An OMG® Alert Management Service™ Publication

ALert MAnagement Service (ALMAS)

Version 1.4 beta

OMG Document Number: formal/24-01-03 [smsc/24-01-02]

Standard document URL: https://www.omg.org/spec/ALMAS

OMG's Issue Reporting Procedure

Table of Contents

Preface

About the Object Management Group

Founded in 1989, the Object Management Group, Inc. (OMG) is an open membership, not-for-profit computer industry standards consortium that produces and maintains computer industry specifications for interoperable, portable and reusable enterprise applications in distributed, heterogeneous environments. Membership includes Information Technology vendors, end users, government agencies and academia.

OMG member companies write, adopt, and maintain its specifications following a mature, open process. OMG's specifications implement the Model Driven Architecture® (MDA®), maximizing ROI through a full-lifecycle approach to enterprise integration that covers multiple operating systems, programming languages, middleware and networking infrastructures, and software development environments. OMG's specifications include: UML® (Unified Modeling Language™); CORBA® (Common Object Request Broker Architecture); CWM™ (Common Warehouse Meta-model); and industry-specific standards for dozens of vertical markets.

More information on the OMG is available at *https://www.omg.org/*.

OMG Specifications

As noted, OMG specifications address middleware, modeling and vertical domain frameworks. All OMG Formal Specifications are available from this URL: *https://www.omg.org/spec*

All of OMG‟s formal specifications may be downloaded without charge from our website. (Products implementing OMG specifications are available from individual suppliers.) Copies of specifications, available in PostScript and PDF format, may be obtained from the Specifications Catalog cited above or by contacting the Object Management Group, Inc. at:

OMG Headquarters
9C Medway Road, PMB 274
Milford, MA 01757
USA

Tel: +1-781-444-0404
Fax: +1-781-444-0320

Email: *pubs@omg.org*

Certain OMG specifications are also available as ISO/IEC standards. Please consult: http://www.iso.org

Issues

The reader is encouraged to report and technical or editing issues/problems with this specification to:
https://www.omg.org/report_issue.htm

1 Scope

The domain of naval Combat Management Systems is characterized by a huge variety of underlying computing platforms, with different and often incompatible means of managing and reporting alerts. Standards-based alert management services are essential for interoperable and open systems. This specification is a standard for ALert MAnagement Service (ALMAS) in CMS systems, consisting of a standard alerts data model and a model for an alert delivery and lifecycle management service.

2 Conformance

This specification provides a level of conformance for a minimalist, basic ALMAS system; a fully functional ALMAS system; plus, additional levels for specialized extensions. In addition, conformant ALMAS implementation must conform to one or more of the middleware platform specific models presented in Chapters 8, 9, 10 and 11 of this document in addition to conforming to the XML Alert template data model and the XML initialization PSMs as presented in sections 7.1to 7.3 of this document.

There are three distinct roles in the ALMAS abstracted by the interface classes defined in the ALMAS Management package: Producer, Manager and Receiver. Conformance recognises that a conforming application will be performing only one of these roles and therefore only a subset of the interface will be applicable. Accordingly, conformance is defined in terms of the PIM interface methods that are applicable to each of these roles.

Level	Producer	Manager	Receiver
1	Invokes: RaiseAlertFromData CancelAlert	Implements: RaiseAlertFromData CancelAlert Invokes: AlertDataNotification	Implements: AlertDataNotification
2	Implements: ALMASNotificationListener interface Invokes: ALMASConfiguration interface and any of the ALMASProducer and ALMASManager interface methods	Implements: ALMASConfiguration, ALMASManager, ALMASResponder and ALMASProducer interfaces Invokes: ALMASNotificationListener and ALMASReceiver interfaces	Implements: ALMASReceiver interface Invokes: Any of the ALMASResponder and ALMASManager interface methods
3A	N/A	Level 2 plus Implements: ALMASResponderExtensions interface	Level 2 plus Invokes: ALMASResponderExtensions interface
3B	Level 2 plus	Level 2 plus	N/A

	Invokes: RemoveAlertsWithDynamic MessageData	Implements: RemoveAlertsWithDynamic MessageData	
3C	Level 2 plus Invokes: AttachCategorizationRule & DetachCategorizationRule	Level 2 plus Implements: AttachCategorizationRule & DetachCategorizationRule	N/A

Level 3A groups together extensions for mulit-language support; 3B is an extension for a more complex alert lifecycle from a producer's perspective; and 3C is an extension for raising alerts indirectly through categorization rules.

Alternatively, configuration may be performed centrally by a system function, in which case applications with the Producer role do not invoke the ALMASConfiguration interface.

3 Normative References

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this specification. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply.

Table 3-1: Normative References

Title (Acronym)	**Version / Date**	**Organization**	**Reference / URL**
Data Distribution Service (DDS)	1.4 / March 2015	OMG	formal/2015-04-10 https://www.omg.org/spec/DDS/1.4/PDF
Interface Definition Language (IDL)	4.2 / January 2018	OMG	formal/2018-01-05 https://www.omg.org/spec/IDL/4.2/PDF
Graph Query Language (GraphQL)	June 2018	Facebook	https://spec.graphql.org/June2018/
OASIS Common Alerting Protocol (OASIS)	1.0 / 2004	OASIS	https://www.oasis-open.org/committees/download.php/6334/oasis-200402-cap-core-1.0.pdf
Microsoft Component Object Model (COM)	2009	Microsoft	https://www.docs.microsoft.com/en-us/windows/win32/com/component-object-model--com--portal
Common Object Request Broker Architecture (CORBA)	3.0.3 / March 2004	OMG	https://www.omg.org/spec/CORBA
Extensible Markup Language (XML)	1.0 / 2008	W3C	https://www.w3.org/TR/xml/

Open Telemetry (OTEL)	1.38.0	CNCF	https://opentelemetry.io/docs/specs/otel/

ALMAS14-6

Unknown Author
10/25/2024 15:53

4 Terms and definitions

4.1 General Definitions

Architecture Board (AB) - The OMG plenary that is responsible for ensuring the technical merit and MDA-compliance of RFPs and their submissions.
Board of Directors (BoD) - The OMG body that is responsible for adopting technology.
Component Object Model (COM) – A platform-independent, distributed, object-oriented system for creating binary software components that can interact.
Common Object Request Broker Architecture (CORBA) - An OMG distributed computing platform specification that is independent of implementation languages.
Common Warehouse Metamodel (CWM) - An OMG specification for data repository integration.
CORBA Component Model (CCM) - An OMG specification for an implementation language independent distributed component model.
Data-Centric Publish-Subscribe (DCPS) – The DDS specification describing the application interfaces and communication semantics for distributed application communication and integration.
Data Distribution Service (DDS) – a middleware protocol and API standard for data-centric connectivity.
Data Local Reconstruction Layer (DLRL) – describes a high-level interface to DDS that allows a simple integration of the DDS Service into the application layer.
Graph Query Language (GraphQL) – a query language for Application Programmable Interfaces and a runtime for fulfilling those queries with your existing data.
Interface Definition Language (IDL) - An OMG and ISO standard language for specifying interfaces and associated data structures.
Internet Assigned Numbers Authority (IANA) – a standards organization that oversees global Internet Protocol (IP) address allocation and other internet Protocol-related symbols and numbers.
Letter of Intent (LOI) - A letter submitted to the OMG BoD’s Business Committee signed by an officer of an organization signifying its intent to respond to the RFP and confirming the organization’s willingness to comply with OMG’s terms and conditions, and commercial availability requirements.
Mapping - Specification of a mechanism for transforming the elements of a model conforming to a particular metamodel into elements of another model that conforms to another (possibly the same) metamodel.
Metadata - Data that represents models. For example, a UML model; a CORBA object model expressed in IDL; and a relational database schema expressed using CWM.
Metamodel - A model of models.
Meta Object Facility (MOF) - An OMG standard, closely related to UML, that enables metadata management and language definition.
Model - A formal specification of the function, structure and/or behavior of an application or system.
Model Driven Architecture (MDA) - An approach to IT system specification that separates the specification of functionality from the specification of the implementation of that functionality on a specific technology platform.
Normative – Provisions that one must conform to in order to claim compliance with the standard. (as opposed to non-normative or informative which is explanatory material that is included in order to assist in understanding the standard and does not contain any provisions that must be conformed to in order to claim compliance).
Normative Reference – References that contain provisions that one must conform to in order to claim compliance with the standard that contains said normative reference.
Platform - A set of subsystems/technologies that provide a coherent set of functionality through interfaces and specified usage patterns that any subsystem that depends on the platform can use without concern for the details of how the functionality provided by the platform is implemented.
Platform Independent Model (PIM) - A model of a subsystem that contains no information specific to the platform, or the technology that is used to realize it.
Platform Specific Model (PSM) - A model of a subsystem that includes information about the specific technology that is used in the realization of it on a specific platform, and hence possibly contains elements that are specific to the platform.
Quality of Service (QOS) – in the context of DDS, a rich set of characteristics that define the behavior of the DDS systems (such as reliability, liveliness, durability, etc.)
Request for Information (RFI) - A general request to industry, academia, and any other interested parties to submit information about a particular technology area to one of the OMG's Technology Committee subgroups.

Request for Proposal (RFP) - A document requesting OMG members to submit proposals to the OMG's Technology Committee. Such proposals must be received by a certain deadline and are evaluated by the issuing task force.
Task Force (TF) - The OMG Technology Committee subgroup responsible for issuing an RFP and evaluating submission(s).
Technology Committee (TC) - The body responsible for recommending technologies for adoption to the BoD. There are two TCs in OMG – Platform TC (PTC), that focuses on IT and modeling infrastructure related standards; and Domain TC (DTC), that focus on domain specific standards.
Unified Modeling Language (UML) - An OMG standard language for specifying the structure and behavior of systems. The standard defines an abstract syntax and a graphical concrete syntax.
UML Profile - A standardized set of extensions and constraints that tailors UML to particular use.
XML Metadata Interchange (XMI) - An OMG standard that facilitates interchange of models via XML documents.

4.2 Definitions Specific to this Document

The RFP prompting this response defined the following set of standard terminology which will henceforth be used within this document:

- An ***event*** is an occurrence that has been detected by the system whose happening must be reported to other members of the system, including human operators.
- An ***alert*** is an entity of observation regarding an event (or sequence of related events) to be reported (directly or indirectly) to an appropriate set of actors.
- ***Alert clients*** are the entities within the system that raise, modify, receive, process, or handle alerts generated by ALMAS.
- An ***alert template*** is a generic definition of a type of alert which can be raised, e.g., 'collision warning' – it requires instantiation to create an alert.
- An ***instance*** of an alert is a specifically raised alert e.g., 'collision warning with track number 111, bearing 020, range 2nm'

In addition to the general terms defined above, the RFP indicates that there is an expectation that the ALMAS standard will include three main alert categories, as follows:

- Alerts which require no actor action or acknowledgement. This collection of alert templates are generally ***informative*** or routine alerts, they are usually of lower priority / urgency and require some action by ALMAS to be removed.
- Alerts which require acknowledgement by actor(s). This collection of ***acknowledgement*** alert templates is usually more urgent alerts where at least one actor must indicate acknowledgement to ALMAS that the alert has been received.
- Alerts which require both acknowledgement and action confirmation by actor(s). This collection of ***action*** alert templates is frequently used for important or critical events where not only is acknowledgement of the receipt required, but also confirmation that the required action has been taken[1].

5 Acronyms and Abbreviations

CMS	(Naval) Combat Management System
CORBA	Common Object Request Broker Architecture
DCOM	Distributed Component Object Model
HTTP	HyperText Transfer Protocol
OMG	Object Management Group
RFP	Request For Proposal
UML	Unified Modelling Language
XML	eXtensible Mark-up Language

[1] Definition of the required action is not within the scope of ALMAS.

6 Platform Independent Model (PIM)

The PIM has been split into three packages as follows:

- ALMAS Client Callbacks: The interface to be implemented by system components that wish to be notified of ALMAS events such as alerts created, deleted, etc.
- ALMAS Data Model: The structures and their relationships used in an ALMAS system.
- ALMAS Management: Components of the ALMAS system responsible for setting up ALMAS and alert lifecycle oversight.

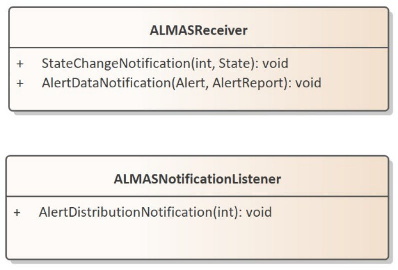
These are described below, note that ALMAS Categorization is an optional PIM for attaching event-based categorization rules to alerts defined in the core parts of this specification.
Section 6.5 describes ALMAS dynamic behavior: alert state transition as well as the interactions between ALMAS Receivers, Producers, and the ALMAS System itself.

ALMAS14-4

Unknown Author
10/25/2024 17:47

6.1 ALMAS Client Callbacks

ALMAS Client Callbacks are the interfaces to be implemented by system components that wish to be notified of ALMAS events such as alerts created, deleted, etc. There are two classes in this package. In order to be plugged into the ALMAS system, a client must implement one of these interfaces, and register with the Alert Manager.



ALMASReceiver
+ StateChangeNotification(int, State): void
+ AlertDataNotification(Alert, AlertReport): void
ALMASNotificationListener
+ AlertDistributionNotification(int): void

Figure 6-1: PIM class diagram for ALMAS Clients

6.1.1 ALMASNotificationListener

Class provided by registering notification listeners for receipt of alert distribution notifications.

6.1.1.1 Operation

Name	Type	Summary
AlertDistributionNotification(int)	public void[Parameters]AlertID: int	This is called as soon as an alter requiring confirmation has been received by the ALMAS system. This callback is generated when the alert is in the Raised state. (Note: StateChangeNotification callbacks are also generated for this event.) The onward distribution is notified through additional StateChangeNotification callbacks.

6.1.2 ALMASReceiver

Class provided by registering alert receivers for provision of the notification callbacks. Only clients that implement this interface and register as receivers can access active alert data. Clients can only register if they are built against the

ALMAS interface; therefore, no runtime security control is required in this context. Note: The ALMASResponder interface is used to notify ALMAS of “progress” in satisfying the received alert.

6.1.2.1 Operation

Name	Type	Summary
StateChangeNotification(int, Enumeration)	public void[Parameters]AlertID: int,NewState: Enumeration	Indicates a change of state of an alert to a receiver who has registered for this alert's state change notifications. These states are the same states as used in CurrentState for an Alert. This callback is generated for an alert’s initial state and all subsequent state transitions. it is not generated when an alert instance is deleted. (Note: instances can only be deleted by the ALMAS system from a non-current state).
AlertDataNotification(Alert, AlertReport)	public void[Parameters]AlertInfo: Alert,Report: AlertReport	Provides notifications of new and modified alert data.

6.2 ALMAS Data Model

The classes described in this section provide the definition of the contents of Alerts, Alert Templates, and Receivers for ALMAS. The two primary concepts in this data model are of an Alert Template and an Alert. The Alert Template describes the static description of a pre-defined class of alerts, while an Alert contains the specific attributes of a “live” Alert within the ALMAS system. Both utilize the AlertData class to describe many of their field attributes and values.

Note that the constraint called ‘alert_data’ in the figure below is defined as follows:

```
"context a: Alert inv: if ((a.alert_data.Category = Information) or (a.alert_data.Category = Warning))) then
    (a.CurrentState <> Handled)"
```

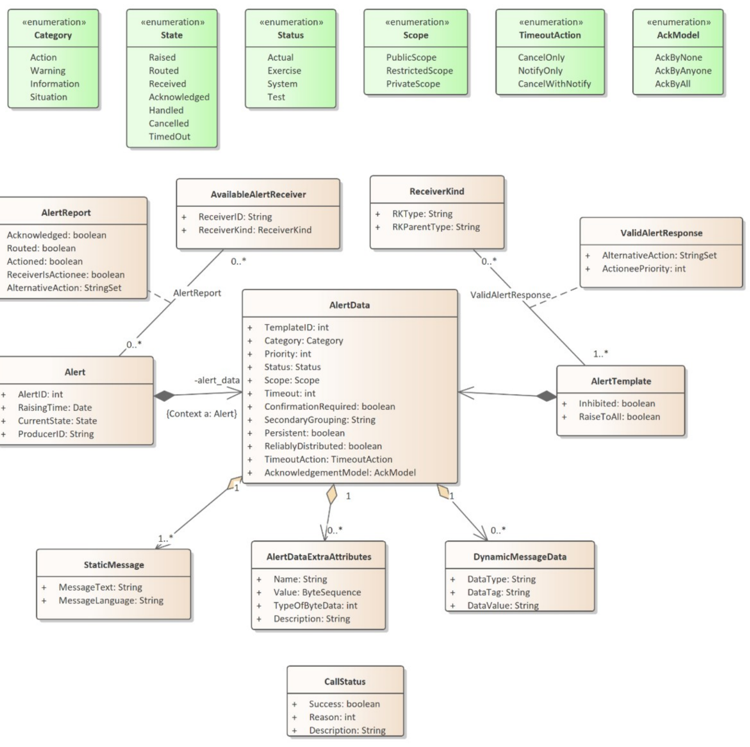


Figure 6-2: PIM class diagram for ALMAS Data Model

6.2.1 Alert

An active alert within ALMAS. The Alert class provides the main entity that ALMAS uses for tracking the state of an alert. The specific data such as message and other attributes for an active alert is provided in the AlertData class which is a member attribute of the Alert.

