

**Isode Extensions  
to the  
Open Group X.400 Gateway API  
to support  
STANAG 4406 Military Messaging,  
File Transfer Body Part  
and  
IPM Business Class Function Group**

**isode**

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# Introduction

The Open Group X.400 Gateway API is a standardized API to X.400 services, that covers core commercial X.400 functionality. Isode has specified and implemented extensions to this API to support STANAG 4406 Military Messaging. These extensions also include support for the standard X.400 File Transfer Body Part and the IPM Business Class Function Group, which are not covered in the Open Group specification.

These extensions will be of interest to vendors developing products that need to integrate with STANAG 4406 Military Messaging. The product is available immediately as a part of Isode's Open Group X.400 API Developer's Kit.

This document describes the set of object classes which are provided by the Isode Open Group X.400 API implementation to support STANAG 4406 Military Messaging. It also describes extensions to the standard Interpersonal Messaging class definitions which enable MIME and File Transfer bodyparts to be constructed and encoded. Support for the Acp127NotificationRequest attribute within the RecipientSpecifier class is also added, and the extension made to the standard MessageHandling class definitions which enables support for the Priority Level Qualifier envelope extension. In addition, it describes the extensions to the standard IPM Heading and RecipientSpecifier class definitions to enable the IPM Business Class Function Group to be supported.

# STANAG 4406 Package

## Summary

This chapter defines the STANAG 4406 (S4) package.

## Class Hierarchy

This section defines the S4 (STANAG 4406) classes. Subclassification is indicated by indentation. The names of abstract classes are in italics. Thus, for example, **Acp127 Body Part** is an immediate subclass of *Body Part*, an abstract class. The names of classes to which the *om\_encode()* function applies are in bold. The *om\_create()* function applies to all concrete classes.

*Object* (defined in the referenced **XOM** specification)

- **Acp127 Notification Response**
- **Address List Designator**
- *Body Part* (defined in the referenced **IM** specification)
  - **Acp127 Body Part**
  - **Adatp3 Body Part**
  - **Corrections Body Part**
  - **Forwarded Encrypted Body Part**
  - **MM Message Body Part**
- **Bodypart Security Label**
- **Distribution Codes**
- **Distribution Extension**
- **Message Type**
- *Content* (defined in the referenced **MH** specification)
  - *Military Information Object*
    - **Military Message**
    - *Military Notification*
      - **Military Non Receipt Notification**
      - **Military Receipt Notification**
      - **Military Other Notification**
- **Other Recipient Designator**
- **Pilot Information**
- **Security Information Labels**

**Note:** The identifier for the variable name of type OM\_STRING of a class in the STANAG 4406 Package can usually be derived using the name of the class, preceded by "S4\_C\_" and replacing a blank space with an underscore. To be in line with the ANSI C language limitation, some words in the class names are excepted and are abbreviated as below:

NOTIFICATION is abbreviated as	NOTIF
BODY_PART	BD_PRT

## Class Definitions

This section defines the S4 classes. It describes the attributes specific to a class in a table like those used in the referenced **XOM** Specification.

### Acp127 Body Part

An instance of class **Acp127 Body Part** is used to convey data pattern traffic. This body part is only used when interoperating with ACP 127 domains.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Acp127 Data Parameter	Integer	-	0-1	-
Acp127 Data Data	String (IA5)	1-65535	1	-

### Acp127 Notification Response

An instance of class **Acp127 Notification Response** indicates the result of an attempt to transfer a message into an ACP 127 domain.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Acp127-Notification-Type	Enumeration (Acp127 Notification Type)	-	1	-
Receipt Time	String(UTCTime)	-	1	-
Address List Indicator	Object (Address List Designator)	-	0-1	-
Acp127 Recipient	String (Printable)	1-69	0-1	-
Acp127 Supplementary Information	String (Printable)	1-69	0-1	-

### AdatP3 Body Part

An instance of class **Adatp3 Body Part** represents an information object which is used to convey military AdatP3 messages.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Adatp3 Parameters	Integer	-	1	0
Line Orientated	String (IA5)	-	0-1	-
Set Orientated	String (IA5)	-	0-*	-

