Isode

Military Messaging Application Profile for use with XML Guard

20th February 2025

1 Overview

This white paper specifies an Application Profile for Isode's Military Messaging XML protocol with an XML Guard. It defines:

- Schema for the Application Profile
- Normalization Requirements
- Rules which can be used to constrain the base profile

Application Profiles are summarized in the Isode white paper "XML Guard Application Profiles". They define a product-independent approach to specify functionality across an XML Guard.

Goals of this specification:

- To provide a clear specification to enable system accreditation of a system using Isode's Military Messaging Cross Domain products.
- To enable use of a third party XML Guard with Isode's Military Messaging.

2 Military Messaging XML Protocol

M-Switch processes messages with various military formats, including ACP 127, STANAG 4406 and SMTP. The M-Switch Edge component converts these to the XML format specified here. This is transferred through M-Guard across the domain boundary to another M-Switch Edge.

Details are provided in the Isode white paper "Cross Domain Military Messaging".

M-Switch Edge communicates using Isode's open GCXP (Guard Content Exchange Protocol) with the XML message format specified in this document.

This communication can use M-Guard or another XML Guard to provide red/black separation.

3 Profile Summary

This profile is based on the Military Messaging XML schema, which defines the XML messages exchanged and is specified below. The Schema, specified as an XML Schema Definition (XSD), specifies an “outer bound” for what is allowed through the guard.

The associated rules then constrain this schema, by blocking elements of the schema. This allows the messages being passed to be more tightly checked

4 Cross Protection Requirements

Cross Domain checking will usually include security label checking.

The information being transferred needs to be limited to what is needed and to avoid sharing of unnecessary information.

Rules as part of this application can constrain the information further, in order to reduce potential for covert signaling.

5 Mapping Messages to XML

Broadly the XML specification provides a logical equivalent to SMTP messages. Some information will be discarded in particular:

1. Message Headers that are not represented in the XML are discarded.
2. RFC 5322 comments are discarded.
3. S/MIME signatures and encryption are not mapped.

6 Normalization

This profile requires the following normalization of FAB messages:

- Prohibition of XML Comments and XML Processing Instructions.
- Use of Canonical XML. Following Canonical XML Version 1.1 of May 2008.
- Unicode Normalization following UNICODE NORMALIZATION FORMS 13.0.0 using Normalization Form C (NFC) “Canonical Decomposition, followed by Canonical Composition”

7 Rules

This version of the Application Profile defines the following associated rules, that may be enabled to further constrain the base schema.

Note that all rules are “block” rules, which constrain what is sent. All rules work independently. Some rules are formulated as “allow”, such as "Allowed Recipients”, which works as “if rule is enabled, recipients other than the ones listed are blocked”. A consequence of this is that it will only be sensible to use one rule to constrain a specific type. For example, if “Allowed Recipients” is used, then “Allowed Recipient Domains” will have no useful effect.

Rule	Notes
Header Fields Not Allowed	For each header field in the schema, there is a rule which if enabled will block a message that contains that header field of the outer message
ESS Security Label Required	A message without an ESS security label in the outer message will be blocked
STANAG 4774 Security Label Required	A message without a STANAG 4774 security label in the outer message will be blocked
ESS Security Label Prohibited	A message with an ESS security label in the outer message or forwarded will be blocked
STANAG 4774 Security Label Prohibited	A message with a STANAG 4774 security label in the outer message or forwarded will be blocked
Valid ESS Security Labels	A message with an ESS security label not in the configured list will be blocked. This check applies to the outer message and forwarded messages.
Valid STANAG 4774 Security Labels	A message with a STANAG 4774 security label not in the configured list will be blocked. This check applies to the outer message and forwarded messages.
Allowed Recipients	This applies to envelope recipients. If any recipient does not match a listed recipient, it will be blocked.
Allowed Recipient Domains	This applies to envelope recipients. If the domain of recipient email address does not exactly match a listed domain, it will be blocked.
Allowed Recipient Subdomains	This applies to envelope recipients. If the domain of recipient email address does not match a listed subdomain (e.g., site.nato.int matches nato.int) it will be blocked.
Allowed From	This applies to From header field of the outer message If the address does not match a listed address, it will be blocked. Addresses specified in style “commander@nato.int”
Allowed Full From	This applies to From header field of the outer message If the address does not fully match a listed address, it will be blocked. Addresses specified in style “Commander <commander@nato.int>"