6.2.1.1 Attribute

Name	Type	Summary
AlertID	public int	The instance id for the specific instance of the alert.
RaisingTime	public Date	The time at which the alert was raised.
CurrentState	public State	Holds the current state of the alert, valid states are determined by the category of the alert, {Raised, Routed, Received, Acknowledged, Handled, Cancelled, Timed_Out}. Note that Handled is not a valid state for Information and Warning Alerts.
ProducerID	public String	The producer freetext ID - corresponds to CAP source

6.2.2 AlertData

This represents the set of data shared between the alert template and alert classes. All fields have default values which can be changed when alerts are raised/updated. This may be set up through the use of templates as specified through the XML PSM, which initialises AlertTemplate and its associated classes.

6.2.2.1 Attribute

Name	Type	Summary
TemplateID	public int	A unique identifier for template which owns this alert data (or that was used to create the alert if this is referenced from Alert). Valid range from 1 upwards.
Category	public Enumeration	This enumeration can take the value Action / Warning / Information / Situation
Priority	public int	Alert priority as an integer value in the range 1-99. The priority is open for client use and not intended for interpretation by ALMAS.
Status	public Status	Corresponds to the OASIS CAP Status field.
Scope	public Scope	Corresponds to CAP scope.
Timeout	public int	Specifies the time, in seconds, required to elapse before the alert will timeout and perform its default timeout action. 0 implies there is no timeout.
ConfirmationRequired	public boolean	This is set if confirmation of receipt is required, that it has been distributed. If this is set to true, the producer has registered for receipt of the distribution notification.
SecondaryGrouping	public String	This is an additional field to support client specific filtering mechanisms.
Persistent	public boolean	Indicates whether the alert data is required to be persistent in the event of a system restart
ReliablyDistributed	public boolean	A flag which, when true, indicates that the alert should have guaranteed delivery.
TimeoutAction	public TimeoutAction	When the alert times-out, ALMAS acts according to this attribute.
AcknowledgementModel	public AckModel	Sets the conditions upon which the alert state can transition to 'acknowledged'.This has the options of {none, anyone, all}

6.2.3 AlertDataExtraAttributes

This is a class representing items of alert data that are specific to particular clients, that require supporting in order to fulfil possible requirements of an alert management system (such as images, screen locations or other binary data), but are not general enough to be defined explicitly as data types in an ALMAS. Effectively ALMAS provides blind delivery of the information provided by this class to the alert receiver without any knowledge as to its intended meaning and behaviour. The extra attributes are configured via the ALMAS Alert definition xml PSM specified in section 7.1. If defined in the Alert definition XML provided to ALMAS, then ALMAS shall support the definition, receipt, storage and passing of this data to receivers as part of a standard implementation.

6.2.3.1 Attribute

Name	Type	Summary
Name	public String	Name of the client specific attribute
Value	public ByteSequence	Contents as a byte sequence. (Note: strings are not null-terminated).
TypeOfByteData	public int	Valid values for this are: 0 = string (UTF-8) 1 = Integer8 2 = Integer16 3 = Integer32 4 = Float32 5 = Float64 6 = bytes (private format) 7 = bytes (defined by media type)
Description	public String	This field is used to provide an indication of the content e.g., 'image (jpg), URL, track object ID, … When the TypeOfByteData is 7, this is set to the media type / subtype tree as defined by IANA.

6.2.4 AlertReport

This provides the delivery message of an Alert to an ALMASReceiver. It contains the Alert and the current status information. This will contain details of whether the instance has been acknowledged by this receiver etc. and will also be completed with respect to any dynamic message data.

6.2.4.1 Attribute

Name	Type	Summary
Acknowledged	public boolean	Identified whether the alert has been acknowledged by this receiver.
Routed	public boolean	Identified whether the alert can be confirmed to have been routed as per the 'routed' alert substate.
Actioned	public boolean	Identified whether the alert has been actioned by this receiver.
ReceiverIsActionee	public boolean	Indicates that this receiver is the chosen actionee for this alert.
AlternativeAction	public StringSet	Provides means by which an alternative action outside of the scope of ALMAS can be distributed with the alert via ALMAS.

6.2.5 AlertTemplate

An AlertTemplate specifys the generic characteristics of a specific alert type "at rest" (e.g., the general characteristics of a collision warning alert). This includes the category of alert, such as Action etc. An AlertTemplate uses an associated AlertData object to specify the contents of the template. An AlertTemplate can be used to specify the properties of commonly used within a system. At the time of raising an Alert from a template, the user/system provides the relevant instance data of that alert. It is an error to specify RaiseToAll and to define either ReceiverKind instances or a Secondary Grouping in the AlertData instance.

6.2.5.1 Attribute

Name	Type	Summary
Inhibited	public boolean	The inhibition status of that alert type. If this is 'true' then attempts to raise an alert of that type will fail.
RaiseToAll	public boolean	Indicates that the alert should be raised to all available receivers rather than specified ones.

6.2.6 AvailableAlertReceiver

The class used to identify a receiver of alerts. A registered receiver of alerts. The AvailableAlertReceiver is registered with ALMAS through the ALMASResponder API. The AvailableAlertReceiver is directly associated with an ALMASReceiver through the ReceiverID attribute, which is provided at registration time to ALMAS using the RegisterReceiver method.

6.2.6.1 Attribute

Name	Type	Summary
ReceiverID	public String	Unique identifier for the receiver.
ReceiverKind	public ReceiverKind	The kind of the receiver as an explicit attribute link to the Receiver Kind class.

6.2.7 CallStatus

This is the ALMAS a general-purpose success/failure descriptor class used throughout ALMAS. If Success, then the other parameters are not applicable.

6.2.7.1 Attribute

Name	Type	Summary
Success	public boolean	Flag indicating pass/fail status
Reason	public int	Enumerated reason correlating to the "Call Status" 0 = Success 1 = Not Accepted 2 = Malformed Alert 3 = Timeout/delivery 4 = Requested Service Unavailable 5+ = Other
Description	public String	Additional String data further describing status

ALMAS14-8

Unknown Author
10/24/2024 16:15

6.2.8 DynamicMessageData

Since Alerts often have variable data fields, the DynamicMessageData class provides the means for inserting variable content into the Alert's MessageText during runtime. Replacement values for the DataTag are treated as strict string substitution within the MessageText of the StaticMessage associated with the Alert. This is used to capture the triplet of data tag type, tag position in the alert message and the value that this tag in the template message text should be replaced with. Note: if the text specified in the StaticMessage contains multiple replacement points then an equal number of DynamicMessageData objects are required for full substitution. It is an error to specify StaticMessage and DynamicDataMessage instance collections with different sets of substitution tags for the same alert template. To substitute language locale specific dynamic data, define and supply distinct language locale specific tags when raising alerts. (I.e., for each language and placeholder combination, supply a DynamicMessageData instance with a unique DataTag to match a placeholder in exactly one StaticMessage instance).

6.2.8.1 Attribute

Name	Type	Summary
DataType	public String	The type of related object e.g., freetext, track, vehicle, position, etc.
DataTag	public String	This identifies the insertion point for the related object in the MessageText associated with the Alert. Tags are alphanumeric so to match StaticMessage text "xxxxx %number% yyyyyyy zzzz", a DataTag with the value "number" is required. It is a case sensitive, alphanumeric string.
DataValue	public String	The value of the object instantiation. Given a type of string to be general enough to support free text and track/vehicle id's alike.

6.2.9 ReceiverKind

The descriptor of an alert receiver. This could for example be an operator role. ReceiverKind objects are used in many places in ALMAS including the specification of what operators/clients will receive which Alerts.

- These are used to show all possible receivers of an Alert, when used in an AlertTemplate.
- These are used during runtime to identify the actual receivers for an active alert.

6.2.9.1 Attribute

Name	Type	Summary
RKType	public String	String identifier of the kind of receiver, for example the role of a receiving operator.
RKParentType	public String	The hierarchical parent receiver kind name that this one "belongs to". This is used by ALMAS to resolve cases where a specific RK is not available, but handing is required by an appropriate receiver. Note that a lack of a Parent is indicated by an empty string.

6.2.10 StaticMessage

Provides the default message text for an alert as a tuplet of the actual static text and the language in which the text is provided. An AlertData object has a StaticMessage instance for each language supported by a particular ALMAS. If the StaticMessage requires runtime updating, then use data tags as specified in DynamicMessageData. To support the runtime substitution of different text for different languages, data tags must have different values in each of the languages to define the substitution uniquely.

6.2.10.1 Attribute

Name	Type	Summary
MessageText	Public String	This is a text string, which in an Alert or AlertTemplate is only partially completed. With the MessageText being "xxxxx %number% yyyyyyy zzzz" in an Alert or AlertTemplate, and with a DynamicMessageData with DataTag having the value “number” and DataValue having the value "123" then the resulting MessageText in response to GetFilledMessageText will be "xxxxx 123 yyyyyyy zzzz". All substitution points are of the form "(start | non-alphanumeric%(tag)%(end | non-alphanumeric)", where start and end denote the start and end of the MessageText string respectively and tags are case sensitive, alphanumeric strings ("number" in the above) which should correspond to a DataTag in an associated DynamicMessageData.
MessageLanguage	public String	The message ‘Locale’

6.2.11 ValidAlertResponse

The ValidAlertResponse is the association class that specifies the list of actions that a particular ReceiverKind (e.g., “role”) can take in response to an Alert of an AlertTemplate type. It also specifies the priority for being chosen as the actionee of that ReceiverKind among all ReceiverKinds associated with that AlertTemplate.

The set of alternative action strings can be used by the system to provide a constraind set of “command-response” options to the client. For example, ValidAlertResponses for an “Engagement Request Alert” might include “WILCO”, “CANTCO”, etc.

6.2.11.1 Attribute

Name	Type	Summary
AlternativeAction	public StringSet	The 'names' of alternative actions available to the relevant actor.
ActioneePriority	public int	The priority of the ReceiverKind as actionee for a specifc alert as described by its template. The highest priority actionee for an action alert should be chosen as the current actionee for the alert. This will then flow into the ReceiverIsActionee field of the AlertReport.

6.2.12 Category

The categories of alerts in terms of the expectation placed on the operator receiving the alert; i.e., generically, why has the alert been received and what type of implicit or explicit response is expected.

6.2.12.1Attribute

Name	Summary
Action	An explicit input to the system is expected as a result of receiving the alert. The alert persists until it is

	cancelled due to the condition to which it relates no longer being present (due either to explicit operator action relating to the alert or action external to the ALMAS system).
Warning	The receiver may decide to take an explicit action in mitigation to the condition to which the warning relates. The alert does not persist according to the underlying condition that the alert warns about.
Information	The receiver is expected to take account of this information in subsequent decisions. The alert does not persist according to the underlying condition that the alert informs about.
Situation	The receiver is expected to take account of the new state of the situation in subsequent decisions. The alert persists until it is cancelled due to the condition to which it relates no longer being present (due either to explicit operator action relating to the alert or action external to the ALMAS system).

6.2.13 State

The states between which an alert transitions in its lifetime.

6.2.13.1 Attribute

Name	Summary
Raised	The alert has been created by the alert producer.
Routed	The alert has been routed to the receivers, but reception has not been confirmed by sufficient receivers to enter the received state.
Received	The alert has been received by sufficient receivers.
Acknowledged	All necessary acknowledgements have been made.
Handled	The alert ends its lifetime through being handled.
Cancelled	The alert ends its lifetime through being cancelled by the producer.
TimedOut	The alert ends its lifetime through being timed-out.

6.2.14 Status

The status of the entities with regards to the mode of use of ALMAS in comparison to the mode of use of receivers and producers.

6.2.14.1 Attribute

Name	Summary
Actual	Actionable by all targeted recipients.
Exercise	Actionable only by designated exercise participants.
System	For entities that support alert network internal functions.
Test	Technical testing only, all recipients disregard

6.2.15 Scope

This class models the scope of the alert's dissemination.

6.2.15.1 Attribute

Name	Summary
PublicScope	unrestricted dissemination
RestrictedScope	dissemination restricted to known functions
PrivateScope	dissemination restricted to specified addresses

6.2.16 TimeoutAction

This class models the possible behaviors when an alert is timed-out.

6.2.16.1 Attribute

Name	Summary
CancelOnly	The alert is just cancelled (the alert instance's lifetime ends).
NotifyOnly	The alert manager is notified.
CancelWithNotify	The alert is cancelled (the alert instance's lifetime ends) and the alert manager is notified.

6.2.17 AckModel

This class models the conditions upon which an alert state can transition to 'acknowledged'.

6.2.17.1 Attribute

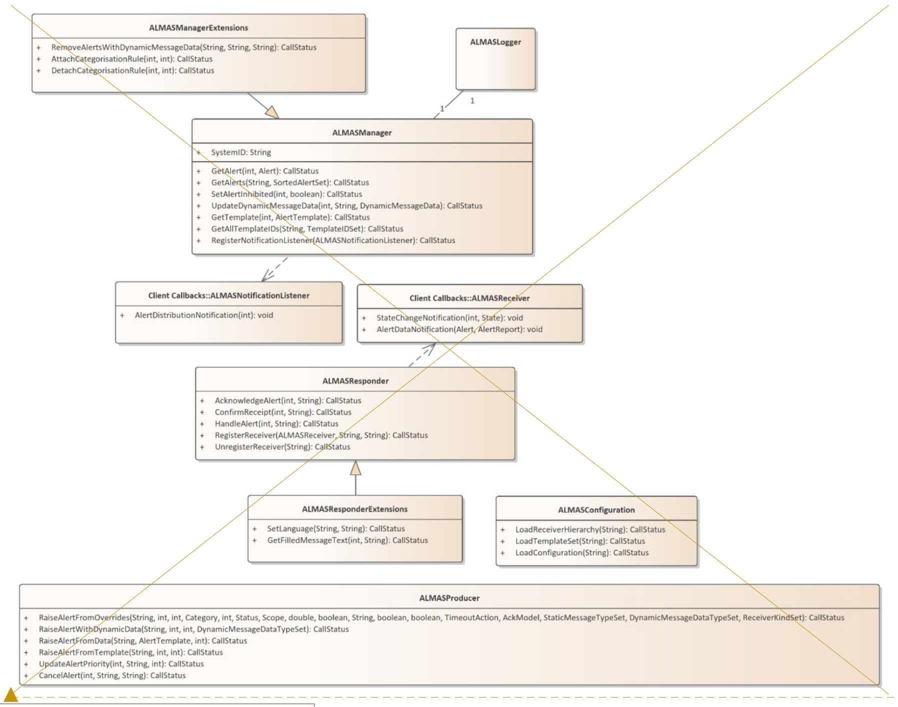
Name	Summary
AckByNone	No acknowledgement is required.
AckByAnyone	Any single acknowledgement is sufficient.
AckByAll	The alert must be acknowledged by all recipients.

6.3 ALMAS Management

This section describes the classes responsible for raising, routing, maintaining the state of, and destroying alerts through their lifecycle. ALMAS uses a collection of specialized component interfaces for maintaining state, data, and lifecycle of Alerts. In general, systems that utilize ALMAS will interact during runtime primarily through the ALMAS Producer, Responder, and Notification Listener classes. The ALMAS Manager interface is utilized more at system startup.

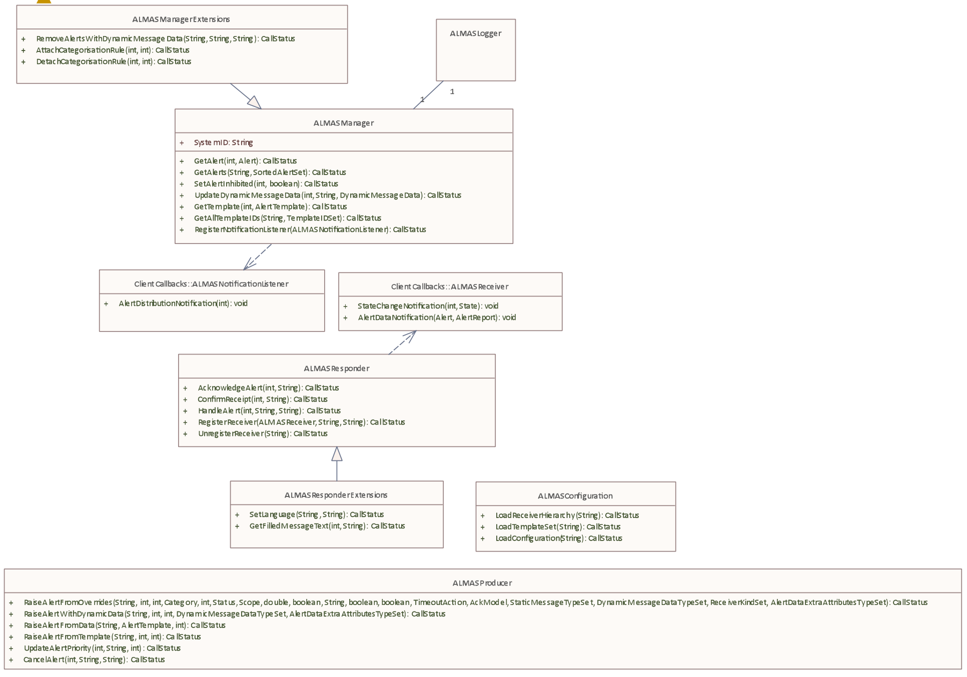
Deleting alert instances is under the control of ALMAS itself as part of its lifecycle management, and not at the request of its users. In more detail:

- Any alert is removed when cancelled. Note that Situation alerts are only removed when cancelled.
- Information and Warning alerts are removed when the required number of acknowledgements (as identified in the AlertData AcknowledgementModel attribute) are given or (if a timeout is defined) when the timeout is expired.
- Action alerts are removed when HandleAlert is called by the Receiver identified as the Actionee in its AlertReport.