## Address List Designator

An instance of class **Address List Designator** indicates the name of a predefined list of recipients. In addition, it specifies the precedence level of each list and whether a notification or a reply has been requested.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Type	Integer	-	1	-
List Name	Object (OR Descriptor)	-	1	-
Notification Request	Integer	-	0-1	-
Reply Request	Integer	-	0-1	-

## Bodypart Security Label

An instance of class **Bodypart Security Label** conveys a **Security Label** object which is associated with a specific bodypart of a message.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Body Part Security Label	Object (Security Label)	-	1	-
Body Part Sequence Number	Integer	-	0-1	-

## Corrections Body Part

An instance of class **Corrections Body Part** represents an information object which is used to convey corrections to information in another body part. This body part is only used when interoperating with ACP 127 domains.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Corrections Parameter	Integer	-	0-1	-
Corrections Data	String (IA5)	-	0-1	-

## Distribution Codes

An instance of class **Distribution Codes** indicates distribution information which can be used to perform automatic or manual local distribution of a message.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Sics	String (Printable)	3-8	1-8	-
Dist Extensions	Object (Distribution Extension)	-	0-*	-

## Distribution Extension

An instance of class **Distribution Extension** conveys extensions to the standard Distribution Code object.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Dist Type	String (Object Identifier)	-	1	-
Dist Value	Any	-	1	-

## Forwarded Encrypted Body Part

An instance of class **Forwarded Encrypted Body Part** is used to convey information about an encrypted message which has been forwarded prior to any decryption having taken place.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Delivery Time	String (UTCtime)	-	0-1	-
Delivery Envelope	Object (Delivery Envelope)	-	1	-
Forwarded Encrypted Data	String (Bit)	-	1	-

## Message Type

An instance of class **Message Type** indicates whether a message is to be considered as an exercise, an operation, a project or a drill.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Type	Integer	-	1	-
Identifier	String (Printable)	1-69	0-1	-

## Military Message

An instance of class **Military Message** is the primary information object conveyed between users in Military Messaging.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
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Authorising Users*	Object (OR Descriptor)	-	0-*	-
Auto Forwarded*	Boolean	-	1	false
Auto Submitted*	Enumeration (Auto Submitted)	-	1	<b>0</b>
Blind Copy Recipients*	Object (Recipient-Specifier)	-	0-*	-
Body*	Object (Body Part)	-	0-*	-
Copy Recipients*	Object (Recipient Specifier)	-	0-*	-
Expiry Time*	String (UTCTime)	-	0-1	-
Importance*	Enumeration (Importance)	-	1	<b>1</b>
Incomplete Copy*	Boolean	-	1	<b>0</b>
IPMS-Extensions*	Object(IPMS-Extension)	-	0-*	-
Languages*	String (Printable)	-	0-*	-
Obsolete IPMs*	Object (IPM Identifier)	-	0-*	-
Originator*	Object (OR Descriptor)	-	0-1	-
Primary Recipients*	Object(Recipient Specifier)	-	0-*	-
Related IPMs*	Object (IPM Identifier)	-	0-*	-
Replied to IPM*	Object (IPM Identifier)	-	0-*	-
Reply Recipients*	Object (OR Descriptor)	-	0-*	-
Reply Time*	String (UTCTime)	-	0-*	-
Sensitivity*	String(Teletex)	-	0-*	-
This IPM*	Object (IPM Identifier)	-	1	-
Exempted Addresses	Object (OR Descriptor)	-	0-*	-
Extended Authorization Information	String(UTCTime)	-	0-1	-
Handling Instructions	String (Printable)	1-69	0-*	-
Codress Message	Integer	-	0-1	-
Originator Reference	String (Printable)	1-69	0-1	-
Primary Precedence	Integer	-	0-1	-
Copy Precedence	Integer	-	0-1	-
Message Type	Object (Message Type)	-	0-1	-
Address List Indicator	Object (Address List Designator)	-	0-*	-
Other Recipients Indicator	Object (Other Recipient Designator)	-	0-*	-
Pilot Forwarding Information	Object (Pilot Information)	-	0-*	-
Acp127 Message Identifier	String (Printable)	1-69	0-1	-
Originator Plad	String (Printable)	1-69	0-1	-
Security Information Labels	Object (Security Information Labels)	-	0-1	-

