org/data/v4.3/BattlespaceConcept/Metadata"
  xmlns:concept="https://mip-interop.org/data/v4.3/Concept"
  xmlns:conceptmetadata="https://mip-interop.org/data/v4.3/Concept/Metadata"
  xmlns:location="https://mip-interop.org/data/v4.3/BattlespaceConcept/Location"
  xmlns:object="https://mip-interop.org/data/v4.3/BattlespaceConcept/Object"

xmlns:organisation="https://mip-interop.org/data/v4.3/BattlespaceConcept/Object/Actor/Organisation"
  xmlns:staffconcept="https://mip-interop.org/data/v4.3/StaffConcept"

xmlns:staffconceptmetadata="https://mip-interop.org/data/v4.3/StaffConcept/Metadata"
  xmlns:staffconceptoverlay="https://mip-interop.org/data/v4.3/StaffConcept/Overlay"

xmlns:unit="https://mip-interop.org/data/v4.3/BattlespaceConcept/Object/Actor/Organisation/Unit">
  <base:ContextIdentifier>/Overlay</base:ContextIdentifier>
  <base:Data xsi:type="staffconceptoverlay:OverlayType">
    <base:ID>3a9b275a-07d2-42df-a6c0-92394e46b19b</base:ID>
    <concept:ConceptName>Sample Overlay</concept:ConceptName>
    <staffconcept:StaffConceptMetadata>
      <staffconceptmetadata:StaffConceptMetadataOriginator>
        <conceptmetadata:OriginatorName>a</conceptmetadata:OriginatorName>
        </staffconceptmetadata:StaffConceptMetadataOriginator>
      </staffconcept:StaffConceptMetadata>
      <staffconceptoverlay:OverlayContent xsi:type="unit:InfantryUnitType">
        <base:ID>4f213be7-58fd-4c7b-90dd-b46d62e4f237</base:ID>
        <concept:ConceptName>12 BN Artillery4</concept:ConceptName>
        <battlespaceconcept:BattlespaceConceptGeographicLocation>
          <location:LocationGeometry xsi:type="location:AbsolutePointType">
            <location:AbsolutePointLatitudeCoordinate>
              <location:LatitudeCoordinateCoordinate>52.79</location:LatitudeCoordinateCoordinate>
              </location:AbsolutePointLatitudeCoordinate>
              <location:AbsolutePointLongitudeCoordinate>
                <location:LongitudeCoordinateCoordinate>15.60</location:LongitudeCoordinateCoordinate>
                </location:AbsolutePointLongitudeCoordinate>
              </location:LocationGeometry>
            </battlespaceconcept:BattlespaceConceptGeographicLocation>
          <battlespaceconcept:BattlespaceConceptMetadata>
            <conceptmetadata:ConceptMetadataReportingData>

<conceptmetadata:ReportingDataCategoryCode>Reported</conceptmetadata:ReportingDataCategoryCode>

<conceptmetadata:ReportingDataObservationDateTime>2020-09-28T10:16:53.878Z</conceptmetadata:ReportingDataObservationDateTime>

<conceptmetadata:ReportingDataReportingDateTime>2020-09-28T10:16:53.878Z</conceptmetadata:ReportingDataR

```

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```

eportingDateTime>
                <conceptmetadata:ReportingDataReporter>
                <conceptmetadata:ReporterName>Reporter</conceptmetadata:ReporterName>
                </conceptmetadata:ReportingDataReporter>
            </conceptmetadata:ConceptMetadataReportingData>
        </battlespaceconcept:BattlespaceConceptMetadata>

<organisation:OrganisationHasCommandFunctionIndicator>false</organisation:OrganisationHasCommandFunction
Indicator>

<organisation:MilitaryOrganisationServiceCode>Army</organisation:MilitaryOrganisationServiceCode>
    <unit:UnitEchelon xsi:type="object:ArmyEchelonType">
    <object:ArmyEchelonCode>Battalion</object:ArmyEchelonCode>
    </unit:UnitEchelon>
    </staffconceptoverlay:OverlayContent>
</base:Data>
    <base:ContextLastModificationDateTime>2020-09-28T10:16:53.878Z
    </base:ContextLastModificationDateTime>
</base:Context>
</ns2:Data>
<ns3:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-1/TopicExpression/Simple"

xmlns:xxxx="https://insane.fkie.fraunhofer.de/models/datapool">xxxx:SAD
    </ns3:TopicExpression>
    </ns7:Update>
</ns7:WSMPMsg>