Rule	Notes
Allowed From Domains	This applies to From header field of the outer message. If the domain of from address does not exactly match a listed domain, it will be blocked.
Allowed From Subdomains	This applies to From header field of the outer message If the domain of from address does not match a listed subdomain (e.g., site.nato.int matches nato.int) it will be blocked.
Allowed Addresses in Recipient Header Fields	This applies to recipient header fields (Action, Info, Exempt) of the outer message If an address does not match a listed address, it will be blocked. Addresses specified in style “commander@nato.int”
Allowed Full Addresses in Recipient Header Fields	This applies to recipient header fields (Action, Info, Exempt) of the outer message If an address does not fully match a listed address, it will be blocked. Addresses specified in style “Commander <commander@nato.int>"
Allowed Domains in Recipient Header fields	This applies to recipient header fields (Action, Info, Exempt) of the outer message If the domain of an address does not exactly match a listed domain, it will be blocked.
Allowed Subdomains in Recipient Header fields	This applies to recipient header fields (Action, Info, Exempt) of the outer message If the domain of an address does not match a listed subdomain (e.g., site.nato.int matches nato.int) it will be blocked.
Max Elements	For all header fields such as Action where the single header field allows multiple values of an element, a rule will be available to specify the maximum number values. This applies to outer message and forwarded messages.
Maximum Subject Length	The longest allowed subject header field. This applies to outer message and forwarded messages.
Maximum Text Body size	Upper limit for text body. This limit is applied to plain text and MTF data bodies. This applies to outer message and forwarded messages.
Maximum Body size	Upper limit for any data body (text, MTF, XML, HTML, Other). This applies to outer message and forwarded messages.

Rule	Notes
Forwarded Messages Not Allowed	If set, forwarded messages are blocked
Max Forwarded Message Depth	If set, this integer constrains the level of nesting of forwarded messages. If set to 1, the outer message can contain forwarded messages, but the forwarded messages cannot contain forwarded messages.
Max number forwarded messages	Maximum number of forwarded messages directly contained within a single message. This rules applies to outer message and to messages that are forwarded.
Maximum body parts	Maximum number of body parts in a message. This applies to outer message and forwarded messages.
Text messages only	Messages with any other body part types will be blocked. This applies to outer message and forwarded messages.
ITA2	Message subject and body parts constrained to ITA2 character set. This applies to outer message and forwarded messages.
IA5	Message subject and body parts constrained to IA5 character se. This applies to outer message and forwarded messages.t
Dirty Words	If any of the listed words found in subject or body text, message will be blocked. The term “dirty words” is well known, but this rule is more likely to be used to prevent use of sensitive words rather than remove profanity. This applies to outer message and forwarded messages.

8 Isode Application Profile Product

Isode provides an Military Messaging Cross Domain Application Profile product that follows this specification. This profile will enable M-Guard to provide a guard compliant to this profile.

9 Schema

The Military Messaging protocol schema is specified in this section.

9.1 Example Messages

This is a short example message, showing basic encoding and an ESS Security Label.

```
<TransferredMessage xmlns="http://isode.com/m-switch/edge/0">
        <MessageAndEnvelope>
                <Envelope>
```

```
                    <MessageRecipient>
                              <SMTPAddress>
                                        <LocalPart>Joe.Blogs</LocalPart>
                                        <Domain>example.com</Domain>
                              </SMTPAddress>
                    </MessageRecipient>
          </Envelope>
          <Message>
                    <Heading>
                              <Message-ID>ESSExample</Message-ID>
                              <ESSSecurityLabel>MQYCAQQGASk=</ESSSecurityLabel>
                              <Subject>Example ESS Label Message</Subject>
                              <From>
                                        <Mailbox>
                                                  <SMTPAddress>
                                                            <LocalPart>Carl.Ook</LocalPart>
                                                            <Domain>example.com</Domain>
                                                  </SMTPAddress>
                                                  <DisplayName>Captain</DisplayName>
                                        </Mailbox>
                              </From>
                              <Action>
                                        <Address>
                                                  <Mailbox>
                                                            <SMTPAddress>
                                                                      <LocalPart>Joe.Blogs</LocalPart>
                                                                      <Domain>example.com</Domain>
                                                            </SMTPAddress>
                                                            <DisplayName>Private</DisplayName>
                                                  </Mailbox>
                                        </Address>
                              </Action>
                    </Heading>
                    <Body>
                              <DataBody>
                                        <PlainTextBody>Hi


          Message with an example ess label.


          Thanks</PlainTextBody>
                                        <MIMEType>text</MIMEType>
                              </DataBody>
                    </Body>
          </Message>
</MessageAndEnvelope>
<Audit-ID>Audit ExampleESS</Audit-ID>
</TransferredMessage>
```