ALMASManagerExtensions
+ RemoveAlertsWithDynamicMessageData(String, String, String): CallStatus
+ AttachCategorisationRule(int, int): CallStatus
+ DetachCategorisationRule(int, int): CallStatus
ALMASLogger
1
1
ALMASManager
+ SystemID: String
+ GetAlert(int, Alert): CallStatus
+ GetAlerts(String, SortedAlertSet): CallStatus
+ SetAlertInhibited(int, boolean): CallStatus
+ UpdateDynamicMessageData(int, String, DynamicMessageData): CallStatus
+ GetTemplate(int, AlertTemplate): CallStatus
+ GetAllTemplateIDs(String, TemplateIDSet): CallStatus
+ RegisterNotificationListener(ALMASNotificationListener): CallStatus
Client Callbacks::ALMASNotificationListener
+ AlertDistributionNotification(int): void
Client Callbacks::ALMASReceiver
+ StateChangeNotification(int, State): void
+ AlertDataNotification(Alert, AlertReport): void
ALMASResponder
+ AcknowledgeAlert(int, String): CallStatus
+ ConfirmReceipt(int, String): CallStatus
+ HandleAlert(int, String): CallStatus
+ RegisterReceiver(ALMASReceiver, String, String): CallStatus
+ UnregisterReceiver(String): CallStatus
ALMASResponderExtensions
+ SetLanguage(String, String): CallStatus
+ GetFilledMessageText(int, String): CallStatus
ALMASConfiguration
+ LoadReceiverHierarchy(String): CallStatus
+ LoadTemplateSet(String): CallStatus
+ LoadConfiguration(String): CallStatus
ALMASProducer
+ RaiseAlertFromOverrides(String, int, int, Category, int, Status, Scope, double, boolean, String, boolean, boolean, TimeoutAction, AckModel, StaticMessageTypeSet, DynamicMessageDataTypeSet, ReceiverKindSet): CallStatus
+ RaiseAlertWithDynamicData(String, int, int, DynamicMessageDataTypeSet): CallStatus
+ RaiseAlertFromData(String, AlertTemplate, int): CallStatus
+ RaiseAlertFromTemplate(String, int, int): CallStatus
+ UpdateAlertPriority(int, String, int): CallStatus
+ CancelAlert(int, String, String): CallStatus

ALMAS14-9

Unknown Author
10/24/2024 16:19


ALMASManagerExtensions
+ RemoveAlertsWithDynamicMessageData(String, String, String): CallStatus
+ AttachCategorisationRule(int, int): CallStatus
+ DetachCategorisationRule(int, int): CallStatus
ALMASLogger
1
1
ALMASManager
+ SystemID: String
+ GetAlert(int, Alert): CallStatus
+ GetAlerts(String, SortedAlertSet): CallStatus
+ SetAlertInhibited(int, boolean): CallStatus
+ UpdateDynamicMessageData(int, String, DynamicMessageData): CallStatus
+ GetTemplate(int, AlertTemplate): CallStatus
+ GetAllTemplateIDs(String, TemplateIDSet): CallStatus
+ RegisterNotificationListener(ALMASNotificationListener): CallStatus
Client Callbacks::ALMASNotificationListener
+ AlertDistributionNotification(int): void
Client Callbacks::ALMASReceiver
+ StateChangeNotification(int, State): void
+ AlertDataNotification(Alert, AlertReport): void
ALMASResponder
+ AcknowledgeAlert(int, String): CallStatus
+ ConfirmReceipt(int, String): CallStatus
+ HandleAlert(int, String, String): CallStatus
+ RegisterReceiver(ALMASReceiver, String, String): CallStatus
+ UnregisterReceiver(String): CallStatus
ALMASResponderExtensions
+ SetLanguage(String, String): CallStatus
+ GetFilledMessageText(int, String): CallStatus
ALMASConfiguration
+ LoadReceiverHierarchy(String): CallStatus
+ LoadTemplateSet(String): CallStatus
+ LoadConfiguration(String): CallStatus
ALMASProducer
+ RaiseAlertFromOverrides(String, int, int, Category, int, Status, Scope, double, boolean, String, boolean, boolean, TimeoutAction, AckModel, StaticMessageTypeSet, DynamicMessageDataTypeSet, ReceiverKindSet, AlertDataExtraAttributesTypeSet): CallStatus
+ RaiseAlertWithDynamicData(String, int, int, DynamicMessageDataTypeSet, AlertDataExtraAttributesTypeSet): CallStatus
+ RaiseAlertFromData(String, AlertTemplate, int): CallStatus
+ RaiseAlertFromTemplate(String, int, int): CallStatus
+ UpdateAlertPriority(int, String, int): CallStatus
+ CancelAlert(int, String, String): CallStatus

ALMAS14-9 & ALMAS14-3

Unknown Author
10/24/2024 16:47

Figure 6-3: PIM class diagram for ALMAS Management

This package provides the main API to the ALMAS service.

6.3.1 ALMASConfiguration

Provides an API by which systems can configure ALMAS to behave in a more tailored manner in order to satisfy very specific requirements. There are three categories of configuration file that can be used by ALMAS: the receiver hierarchy, templates, and configuration information. The string filename is expected to resolve to either a local file accessible to ALMAS, or a URL accessible to ALMAS. The returned CallStatus object from each of the methods provides an indication of success/failure and any additional relevant rationale describing that status. The effect of invoking the ALMASConfiguration interface does not persist beyond the lifetime of the application. Clients must invoke the operations on the interface for each execution lifetime of the Manage application.

6.3.1.1 Operation

Name	Type	Summary
LoadReceiverHierarchy(String)	public CallStatus[Parameters]Filename: String	Loads the receiver hierarchy as provided by the client via xml conforming to the relevant xml schema document. The specification of the ReceiverHierarchy file format can be found in section 7.3. If invoked multiple times for an application lifetime, the semantics are additive but disjoint; it is an error to define a receiver in a hierarchy file that has already been defined.
LoadTemplateSet(String)	public CallStatus[Parameters]Filename: String	Loads a template set into the ALMAS database. Multiple calls to this method result in the union of the new templates with the existing templates in ALMAS. It is an error to refer to ReceiverKind instances in the template file that have not been previously defined in a loaded hierarchy file. It is also an error to duplicate an existing template id or to mismatch tags between static messages and dynamic data. These are permitted implementation-specific error conditions: to use an unsupported data type for dynamic message data, to use an out of range value for type of byte data, to omit a static message for a particular language or to exceed capacity limits. The specification of the template file format can be found in section 7.1.
LoadConfiguration(String)	public CallStatus[Parameters]Filename: String	Loads the ALMAS configuration file as provided by the client. The specification of the configuration file format can be found in section 7.2.

6.3.2 ALMASLogger

The ALMASLogger interface provides a ~~L~~logging mechanism to record ~~historical~~ Alert information created by the system. ~~This version of the ALMAS Standard does not specify a specific interface to/from the ALMAS logger, however conformant ALMAS implementations must include logging of alerts raised, delivered, received, handled, and cleared.~~ All API methods are logged by conformant implementations; the mechanism to do so is defined by each of the PSM sections later in this document.

ALMAS14-6

Unknown Author
10/25/2024 15:42

6.3.3 ALMASManager

The ALMASManager interface provides the minimal set of APIs necessary to track ALMAS activity. Additionally, the ALMASManager provides the interface in ALMAS for retrieving Alerts and AlertTemplates and registering for the notification of delivery of Alerts. Note that the registration of receivers is done via the ALMAS Responder class.

Note: The methods found in the ALMASProducer interface allow the system to update the status or attributes of an alert during runtime. The ALMAS Manager resolves dynamic message data and each recipient's language selection that each Alert instance contains exactly one static message and no dynamic message data. A component implementing the ALMASManager, ALMASProducer and ALMASResponder interfaces is able to flexibly coordinate the distribution of alerts and responses between producers and responders.

ALMAS14-5

Unknown Author
10/25/2024 18:08

6.3.3.1 Attribute

Name	Type	Summary
SystemID	private String	Provides a field for specifying the current instance of ALMAS. Corresponds to CAP sender

6.3.3.2 Operation

Name	Type	Summary
GetAlert(int, Alert)	public CallStatus[Parameters]AlertID: int,out Alert: Alert	Retrieves data for a specific raised alert from ALMAS given the passed AlertID. Assumes the requestor knows the AlertID to retrieve. This operation retrieves the current data for an alert that is already known to the client.
GetAlerts(String, SortedAlertSet)	public CallStatus[Parameters]Filter: String,out AlertSet: SortedAlertSet	Retrieves a set of all alert instances within ALMAS that satisfy the filter. The filter string provided will be compared with the value in the AlertData SecondaryGrouping field. All matches will be returned in the Set.
SetAlertInhibited(int, boolean)	public CallStatus[Parameters]TemplateID: int,Inhibition: boolean	Sets the inhibition status of a specific alert template to suppress or allow the raising of all

		alerts of that template. Whilst set to inhibited, the ALMAS Manager fails attempts to raise an alert using that template.
UpdateDynamicMessageData(int, String, DynamicMessageData)	public CallStatus[Parameters]AlertID: int,ObjectValue: String,OldData: DynamicMessageData	Indicates a change to the value of a related object for the provided alert ID. OldData is necessary in order to clearly indicate which dynamic message data should be changed.
GetTemplate(int, AlertTemplate)	public CallStatus[Parameters]TemplateID: int,out Template: AlertTemplate	Retrieves an existing alert template from ALMAS by providing the template ID.
GetAllTemplateIDs(String, TemplateIDSet)	public CallStatus[Parameters]Filter: String,out TemplateIDs: TemplateIDSet	Retrieves all Alert Template IDs, or if the Filter string is non-null, it returns those which satisfy the Filter. The filter string provided will be compared with the value in the AlertData SecondaryGrouping field. All matches will be returned in the Set.
RegisterNotificationListener(ALMASNotificationListener)	public CallStatus[Parameters]Handle: ALMASNotificationListener	Registers a new Notification Listener for receipt of the alert distribution notifications.

6.3.4 ALMASManagerExtensions

This class contains optional extensions to the alert manager functionality. These extensions may or may not be implemented in simple ALMAS implementations.

6.3.4.1 Operation

Name	Type	Summary
RemoveAlertsWithDynamicMessageData(String,	public CallStatus[Parameters]CancellerID:	Indicates to ALMAS that a specific object has been

String)	String,DataType: String,DataValue: String	removed from the system, and therefore all associated alerts are no longer valid. These will then be deleted from ALMAS.
AttachCategorisationRule(int, int)	public CallStatus[Parameters]TemplateID: int,RuleID: int	Associates an event categorisation rule with an AlertTemplate
DetachCategorisationRule(int, int)	public CallStatus[Parameters]TemplateID: int,RuleID: int	Disassociates an event categorisation rule from an AlertTemplate

ALMAS14-4
Unknown Author
10/25/2024 17:52

ALMAS14-4
Unknown Author
10/25/2024 17:52

6.3.5 ALMAS Producer

Provides the API by which system components producing alerts can create and update alerts that are generated. A CallStatus object will be returned to indicate whether the request has been accepted by ALMAS. If a system wished to track the lifecycle of the alert, they must implement the NotificationListener functionality to receive updates.

Four mechanisms by which alerts can be raised are provided by the ALMASProducer interface class. Three variants RaiseAlertFromTemplate, RaiseAlertWithDynamicData and RaiseAlertFromOverrides allow the system to raise an alert by simply specifying the alert ID, template ID and their own ProducerID; with dynamic data allows the specification of the intentionally variable data to supplement the template alert definition; from overrides also allows the over-ride of any placeholders that may be present in the 'Message' attribute of the alert data class associated with that template.

The raiser may also optionally override any of the following parameters: Message, MessageLanguage, Category, Status, Scope, Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and AcknowledgementModel.

The RaiseAlertFromData method allows the raiser to specify a completely new alert with no basis on any existing templates. Systems using ALMAS may not wish to support alert templates depending on their size, complexity, and level of alert usage, in which case that system can always use RaiseAlertFromData without need to instantiate any templates at any point during operation.

The status or attributes of an alert can be updated during runtime by calling the UpdateAlert method found in the ALMASProducer interface. The ALMASProducer then works with the ALMAS system to ensure state and data is properly maintained in the system.

6.3.5.1 Operation

Name	Type	Summary
RaiseAlertFromOverrides(String, int, int, Category, int, Status, Scope, double, boolean, String, boolean, boolean, TimeoutAction, AckModel, StaticMessageTypeSet, DynamicMessageDataTypeSet, ReceiverKindTypeSet, AlertDataExtraAttributesTypeSet)	public CallStatus[Parameters]ProducerID: String,TemplateID: int,out AlertID: int,Category: Category,Priority: int,Status: Status,Scope: Scope,Timeout: double,ConfirmationRequired: boolean,SecondaryGrouping: String, Persistent: boolean, ReliablyDistributed: boolean, TimeoutAction: TimeoutAction,AcknowledgementModel: AckModel, StaticMessages: StaticMessageTypeSet, DynamicMessages: DynamicMessageDataTypeSet,AlertReceivers: ReceiverKindTypeSet, ExtraAttributes:	This will cause an alert based on a known alert template to be created and raised. ProducerID, TemplateID and the out parameter AlertID are mandatory, all other parameters are optional. Return parameter indicates success or

ALMAS14-9
Unknown Author
10/24/2024 16:40

	AlertDataExtraAttributesTypeSet	failure reason. The operation fails if the template is inhibited, or the hierarchy does not define the receiver kinds or static and dynamic tags are mismatched. The following are permitted implementation-specific failure cases: unsupported data type for dynamic message data, omitted language in static messages, capacity exceeded.
RaiseAlertWithDynamicData(String, int, int, DynamicMessageDataTypeSet, AlertDataExtraAttributesTypeSet)	public CallStatus[Parameters]ProducerID: String,TemplateID: int,out AlertID: int, DynamicMessages: DynamicMessageDataTypeSet, ,ExtraAttributes: AlertDataExtraAttributesTypeSet	This will cause an alert based on a known alert templateto be created and raised, whilst only specifying the dynamic data content that differs from the template definition. All parameters are mandatory. Return parameter indicates success or failure reason. The operation fails if the template is inhibited.
RaiseAlertFromData(String, AlertTemplate, int)	public CallStatus[Parameters]ProducerID: String,AlertInfo: AlertTemplate,out AlertID: int	Raise an alert not present in the ALMAS template database. A temporary AlertTemaplate is created (whose TemplateID is ignored), to facilitate the creation. Return parameter indicates success or failure reason. The operation fails if the hierarchy does not define the receiver kinds or static and dynamic tags are mismatched. The following are permitted implementation-specific failure cases: unsupported data type

ALMAS14-23
Unknown Author
10/28/2024 15:09

ALMAS14-9
Unknown Author
10/24/2024 16:23

ALMAS14-9
Unknown Author
10/24/2024 16:40

ALMAS14-23
Unknown Author
10/28/2024 15:09

ALMAS14-9
Unknown Author
10/24/2024 16:23

		for dynamic message data, value for type of byte data out of range, omitted language in static messages, capacity exceeded.
RaiseAlertFromTemplate(String, int, int)	public CallStatus[Parameters]ProducerID: String,TemplateID: int,out AlertID: int	Raise an alert without any of the optional parameters for optimal use in the normal case. The operation fails if the template is inhibited.
UpdateAlertPriority(int, String, int)	public CallStatus[Parameters]AlertID: int,ProducerID: String,Priority: int	Updated the priority of existing alert instances that have previously been raised.
CancelAlert(int, String, String)	public CallStatus[Parameters]AlertID: int,CancellerID: String,CancellationReason: String	Cancel a specific alert within ALMAS Return parameter indicates success or failure reason.

6.3.6 ALMASResponder

Provides the API for systems to respond to and provide feedback to ALMAS about alerts received. Embedded in this class are the methods to register and un-register your system-specific receiver.

The system notifies ALMAS through this interface of significant events that have occurred to change the state of an alert.