```

## Sample - File with multiple MIP4-IES objects

```

<?xml version="1.0" encoding="UTF-8"?>
<wsmp:WSMPMsg xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:texpr="http://docs.oasis-open.org/wsn/b-2" xmlns:wsmp="urn:nato:stanag:5644:wsmp:1:3">
    <wsmp:MetadataBinding wsmp:Dialect="https://mip-interop.org/data/v4.3/Dialect"/>
    <wsmp:Update>
        <wsmp:Data wsmp:Dialect="https://mip-interop.org/data/v4.3/Dialect">
            <base:Context
xmlns:orga="https://mip-interop.org/data/v4.3/BattlespaceConcept/Object/Actor/Organisation"
xmlns:stfcpt="https://mip-interop.org/data/v4.3/StaffConcept"
xmlns:cmeta="https://mip-interop.org/data/v4.3/Concept/Metadata"
xmlns:wsmp="urn:nato:stanag:5644:wsmp:1:3"
xmlns:gen="https://mip-interop.org/data/v4.3/BattlespaceConcept/Generic"
xmlns:ovrlay="https://mip-interop.org/data/v4.3/StaffConcept/Overlay"
xmlns:concept="https://mip-interop.org/data/v4.3/Concept"
xmlns:bsc="https://mip-interop.org/data/v4.3/BattlespaceConcept"
xmlns:obj="https://mip-interop.org/data/v4.3/BattlespaceConcept/Object"
xmlns:unit="https://mip-interop.org/data/v4.3/BattlespaceConcept/Object/Actor/Organisation/Unit"
xmlns:stfcptmeta="https://mip-interop.org/data/v4.3/StaffConcept/Metadata"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:loc="https://mip-interop.org/data/v4.3/BattlespaceConcept/Location"
xmlns:base="https://mip-interop.org/data/v4.3/Base">
                <base:ContextIdentifier>/Overlay</base:ContextIdentifier>
                <base:Data xsi:type="ovrlay:RecognizedGroundPictureType">