A short example with a STANAG 4774 label<<?xml version="1.0" encoding="UTF-8"?>

```
<TransferredMessage xmlns="http://isode.com/m-switch/edge/0">
  <MessageAndEnvelope>
    <Envelope>
      <Priority>
        <STANAG4406Priority>OVERRIDE</STANAG4406Priority>
      </Priority>
      <DeliverBy>2029-12-31T09:00:00</DeliverBy>
      <MessageRecipient>
        <SMTPAddress>
          <LocalPart>jm</LocalPart>
          <Domain>isode.com</Domain>
        </SMTPAddress>
      </MessageRecipient>
    </Envelope>
    <Message>
      <Heading>
        <Message-ID>&lt;d6707ab5-21cb-4b43-b919-0dbee40ac06d@myhost&gt;</Message-ID>
        <STANAG4774SecurityLabel>
          <originatorConfidentialityLabel ReviewDateTime="2025-02-17T13:48:02">
            <ConfidentialityInformation xmlns="urn:nato:stanag:4774:confidentialitymetadatalabel:1:0">
              <PolicyIdentifier URI="urn:oid:1.3.6.1.4.1.453.25.5.13">NATO</PolicyIdentifier>
              <Classification>RESTRICTED</Classification>
              <Category TagName="Releasable to" Type="PERMISSIVE" URI="urn:oid:1.3.6.1.4.1.453.25.5.13.1.2">
                <GenericValue>NATO</GenericValue>
              </Category>
            </ConfidentialityInformation>
            <CreationDateTime xmlns="urn:nato:stanag:4774:confidentialitymetadatalabel:1:0">2025-02-
10T13:48:02</CreationDateTime>
          </originatorConfidentialityLabel>
        </STANAG4774SecurityLabel>
        <Date>2025-02-10T14:48:02+01:00</Date>
        <Subject>NATO restricted message</Subject>
        <From>
          <Mailbox>
            <SMTPAddress>
              <LocalPart>user1</LocalPart>
              <Domain>example.com</Domain>
            </SMTPAddress>
            <DisplayName>"Test Person user1"</DisplayName>
          </Mailbox>
        </From>
        <Action>
          <Address>
            <Mailbox>
              <SMTPAddress>
                <LocalPart>user2</LocalPart>
                <Domain>example.com</Domain>
              </SMTPAddress>
              <DisplayName>"user2@example.com"</DisplayName>
            </Mailbox>
```

```
          </Address>
        </Action>
        <MilitaryHeaders>
          <DTG>2025-02-10T13:46:54Z</DTG>
          <ActionPrecedence>
            <STANAG4406Priority>ROUTINE</STANAG4406Priority>
          </ActionPrecedence>
          <InfoPrecedence>
            <STANAG4406Priority>ROUTINE</STANAG4406Priority>
          </InfoPrecedence>
        </MilitaryHeaders>
      </Heading>
      <Body>
        <DataBody>
          <PlainTextBody>Message content.&#13;
&#13;
</PlainTextBody>
          <MIMEType>text</MIMEType>
          <MIMESubType>plain</MIMESubType>
        </DataBody>
      </Body>
    </Message>
  </MessageAndEnvelope>
  <Audit-ID>0</Audit-ID>
</TransferredMessage>
```

A longer example, containing common military messaging features.

```
<TransferredMessage
          xmlns="http://isode.com/m-switch/edge/0">
          <MessageAndEnvelope>
                    <Envelope>
                              <Priority>
                                        <STANAG4406Priority>IMMEDIATE</STANAG4406Priority>
                              </Priority>
                              <MessageRecipient>
                                        <SMTPAddress>
                                                  <LocalPart>bayern</LocalPart>
                                                  <Domain>bayern.de</Domain>
                                        </SMTPAddress>
                              </MessageRecipient>
                    </Envelope>
                    <Message>
                              <Heading></Heading>
                              <Body>
                                        <Message>
```

```
                                        <Heading>
                                                <Message-ID>&lt;1470cabb-56f2-4523-bc39-
5da5f82db8a1@gosport.uk&gt;</Message-ID>
        <ESSSecurityLabel>MQ8CAQIGCisGAQQBg0UZBQ0=</ESSSecurityLabel>
                                                <Date>2025-01-27T08:44:55Z</Date>
                                                <Subject>DEMO MESSAGE</Subject>
                                                <From>
                                                        <Mailbox>
                                                                <SMTPAddress>
        <LocalPart>joint.hq</LocalPart>
                                                                        <Domain>navcom.uk</Domain>
                                                                </SMTPAddress>
                                                                <DisplayName>"JOINT HQ"</DisplayName>
                                                        </Mailbox>
                                                </From>
                                                <Action>
                                                        <Address>
                                                                <Mailbox>
                                                                        <SMTPAddress>
        <LocalPart>bayern</LocalPart>
        <Domain>bayern.de</Domain>
                                                                        </SMTPAddress>
        <DisplayName>BAYERN</DisplayName>
                                                                </Mailbox>
                                                        </Address>
                                                </Action>
                                                <Info>
                                                        <Address>
                                                                <Mailbox>
                                                                        <SMTPAddress>
        <LocalPart>rome</LocalPart>
        <Domain>rome.it</Domain>
                                                                        </SMTPAddress>
        <DisplayName>ROME</DisplayName>
                                                                </Mailbox>
                                                        </Address>
                                                </Info>
                                                <MilitaryHeaders>
                                                        <DTG>2025-01-27T08:43:30Z</DTG>
                                                        <MessageType>
                                                                <PrimaryType>Operation</PrimaryType>
                                                                <SubType>"Desert Fox"</SubType>
                                                        </MessageType>
                                                        <SIC>AEC</SIC>
                                                        <SIC>AFD</SIC>
```

```
                                                                <ActionPrecedence>
          <STANAG4406Priority>IMMEDIATE</STANAG4406Priority>
                                                                </ActionPrecedence>
                                                                <InfoPrecedence>
          <STANAG4406Priority>PRIORITY</STANAG4406Priority>
                                                                </InfoPrecedence>
                                                        </MilitaryHeaders>
                                                </Heading>
                                                <Body>
                                                        <DataBody>
                                                                <PlainTextBody>MSGID/UNITPOSREP/01/IRIS FORMS/14-
05-2024//&#xD;
UNITPOS/U36/GC/SUB/54N010E/141055Z//&#xD;
UNITPOS/F218/GC/SHIP/54N007E/141104Z//&#xD;
</PlainTextBody>
                                                                <MIMEType>text</MIMEType>
                                                                <MIMESubType>plain</MIMESubType>
                                                        </DataBody>
                                                </Body>
                                        </Message>
                                </Body>
                        </Message>
          </MessageAndEnvelope>
          <Audit-ID>0</Audit-ID>
</TransferredMessage>
```