6.3.6.1 Operation

Name	Type	Summary
AcknowledgeAlert(int, String)	public CallStatus[Parameters]AlertID: int,ReceiverID: String	Indication from an alert receiver that they have acknowledged receipt of the alert and no longer require distribution of its information.
ConfirmReceipt(int, String)	public CallStatus[Parameters]AlertID: int,ReceiverID: String	Confirmation by an alert receiver that they have successfully received the alert to ensure reliable distribution. The ReceiverID field enables action & situation alerts to transition when sufficient confirmations have been received. 'Sufficient' is the 'actionee' for action alerts, and anyone for situation alerts. It can also be used for logging purposes.
HandleAlert(int, String, String)	public CallStatus[Parameters]AlertID: int,ReceiverID: String, AlternativeAction:	Indication from an Alert Receiver that they have performed the

ALMAS14-3

Unknown Author
10/24/2024 16:54

	String	appropriate action required by an Action alert and that the alert can therefore be removed from ALMAS as no longer applicable. An Alternative Action has been performed if that parameter is non-null.
RegisterReceiver(ALMASReceiver, String, String)	public CallStatus[Parameters]ReceiverHandler: ALMASReceiver,ReceiverID: String,RKType: String	This registers a receiver with ALMAS, the parameters are ReceiverHandle (for callback); ReceiverID (for use in all other methods, including UnregisterReceiver) and RKType to provide link to RK hierarchy. It is an error to refer to an RKType that has not been previously defined in a loaded hierarchy file.
UnregisterReceiver(String)	public CallStatus[Parameters]ReceiverID: String	Removes a registered receiver from ALMAS, indicating that they are no longer available for receipt of alert data.

ALMAS14-3

Unknown Author
10/24/2024 16:54

ALMAS14-3

Unknown Author
10/24/2024 16:54

6.3.7 ALMASResponderExtensions

Optional extensions to the alert responder functionality.

6.3.7.1 Operation

Name	Type	Summary
SetLanguage(String, String)	public CallStatus[Parameters]ReceiverID: String,Language: String	Sets the language that this specific receiver should see their message text displayed in where appropriate. This method fails (Requested Service Unavailable) if there is no support for the language.
GetFilledMessageText(int, String)	public CallStatus[Parameters]AlertID: int,out MessageText: String	Returns the message text post related info substitutions. This is an optional helper function as the client could derive this itself.

6.4 Alert Categorisation

The Alert Categorisation PIM allows the expression of Event-Condition-Action rules which can guide automatic triggering of alerts. This represents an optional part of the specification, as it is also possible to trigger alerts through the ALMAS API. The Categorisation PIM allows for the implementation of monitoring components (agents) which can trigger alerts based on different events taking place in the system, such as time events or changes in the internal state of the system.

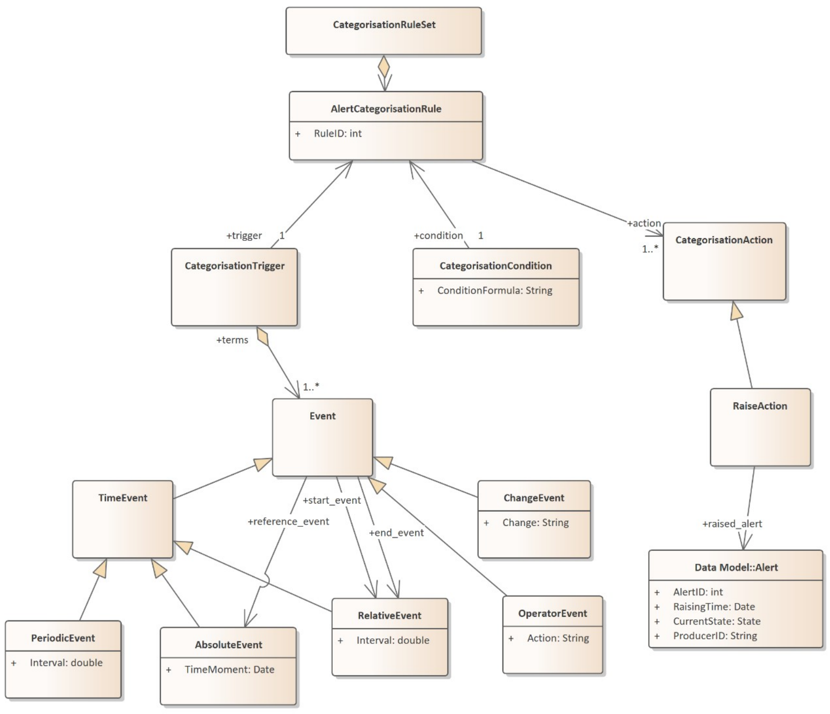


Figure 6-4: Alert Categorisation Platform Independent Model

6.4.1 AbsoluteEvent

Represents an event taking place once at a specific time moment.

6.4.1.1 Attribute

Name	Type	Summary
TimeMoment	public Date	The time of the trigger event

6.4.2 AlertCategorisationRule

Alert Categorisation Rule represents an Event-Condition-Action rule guiding the categorisation. On Event being triggered, a Condition is evaluated. If it evaluates to true, the corresponding Categorisation Action is executed.

6.4.2.1 Attribute

Name	Type	Summary
RuleID	public int	The rule identifier

6.4.3 CategorisationAction

Categorisation Action represents the action to be executed when an event has occurred, and the conditions required have been fulfilled.

6.4.4 CategorisationCondition

The Categorisation Condition represents the condition part of the Event, Condition Action rule.

6.4.4.1 Attribute

Name	Type	Summary
ConditionFormula	public String	The condition formula

6.4.5 CategorisationRuleSet

This is the set of Event, Condition Action rules which apply to this ALMAS system.

6.4.6 CategorisationTrigger

The Categorisation Trigger represents the Event which is able to be observed by ALMAS that can trigger categorisation.

6.4.7 ChangeEvent

One type of event such as enter/leave area, change of generic data value, etc.

6.4.7.1 Attribute

Name	Type	Summary
Chang e	public String	The change which is required

6.4.8 Event

General class of Event, used within the Categorisation Trigger.

6.4.9 OperatorEvent

Operator initiated events, for example operator changing a role.

6.4.9.1 Attribute

Name	Type	Summary
Actio n	public String	The operator action required

6.4.10 PeriodicEvent

Represents a relative event, i.e., an event taking place at a specific (time) interval after another event.

6.4.10.1 Attribute

Name	Type	Summary
Interva l	public double	The condition formula

6.4.11 RaiseAction

A kind of Categorisation Action which raises an alert. Other categorisation actions could be added.

6.4.12 RelativeEvent

Represents a periodic event taking place between start_event and end_event at a specific periodicity (interval).

6.4.12.1 Attribute

Name	Type	Summary
Interva l	public double	Time interval after the reference_interval event at which the RelativeEvent is to take place.

6.4.13 Time Event

A timeout event, which can be absolute, relative, or periodic.

6.5 Dynamic behaviour

6.5.1 Action Situation Alert State Model

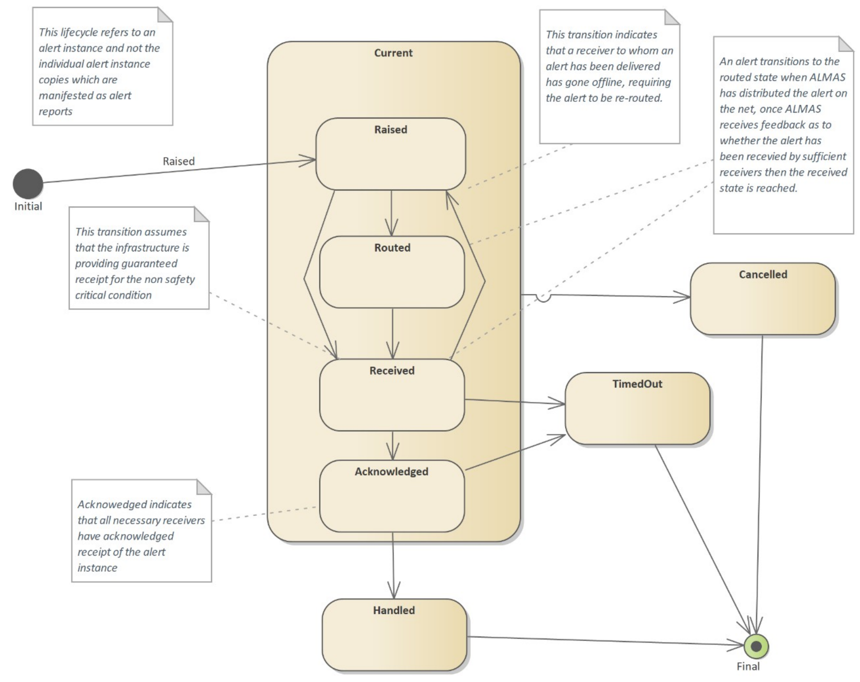

This lifecycle refers to an alert instance and not the individual alert instance copies which are manifested as alert reports
Current
This transition indicates that a receiver to whom an alert has been delivered has gone offline, requiring the alert to be re-routed.
An alert transitions to the routed state when ALMAS has distributed the alert on the net, once ALMAS receives feedback as to whether the alert has been recevied by sufficient receivers then the received state is reached.
Raised
Raised
Initial
Routed
This transition assumes that the infrastructure is providing guaranteed receipt for the non safety critical condition
Cancelled
Received
TimedOut
Acknowledged
Acknowedged indicates that all necessary receivers have acknowledged receipt of the alert instance
Handled
Final

Figure 6-5: Action/Situation Alert Lifecycle

6.5.2 Information Warning Alert State Model

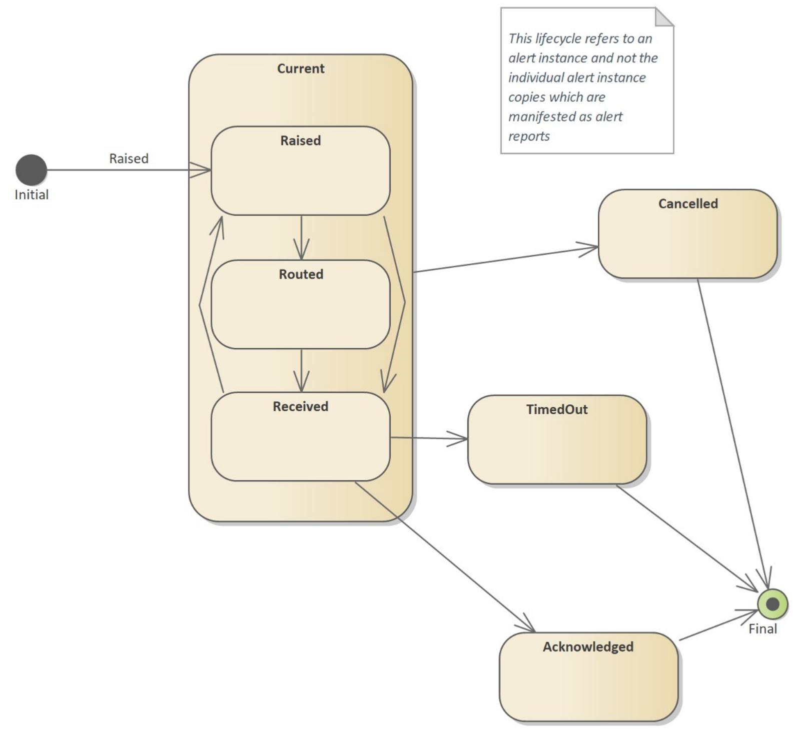
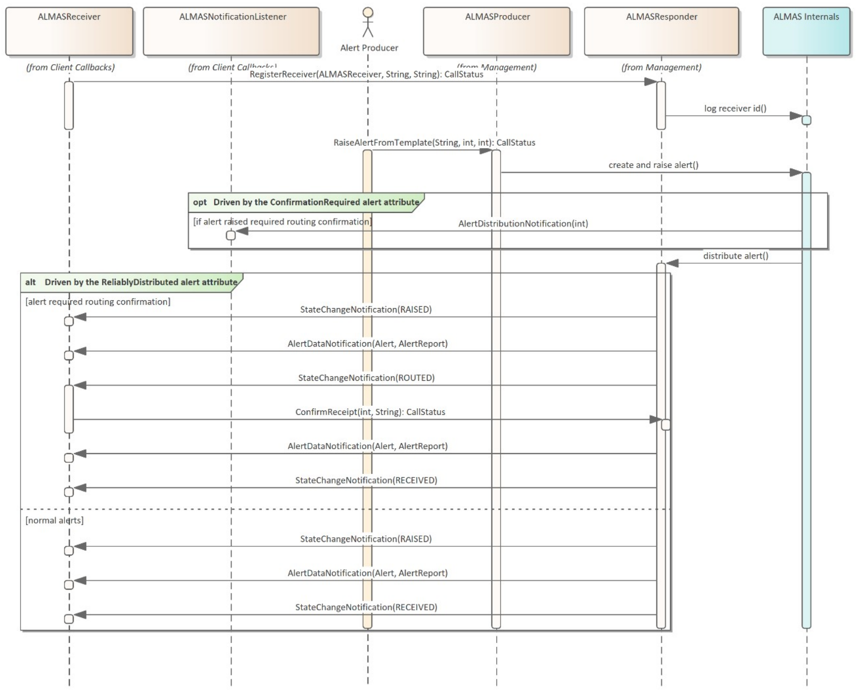

This lifecycle refers to an alert instance and not the individual alert instance copies which are manifested as alert reports
Current
Raised
Initial
Raised
Routed
Received
Cancelled
TimedOut
Acknowledged
Final

Figure 6-6: Information/Warning Alert Instance Lifecycle

6.5.3 Alert Registration and Creation



ALMASReceiver
ALMASNotificationListener
Alert Producer
ALMASProducer
ALMASResponder
ALMAS Internals
(from Client Callbacks)
(from Client Callbacks)
(from Management)
(from Management)
RegisterReceiver(ALMASReceiver, String, String): CallStatus
log receiver id()
RaiseAlertFromTemplate(String, int, int): CallStatus
create and raise alert()
opt Driven by the ConfirmationRequired alert attribute
[if alert raised required routing confirmation]
AlertDistributionNotification(int)
distribute alert()
alt Driven by the ReliablyDistributed alert attribute
[alert required routing confirmation]
StateChangeNotification(RAISED)
AlertDataNotification(Alert, AlertReport)
StateChangeNotification(ROUTED)
ConfirmReceipt(int, String): CallStatus
AlertDataNotification(Alert, AlertReport)
StateChangeNotification(RECEIVED)
[normal alerts]
StateChangeNotification(RAISED)
AlertDataNotification(Alert, AlertReport)
StateChangeNotification(RECEIVED)

Figure 6-7: Alert Registration and Creation Sequence Diagram

The above sequence diagram shows the interaction with the ALMAS service from several user perspectives.

First it indicates the receiver registration interactions (shown as threads 1 and 2 in the figure).

Second it shows the alert raising interactions from an alert producer, with an illustration of the additional callback made if the alert requires routing confirmation (thread 3 up to 3.1.1).

Interactions 3.1.2 through 3.1.6 are indications of the internal activities but are not requirements upon the internals (hence shown under the fictional class ALMAS System Internals).

Finally, interactions 3.1.6.1-4 and 3.1.6.5-7 are two possible interaction from ALMAS back to the alert receiver, depending upon the ReliablyDistributed attribute of the alert. In the case of this attribute being TRUE then 3.1.6.1-4 are executed, otherwise 3.1.6.5-7 are executed.

This page intentionally left blank.

7 XML Platform Specific Model

7.1 The Template Alert Data specification file

The Template Alert Data specification file is an xml schema document which specifies the ontology of the alert template data to be loaded into an ALMAS by the LoadTemplateSet method. Use of this is therefore effectively optional but any client that wishes to make use of templates may do so by supplying corresponding valid xml for loading into the system. There are no API methods in this PSM and therefore there is no logging mechanism associated with this PSM.