```

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```

        <base:ID>a9117d70-b725-473e-b392-62f9583b98f3</base:ID>
        <concept:ConceptName>CURSIT</concept:ConceptName>
        <stfcpt:StaffConceptMetadata>
            <stfcptmeta:StaffConceptMetadataOriginator>
                <cmeta:OriginatorName>CAN REP
ORG</cmeta:OriginatorName>
            </stfcptmeta:StaffConceptMetadataOriginator>
        </stfcpt:StaffConceptMetadata>
        <ovrlay:OverlayContent xsi:type="unit:TransportationUnitType">
            <base:ID>7dc2fd02-34ed-4692-ab08-2f5678f44a1c</base:ID>
            <concept:ConceptName>Sample Unit</concept:ConceptName>
            <bsc:BattlespaceConceptGeographicLocation>
                <loc:LocationGeometry
xsi:type="loc:AbsolutePointType">
                    <loc:AbsolutePointLatitudeCoordinate>
<loc:LatitudeCoordinateCoordinate>56.712378</loc:LatitudeCoordinateCoordinate>
                        </loc:AbsolutePointLatitudeCoordinate>
                        <loc:AbsolutePointLongitudeCoordinate>
<loc:LongitudeCoordinateCoordinate>-119.804690</loc:LongitudeCoordinateCoordinate>
                            </loc:AbsolutePointLongitudeCoordinate>
                            </loc:LocationGeometry>
                        </bsc:BattlespaceConceptGeographicLocation>
<bsc:BattlespaceConceptHostilityCode>Friend</bsc:BattlespaceConceptHostilityCode>
                            <bsc:BattlespaceConceptMetadata>
                                <cmeta:ConceptMetadataAppraisal
xsi:type="cmeta:OperationalAppraisalType">
<cmeta:OperationalAppraisalCredibilityCode>ReportedAsAFact
                                    </cmeta:OperationalAppraisalCredibilityCode>
                                    </cmeta:ConceptMetadataAppraisal>
                                    <cmeta:ConceptMetadataReportingData>
<cmeta:ReportingDataCategoryCode>Reported</cmeta:ReportingDataCategoryCode>
<cmeta:ReportingDataObservationDateTime>2020-09-16T12:41:07.4Z
                                        </cmeta:ReportingDataObservationDateTime>
<cmeta:ReportingDataReportingDateTime>2020-09-16T12:41:07.4Z
                                            </cmeta:ReportingDataReportingDateTime>
                                            <cmeta:ReportingDataReporter>
                                                <cmeta:ReporterName>CAN REP
ORG</cmeta:ReporterName>
                                            </cmeta:ReportingDataReporter>
                                            </cmeta:ConceptMetadataReportingData>
                                            <cmeta:ConceptMetadataValidityTimePeriod
xsi:type="gen:AbsoluteTimePeriodType">
<gen:AbsoluteTimePeriodStartDateTime>2020-09-16T12:41:07.4Z
                                                </gen:AbsoluteTimePeriodStartDateTime>
                                                </cmeta:ConceptMetadataValidityTimePeriod>

```

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```

        </bsc:BattlespaceConceptMetadata>
        <orga:OrganisationHasCommandFunctionIndicator>false
    </orga:OrganisationHasCommandFunctionIndicator>

    <orga:OrganisationOperationalStatusCode>Operational</orga:OrganisationOperationalStatusCode>

    <orga:MilitaryOrganisationServiceCode>Army</orga:MilitaryOrganisationServiceCode>
        <unit:UnitEchelon xsi:type="obj:ArmyEchelonType">
            <base:Amplification>

    <base:AmplificationLocationText>ArmyEchelonCode</base:AmplificationLocationText>

    <base:AmplificationText>Unknown</base:AmplificationText>
        </base:Amplification>
        <obj:ArmyEchelonCode xsi:nil="true"/>
    </unit:UnitEchelon>

    <unit:UnitFormalAbbreviatedName>SU</unit:UnitFormalAbbreviatedName>

    <unit:TransportationUnitCategoryCode>APODOrAPOEUnit</unit:TransportationUnitCategoryCode>
        </ovrlay:OverlayContent>
        <ovrlay:OverlayContent xsi:type="unit:MedicalUnitType">
            <base:ID>d0279512-a94e-4ffb-8f63-38d477eb1516</base:ID>
            <concept:ConceptName>CAN_UN_012</concept:ConceptName>
            <bsc:BattlespaceConceptGeographicLocation>
                <loc:LocationGeometry
xsi:type="loc:AbsolutePointType">
                    <loc:AbsolutePointLatitudeCoordinate>

    <loc:LatitudeCoordinateCoordinate>56.705363</loc:LatitudeCoordinateCoordinate>
                    </loc:AbsolutePointLatitudeCoordinate>
                    <loc:AbsolutePointLongitudeCoordinate>

    <loc:LongitudeCoordinateCoordinate>-119.804334</loc:LongitudeCoordinateCoordinate>
                    </loc:AbsolutePointLongitudeCoordinate>
                </loc:LocationGeometry>
            </bsc:BattlespaceConceptGeographicLocation>

    <bsc:BattlespaceConceptHostilityCode>Friend</bsc:BattlespaceConceptHostilityCode>
            <bsc:BattlespaceConceptMetadata>
                <cmeta:ConceptMetadataReportingData>

    <cmeta:ReportingDataCategoryCode>Reported</cmeta:ReportingDataCategoryCode>

    <cmeta:ReportingDataObservationDateTime>2020-09-16T12:42:07.277Z
        </cmeta:ReportingDataObservationDateTime>

    <cmeta:ReportingDataReportingDateTime>2020-09-16T12:42:07.277Z
        </cmeta:ReportingDataReportingDateTime>
            <cmeta:ReportingDataReporter>
                <cmeta:ReporterName>CAN REP
    ORG</cmeta:ReporterName>
            </cmeta:ReportingDataReporter>

```

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```

                                </cmeta:ConceptMetadataReportingData>
                                <cmeta:ConceptMetadataValidityTimePeriod
xsi:type="gen:AbsoluteTimePeriodType">
<gen:AbsoluteTimePeriodStartDateTime>2020-09-16T12:42:07.277Z
                                </gen:AbsoluteTimePeriodStartDateTime>
                                </cmeta:ConceptMetadataValidityTimePeriod>
                                </bsc:BattlespaceConceptMetadata>
                                <orga:OrganisationHasCommandFunctionIndicator>false
                                </orga:OrganisationHasCommandFunctionIndicator>

<orga:OrganisationOperationalStatusCode>Operational</orga:OrganisationOperationalStatusCode>