9.2 Schema Specification

This is the formal XML Schema Definition:

```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
    xmlns="http://isode.com/m-switch/edge/0"
    xmlns:slab="urn:nato:stanag:4774:confidentialitymetadatalabel:1:0"
    xml:lang="en"
    targetNamespace="http://isode.com/m-switch/edge/0"
    elementFormDefault="qualified"
    attributeFormDefault="unqualified">


  <xs:import namespace="urn:nato:stanag:4774:confidentialitymetadatalabel:1:0"
schemaLocation="urn:nato:stanag:4774:confidentialitymetadatalabel:1:0"/>


  <xs:element name="Address">
    <xs:annotation>
      <xs:documentation>RFC 5322 Address List: 'address-list = (address *("," address))' with 'address: mailbox /
group'</xs:documentation>
    </xs:annotation>
    <xs:complexType>
      <xs:choice maxOccurs="unbounded">
        <xs:element ref="Group"/>
```

```
      <xs:element ref="Mailbox"/>
    </xs:choice>
  </xs:complexType>
</xs:element>

<xs:complexType name="Address-Filter">
  <xs:complexContent>
    <xs:extension base="Address-Wrapper">
      <xs:attribute name="filter">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:pattern value=""/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="Address-Wrapper">
  <xs:sequence>
    <xs:element ref="Address"/>
  </xs:sequence>
</xs:complexType>

<xs:element name="Body">
  <xs:complexType>
    <xs:choice>
      <xs:element ref="DataBody"/>
      <xs:element ref="Message"/>
      <xs:element ref="Multipart"/>
    </xs:choice>
  </xs:complexType>
</xs:element>

<xs:element name="DataBody">
  <xs:complexType>
    <xs:sequence>
      <xs:choice>
        <xs:element name="PlainTextBody" type="xs:string">
          <xs:annotation>
            <xs:documentation>Plain Text Encoded Body Part (UTF-8 or ASCII encoding) - text/plain.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="HTML" type="xs:string">
          <xs:annotation>
            <xs:documentation>HTML Encoded Body Part - text/html.</xs:documentation>
          </xs:annotation>
        </xs:element>
```

```
          <xs:element name="XML" type="xs:string">
            <xs:annotation>
              <xs:documentation>XML Encoded Body Part - text/xml.</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element name="MTF" type="xs:string">
            <xs:annotation>
              <xs:documentation>Military messaging form (MTF format) such as ADatP-3.</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element name="OtherBody" type="xs:base64Binary">
            <xs:annotation>
              <xs:documentation>Other attachment formats such as Word, JPEG  or PDF, base64 encoded. Type identified by
MIMEType.</xs:documentation>
            </xs:annotation>
          </xs:element>
        </xs:choice>
        <xs:element name="STANAG4774SecurityLabel" type="STANAG4774SecurityLabelType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>This is a STANAG 4474 label bound to an attachment. This might be embedded in the
attachment or use a generic binding mechanism such as 4778-2 OPC. The higher level 4778 bindings are expected to
include this in the item binding.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="MIMEType" type="xs:string">
          <xs:annotation>
            <xs:documentation>MIME type, such as "text" or "application".</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="MIMESubType" type="xs:string" minOccurs="0">
          <xs:annotation>
            <xs:documentation>Subtype such as "plain" or "html" for "text", "xml" for "application" or "gif" for
"image".</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="TransferEncoding" minOccurs="0">
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:enumeration value="base64"/>
              <xs:enumeration value="quoted-printable"/>
              <xs:enumeration value="7bit"/>
              <xs:enumeration value="8bit"/>
              <xs:enumeration value="binary"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="ID" type="xs:string" minOccurs="0">
          <xs:annotation>
            <xs:documentation>To hold value of 'MIME Content-Id: {ID}'.</xs:documentation>
          </xs:annotation>
        </xs:element>
```

```
        <xs:element name="Disposition" type="xs:string" minOccurs="0">
          <xs:annotation>
            <xs:documentation>To hold the primary (attachment/inline) value of 'MIME Content-Disposition:
{Disposition}; ...'.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="FileName" type="xs:string" minOccurs="0">
          <xs:annotation>
            <xs:documentation>To hold the file name value of 'MIME Content-Disposition: ...;
filename="{FileName}"'.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="Description" type="xs:string" minOccurs="0">
          <xs:annotation>
            <xs:documentation>To hold MIME 'Content-Description: {Description}'.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="Language" type="xs:string" minOccurs="0" maxOccurs="unbounded">
          <xs:annotation>
            <xs:documentation>To hold MIME 'Content-Language: de-DE, en-CA'.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>

  <xs:simpleType name="DateTime-Wrapper">
      <xs:restriction base="xs:dateTime"></xs:restriction>
  </xs:simpleType>

  <xs:complexType name="DateTime-Filter">
    <xs:simpleContent>
      <xs:extension base="DateTime-Wrapper">
        <xs:attribute name="filter">
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:pattern value=""/>
                </xs:restriction>
            </xs:simpleType>
        </xs:attribute>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>

  <xs:element name="Envelope">
    <xs:annotation>
      <xs:documentation>Information from the address (addr) envelope.</xs:documentation>
    </xs:annotation>
    <xs:complexType>
      <xs:sequence>
```

```
        <xs:element name="Priority" minOccurs="0">