*Note: Attribute types marked \* are taken from the IM88 package*

## Military Non Receipt Notification

An instance of class **Military Non Receipt Notification** reports its originator's failure to receive, failure to accept or delay in receiving, an MM.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Auto Forward Comment*	String(Printable)	1-256	0-1	-
Discard Reason*	Enumeration (Discard Reason)	-	1	-1
Non Receipt Reason*	Enumeration (Non Receipt Reason)	-	1	<b>0</b>
Returned IPM*	Object (Interpersonal Message)	-	0-1	-

*Chapter 1: Note: Attribute types marked \* are taken from the IM88 package*

## Military Notification

An instance of class **Military Notification** is a secondary information object conveyed between users in Military Messaging It reports to the originator of an MM a particular recipient's receipt or non-receipt of that MM.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Conversion EITs*	Object (EITs)	-	0-1	-
IPM Intended Recipient*	Object (OR Descriptor)	-	0-1	-
IPN Originator*	Object (OR Descriptor)	-	0-1	-
Notification Extensions*	Object (IPMS Extension)	-	0-*	-
Subject IPM*	Object (IPM Identifier)	-	1	-

*Chapter 2: Note: Attribute types marked \* are taken from the IM88 package*

## Military Other Notification

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Acp127 Notification Response	Object (Acp127 Notification Response)	-	1	-

## Military Receipt Notification

An instance of class **Military Receipt Notification** reports its originator's receipt, or his expected and arranged future receipt , of an MM.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Receipt Time*	String(UTCTime)	-	1	-
Acknowledgement Mode*	Enumeration (Acknowledgment Mode)	-	1	0
Recipient Extensions*	Object (IPMS Extension)	-	0-1	-
Supplementary Receipt Information*	String (Printable)	1-256	0-1	-

*Chapter 3: Note: Attribute types marked \* are taken from the IM88 package*

## MM Message Body Part

An instance of class **MM Message Body Part** is used to convey an forwarded message which is unencrypted.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Delivery Time	String (UTCTime)	-	0-1	-
Delivery Envelope	Object (Delivery Envelope)	-	1	-
MM Data	Object (Military Message)	-	1	-

## Other Recipient Designator

An instance of class **Other Recipient Designator** indicates the name of a recipient, as well as the category (primary or copy) in which they have been placed, that is intended to receive, or has received, the message via means other than the MMHS.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Type	Integer	-	1	-
Designator	String (Printable)	1-69	1	-

## Pilot Information

An instance of class **Pilot Information** indicates ACP127 related useful information, which equals or supersedes the received header information for precedence, classification, local handling instruction and addressing.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Pilot Precedence	Integer	-	0-1	-
Pilot Recipient	Object (OR Descriptor)	-	0-*	-
Pilot Security	Object (Security Label)	-	0-1	-
Pilot Handling	String (Printable)	1-69	0-*	-

## Security Information Labels

An instance of class **Security Information Labels** indicates that a security label has been assigned to the complete message content, the heading of the message or one or more of the message bodyparts.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Content Security Label	Object (Security Label)	-	0-1	-
Heading Security Label	Object (Security Label)	-	0-1	-
Bodypart Security Labels	Object (Bodypart Security Label)	-	0-*	-

## Syntax Definitions

This section defines the S4 enumeration syntaxes.

### Acp127NotificationType

An instance of enumeration syntax Acp127NotificationType indicates either the type of Acp127 Notification which is being requested or the type of a notification which has been received. Its value is chosen from one of the following:

#### **negative-notification**

An indication that the subject message has failed to reach a gateway to an ACP127 domain.

#### **positive-notification**

An indication that the subject message has successfully reached a gateway to an ACP127 domain.