<orga:MilitaryOrganisationServiceCode>Army</orga:MilitaryOrganisationServiceCode>
                                <unit:UnitEchelon xsi:type="obj:ArmyEchelonType">
                                    <obj:ArmyEchelonCode>Section</obj:ArmyEchelonCode>
                                </unit:UnitEchelon>

<unit:UnitFormalAbbreviatedName>CAN_UN_012</unit:UnitFormalAbbreviatedName>

<unit:MedicalUnitCategoryCode>MedicalTreatmentUnit</unit:MedicalUnitCategoryCode>
                                </ovrlay:OverlayContent>
                                </base:Data>
                                <base:ContextLastModificationDateTime>2020-09-16T12:59:51.2955886Z
                                </base:ContextLastModificationDateTime>
                                </base:Context>
                                </wsmp:Data>
                                <wsmp:Filter/>
                                </wsmp:Update>
</wsmp:WSMPMsg>

```

## 7 Use Cases

The following section describes typical scenarios between two systems using the MIP4-IES File exchange pattern. The system creating the MIP4-IES compliant file will be referred to as the Producer, the system importing this file will be referred as the Consumer.

### 7.1 System Initialization

#### 7.1.1 Problem

The Consumer wants to attain the Situation as known by the Producer.

#### 7.1.2 Solution

Step	Description
1	Producer exports his Situation to one or more files compliant to the schema defined in <i>WSMP-Common.xsd</i> [ART-EM-11].
2	Producer transfers the file to the Consumer. How it is transferred is beyond the scope of this specification and depends on the specific deployment and operational context.
3	Consumer imports the data objects from the file. Data of a type unknown (or using an unknown dialect) to the Consumer or extensions from a different CoI may be ignored.

### 7.2 Situation Recovery

#### 7.2.1 Problem

The Consumer has determined, or suspects, that it has lost the Situation as known by one or more Providers and requires a recovery. The exchange can be initiated upon request of the Consumer or directly by the Producer.

#### 7.2.2 Solution

Step	Description
1	Producer exports his Situation to one or more files compliant to the schema defined in <i>WSMP-Common.xsd</i> [ART-EM-11].
2	Producer transfers the file to the Consumer. How it is transferred is beyond the scope of this specification and depends on the specific deployment and operational context.

3	When an MIP4-IES file is imported, compare the Situation objects with the Outdated Situation objects.
3.a	Where a data object exists in the Outdated Situation but not in the Situation, the object should be removed from the Outdated Situation.
3.b	Where a data object exists in the Situation but not in the Outdated Situation, include the data object in the Outdated Situation.
3.c	Where a data object exists in both the Current and Outdated Situation, and if the data object contains information about its updated time, then a comparison SHOULD be performed on this element.
3.c.1	If the received object is older or identical to the previous one, then nothing should be done.
3.c.2	If the received object is newer than the 'outdated' one, then the latter SHOULD be updated consequently

## 7.3 Offline Archive

### 7.3.1 Problem

The Producer desires to archive the Situation, in an offline mode.

### 7.3.2 Solution

Step	Description
1	Producer exports his Situation to one or more files compliant to the schema defined in <i>WSMP-Common.xsd</i> [ART-EM-11].



## 8 Glossary

Refer to the *MIP4-IES Exchange Mechanism Overview* [REF-MIP-02] for the definition of any acronyms/terms used in this document.

## 9 MIP4-IES Profile

MIP4-IES defines a COI specific profile to implement on top of the *WSMP Core Specification* [REF-EM-11]. In terms of the File exchange pattern, this profile is structured for only one usage: Payload wrapping.

Also, in order to detect that the payload corresponds to MIP4-IES, the Provider SHALL fill the Dialect attribute of the Data element with the following value:

<a href="https://mip-interop.org/data/v4.3/Dialect">https://mip-interop.org/data/v4.3/Dialect</a>
---------------------------------------------------------------------------------------------------

### 9.1 Using Operations on File Exchange Pattern

WSMP allows a producer to send Create, Update and Delete operations through files, using *wsmmp:WSMPMsg*.

In the MIP4-IES context, a Consumer shall support all of the three operations.

In the case of the reception of a Create or an Update, it is up to the Consumer to determine which behaviour is to be adopted, depending on its own internal state.

When producing a file, it is up to the Producer to determine whether the operation is a Creation or an Update.