          <xs:annotation>
            <xs:documentation>priority: STANAG 4406 message priority indicating the priority to be used in Message
Transfer (MTS).</xs:documentation>
          </xs:annotation>
          <xs:complexType>
            <xs:sequence>
              <xs:element ref="STANAG4406Priority"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="DeliverBy" type="xs:dateTime" minOccurs="0">
          <xs:annotation>
            <xs:documentation>latest-time: Delivery By Time. This indicates a message with time limited validity.
Message may be discarded after this time (e.g, in queue for slow link).</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="MessageRecipient" maxOccurs="unbounded">
          <xs:annotation>
            <xs:documentation>recip: List of recipients</xs:documentation>
          </xs:annotation>
          <xs:complexType>
            <xs:sequence>
              <xs:element ref="SMTPAddress"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>


  <xs:simpleType name="ESSSecurityLabel">
    <xs:restriction base="xs:base64Binary"></xs:restriction>
  </xs:simpleType>


  <xs:complexType name="ESSSecurityLabel-Filter">
    <xs:simpleContent>
      <xs:extension base="ESSSecurityLabel">
        <xs:attribute name="filter">
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:pattern value=""/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>


  <xs:element name="Group">
```

```
  <xs:annotation>
    <xs:documentation>RFC 5322 - group: display-name: [group-list];</xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
      <xs:element name="DisplayName" type="xs:string"/>
      <xs:element ref="Mailbox" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

<xs:complexType name="Importance-Filter">
  <xs:simpleContent>
    <xs:extension base="Importance-Wrapper">
      <xs:attribute name="filter">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:pattern value=""/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

<xs:simpleType name="Importance-Wrapper">
    <xs:restriction base="xs:string">
      <xs:enumeration value="Low"/>
      <xs:enumeration value="Normal"/>
      <xs:enumeration value="High"/>
    </xs:restriction>
</xs:simpleType>

<xs:element name="Mailbox">
  <xs:annotation>
    <xs:documentation>
      RFC 5322 - name-addr / addr-spec: [display-name] &lt;addr-spec&gt;
      SMTP address along with display name - "Joe Bloggs" &lt;jb@isode.com&gt;.</xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="SMTPAddress"/>
      <xs:element name="DisplayName" type="xs:string" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

<xs:complexType name="Mailbox-Filter">
  <xs:complexContent>
```

```
    <xs:extension base="Mailbox-Wrapper">
      <xs:attribute name="filter">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:pattern value=""/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="Mailbox-List-Filter">
  <xs:complexContent>
    <xs:extension base="Mailbox-List-Wrapper">
      <xs:attribute name="filter">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:pattern value=""/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="Mailbox-List-Wrapper">
  <xs:sequence>
    <xs:element ref="Mailbox" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="Mailbox-Wrapper">
  <xs:sequence>
    <xs:element ref="Mailbox"/>
  </xs:sequence>
</xs:complexType>

<xs:element name="Message">
  <xs:annotation>
    <xs:documentation/>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
      <xs:element name="MIMEType" type="xs:string" minOccurs="0"/>
      <xs:element name="MIMESubType" type="xs:string" minOccurs="0"/>
      <xs:element name="Disposition" type="xs:string" minOccurs="0"/>
      <xs:element name="FileName" type="xs:string" minOccurs="0"/>
      <xs:element name="Heading" minOccurs="0">
```

```
          <xs:annotation>
            <xs:documentation>Heading may be omitted, which could be useful in some scenarios. In most messages, it
will be present.</xs:documentation>
          </xs:annotation>
          <xs:complexType>
            <xs:sequence>
              <xs:element name="Message-ID" type="Message-ID-Filter" minOccurs="0">
                <xs:annotation>
                  <xs:documentation>Mandatory in RFC 5322 and will usually be present.</xs:documentation>
                </xs:annotation>
              </xs:element>
              <xs:element name="ESSSecurityLabel" type="ESSSecurityLabel-Filter" minOccurs="0">
                <xs:annotation>
                  <xs:documentation>SIO Label (ESS only), with the value encoded as the "SIO-Label:" header specified
in RFC 7444.</xs:documentation>
                </xs:annotation>
              </xs:element>
              <xs:element name="STANAG4774SecurityLabel" type="STANAG4774SecurityLabelType" minOccurs="0">
                <xs:annotation>
                  <xs:documentation>STANAG 4774 Label (ESS only), with the value encoded as the "Binding-Data:"
header.</xs:documentation>
                </xs:annotation>
              </xs:element>
              <xs:element name="Date" type="DateTime-Filter" minOccurs="0">
                <xs:annotation>
                  <xs:documentation>RFC 5322 Date. Mandatory in messages and will usually be present. Used as filing
time in military messages.</xs:documentation>
                </xs:annotation>
              </xs:element>
              <xs:element name="In-Reply-To" type="Message-List-Filter" minOccurs="0"/>
              <xs:element name="References" type="Message-List-Filter" minOccurs="0"/>
              <xs:element name="Supersedes" type="Message-List-Filter" minOccurs="0"/>
              <xs:element name="Subject" type="String-Filter" minOccurs="0"/>
              <xs:element name="From" type="Mailbox-Filter" minOccurs="0">
                <xs:annotation>