ALMAS14-6

Unknown Author
10/25/2024 15:44

```
~~<?xml version="1.0" encoding="UTF-8"?>~~
~~<!-- Alert Data Template schema -->~~
~~<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified"~~
~~attributeFormDefault="unqualified" version="1.0a" id="Alert_Template_Data">~~
~~	<xs:element name="Alert_Template_Root" type="Alerts_Templates_T">~~
~~		<xs:annotation>~~
~~			<xs:documentation>Root element containing Alert Template Data.</xs:documentation>~~
~~		</xs:annotation>~~
~~		<xs:unique name="Template_Id">~~
~~			<xs:selector xpath="./Alert_Template"/>~~
~~			<xs:field xpath="Template_Id"/>~~
~~		</xs:unique>~~
~~	</xs:element>~~
~~	<xs:complexType name="Alerts_Templates_T">~~
~~		<xs:sequence>~~
~~			<xs:element name="Alert_Template" type="Alerts_Template_T" minOccurs="0"~~
~~maxOccurs="unbounded">~~
~~				<xs:annotation>~~
~~					<xs:documentation>The template of an alert.</xs:documentation>~~
~~				</xs:annotation>~~
~~			</xs:element>~~
~~		</xs:sequence>~~
~~	</xs:complexType>~~
~~	<xs:complexType name="Alerts_Template_T">~~
~~		<xs:sequence>~~
~~			<xs:element name="Template_Id">~~
~~				<xs:simpleType>~~
~~					<xs:annotation>~~
~~						<xs:documentation>The unique template identifier.</xs:documentation>~~
~~					</xs:annotation>~~
~~					<xs:restriction base="xs:integer">~~
~~						<xs:minInclusive value="1"/>~~
~~					</xs:restriction>~~
~~				</xs:simpleType>~~
~~			</xs:element>~~
~~			<xs:element name="Alert_Category">~~
~~				<xs:simpleType>~~
~~					<xs:annotation>~~
~~						<xs:documentation>Enumeration of Alert Category.</xs:documentation>~~
~~					</xs:annotation>~~
~~					<xs:restriction base="xs:string">~~
~~						<xs:enumeration value="Action"/>~~
~~						<xs:enumeration value="Situation"/>~~
~~						<xs:enumeration value="Information"/>~~
~~						<xs:enumeration value="Warning"/>~~
~~					</xs:restriction>~~
~~				</xs:simpleType>~~
~~			</xs:element>~~
~~			<xs:element name="Alert_Default_Priority">~~
~~				<xs:simpleType>~~
~~					<xs:restriction base="xs:integer">~~
~~						<xs:minInclusive value="1"/>~~
~~						<xs:maxInclusive value="99"/>~~
~~					</xs:restriction>~~
~~				</xs:simpleType>~~
~~			</xs:element>~~
~~			<xs:element name="Status">~~
~~				<xs:simpleType>~~
~~					<xs:annotation>~~
~~						<xs:documentation>OASIS CAP Derived Status</xs:documentation>~~
```

```
                ~~</xs:annotation>~~
                ~~<xs:restriction base="xs:string">~~
                    ~~<xs:enumeration value="Actual"/>~~
                    ~~<xs:enumeration value="Exercise"/>~~
                    ~~<xs:enumeration value="System"/>~~
                    ~~<xs:enumeration value="Test"/>~~
                ~~</xs:restriction>~~
            ~~</xs:simpleType>~~
        ~~</xs:element>~~
        ~~<xs:element name="Scope">~~
            ~~<xs:simpleType>~~
                ~~<xs:annotation>~~
                    ~~<xs:documentation>OASIS CAP Derived Scope</xs:documentation>~~
                ~~</xs:annotation>~~
                ~~<xs:restriction base="xs:string">~~
                    ~~<xs:enumeration value="PublicScope"/>~~
                    ~~<xs:enumeration value="RestrictedScope"/>~~
                    ~~<xs:enumeration value="PrivateScope"/>~~
                ~~</xs:restriction>~~
            ~~</xs:simpleType>~~
        ~~</xs:element>~~
        ~~<xs:element name="Timeout">~~
            ~~<xs:simpleType>~~
                ~~<xs:annotation>~~
                    ~~<xs:documentation>Time until alert timeout in seconds, where 0 indicates no timeout~~
~~required</xs:documentation>~~
                ~~</xs:annotation>~~
                ~~<xs:restriction base="xs:integer">~~
                    ~~<xs:minInclusive value="0"/>~~
                    ~~<xs:maxInclusive value="3600"/>~~
                ~~</xs:restriction>~~
            ~~</xs:simpleType>~~
        ~~</xs:element>~~
        ~~<xs:element name="ConfirmationRequired" type="xs:boolean"/>~~
        ~~<xs:element name="Secondary_Grouping" minOccurs="0">~~
            ~~<xs:simpleType>~~
                ~~<xs:annotation>~~
                    ~~<xs:documentation>Secondary grouping for filtering aid</xs:documentation>~~
                ~~</xs:annotation>~~
                ~~<xs:restriction base="xs:string"/>~~
            ~~</xs:simpleType>~~
        ~~</xs:element>~~
        ~~<xs:element name="Persistent" type="xs:boolean"/>~~
        ~~<xs:element name="ReliablyDistributed" type="xs:boolean"/>~~
        ~~<xs:element name="TimeoutAction">~~
            ~~<xs:simpleType>~~
                ~~<xs:annotation>~~
                    ~~<xs:documentation>The action to be performed upon alert timeout</xs:documentation>~~
                ~~</xs:annotation>~~
                ~~<xs:restriction base="xs:string">~~
                    ~~<xs:enumeration value="CancelOnly"/>~~
                    ~~<xs:enumeration value="NotifyOnly"/>~~
                    ~~<xs:enumeration value="CancelWithNotify"/>~~
                ~~</xs:restriction>~~
            ~~</xs:simpleType>~~
        ~~</xs:element>~~
        ~~<xs:element name="AcknowledgementModel">~~
            ~~<xs:simpleType>~~
                ~~<xs:annotation>~~
                    ~~<xs:documentation>Required acknowledgement profile before progressing the alert to~~
~~'Acknowledged'</xs:documentation>~~
                ~~</xs:annotation>~~
                ~~<xs:restriction base="xs:string">~~
            ~~<xs:enumeration value="AckByNone"/>~~
            ~~<xs:enumeration value="AckByAnyone"/>~~
            ~~<xs:enumeration value="AckByAll"/>~~
          ~~</xs:restriction>~~
        ~~</xs:simpleType>~~
      ~~</xs:element>~~
      ~~<xs:element name="Inhibited" type="xs:boolean" minOccurs="0"/>~~
      ~~<xs:element name="Raise_To_All" type="xs:boolean"/>~~
      ~~<xs:element name="Static_Message" type="Static_Message_T" maxOccurs="unbounded"/>~~
      ~~<xs:element name="Alert_Data_Extra_Attributes" type="Alert_Data_Extra_Attributes_T"~~
~~minOccurs="0"~~
~~maxOccurs="unbounded"/>~~
      ~~<xs:element name="Dynamic_Message_Data" type="Dynamic_Message_Data_T"~~
~~minOccurs="0" maxOccurs="unbounded"/>~~
      ~~<xs:element name="Alert_Routing" type="Alert_Routing_T" minOccurs="0"~~
~~maxOccurs="unbounded"/>~~
    ~~</xs:sequence>~~
  ~~</xs:complexType>~~
  ~~<xs:complexType name="Static_Message_T">~~
    ~~<xs:sequence>~~
      ~~<xs:element name="MessageText">~~
        ~~<xs:simpleType>~~
          ~~<xs:annotation>~~
            ~~<xs:documentation>The Alert Template Text</xs:documentation>~~
          ~~</xs:annotation>~~
          ~~<xs:restriction base="xs:string">~~
            ~~<xs:minLength value="1"/>~~
          ~~</xs:restriction>~~
        ~~</xs:simpleType>~~
      ~~</xs:element>~~
      ~~<xs:element name="MessageLanguage">~~
        ~~<xs:simpleType>~~
          ~~<xs:annotation>~~
            ~~<xs:documentation>The alert locale</xs:documentation>~~
          ~~</xs:annotation>~~
          ~~<xs:restriction base="xs:string">~~
            ~~<xs:minLength value="1"/>~~
          ~~</xs:restriction>~~
        ~~</xs:simpleType>~~
      ~~</xs:element>~~
    ~~</xs:sequence>~~
  ~~</xs:complexType>~~
  ~~<xs:complexType name="Alert_Data_Extra_Attributes_T">~~
    ~~<xs:sequence>~~
      ~~<xs:element name="Name">~~
        ~~<xs:simpleType>~~
          ~~<xs:annotation>~~
            ~~<xs:documentation>The Attribute Name</xs:documentation>~~
          ~~</xs:annotation>~~
          ~~<xs:restriction base="xs:string">~~
            ~~<xs:minLength value="1"/>~~
          ~~</xs:restriction>~~
        ~~</xs:simpleType>~~
      ~~</xs:element>~~
      ~~<xs:element name="TypeOfByteData">~~
        ~~<xs:simpleType>~~
          ~~<xs:annotation>~~
            ~~<xs:documentation>Flag to indicate the type of data</xs:documentation>~~
          ~~</xs:annotation>~~
          ~~<xs:restriction base="xs:integer">~~
            ~~<xs:minInclusive value="0"/>~~
          ~~</xs:restriction>~~
        ~~</xs:simpleType>~~
```

```
~~      </xs:element>~~
~~      <xs:element name="Description">~~
~~        <xs:simpleType>                                    <xs:annotation>~~
~~            <xs:documentation>Description of contents e.g. image(jpg), URL, Track report~~
~~etc</xs:documentation>                                    </xs:annotation>~~
~~          <xs:restriction base="xs:string">~~
~~            <xs:minLength value="1"/>~~
~~          </xs:restriction>~~
~~        </xs:simpleType>~~
~~      <xs:element>~~
~~    </xs:sequence>~~
~~  </xs:complexType>~~
~~  <xs:complexType name="Dynamic_Message_Data_T">~~
~~    <xs:sequence>~~
~~      <xs:element name="Variable_Type">~~
~~        <xs:simpleType>~~
~~          <xs:annotation>~~
~~            <xs:documentation>Type of variable data</xs:documentation>~~
~~          </xs:annotation>~~
~~          <xs:restriction base="xs:string">~~
~~            <xs:minLength value="1"/>~~
~~          </xs:restriction>~~
~~        </xs:simpleType>~~
~~      </xs:element>~~
~~      <xs:element name="Tag">~~
~~        <xs:annotation>~~
~~          <xs:documentation>The position of the data item within message</xs:documentation>~~
~~        </xs:annotation>~~
~~        <xs:simpleType>~~
~~          <xs:restriction base="xs:string">~~
~~            <xs:minLength value="1"/>~~
~~            <xs:maxLength value="20"/>~~
~~        </xs:restriction>~~
~~        </xs:simpleType>~~
~~      </xs:element>~~
~~    </xs:sequence>~~
~~  </xs:complexType>~~
~~  <xs:complexType name="Alert_Routing_T">~~
~~    <xs:sequence>~~
~~      <xs:element name="Receiver_Kind">~~
~~        <xs:annotation>~~
~~          <xs:documentation>A receiver kind</xs:documentation>~~
~~        </xs:annotation>~~
~~        <xs:simpleType>~~
~~          <xs:restriction base="xs:string">~~
~~            <xs:minLength value="1"/>~~
~~          </xs:restriction>~~
~~        </xs:simpleType>~~
~~      </xs:element>~~
~~      <xs:element name="AlternativeAction" minOccurs="0" maxOccurs="unbounded">~~
~~        <xs:annotation>~~
~~          <xs:documentation>A non-standard alert response</xs:documentation>~~
~~        </xs:annotation>~~
~~        <xs:simpleType>~~
~~          <xs:restriction base="xs:string">~~
~~            <xs:minLength value="1"/>~~
~~          </xs:restriction>~~
~~        </xs:simpleType>~~
~~      </xs:element>~~
~~      <xs:element name="Actionee_Priority">~~
~~        <xs:annotation>~~
~~          <xs:documentation>The priority of the actionee to deal with this alert</xs:documentation>~~
~~        </xs:annotation>~~
```

```
        ~~<xs:simpleType>~~
          ~~<xs:restriction base="xs:integer">~~
            ~~<xs:minInclusive value="1"/>~~
            ~~<xs:maxInclusive value="10"/>~~
          ~~</xs:restriction>~~
        ~~</xs:simpleType>~~
      ~~</xs:element>~~
    ~~</xs:sequence>~~
  ~~</xs:complexType>~~
~~</xs:schema>~~
```

ALMAS14-20

Unknown Author
10/26/2024 12:00

7.2 The ALMAS configuration file

The ALMAS configuration file is an xml schema document specifying some client specific attributes to allow an ALMAS to be more flexible to a client's specific needs from their ALMAS implementation. This should allow for greater interoperability and usability. It is loaded by use of the LoadConfiguration method.

```
~~<?xml version="1.0" encoding="UTF-8" ?>~~
~~<!-- ALMAS Configuration -->~~
~~<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified"~~
~~attributeFormDefault="unqualified" version="1.0a" id="ALMAS_Configuration_Data">~~
  ~~<xs:element name="ALMAS_Config_Root" type="Alerts_Config_T">~~
    ~~<xs:annotation>~~
      ~~<xs:documentation>Root element containing ALMAS Configuration Data.</xs:documentation>~~
    ~~</xs:annotation>~~
  ~~</xs:element>~~
  ~~<xs:complexType name="Alerts_Config_T">~~
    ~~<xs:sequence>~~
      ~~<xs:element name="Max_No_Alerts">~~
        ~~<xs:annotation>~~
          ~~<xs:documentation>Maximum number of alerts in the system</xs:documentation>~~
        ~~</xs:annotation>~~
        ~~<xs:simpleType>~~
          ~~<xs:restriction base="xs:integer">~~
            ~~<xs:minInclusive value="0"/>~~
          ~~</xs:restriction>~~
        ~~</xs:simpleType>~~
      ~~</xs:element>~~
      ~~<xs:element name="Max_No_Alerts_For_Receiver">~~
        ~~<xs:annotation>~~
          ~~<xs:documentation>Maximum number of alerts for each receiver</xs:documentation>~~
        ~~</xs:annotation>~~
        ~~<xs:simpleType>~~
          ~~<xs:restriction base="xs:integer">~~
            ~~<xs:minInclusive value="0"/>~~
          ~~</xs:restriction>~~
        ~~</xs:simpleType>~~
      ~~</xs:element>~~
    ~~</xs:sequence>~~
  ~~</xs:complexType>~~
~~</xs:schema>~~
```

ALMAS14-20

Unknown Author
10/26/2024 12:00

7.3 The Receiver Hierarchy configuration file

The receiver hierarchy configuration file specifies the structure of the relationships between alert receivers to allow for resilience processing in the event of receiver non-availability. If an alert requires routing to a specific receiver who is not available, then the receiver Hierarchy file specifies a parent receiver in place of the higher-priority receiver originally specified.
Search progresses iteratively up the hierarchy until an available receiver is found in place of the original one.

The receiver hierarchy is loaded via the LoadReceiverHierarchy method.

```
~~<?xml version="1.0" encoding="UTF-8" ?>~~
~~<!-- Receiver Hierarchy schema -->~~
~~<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified"~~
~~attributeFormDefault="unqualified" version="1.3" id="Receiver_Hierarchy_Data">~~
~~  <xs:element name="Receiver_Hierarchy_Root" type="Receiver_Hierarchy_T">~~
~~    <xs:annotation>~~
~~      <xs:documentation>Root element containing Hierarchy Data.</xs:documentation>~~
~~    </xs:annotation>~~
~~  </xs:element>~~
~~  <xs:complexType name="Receiver_Hierarchy_T">~~
~~    <xs:sequence>~~
~~      <xs:element name="Base_Receiver_Kind" type="Receiver_Kind_T" maxOccurs="unbounded">~~
~~        <xs:annotation>~~
~~          <xs:documentation>A base alert receiver for which no alternative kinds of receiver~~
~~exist</xs:documentation>~~
~~        </xs:annotation>~~
~~      </xs:element>~~
~~    </xs:sequence>~~
~~    <xs:unique name="ReceiversToBeUniqueInTheHierarchy">~~
~~      <xs:selector xpath="//Type"/>~~
~~      <xs:field xpath="."/>~~
~~    </xs:unique>~~
~~  </xs:complexType>~~
~~  <xs:complexType name="Receiver_Kind_T">~~
~~    <xs:sequence>~~
~~      <xs:element name="Type">~~
~~        <xs:annotation>~~
~~          <xs:documentation>The receiver kind e.g. SPS</xs:documentation>~~
~~        </xs:annotation>~~
~~        <xs:simpleType>~~
~~          <xs:restriction base="xs:string">~~
~~            <xs:minLength value="1" />~~
~~          </xs:restriction>~~
~~        </xs:simpleType>~~
~~      </xs:element>~~
~~      <xs:element name="Priority_Receiver_Kind" type="Receiver_Kind_T"~~
~~maxOccurs="unbounded">~~
~~        <xs:annotation>~~
~~          <xs:documentation>A more specialised, higher priority receiver. Alerts are routed to the~~
~~enclosing parent receiver if no receiver of this type is available.</xs:documentation>~~
~~        </xs:annotation>~~
~~      </xs:element>~~
~~    </xs:sequence>~~
~~  </xs:complexType>~~
~~</xs:schema>~~
```