**transfer-notification**

An indication that the subject message has been transferred through a gateway to an ACP127 domain.

**Priority Level Qualifier**

An instance of enumeration syntax PriorityLevelQualifier enhances the standard message priority field to provide six possible levels of military precedence. Its value can be either **low** or **high**.

**Precedence**

Precedence is defined as an Integer syntax, to match the ASN.1 definitions in STANAG 4406, but it has a small set of defined values: **deferred**, **routine**, **priority**, **immediate**, **flash** and **override**.

# Extensions to IM Package

## Summary

This chapter defines the extensions to the standard Interpersonal Messaging package which are provided within the Isode XAPI implementation.

## Class Hierarchy

This section defines the additional IM classes. Subclassification is indicated by indentation. The names of abstract classes are in italics. Thus, for example, **File Transfer Body Part** is an immediate subclass of *Body Part*, an abstract class. The names of classes to which the *om\_encode()* function applies are in bold. The *om\_create()* function applies to all concrete classes.

*Object* (defined in the referenced **XOM** specification)

• *Body Part* (defined in the referenced **IM** specification)

- **File Transfer Body Part**
- **Mime Generic Body Part**
- **Mime Gif Body Part**
- **Mime Jpeg Body Part**
- **Mime Postscript Body Part**
- **Forwarded Content Body Part**

• **File Transfer Document Type**

• **File Transfer File Attributes**

• **Mime Content Parameters**

• **Mime Parameters**

**Note:** The identifier for the variable name of type OM\_STRING of a class in the Interpersonal Messaging Package can usually be derived using the name of the class, preceded by "IM\_C\_" and replacing a blank space with an underscore. To be in line with the ANSI C language limitation, some words in the class names are excepted and are abbreviated as below:

BODY\_PART is abbreviated as BD\_PRT

## Class Definitions

This section defines the additional IM classes which are added by the Isode XAPI implementation. It describes the attributes specific to a class in a table like those used in the referenced **XOM** Specification. It also describes the extra attributes which are added to some standard IM classes.

## File Transfer Body Part

An instance of class **File Transfer Body Part** is used to convey data files.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
FTBP Document Type	Object (File Transfer Document Type)	-	0-1	-
Environment Application Reference	String (Object Identifier)	-	0-1	-
File Attributes	Object (File Transfer File Attributes)	-	0-1	-
Ftbp Data	String (Octet)	-	0-*	-

## File Transfer Document Type

An instance of class **File Transfer Document Type** is used to convey information about the types of data files.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Document Type Name	String (Object Identifier)	-	1	-

## File Transfer File Attributes

An instance of class **File Transfer File Attributes** is used to convey information about data files.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Object Size	Integer	-	0-1	-
Pathname	String (Graphic)	-	0-*	-

## Forwarded Content Body Part

An instance of class **Forwarded Content Body Part** gives a means of forwarding an arbitrary content type plus optionally the envelope which accompanied it.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Forwarded Content Type	String (Object Identifier)	-	1	-

Forwarded Content Parameters	Object (Delivery Envelope)	-	0-1	-
Forwarded Content Data	Object (Content)	-	1	-

## Mime Content Parameters

An instance of class **Mime Content Parameters** conveys a single MIME parameter type/value pair.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Parameter	String (IA5)	-	1	-
Parameter Value	String (IA5)	-	1	-

## Mime Parameters

An instance of class **Mime Parameters** is used to convey the parameters of a MIME bodypart.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Content Type	String (IA5)	-	1	-
Content Parameters	Object (Mime Content Parameters)	-	0-*	-
Other Header Fields	String (IA5)	-	0-*	-

## Mime Generic Body Part

An instance of class **Mime Generic Body Part** is used to convey a MIME bodypart.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Mime Parameters	Object (Mime Parameters)	-	1	-
Mime Data	String (Octet)	-	1	-

## Mime Gif Body Part

An instance of class **Mime Gif Body Part** is used to convey a GIF image.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Gif Data	String (Octet)	-	0-*	-