                  <xs:documentation>From: / Originator</xs:documentation>
                </xs:annotation>
              </xs:element>
              <xs:element name="Sender" type="Mailbox-Filter" minOccurs="0">
                <xs:annotation>
                  <xs:documentation>Sender: / Originator</xs:documentation>
                </xs:annotation>
              </xs:element>
              <xs:element name="Action" type="Address-Filter" minOccurs="0">
                <xs:annotation>
                  <xs:documentation>Action recipients. Carried in RFC 5322 To: header.</xs:documentation>
                </xs:annotation>
              </xs:element>
              <xs:element name="Info" type="Address-Filter" minOccurs="0">
                <xs:annotation>
                  <xs:documentation>Info recipients. Carried in RFC 5322 Cc: header.</xs:documentation>
```

```
      </xs:annotation>
    </xs:element>
    <xs:element name="Bcc" type="Address-Filter" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          Bcc recipients. Carried in RFC 5322 Bcc: header.
          This can be empty.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Reply-To" type="Address-Filter" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          Reply-To recipients. Carried in RFC 5322 Reply-To: header.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="MilitaryHeaders">
      <xs:annotation>
        <xs:documentation>Standard military headers taken from RFC 6477.</xs:documentation>
      </xs:annotation>
      <xs:complexType>
        <xs:sequence>
          <xs:element name="DTG" type="DateTime-Filter" minOccurs="0">
            <xs:annotation>
              <xs:documentation>MMHS-Extended-Authorisation-Info: header DTG.</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element name="MessageType" type="MessageType-Filter" minOccurs="0">
            <xs:annotation>
              <xs:documentation>MMHS-Message-Type: header (e.g.,  Exercise, Trident
Warrior).</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element name="SIC" type="SIC-Filter" minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
              <xs:documentation>MMHS-Subject-Indicator-Codes: header.</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element name="AuthorisingUsers" type="Mailbox-List-Filter" minOccurs="0">
            <xs:annotation>
              <xs:documentation>MMHS-Authorizing-Users: header.</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element name="ActionPrecedence" type="STANAG-Precedence-Filter" minOccurs="0">
            <xs:annotation>
              <xs:documentation>MMHS-Primary-Precedence: header.</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element name="InfoPrecedence" type="STANAG-Precedence-Filter" minOccurs="0">
```

```
                    <xs:annotation>
                      <xs:documentation>MMHS-Copy-Precedence: header.</xs:documentation>
                    </xs:annotation>
                  </xs:element>
                  <xs:element name="Exempt" type="Address-Filter" minOccurs="0">
                    <xs:annotation>
                      <xs:documentation>MMHS-Exempted-Address: header.</xs:documentation>
                    </xs:annotation>
                  </xs:element>
                </xs:sequence>
              </xs:complexType>
            </xs:element>
            <xs:element name="ACP127Headers" minOccurs="0">
              <xs:annotation>
                <xs:documentation>RPF 6477 headers used only for messages converted from ACP 127.</xs:documentation>
              </xs:annotation>
              <xs:complexType>
                <xs:sequence>
                  <xs:element name="ACP127OriginatorReference" type="String-Filter" minOccurs="0">
                    <xs:annotation>
                      <xs:documentation>MMHS-Originator-Reference: header.</xs:documentation>
                      <xs:documentation>Fields starting with ACP 127 will generally only be generated from ACP 127
and related protocol systems.</xs:documentation>
                    </xs:annotation>
                  </xs:element>
                  <xs:element name="HandlingInstructions" type="String-Filter" minOccurs="0">
                    <xs:annotation>
                      <xs:documentation>MMHS-Handling-Instructions: header.</xs:documentation>
                      <xs:documentation>Used to carry ACP 127 generated FL4 information.</xs:documentation>
                    </xs:annotation>
                  </xs:element>
                  <xs:element name="MessageInstructions" type="String-Filter" minOccurs="0">
                    <xs:annotation>
                      <xs:documentation>MMHS-Message-Instructions: header.</xs:documentation>
                      <xs:documentation>Used to carry ACP 127 generated FL5 information.</xs:documentation>
                    </xs:annotation>
                  </xs:element>
                  <xs:element name="ACP127MessageIdentifier" type="String-Filter" minOccurs="0">
                    <xs:annotation>
                      <xs:documentation>MMHS-Acp127-Message-Identifier: header.</xs:documentation>
                    </xs:annotation>
                  </xs:element>
                  <xs:element name="ACP127OriginatorPLAD" type="String-Filter" minOccurs="0">
                    <xs:annotation>
                      <xs:documentation>MMHS-Originator-PLAD: header.</xs:documentation>
                    </xs:annotation>
                  </xs:element>
                </xs:sequence>
              </xs:complexType>
            </xs:element>
```

```
            <xs:element name="TimeRelatedHeaders" minOccurs="0">
              <xs:annotation>
                <xs:documentation>Specialised headers related to time handling of particular interest for military
messages. Defined in MIXER RFC 2156.</xs:documentation>