ALMAS14-20

Unknown Author
10/26/2024 12:01

7.4 The ALMAS categorisation rule file

The categorization rule file is an xml schema document which specifies the categorization rules which can be attached to (or detached from) alerts by means of AttachCategorisationRule method in ALMAS Manager. The configuration file is read by an ALMAS implementation at startup but attaching/detaching of rules to alerts can be done dynamically at runtime using those methods.

```
~~<?xml version="1.0" encoding="ISO-8859-1"?>~~
~~<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">~~
~~  <xs:element name="Categorisation_Rule_Set" type="Categorisation_Rule_Set"/>~~
~~  <xs:complexType name="Categorisation_Rule_Set">~~
~~    <xs:sequence>~~
~~      <xs:element name="Alert_Categorisation_Rule" type="Alert_Categorisation_Rule"/>~~
~~    </xs:sequence>~~
~~  </xs:complexType>~~
```

```
~~<xs:element name="Alert_Categorisation_Rule" type="Alert_Categorisation_Rule"/>~~
~~<xs:complexType name="Alert_Categorisation_Rule">~~
~~    <xs:sequence>~~
~~        <xs:element name="ruleID" type="xs:int"/>~~
~~        <xs:element name="action" type="Categorisation_Action" maxOccurs="unbounded"/>~~
~~        <xs:element name="condition" type="Categorisation_Condition"/>~~
~~        <xs:element name="trigger" type="Categorisation_Trigger"/>~~
~~    </xs:sequence>~~
~~</xs:complexType>~~
~~<xs:element name="Categorisation_Trigger" type="Categorisation_Trigger"/>~~
~~<xs:complexType name="Categorisation_Trigger">~~
~~    <xs:sequence>~~
~~        <xs:element name="terms" type="Event" maxOccurs="unbounded"/>~~
~~    </xs:sequence>~~
~~</xs:complexType>~~
~~<xs:element name="RelativeEvent" type="RelativeEvent"/>~~
~~<xs:complexType name="RelativeEvent">~~
~~    <xs:complexContent>~~
~~        <xs:extension base="TimeEvent">~~
~~            <xs:sequence>~~
~~                <xs:element name="interval" type="xs:double"/>~~
~~                <xs:element name="reference_event" type="Event"/>~~
~~            </xs:sequence>~~
~~        </xs:extension>~~
~~    </xs:complexContent>~~
~~</xs:complexType>~~
~~<xs:element name="PeriodicEvent" type="PeriodicEvent"/>~~
~~<xs:complexType name="PeriodicEvent">~~
~~    <xs:complexContent>~~
~~        <xs:extension base="TimeEvent">~~
~~            <xs:sequence>~~
~~                <xs:element name="interval" type="xs:double"/>~~
~~                <xs:element name="start_event" type="Event"/>~~
~~                <xs:element name="end_event" type="Event"/>~~
~~            </xs:sequence>~~
~~        </xs:extension>~~
~~    </xs:complexContent>~~
~~</xs:complexType>~~
~~<xs:element name="AbsoluteEvent" type="AbsoluteEvent"/>~~
~~<xs:complexType name="AbsoluteEvent">~~
~~    <xs:complexContent>~~
~~        <xs:extension base="TimeEvent">~~
~~            <xs:sequence>~~
~~                <xs:element name="time_moment" type="xs:date"/>~~
~~            </xs:sequence>~~
~~        </xs:extension>~~
~~    </xs:complexContent>~~
~~</xs:complexType>~~
~~<xs:element name="Categorisation_Action" type="Categorisation_Action"/>~~
~~<xs:complexType name="Categorisation_Action">~~
~~    <xs:sequence/>~~
~~</xs:complexType>~~
~~<xs:element name="Categorisation_Condition" type="Categorisation_Condition"/>~~
~~<xs:complexType name="Categorisation_Condition">~~
~~    <xs:sequence>~~
~~        <xs:element name="condition_formula" type="xs:string"/>~~
~~    </xs:sequence>~~
~~</xs:complexType>~~
~~<xs:element name="Raise_Action" type="Raise_Action"/>~~
~~<xs:complexType name="Raise_Action">~~
~~    <xs:complexContent>~~
~~        <xs:extension base="Categorisation_Action">~~
~~            <xs:sequence>~~
~~            <xs:element name="raised_alert" type="Alert"/>~~
~~          </xs:sequence>~~
~~        </xs:extension>~~
~~      </xs:complexContent>~~
~~    </xs:complexType>~~
~~    <xs:element name="Alert" type="Alert"/>~~
~~    <xs:complexType name="Alert">~~
~~      <xs:sequence/>~~
~~    </xs:complexType>~~
~~    <xs:element name="Event" type="Event"/>~~
~~    <xs:complexType name="Event">~~
~~      <xs:sequence/>~~
~~    </xs:complexType>~~
~~    <xs:element name="TimeEvent" type="TimeEvent"/>~~
~~    <xs:complexType name="TimeEvent">~~
~~      <xs:complexContent>~~
~~        <xs:extension base="Event">~~
~~          <xs:sequence/>~~
~~        </xs:extension>~~
~~      </xs:complexContent>~~
~~    </xs:complexType>~~
~~    <xs:element name="Operator_Event" type="Operator_Event"/>~~
~~    <xs:complexType name="Operator_Event">~~
~~      <xs:complexContent>~~
~~        <xs:extension base="Event">~~
~~          <xs:sequence>~~
~~            <xs:element name="action" type="xs:string"/>~~
~~          </xs:sequence>~~
~~        </xs:extension>~~
~~      </xs:complexContent>~~
~~    </xs:complexType>~~
~~    <xs:element name="Change_Event" type="Change_Event"/>~~
~~    <xs:complexType name="Change_Event">~~
~~      <xs:complexContent>~~
~~        <xs:extension base="Event">~~
~~          <xs:sequence>~~
~~            <xs:element name="change" type="xs:string"/>~~
~~          </xs:sequence>~~
~~        </xs:extension>~~
~~      </xs:complexContent>~~
~~    </xs:complexType>~~
~~</xs:schema>~~
```

ALMAS14-20

Unknown Author
10/26/2024 12:01

8 OMG CORBA/IDL Platform Specific Model

8.1 Rationale

The objective of this PSM is to normalize the CORBA/IDL structures and interfaces. This PSM aims to support the entire PIM interface.

In order for this interface to be reasonably compatible with the DDS PSM, also provided, the data model part is separated from the functional interface model.

All attributes, methods and associations are mapped to IDL elements. As a general rule, therefore, classes with methods are mapped to CORBA/IDL interfaces, classes without methods are mapped to structs, attributes are mapped to CORBA/IDL attributes, associations, and compositions to read only attributes and methods to methods which deal with errors through CORBA exceptions. Typedef declarations are introduced for UML int attributes mapped to an IDL long, sequences for UML zero-to-many attributes or compositions and to map a PIM date to a CORBA TimeT.

Subscribe methods and indication classes are also mapped within a client IDL file which has to be implemented by clients in order to receive indications (i.e., callbacks) from ALMAS.

The invocation of API methods is logged using the Open Telemetry (OTEL) standard by the implementation of the API method.

ALMAS14-6

Unknown Author
10/25/2024 16:00

~~ALMAS Data Model IDL~~

```
~~// Copyright 2005-2008 THALES, BAE Systems, Raytheon~~

~~#include "timebase.idl"~~
~~#ifndef __ALMAS_DataModel_DEF~~
~~#define __ALMAS_DataModel_DEF~~
~~#pragma prefix "omg.org"~~

~~module ALMAS_DataModel {~~

~~ typedef long ALMAS_AlertIDType;~~

~~ typedef long ALMAS_TemplateIDType;~~

~~ typedef long ALMAS_TimeoutType;~~

~~ typedef TimeBase::TimeT ALMAS_DateTimeType; // EVoT compatible  long long~~

~~ typedef sequence<octet> ALMAS_ByteSequence;~~

~~ typedef sequence<string> ALMAS_StringSet;~~

~~ enum ALMAS_CategoryType {~~
~~   Action,~~
~~   Warning,~~
~~   Information,~~
~~   Situation};~~

~~ enum ALMAS_StateType {~~
~~   Raised,~~
~~   Routed,~~
~~   Received,~~
~~   Acknowledged,~~
~~   Handled,~~
~~   Cancelled,~~
~~   TimedOut};~~

~~ enum ALMAS_StatusType {~~
~~   Actual,~~
~~   Exercise,~~
~~   System,~~
~~   Test};~~

~~ enum ALMAS_ScopeType {~~
~~   PublicScope,~~
~~   RestrictedScope,~~
```

```
~~PrivateScope};~~

~~enum ALMAS_TimeoutActionType {~~
~~CancelOnly,~~
~~NotifyOnly,~~
~~CancelWithNotify};~~

~~enum ALMAS_AckModelType {~~
~~AckByNone,~~
~~AckByAnyone,~~
~~AckByAll};~~

~~struct ALMAS_CallStatus {~~
~~boolean Success;~~
~~short Reason;~~
~~string Description; };~~

~~struct ALMAS_ValidAlertResponseType {~~
~~ALMAS_StringSet AlternativeAction;~~
~~short ActioneePriority; };~~

~~struct ALMAS_ReceiverKindType {~~
~~string RKType;~~
~~string RKParentType;~~
~~ALMAS_ValidAlertResponseType ValidResponse; };~~
~~typedef sequence<ALMAS_ReceiverKindType> ALMAS_ReceiverKindTypeSet;~~

~~struct ALMAS_DynamicMessageDataType {~~
~~string DataType;~~
~~string DataTag;~~
~~string DataValue; };~~
~~typedef sequence<ALMAS_DynamicMessageDataType> ALMAS_DynamicMessageDataTypeSet;~~

~~struct ALMAS_StaticMessageType {~~
~~string MessageText;~~
~~string MessageLanguage; };~~
~~typedef sequence<ALMAS_StaticMessageType> ALMAS_StaticMessageTypeSet;~~

~~struct ALMAS_AlertDataExtraAttributesType {~~
~~string Name;~~
~~short TypeOfByteData;~~
~~string Description;~~
~~ALMAS_ByteSequence Value; };~~
~~typedef sequence<ALMAS_AlertDataExtraAttributesType> ALMAS_AlertDataExtraAttributesTypeSet;~~

~~struct ALMAS_AlertDataType {~~
~~ALMAS_TemplateIDType TemplateID;~~
~~ALMAS_CategoryType Category;~~
~~short Priority;~~
~~ALMAS_StatusType Status;~~
~~ALMAS_ScopeType Scope;~~
~~ALMAS_TimeoutType Timeout;~~
~~boolean ConfirmationRequired;~~
~~string SecondaryGrouping;~~
~~boolean Persistent;~~
~~boolean ReliablyDistributed;~~
~~ALMAS_TimeoutActionType TimeoutAction;~~
~~ALMAS_AckModelType AcknowledgementModel;~~
~~ALMAS_StaticMessageTypeSet StaticMessages;~~
~~ALMAS_DynamicMessageDataTypeSet DynamicMessages;~~
~~ALMAS_AlertDataExtraAttributesTypeSet ExtraAttributes; };~~

~~struct ALMAS_AlertTemplateType {~~
```

```
~~  boolean Inhibited;~~
~~  boolean RaiseToAll;~~
~~  ALMAS_AlertDataType AlertData;~~
~~  ALMAS_ReceiverKindTypeSet ReceiverKinds; };~~

~~ struct ALMAS_AlertReportType {~~
~~  boolean Acknowledged;~~
~~  boolean Routed;~~
~~  boolean Actioned;~~
~~  boolean ReceiverIsActionee;~~
~~  ALMAS_StringSet AlternativeAction;~~
~~  string ReceiverID;~~
~~  ALMAS_AlertIDType AlertID; };~~

~~ struct ALMAS_AvailableAlertReceiverType {~~
~~  string ReceiverID;~~
~~  ALMAS_ReceiverKindType ReceiverKind; };~~
~~ typedef sequence<ALMAS_AvailableAlertReceiverType> ALMAS_AvailableAlertReceiverTypeSet;~~

~~ struct ALMAS_Alert {~~
~~  ALMAS_AlertIDType AlertID;~~
~~  ALMAS_DateTimeType RaisingTime;~~
~~  ALMAS_StateType CurrentState;~~
~~  string ProducerID;~~
~~  ALMAS_AlertDataType AlertData;~~
~~  ALMAS_AvailableAlertReceiverTypeSet Receivers; };~~
~~};~~

~~#endif~~
```

~~ALMAS Client IDL~~

```
~~// Copyright 2005-2008 THALES, BAE Systems, Raytheon~~

~~#include "ALMAS_DataModel.idl"~~
~~#ifndef __ALMAS_Client_DEF~~
~~#define __ALMAS_Client_DEF~~
~~#pragma prefix "omg.org"~~

~~module ALMAS_Client {~~

~~ interface ALMAS_Receiver {~~

~~  oneway void StateChangeNotification (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
~~    in ALMAS_DataModel::ALMAS_StateType NewState);~~

~~  oneway void AlertDataNotification ( // alert ID is embedded within info~~
~~    in ALMAS_DataModel::ALMAS_Alert AlertInfo,~~
~~    in ALMAS_DataModel::ALMAS_AlertReportType Report);~~
~~ };~~

~~ interface ALMAS_NotificationListener {~~

~~  oneway void AlertDistributionNotification (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID);~~
~~  };~~
~~};~~

~~#endif~~
```

~~ALMAS Management IDL~~

```
~~// Copyright 2005-2008 THALES, BAE Systems, Raytheon~~

~~#include "ALMAS_Client.idl"~~
~~#include "ALMAS_DataModel.idl"~~
~~#ifndef __ALMAS_Management_DEF~~
~~#define __ALMAS_Management_DEF~~
~~#pragma prefix "omg.org"~~

~~module ALMAS_Management {~~

~~ typedef sequence<ALMAS_DataModel::ALMAS_Alert> ALMAS_AlertSet;~~

~~ typedef sequence<ALMAS_DataModel::ALMAS_TemplateIDType> ALMAS_TemplateIDTypeSet;~~

~~ interface ALMAS_Manager {~~

~~  attribute string ALMAS_SystemID;~~

~~  // alert retrieval methods~~

~~  ALMAS_DataModel::ALMAS_CallStatus GetAlert (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
~~    out ALMAS_DataModel::ALMAS_Alert Alert);~~

~~  ALMAS_DataModel::ALMAS_CallStatus GetAlerts (~~
~~    in string Filter,~~
~~    out ALMAS_AlertSet AlertSet);~~

~~  // ALMAS-wide control methods~~

~~  ALMAS_DataModel::ALMAS_CallStatus SetAlertInhibited (~~
~~    in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
~~    in boolean Inhibition);~~

~~  ALMAS_DataModel::ALMAS_CallStatus UpdateDynamicMessageData (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
~~    in string ObjectValue,~~
~~    in ALMAS_DataModel::ALMAS_DynamicMessageDataType OldValue);~~

~~  ALMAS_DataModel::ALMAS_CallStatus RegisterNotificationListener (~~
~~    in ALMAS_Client::ALMAS_NotificationListener Handle);~~

~~  // Template management methods~~

~~  ALMAS_DataModel::ALMAS_CallStatus GetTemplate (~~
~~    in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
~~    out ALMAS_DataModel::ALMAS_AlertTemplateType Template);~~

~~  ALMAS_DataModel::ALMAS_CallStatus GetAllTemplateIDs (~~
~~    in string Filter,~~
~~    out ALMAS_TemplateIDTypeSet TemplateIDSet);~~
~~};~~

~~ interface ALMAS_ManagerExtensions : ALMAS_Manager {~~

~~  ALMAS_DataModel::ALMAS_CallStatus RemoveAlertsWithDynamicData (~~
~~    in string CancellerID,~~
~~    in string DataType,~~
~~    in string DataValue);~~

~~  AMAS_DataModel::ALMAS_CallStatus AttachCategorisationRule (~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~in long RuleID);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus DetachCategorisationRule (~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~in long RuleID);~~
  ~~};~~
~~interface ALMAS_Producer {~~

  ~~ALMAS_DataModel::ALMAS_CallStatus RaiseAlertFromOverrides (~~
    ~~in string ProducerID,~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~in ALMAS_DataModel::ALMAS_CategoryType Category,~~
    ~~in boolean ValidCategory,~~
    ~~in short Priority,~~
    ~~in boolean ValidPriority,~~
    ~~in ALMAS_DataModel::ALMAS_StatusType Status,~~
    ~~in boolean ValidStatus,~~
    ~~in ALMAS_DataModel::ALMAS_ScopeType Scope,~~
    ~~in boolean ValidScope,~~
    ~~in ALMAS_DataModel::ALMAS_TimeoutType Timeout,~~
    ~~in boolean ValidTimeout,~~
    ~~in boolean ConfirmationRequired,~~
    ~~in boolean ValidConfirmationRequired,~~
    ~~in string SecondaryGrouping,~~
    ~~in boolean ValidSecondaryGrouping,~~
    ~~in boolean Persistent,~~
    ~~in boolean ValidPersistent,~~
    ~~in boolean ReliablyDistributed,~~
    ~~in boolean ValidReliablyDistributed,~~
    ~~in ALMAS_DataModel::ALMAS_TimeoutActionType TimeoutAction,~~
    ~~in boolean ValidTimeoutAction,~~
    ~~in ALMAS_DataModel::ALMAS_AckModelType AcknowledgementModel,~~
    ~~in boolean ValidAcknowledgementModel,~~
    ~~in ALMAS_DataModel::ALMAS_StaticMessageSet StaticMessages,~~
    ~~in boolean ValidStaticMessages,~~
    ~~in ALMAS_DataModel::ALMAS_DynamicMessageDataTypeSet DynamicMessageData,~~
    ~~in boolean ValidDynamicMessageData,~~
    ~~in ALMAS_DataModel::ALMAS_ReceiverKindTypeSet AlertReceivers,~~
    ~~in boolean ValidAlertReceiverSet,~~
    ~~out ALMAS_DataModel::ALMAS_AlertIDType AlertID);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus RaiseAlertWithDynamicData (~~
    ~~in string ProducerID,~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~in ALMAS_DataModel::ALMAS_DynamicMessageDataTypeSet DynamicMessageData,~~
    ~~out ALMAS_DataModel::ALMAS_AlertIDType AlertID);~~

   ~~ALAS_DataModel::ALMAS_CallStatus RaiseAlertFromData (~~
    ~~in string ProducerID,~~
    ~~in ALMAS_DataModel::ALMAS_AlertTemplateType AlertInfo,~~
    ~~out ALMAS_DataModel::ALMAS_AlertIDType AlertID);~~

  ~~AMAS_DataModel::ALMAS_CallStatus RaiseAlertFromTemplate (~~
    ~~in string ProducerID,~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~out ALMAS_DataModel::ALMAS_AlertIDType AlertID);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus UpdateAlertPriority (~~
    ~~in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
    ~~in string ProducerID,~~
    ~~in short Priority);~~
```

```
~~AMAS_DataModel::ALMAS_CallStatus CancelAlert (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
~~    in string CancellerID,~~
~~    in string CancellationReason);~~
~~};~~

~~interface ALMAS_Responder {~~

~~ ALMAS_DataModel::ALMAS_CallStatus RegisterReceiver (~~
~~    in ALMAS_Client::ALMAS_Receiver ReceiverHandle,~~
~~    in string ReceiverID,~~
~~    in string RKType);~~

~~ ALMAS_DataModel::ALMAS_CallStatus UnregisterReceiver (~~
~~    in string ReceiverID);~~

~~ AMAS_DataModel::ALMAS_CallStatus AcknowledgeAlert (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
~~    in string ReceiverID);~~

~~ ALMAS_DataModel::ALMAS_CallStatus HandleAlert (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
~~    in string ReceiverID);~~

~~ ALMAS_DataModel::ALMAS_CallStatus ConfirmReceipt (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
~~    in string ReceiverID);~~
~~};~~

~~interface ALMAS_ResponderExtensions : ALMAS_Responder {~~

~~ ALMAS_DataModel::ALMAS_CallStatus SetLanguage (~~
~~    in string ReceiverID,~~
~~    in string Language);~~

~~ ALMAS_DataModel::ALMAS_CallStatus GetFilledMessageText (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
~~    out string MessageText);~~
~~};~~

~~interface ALMAS_Configuration {~~

~~ ALMAS_DataModel::ALMAS_CallStatus LoadReceiverHierarchy (~~
~~    in string Filename );~~

~~ ALMAS_DataModel::ALMAS_CallStatus LoadTemplateSet (~~
~~    in string Filename );~~

~~ ALMAS_DataModel::ALMAS_CallStatus LoadConfiguration (~~
~~    in string Filename );~~
~~};~~
~~};~~

~~#endif~~
```

ALMAS14-20

Unknown Author
10/26/2024 12:02

9 DDS/DCPS Platform Specific Model

9.1 Rationale

The approach in this PSM is to compare it to the CORBA PSM and highlight differences as necessary. In the DDS PSM two (not exclusive) ways are provided for modeling the management module:

- DCPS-only mapping, in which interfaces are modeled as topics (singletons) and methods as pairs of (request- and reply) topics.
- DLRL mapping, which models classes and methods more directly. The mapping is based on information provided by PrismTech on DLRL data modeling. This entails following when compared to the CORBA PSM:
    - use of valuetypes instead of interfaces – note that a valuetype which is to be distributed by DLRL must inherit from DDS::ObjectRoot
    - there must be an XML-based mapping from DLRL to DCPS. This mapping is not provided in the submission as it is expected that the default DLRL-DCPS mapping is used.