## Mime Jpeg Body Part

An instance of class **Mime Jpeg Body Part** is used to convey a JPEG image.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Jpeg Data	String (Octet)	-	0-*	-

## Mime Postscript Body Part

An instance of class **Mime Postscript Body Part** is used to convey a Postscript file.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Postscript Data	String (Octet)	-	0-*	-

## Recipient Specifier

The **Recipient Specifier** class specified in the **IM** Specification is extended with the extra attributes shown below.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Acp127 Notification Request	Integer	-	0-1	-
Precedence	Integer	-	0-1	-

## Interpersonal Message

The **Interpersonal Message** class specified in the **IM** Specification is extended with the extra attributes shown below.

<b>Attribute</b>	<b>Value Syntax</b>	<b>Value Length</b>	<b>Value Number</b>	<b>Value Initially</b>
Authorization Time	String (Generalised Time)	-	0-1	-
Originators Reference	Object (UniversalOrBMPString)	-	0-1	-
Precedence Policy Identifier	String (Object Identifier)	-	0-1	-

# Extensions to MH Package

## Summary

This chapter defines the extensions to the standard Message Handling package which are provided within the Isode XAPI implementation.

## Class Hierarchy

This section defines the additional MH classes. Subclassification is indicated by indentation. The names of abstract classes are in italics. The names of classes to which the *om\_encode()* function applies are in bold. The *om\_create()* function applies to all concrete classes.

*Object* (defined in the referenced **XOM** specification)

- UniversalOrBMPString**

**Note:** The identifier for the variable name of type OM\_STRING of a class in the Message Handling Package can usually be derived using the name of the class, preceded by “MH\_C\_” and replacing a blank space with an underscore. To be in line with the ANSI C language limitation, some words in the class names are excepted and are abbreviated as below

## Class Definitions

This section defines the additional MH classes which are added by the Isode XAPI implementation. It also defines the modifications to standard MH classes which are added by the Isode XAPI implementation. It describes the attributes specific to a class in a table like those used in the referenced **XOM** Specification.

### UniversalOrBMPString

An instance of class **UniversalOrBMPString** is used to convey a string using either the BMPString or UniversalString syntax, together with a language code. Note that either the “Two Octets” or the “Four Octets” attribute must be present in the object.

Attribute	Value Syntax	Value Length	Value Number	Value Initially
Two Octets	String (BMP)	-	0-1	-
Four Octets	String (Universal)	-	0-1	-
Iso 639 Language Code	String (Printable)	-	0-1	-

## Message

The **Message** class specified in the MH Specification is extended with the extra attribute shown below.

<b>Attribute</b>	<b>Value Syntax</b>	<b>Value Length</b>	<b>Value Number</b>	<b>Value Initially</b>
Priority Level Qualifier	Enumeration (Priority Level Qualifier)	-	0-1	-

## Extensions to OM Syntaxes

The **BMPString** OM String syntax is added to enable the **UniversalOrBMPString** class to be specified correctly. The **UniversalString** OM syntax, which was already defined by the XOM Specification but missing from the Isode Limited implementation of the API is added. A **UTF8String** syntax is also added for completeness, but is not currently used in any class definitions.

The contents octets of an OM String which has the **BMPString** syntax are assumed to contain characters encoded using the two-byte BMP (Basic Multilingual Plane) scheme. Similarly, the contents octets of an OM String which has the **UniversalString** syntax are assumed to contain characters encoded using the four-byte ISO-10646 scheme.

# Appendix A: Referenced Documents

## **MH / IM**

API to Electronic Mail (X.400), Issue 3, X/Open CAE Specification, C609,  
ISBN 1-85912-185-3

(Note: this contains both the **MH** and **IM** package specifications)

## **XOM**

OSI-Abstract-Data Manipulation API (XOM), Issue 3, X/Open CAE  
Specification, C607, ISBN 1-85912-175-6

## **STANAG 4406**

Military Message Handling System, Edition 2, March 1999.

## **X.420**

ITU-T Recommendation X.420, 06/1999.