              </xs:annotation>
              <xs:complexType>
                <xs:sequence>
                  <xs:element name="Reply-By" type="DateTime-Filter" minOccurs="0">
                    <xs:annotation>
                      <xs:documentation>Reply-By: header.</xs:documentation>
                    </xs:annotation>
                  </xs:element>
                  <xs:element name="Expires" type="DateTime-Filter" minOccurs="0">
                    <xs:annotation>
                      <xs:documentation>Expires: header.</xs:documentation>
                    </xs:annotation>
                  </xs:element>
                </xs:sequence>
              </xs:complexType>
            </xs:element>
            <xs:element name="X.400Headers" minOccurs="0">
              <xs:annotation>
                <xs:documentation>Headers originating from X.400 and defined in MIXER RFC 2156.</xs:documentation>
              </xs:annotation>
              <xs:complexType>
                <xs:sequence>
                  <xs:element name="Importance" type="Importance-Filter" minOccurs="0"/>
                  <xs:element name="Sensitivity" type="Sensitivity-Filter" minOccurs="0"/>
                </xs:sequence>
              </xs:complexType>
            </xs:element>
            <xs:element name="IsodeMilitaryHeaders" minOccurs="0">
              <xs:annotation>
                <xs:documentation>Isode specified headers to provide functions of interest to military. Some of these
might be of general use.</xs:documentation>
              </xs:annotation>
              <xs:complexType>
                <xs:sequence>
                  <xs:element name="Correction" type="Message-ID-Wrapper-Filter" minOccurs="0"/>
                  <xs:element name="Cancel" type="Message-ID-Wrapper-Filter" minOccurs="0"/>
                  <xs:element name="Retransmit" type="Message-ID-Wrapper-Filter" minOccurs="0"/>
                  <xs:element name="Special-Handling" type="String-Filter" minOccurs="0">
                    <xs:annotation>
                      <xs:documentation>Uses MMHS-Special-Handling: header</xs:documentation>
                    </xs:annotation>
                  </xs:element>
                </xs:sequence>
              </xs:complexType>
            </xs:element>
            <xs:element name="ResendHeaders" minOccurs="0">
```

```
              <xs:annotation>
                <xs:documentation>These are headers once used more often, but now uncommon in standard email clients.
Isode uses these for military message retransmission.</xs:documentation>
              </xs:annotation>
              <xs:complexType>
                <xs:sequence>
                  <xs:element name="Resent-From" type="Mailbox-Filter" minOccurs="0"/>
                  <xs:element name="Resent-To" type="Address-Filter" maxOccurs="unbounded" minOccurs="0"/>
                  <xs:element name="Resent-Cc" type="Address-Filter" maxOccurs="unbounded" minOccurs="0"/>
                  <xs:element name="Resent-Date" type="DateTime-Filter" minOccurs="0"/>
                  <xs:element name="Resent-Message-ID" type="Message-ID-Wrapper-Filter" minOccurs="0"/>
                </xs:sequence>
              </xs:complexType>
            </xs:element>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element ref="Body" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

<xs:simpleType name="Message-ID">
  <xs:restriction base="xs:string"/>
</xs:simpleType>

<xs:complexType name="Message-ID-Filter">
  <xs:simpleContent>
    <xs:extension base="Message-ID">
      <xs:attribute name="filter">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:pattern value=""/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

<xs:complexType name="Message-ID-Wrapper" mixed="true">
  <xs:sequence>
    <xs:element name="Message-ID" type="Message-ID"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="Message-ID-Wrapper-Filter">
  <xs:complexContent>
    <xs:extension base="Message-ID-Wrapper">
      <xs:attribute name="filter">
```

```
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:pattern value=""/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="Message-List">
    <xs:sequence>
      <xs:element name="Message-ID" type="Message-ID" maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>

<xs:complexType name="Message-List-Filter">
  <xs:complexContent>
    <xs:extension base="Message-List">
      <xs:attribute name="filter">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:pattern value=""/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="MessageType">
  <xs:sequence>
    <xs:element name="PrimaryType">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="Operation"/>
          <xs:enumeration value="Exercise"/>
          <xs:enumeration value="Project"/>
          <xs:enumeration value="Drill"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="SubType" type="xs:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="MessageType-Filter">
  <xs:complexContent>
    <xs:extension base="MessageType">
```

```
        <xs:attribute name="filter">
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:pattern value=""/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>

  <xs:element name="Multipart">
    <xs:annotation>
      <xs:documentation>MIME Grouping reflects how standard MIME messages are structured. This grouping is included
primarily to enable support of arbitrary legal message structures.</xs:documentation>
    </xs:annotation>
    <xs:complexType>
      <xs:sequence>
        <xs:element name="MIMEMultipartSubType">
          <xs:annotation>
            <xs:documentation>MIME Multipart SubType reflects options allowed by the MIME standard. Mixed is expected
to be the one commonly used. Signed is not included, as this cannot be sensibly mapped. Alternative and Related are