A DCPS-only implementation will use only DCPS-only mapping, while a DLRL implementation will use a combination of DCPS and DLRL mappings.

If DDS_XTYPES is defined topic keys are defined using the @key annotation defined by the DDS_XTYPES specification. Otherwise an alternate #pragma keylist mechanism is used for compatibility with earlier versions of this specification.~~All topics are identified by the #pragma keylist immediately after them. Submitters are aware that this is not a DDS standard construct (this is a product-specific OpenSplice facility) and will revise the submission when there is a standardised way of declaring keys.~~

ALMAS14-2
Unknown Author
10/24/2024 16:25

The invocation of API methods is logged using the Open Telemetry (OTEL) standard by the implementation of the API method or by a DDS Logging tool using the DDS RTPS protocol.

ALMAS14-6
Unknown Author
10/25/2024 16:05

9.1.1 DCPS level mapping

A generic response topic is used for responses to all method calls; note that this does not provide return values, but just the error code.

Return values are implemented in DCPS by publication of an appropriate topic.

In terms of mapping the PIM-level methods on DCPS, following rules are applied:

- Wherever possible, PIM-level methods are mapped to subscriptions or publications of respective DDS topics. This means that even though these methods cannot be found in the DDS PSM IDL, they can be executed on the PSM level by simply calling the required function from the DDS API. For example, the method GetAlert in ALMAS Manager can therefore be implemented by a DDS read of the Alert topic, with attached condition to receive only the Alert with the ID we are interested in.
- In all other cases, so-called "control topics" are used (such as also applied in the AMSM specification). The names of the topics identify the method which they realize. The control topics also include an identifier of the request (assumed to be uniquely generated by the calling application). The responses to methods are modelled as instances of topic ALMAS_Response, which includes the error code (return_type on the PIM level) and the request identifier (which then can be used to relate the response to the request). In case a method has output parameters other than return_type, these are obtained by reading the relevant topic.

Also, ALMAS_RegisterReceiver and ALMAS_UnregisterReceiver are mapped to DCPS built-in API methods and so are omitted from the IDL for this PSM. It is assumed that request IDs are generated by the producer and that they are unique to an individual ALMAS producer. Topic instances are post-fixed with the Producer ID so that they are unique to a producer. The caller is responsible for finding the instance of topic ALMAS_Response that corresponds to their request. This is in alignment with the approach taken in AMSM.

ALMAS14-1
Unknown Author
10/24/2024 16:27

~~ALMAS Data Model – shared~~
~~// copyright 2005-8 THALES, BAE Systems, Raytheon~~

~~// #include "timebase.idl"~~
~~#include "dds_dcps.idl" // use for DDS standard compatible time types~~

```
~~#ifndef __ALMAS_DataModel_DEF~~
~~#define __ALMAS_DataModel_DEF~~

~~module ALMAS_DataModel {~~

~~ typedef long ALMAS_AlertIDType;~~

~~ typedef long ALMAS_TemplateIDType;~~

~~ typedef long ALMAS_TimeoutType;~~

~~ // typedef TimeBase::TimeT ALMAS_DateTimeType; // EVoT compatible – long long~~
~~ typedef DDS::Time_t ALMAS_DateTimeType; // DDS compatible~~

~~ typedef sequence<octet> ALMAS_ByteSequence;~~

~~ typedef sequence<string> ALMAS_StringSet;~~

~~ enum ALMAS_CategoryType {~~
~~   Action,~~
~~   Warning,~~
~~   Information,~~
~~   Situation};~~

~~ enum ALMAS_StateType {~~
~~   Raised,~~
~~   Routed,~~
~~   Received,~~
~~   Acknowledged,~~
~~   Handled,~~
~~   Cancelled~~
~~   Timed_Out};~~

~~ enum ALMAS_StatusType {~~
~~   Actual,~~
~~   Exercise,~~
~~   System,~~
~~   Test};~~

~~ enum ALMAS_ScopeType {~~
~~   PublicScope,~~
~~   RestrictedScope,~~
~~   PrivateScope};~~

~~ enum ALMAS_TimeoutActionType {~~
~~   CancelOnly,~~
~~   NotifyOnly,~~
~~   CancelWithNotify};~~

~~ enum ALMAS_AckModelType {~~
~~   AckByNone,~~
~~   AckByAnyone,~~
~~   AckByAll};~~

~~ struct ALMAS_CallStatus {~~
~~   boolean Success;~~
~~   short Reason;~~
~~   string Description; };~~

~~ struct ALMAS_ValidAlertResponseType {~~
~~   ALMAS_StringSet AlternativeAction;~~
~~   short ActioneePriority; };~~
```

```
~~struct ALMAS_ReceiverKindType {~~
~~string RKType;~~
~~string RKParentType;~~
~~ALMAS_ValidAlertResponseType ValidResponse; };~~
~~typedef sequence<ALMAS_ReceiverKindType> ALMAS_ReceiverKindTypeSet;~~

~~struct ALMAS_DynamicMessageDataType {~~
~~string DataType;~~
~~string DataTag;~~
~~string DataValue; };~~
~~typedef sequence<ALMAS_DynamicMessageDataType> ALMAS_DynamicMessageDataTypeSet;~~

~~struct ALMAS_StaticMessageType {~~
~~string MessageText;~~
~~string MessageLanguage; };~~
~~typedef sequence<ALMAS_StaticMessageType> ALMAS_StaticMessageTypeSet;~~

~~struct ALMAS_AlertDataExtraAttributesType {~~
~~string Name;~~
~~short TypeOfByteData;~~
~~string Description;~~
~~ALMAS_ByteSequence Value; };~~
~~typedef sequence<ALMAS_AlertDataExtraAttributesType> ALMAS_AlertDataExtraAttributesTypeSet;~~

~~struct ALMAS_AlertDataType {~~
~~ALMAS_TemplateIDType TemplateID;~~
~~ALMAS_CategoryType Category;~~
~~short Priority;~~
~~ALMAS_StatusType Status;~~
~~ALMAS_ScopeType Scope;~~
~~ALMAS_TimeoutType Timeout;~~
~~boolean ConfirmationRequired;~~
~~string SecondaryGrouping;~~
~~boolean Persistent;~~
~~boolean ReliablyDistributed;~~
~~ALMAS_TimeoutActionType TimeoutAction;~~
~~ALMAS_AckModelType AcknowledgementModel;~~
~~ALMAS_StaticMessageTypeSet StaticMessages;~~
~~ALMAS_DynamicMessageDataTypeSet DynamicMessages;~~
~~ALMAS_AlertDataExtraAttributesTypeSet ExtraAttributes; };~~

~~struct ALMAS_AlertTemplateType {~~
~~boolean Inhibited;~~
~~boolean RaiseToAll;~~
~~ALMAS_AlertDataType AlertData;~~
~~ALMAS_ReceiverKindTypeSet ReceiverKinds; };~~
~~#pragma keylist ALMAS_AlertTemplateType AlertData.TemplateID~~

~~struct ALMAS_AlertReportType {~~
~~boolean Acknowledged;~~
~~boolean Routed;~~
~~boolean Actioned;~~
~~boolean ReceiverIsActionee;~~
~~ALMAS_StringSet AlternativeAction;~~
~~string ReceiverID;~~
~~ALMAS_AlertIDType AlertID; };~~
~~#pragma keylist ALMAS_AlertReportType ReceiverID, AlertID~~

~~struct ALMAS_AvailableAlertReceiverType {~~
~~string ReceiverID;~~
~~ALMAS_ReceiverKindType ReceiverKind; };~~
~~typedef sequence<ALMAS_AvailableAlertReceiverType> ALMAS_AvailableAlertReceiverTypeSet;~~
```

```
~~struct ALMAS_Alert {~~
~~  ALMAS_AlertIDType AlertID;~~
~~  ALMAS_DateTimeType RaisingTime;~~
~~  ALMAS_StateType CurrentState;~~
~~  string ProducerID;~~
~~  ALMAS_AlertDataType AlertData;~~
~~  ALMAS_AvailableAlertReceiverTypeSet Receivers; };~~
~~#pragma keylist ALMAS_Alert AlertID~~

~~};~~

~~#endif~~
```

ALMAS14-20

Unknown Author
10/26/2024 12:11

9.2 DCPS

9.2.1 ALMAS Client

The ALMAS client module is not required in the DDS PSM since this is all available through the use of the standard DDS mechanisms and the topics already defined for ALMAS_StateType and ALMAS_Alert.

9.2.2 ALMAS Management

Parameters of the operation RaiseAlertFromOverrides are implicitly defined as being optional in the PIM; in this PSM they are explicitly marked as optional using an IDL annotation.

The AlertID out parameter in PIM methods RaiseAlertFromOverrides, RaiseAlertWithDynamicData, RaiseAlertFromData and RaiseAlertFromTemplate is mapped to the ALMAS_CreatedAlert topic type so that producers are aware of the alert id for alerts they have raised in order to cancel them as appropriate.

The following table provides explanation of the mapping of methods in the ALMAS Management module. Only those methods which are mapped directly to DDS level constructs are listed in the table, all methods which are mapped on "control topics" are listed in the subsequent IDL file.

Class (PIM level)	Method	DDS mapping
ALMAS Manager	GetAlert(int, Alert)	DDS read with query condition
ALMAS Manager	GetAlerts(String, SortedAlertSet)	DDS read with query condition
ALMAS Manager	GetTemplate(int)	DDS read with query condition.
ALMAS Manager	GetAllTemplateIDs(String, TempalteIDSet)	DDS read with query condition.
ALMAS Manager	RegisterNotificationListener(ALMAS Notification Listener)	Creation of a new DDS Listener.

```
~~// copyright 2005-8 THALES, BAE Systems, Raytheon~~

~~#include "ALMAS_DataModel.idl"~~

~~#ifndef __ALMAS_Management_DEF~~
~~#define __ALMAS_Management_DEF~~
```

```
~~module ALMAS_Management {~~

~~ typedef long long ALMAS_RequestIdType;~~

~~ typedef sequence<ALMAS_DataModel::ALMAS_Alert> ALMAS_AlertSet;~~

~~ struct ALMAS_Response {~~
~~   ALMAS_RequestIdType request_id;~~
~~   ALMAS_DataModel::ALMAS_CallStatus error_code; };~~
~~ #pragma keylist ALMAS_Response request_id~~

~~ // Need a singleton topic for ALMAS_Manager since it has attributes~~

~~ struct ALMAS_Manager {~~
~~   string SystemID;};~~
~~ #pragma keylist ALMAS_Manager~~

~~ struct ALMAS_RaiseAlertFromTemplate {~~
~~   ALMAS_RequestIdType request_id;~~
~~   string ProducerID;~~
~~   ALMAS_DataModel::ALMAS_TemplateIDType TemplateID; };~~
~~ #pragma keylist ALMAS_RaiseAlertFromTemplate request_id~~

~~struct ALMAS_RegisterReceiver {~~
~~   ALMAS_RequestIdType request_id;~~
~~   string ReceiverID;~~
~~   string RKType; };~~
~~ #pragma keylist ALMAS_RegisterReceiver request_id~~

~~ struct ALMAS_UnregisterReceiver {~~
~~   ALMAS_RequestIdType request_id;~~
~~   string ReceiverID; };~~
~~ #pragma keylist ALMAS_UnregisterReceiver request_id~~

~~ struct ALMAS_RaiseAlertFromOverrides  {~~
~~   ALMAS_RequestIdType request_id;~~
~~   string ProducerID;~~
~~   ALMAS_DataModel::ALMAS_TemplateIDType TemplateID;~~
~~   @optional ALMAS_CategoryType Category;~~
~~   @optional short Priority;~~
~~   @optional ALMAS_StatusType Status;~~
~~   @optional ALMAS_ScopeType Scope;~~
~~   @optional ALMAS_TimeoutType Timeout;~~
~~   @optional boolean ConfirmationRequired;~~
~~   @optional string SecondaryGrouping;~~
~~   @optional boolean Persistent;~~
~~   @optional boolean ReliablyDistributed;~~
~~   @optional ALMAS_TimeoutActionType TimeoutAction;~~
~~   @optional ALMAS_AckModelType AcknowledgementModel;~~
~~   @optional ALMAS_StaticMessageTypeSet StaticMessages;~~
~~   @optional ALMAS_DynamicMessageDataTypeSet DynamicMessages; };~~
~~};~~
~~ #pragma keylist ALMAS_RaiseAlertFromOverrides request_id~~

~~struct ALMAS_RaiseAlertWithDynamicData {~~
~~   ALMAS _RequestIdType request_id;~~
~~   string ProducerID;~~
~~   ALMAS_DataModel::ALMAS_TemplateIDType TemplateID;~~
~~   ALMAS_DataModel::ALMAS_DynamicMessageDataType DynamicMessages };~~
~~ #pragma keylist ALMAS_RaiseAlertWithDynamicData request_id~~

~~ struct ALMAS_RaiseAlertFromData  {~~
~~  ALMAS_RequestIdType request_id;~~
~~  string ProducerID;~~
~~  ALMAS_DataModel::ALMAS_AlertTemplateType AlertInfo; };~~
~~#pragma keylist ALMAS_RaiseAlertFromData request_id~~

~~ struct ALMAS_CreatedAlert {~~
~~  ALMAS_RequestIdType request_id;~~
~~  ALMAS_DataModel::ALMAS_AlertIDType AlertID; };~~
~~#pragma keylist ALMAS_CreatedAlert request_id~~

~~struct ALMAS_UpdateAlertPriority {~~
~~  ALMAS_RequestIdType request_id;~~
~~  string ProducerID;~~
~~  ALMAS_DataModel::ALMAS_AlertIDType AlertID;~~
~~  short Priority; };~~
~~#pragma keylist ALMAS_UpdateAlertPriority request_id~~

~~struct ALMAS_CancelAlert  {~~
~~  ALMAS_RequestIdType request_id;~~
~~  string CancelerID;~~
~~  ALMAS_DataModel::ALMAS_AlertIDType AlertID;~~
~~  string CancellationReason; };~~
~~#pragma keylist ALMAS_CancelAlert request_id~~

~~struct ALMAS_AcknowledgeAlert {~~
~~  ALMAS_RequestIdType request_id;~~
~~  ALMAS_DataModel::ALMAS_AlertIDType AlertID;~~
~~  string ReceiverID;};~~
~~#pragma keylist ALMAS_AcknowledgeAlert request_id~~

~~struct ALMAS_HandleAlert {~~
~~  ALMAS_RequestIdType request_id;~~
~~  ALMAS_DataModel::ALMAS_AlertIDType AlertID;~~
~~  string ReceiverID;};~~
~~#pragma keylist ALMAS_HandleAlert request_id~~

~~struct ALMAS_ConfirmReceipt {~~
~~  ALMAS_RequestIdType request_id;~~
~~  ALMAS_DataModel::ALMAS_AlertIDType AlertID;~~
~~  string ReceiverID;};~~
~~#pragma keylist ALMAS_ConfirmReceipt request_id~~

~~struct ALMAS_SetLanguage {~~
~~  ALMAS_RequestIdType request_id;~~
~~  string ReceiverID;~~
~~  string Language;};~~
~~#pragma keylist ALMAS_SetLanguage request_id~~

~~struct ALMAS_GetFilledMessageText {~~
~~  ALMAS_RequestIdType request_id;~~
~~  ALMAS_DataModel::ALMAS_AlertIDType AlertID;~~
~~  string ReceiverID;};~~
~~#prgma keylist ALMAS_GetFilledMessageText request_id~~

~~struct ALMAS_FilledMessageText {~~
~~  ALMAS_RequestIdType request_id;~~
~~  ALMAS_DataModel::ALMAS_StringSet Messages; };~~
~~#pragma keylist ALMAS_FilledMessageText request_id~~

~~struct ALMAS_LoadReceiverHierarchy {~~
~~  ALMAS_RequestIdType request_id;~~
~~  string Filename ;};~~
~~#pragma keylist ALMAS_LoadReceiverHierarchy request_id~~
```

```
~~struct ALMAS_LoadTemplateSet {~~
~~  ALMAS_RequestIdType request_id;~~
~~  string Filename; };~~
~~#pragma keylist ALMAS_LoadTemplateSet request_id~~

~~struct ALMAS_LoadConfiguration {~~
~~  ALMAS_RequestIdType request_id;~~
~~  string Filename; };~~
~~#pragma keylist ALMAS_LoadConfiguration request_id~~

~~struct ALMAS_UpdateDynamicMessageData {~~
~~  ALMAS_RequestIdType request_id;~~
~~  string ProducerID;~~
~~  ALMAS_DataModel::ALMAS_AlertIDType AlertID;~~
~~  string DataValue;~~
~~  ALMAS_DataModel::ALMAS_DynamicMessageDataType OldData; };~~
~~#pragma keylist ALMAS_UpdateDynamicMessageData request_id~~

~~struct ALMAS_SetAlertInhibited {~~
~~  ALMAS_RequestIdType request_id;~~
~~  string ProducerID;~~
~~  ALMAS_DataModel::ALMAS_TemplateIDType TemplateID;~~
~~  boolean Inhibition; };~~
~~#pragma keylist ALMAS_SetAlertInhibited request_id~~

~~ struct ALMAS_AttachCategorisationRule {~~
~~  ALMAS_RequestIdType request_id;~~
~~  long RuleID;~~
~~  ALMAS_DataModel::ALMAS_TemplateIDType TemplateID; };~~
~~#pragma keylist ALMAS_AttachCategorisationRule request_id~~

~~struct ALMAS_DetachCategorisationRule {~~
~~  ALMAS_RequestIdType request_id;~~
~~  long RuleID;~~
~~  ALMAS_DataModel::ALMAS_TemplateIDType TemplateID; };~~
~~#pragma keylist ALMAS_DetachCategorisationRule request_id~~

~~struct ALMAS_RemoveAlertsWithDynamicMessageData  {~~
~~  ALMAS_RequestIdType request_id;~~
~~  string CancellerID;~~
~~  string DataType;~~
~~  string DataValue; };~~
~~ #prgma keylist ALMAS_RemoveAlertsWithDynamicMessageData request_id~~

~~};~~
~~endif~~
```