allowed, but it is anticipated that most deployments will block this.</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:enumeration value="mixed"/>
              <xs:enumeration value="alternative"/>
              <xs:enumeration value="related"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element maxOccurs="unbounded" ref="Body"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>

  <xs:complexType name="Sensitivity-Filter">
    <xs:simpleContent>
      <xs:extension base="Sensitivity-Wrapper">
        <xs:attribute name="filter">
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:pattern value=""/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
```

```
<xs:simpleType name="Sensitivity-Wrapper">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Personal"/>
    <xs:enumeration value="Private"/>
    <xs:enumeration value="Company-Confidential"/>
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="SIC-Filter">
  <xs:simpleContent>
    <xs:extension base="SIC-Wrapper">
      <xs:attribute name="filter">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:pattern value=""/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

<xs:simpleType name="SIC-Wrapper">
  <xs:restriction base="xs:string">
    <xs:minLength value="3"/>
    <xs:maxLength value="15"/>
  </xs:restriction>
</xs:simpleType>

<xs:element name="SMTPAddress">
  <xs:annotation>
    <xs:documentation>RFC 5322 addr-spec: local@domain.</xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
      <xs:element name="LocalPart" type="xs:string"/>
      <xs:element name="Domain" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

<xs:element name="STANAG4406Priority">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="DEFERRED"/>
      <xs:enumeration value="ROUTINE"/>
      <xs:enumeration value="PRIORITY"/>
      <xs:enumeration value="IMMEDIATE"/>
      <xs:enumeration value="FLASH"/>
```

```
      <xs:enumeration value="OVERRIDE"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>

<xs:complexType name="STANAG4774SecurityLabelType">
  <xs:sequence>
    <xs:annotation>
      <xs:documentation>Security-Label: STANAG 4774 label encoded as the "Binding-Data:" header.</xs:documentation>
    </xs:annotation>
    <xs:element  name="originatorConfidentialityLabel" type="slab:ConfidentialityLabelType" minOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="STANAG-Precedence-Filter">
  <xs:complexContent>
    <xs:extension base="STANAG-Precedence-Wrapper">
      <xs:attribute name="filter">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:pattern value=""/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="STANAG-Precedence-Wrapper">
  <xs:sequence>
    <xs:element ref="STANAG4406Priority"/>
  </xs:sequence>
</xs:complexType>

<xs:simpleType name="String">
  <xs:restriction base="xs:string"/>
</xs:simpleType>

<xs:complexType name="String-Filter">
  <xs:simpleContent>
    <xs:extension base="String">
      <xs:attribute name="filter">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:pattern value=""/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:extension>
```

```
    </xs:simpleContent>

  </xs:complexType>


  <xs:element name="TransferredMessage">

    <xs:annotation>

      <xs:documentation>This schema defines an XML representation for transfer of military message content and envelope
as a single object, with a simple acknowledgement.   </xs:documentation>

      <xs:documentation>The primary purpose of this format is to support message validation by an XML guard.

</xs:documentation>

      <xs:documentation>A secondary purpose is to support XML submission and delivery of messages to systems where XML
is convenient (e.g., a messaging system built on an XML database).</xs:documentation>

      <xs:documentation>The primary protocol target of this is SMTP and MIME, including military extensions such as
those defined in RFC 6477. The formats of this message are designed to be implemented with SMTP/MIME and support broad
coverage.   A wide feature set is supported, to enable good support of secure messaging and military systems. There are
no digital signatures or encryption.   The model is that signatures and encryption are removed before the XML guard and
then re-applied afterwards.  Detailed information on message signatures and encryption is included along with security
labels to facilitate guard operation.</xs:documentation>

      <xs:documentation>It is also designed to support STANAG 4406 (based on X.400) and ACP 127 gateways. ACP 127
functions are represented using RFC 6477 headers and X.400 using MIXER. So all features are represented with an SMTP
model.

Future versions of this specification may support protocol features not available in SMTP (e.g, X.400 Alternate
Recipients and ACP 127 Pilots).

It may also be extended to allow gateway control based on X.400 and ACP 127 addressing.</xs:documentation>

      <xs:documentation>This first TransferredMessage is the data element that is transferred over a TCP connection. It
includes an Audit-ID so that messages can be handled asynchronously (but may be synchronous).

      </xs:documentation>

    </xs:annotation>

    <xs:complexType>

      <xs:sequence>

        <xs:element name="MessageAndEnvelope">

          <xs:complexType>

            <xs:sequence>

              <xs:element ref="Envelope"/>

              <xs:element ref="Message"/>

            </xs:sequence>

          </xs:complexType>

        </xs:element>

        <xs:element name="Audit-ID" type="xs:string">

          <xs:annotation>

            <xs:documentation>An ID associated with the message transfer that enables co-ordination of audit logging on
both sides.</xs:documentation>

          </xs:annotation>

        </xs:element>

      </xs:sequence>

    </xs:complexType>

  </xs:element>


</xs:schema>
```