ALMAS14-20

Unknown Author
10/26/2024 12:14

9.2.3 DCPS topics QoS

ALMAS topics share the same values for most of the DDS QoS (cf. [DDS]):

QoS	Value
USER_DATA	<unspecified>
TOPIC_DATA	<unspecified>
GROUP_DATA	<unspecified>
PRESENTATION	<unspecified>

DEADLINE	Period = infinite
LATENCY_BUDGET	duration = <unspecified>
OWNERSHIP	EXCLUSIVE
OWNERSHIP_STRENGTH	<unspecified>
LIVELINESS	kind = AUTOMATIC / lease_duration = <unspecified>
TIME_BASED_FILTER	<unspecified>
PARTITION	<unspecified>
TRANSPORT_PRIORITY	value=0
DESTINATION_ORDER	BY_SOURCE_TIMESTAMP
HISTORY	kind = KEEP_LAST / depth = 1
RESOURCE_LIMITS	All unlimited.
ENTITY_FACTORY	<unspecified>
WRITER_DATA_LIFECYCLE	<unspecified>
READER_DATA_LIFECYCLE	<unspecified>

The other QoS (DURABILITY, RELIABILITY and LIFESPAN) will be allocated with the following principle:

- As for the "Control topics" (both requests and responses), they have DURABILITY equals to VOLATILE, RELIABILITY set to RELIABLE and LIFESPAN.duration defined by the implementation:

DURABILITY	VOLATILE
RELIABILITY	kind = RELIABLE
LIFESPAN	Implementation dependant

- Others topics have DURABILITY to TRANSIENT, RELIABILITY set to RELIABLE and LIFESPAN.duration to infinite:

DURABILITY	TRANSIENT
RELIABILITY	kind = RELIABLE
LIFESPAN	duration = infinite

9.3 DLRL

9.3.1 ALMAS Client

The ALMAS client module is not required in the DDS PSM since this is all available through the use of the standard DDS mechanisms and the topics already defined for ALMAS_StateType and ALMAS_Alert (i.e., through the DCPS mapping).

~~ALMAS Management IDL~~

~~// Copyright 2005-2007 THALES, BAE Systems, Raytheon~~

~~#include “dds_dlrl.idl”~~

```
~~#include “ALMAS_DataModel.idl”~~
~~#ifndef __ALMAS_Management_DEF~~
~~#define __ALMAS_Management_DEF~~
~~#pragma prefix "omg.org"~~

~~module ALMAS_Management {~~

 ~~typedef sequence<ALMAS_DataModel::ALMAS_Alert> ALMAS_AlertSet;~~

 ~~typedef sequence<ALMAS_DataModel::ALMAS_TemplateIDType> ALMAS_TemplateIDTypeSet;~~

 ~~valuetype ALMAS_Manager : DDS::ObjectRoot {~~

  ~~attribute string ALMAS_SystemID;~~

  ~~// alert retrieval methods~~

  ~~ALMAS_DataModel::ALMAS_CallStatus GetAlert (~~
    ~~in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
    ~~out ALMAS_DataModel::ALMAS_Alert Alert);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus GetAlerts (~~
    ~~in string Filter,~~
    ~~out ALMAS_AlertSet AlertSet);~~

  ~~// ALMAS-wide control methods~~

  ~~ALMAS_DataModel::ALMAS_CallStatus SetAlertInhibited (~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~in boolean Inhibition);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus UpdateDynamicMessageData (~~
    ~~in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
    ~~in string DataValue,~~
    ~~in ALMAS_DataModel::ALMAS_DynamicMessageDataType OldData);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus RegisterNotificationListener (~~
    ~~in ALMAS_Client::ALMAS_NotificationListener Handle);~~

  ~~// Template management methods~~

  ~~ALMAS_DataModel::ALMAS_CallStatus GetTemplate (~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~out ALMAS_DataModel::ALMAS_AlertTemplateType Template);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus GetAllTemplateIDs (~~
    ~~in string Filter,~~
    ~~out ALMAS_TemplateIDTypeSet TemplateIDSet);~~
 ~~};~~

 ~~valuetype ALMAS_ManagerExtensions : ALMAS_Manager {~~

  ~~ALMAS_DataModel::ALMAS_CallStatus RemoveAlertsWithDynamicData (~~
    ~~in string CancellerID,~~
    ~~in string DataType,~~
    ~~in string DataValue);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus AttachCategorisationRule (~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~in long RuleID);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus DetachCategorisationRule (~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~in long RuleID);~~
~~};~~

~~valuetype ALMAS_Producer : DDS::ObjectRoot {~~

  ~~ALMAS_DataModel::ALMAS_CallStatus RaiseAlertFromOverrides (~~
    ~~in string ProducerID,~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~in ALMAS_DataModel::ALMAS_AlertDataType Attributes,~~
    ~~in boolean CategoryValid,~~
    ~~in boolean PriorityValid,~~
    ~~in boolean StatusValid,~~
    ~~in boolean ScopeValid,~~
    ~~in boolean TimeoutValid,~~
    ~~in boolean ConfirmationRequiredValid,~~
    ~~in boolean SecondaryGroupingValid,~~
    ~~in boolean PersistentValid,~~
    ~~in boolean ReliablyDistributedValid,~~
    ~~in boolean TimeoutActionValid,~~
    ~~in boolean AcknowledgementModelValid,~~
    ~~in boolean StaticMessagesValid,~~
    ~~in boolean DynamicMessagesValid,~~
    ~~out ALMAS_DataModel::ALMAS_AlertIDType AlertID);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus RaiseAlertWithDynamicData (~~
    ~~in string ProducerID,~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~in ALMAS_DataModel::ALMAS_DynamicMessageDataType DynamicMessageData,~~
    ~~out ALMAS_DataModel::ALMAS_AlertIDType AlertID);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus RaiseAlertFromData (~~
    ~~in string ProducerID,~~
    ~~in ALMAS_DataModel::ALMAS_AlertTemplateType AlertInfo,~~
    ~~out ALMAS_DataModel::ALMAS_AlertIDType AlertID);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus RaiseAlertFromTemplate (~~
    ~~in string ProducerID,~~
    ~~in ALMAS_DataModel::ALMAS_TemplateIDType TemplateID,~~
    ~~out ALMAS_DataModel::ALMAS_AlertIDType AlertID);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus UpdateAlertPriority (~~
    ~~in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
    ~~in string ProducerID,~~
    ~~in short Priority);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus CancelAlert (~~
    ~~in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
    ~~in string CancellerID,~~
    ~~in string CancellationReason);~~
~~};~~

 ~~valuetype ALMAS_Responder : DDS::ObjectRoot {~~

  ~~ALMAS_DataModel::ALMAS_CallStatus RegisterReceiver (~~
    ~~in ALMAS_Client::ALMAS_Receiver Handle,~~
    ~~in string ReceiverID,~~
    ~~in string RKType);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus UnregisterReceiver (~~
    ~~in string ReceiverID);~~

  ~~ALMAS_DataModel::ALMAS_CallStatus AcknowledgeAlert (~~
    ~~in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
```

```
~~    in string ReceiverID);~~

~~  ALMAS_DataModel::ALMAS_CallStatus HandleAlert (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
~~    in string ReceiverID);~~

~~  ALMAS_DataModel::ALMAS_CallStatus ConfirmReceipt (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
~~    in string ReceiverID);~~
~~ };~~

~~ valuetype ALMAS_ResponderExtensions : ALMAS_Responder {~~

~~  ALMAS_DataModel::ALMAS_CallStatus SetLanguage (~~
~~    in string ReceiverID,~~
~~    in string Language);~~

~~  ALMAS_DataModel::ALMAS_CallStatus GetFilledMessageText (~~
~~    in ALMAS_DataModel::ALMAS_AlertIDType AlertID,~~
~~    out ALMAS_DataModel::ALMAS_StringSet Messages);~~
~~ };~~

~~ valuetype ALMAS_Configuration : DDS::ObjectRoot {~~

~~  ALMAS_DataModel::ALMAS_CallStatus LoadReceiverHierarchy (~~
~~    in string Filename );~~

~~  ALMAS_DataModel::ALMAS_CallStatus LoadTemplateSet (~~
~~    in string Filename );~~

~~  ALMAS_DataModel::ALMAS_CallStatus LoadConfiguration (~~
~~    in string Filename );~~
~~ };~~
~~};~~

~~#endif~~
```

ALMAS14-20

Unknown Author
10/26/2024 12:16

This page intentionally left blank.

10 COM IDL Platform Specific Model

10.1 Rationale

The objective of this PSM is to normalize the structures and interfaces required for a COM implementation of the standard. This PSM aims to support the entire PIM interface.

In order for this interface to be reasonably compatible with the other PSMs provided in this document, the data model part is separated from the functional interface part.

All attributes, methods and associations are mapped to COM IDL elements. As a general rule, therefore, classes with methods are mapped to COM interfaces, classes without methods are mapped to structs, attributes are mapped to interface read/write methods. All return parameters and exceptions are mapped to method out parameters with the COM HRESULT returned from all interface methods.

Subscribe methods and indication classes are also mapped within a client IDL file which has to be implemented by clients in order to receive indications (i.e., callbacks) from ALMAS.

The invocation of API methods is logged using the Open Telemetry (OTEL) standard by the implementation of the API method.

ALMAS14-6

Unknown Author
10/25/2024 16:00

~~ALMAS Data Model IDL~~

```
~~// Copyright 2005-2007 THALES, BAE Systems, Raytheon~~
~~import "oaidl.idl";~~
~~import "ocidl.idl";~~

~~#ifndef __ALMAS_DataModel_DEF~~
~~#define __ALMAS_DataModel_DEF~~

~~typedef long ALMAS_AlertIDType;~~

~~typedef long ALMAS_TemplateIDType;~~

~~typedef long ALMAS_TimeoutType;~~

~~#ifdef NOLONGLONG~~
~~typedef struct {~~
~~unsigned long low;~~
~~unsigned long high;~~
~~} ALMAS_DateTimeType;~~
~~#else~~
~~typedef unsigned long long ALMAS_DateTimeType; // long long to be EVoT compatible~~
~~#endif~~

~~typedef enum {~~
~~  ALMAS_Action = 1,~~
~~  ALMAS_Warning,~~
~~  ALMAS_Information,~~
~~  ALMAS_Situation} ALMAS_CategoryType;~~
```

```
~~typedef enum {~~
~~  ALMAS_Raised = 1,~~
~~  ALMAS_Routed,~~
~~  ALMAS_Received,~~
~~  ALMAS_Acknowledged,~~
~~  ALMAS_Handled,~~
~~  ALMAS_Cancelled,~~
~~  ALMAS_TimedOut} ALMAS_StateType;~~

~~typedef enum {~~
~~  ALMAS_Actual = 1,~~
~~  ALMAS_Exercise,~~
~~  ALMAS_System,~~
~~  ALMAS_Test} ALMAS_StatusType;~~

~~typedef enum {~~
~~  ALMAS_PublicScope = 1,~~
~~  ALMAS_RestrictedScope,~~
~~  ALMAS_PrivateScope} ALMAS_ScopeType;~~

~~typedef enum {~~
~~  ALMAS_CancelOnly = 1,~~
~~  ALMAS_NotifyOnly,~~
~~  ALMAS_CancelWithNotify} ALMAS_TimeoutActionType;~~

~~typedef enum {~~
~~  ALMAS_AckByNone = 1,~~
~~  ALMAS_AckByAnyone,~~
~~  ALMAS_AckByAll} ALMAS_AckModelType;~~

~~ typedef struct {~~
~~  boolean Success;~~
~~  short Reason;~~
~~  BSTR Description;} ALMAS_CallStatus;~~

~~ typedef struct {~~
~~  SAFEARRAY(BSTR) AlternativeAction;~~
~~  short ActioneePriority; } ALMAS_ValidAlertResponseType;~~

~~ typedef [uuid(0B7DF643-8DFF-4cfe-BC48-3C2E07BD6A79)]struct ALMAS_ReceiverKindType {~~
~~  BSTR RKType;~~
~~  BSTR RKParentType;~~
~~  ALMAS_ValidAlertResponseType ValidResponse; } ALMAS_ReceiverKindType;~~


~~  typedef [uuid(62FD9C37-ED08-46b2-8122-8B783D83DC5E)] struct~~
~~ALMAS_DynamicMessageDataType{~~
~~  BSTR DataType;~~
~~  BSTR DataTag;~~
~~  BSTR DataValue; } ALMAS_DynamicMessageDataType;~~


~~ typedef [uuid(06A4B73D-52AD-4009-BC0A-4FC940D3A799)]struct ALMAS_StaticMessageType{~~
~~  BSTR MessageText;~~
~~  BSTR MessageLanguage; } ALMAS_StaticMessageType;~~


~~ typedef [uuid(F42A96DE-F513-4880-8E5A-5C2B308A2898)]struct~~
~~ALMAS_AlertDataExtraAttributesType{~~
~~  BSTR Name;~~
~~  short TypeOfByteData;~~
~~  BSTR Description;~~
~~    SAFEARRAY(byte) Value; } ALMAS_AlertDataExtraAttributesType;~~

~~ typedef struct {~~
~~   ALMAS_TemplateIDType TemplateID;~~
~~   ALMAS_CategoryType Category;~~
~~   short Priority;~~
~~   ALMAS_StatusType Status;~~
~~   ALMAS_ScopeType Scope;~~
~~   ALMAS_TimeoutType Timeout;~~
~~   boolean ConfirmationRequired;~~
~~   BSTR SecondaryGrouping;~~
~~   boolean Persistent;~~
~~   boolean ReliablyDistributed;~~
~~   ALMAS_TimeoutActionType TimeoutAction;~~
~~   ALMAS_AckModelType AcknowledgementModel;~~
~~   SAFEARRAY(ALMAS_StaticMessageType) StaticMessages;~~
~~   SAFEARRAY(ALMAS_DynamicMessageDataType)DynamicMessages;~~
~~   SAFEARRAY(ALMAS_AlertDataExtraAttributesType) ExtraAttributes;} ALMAS_AlertDataType;~~

~~ typedef struct {~~
~~   boolean Inhibited;~~
~~   boolean RaiseToAll;~~
~~   ALMAS_AlertDataType AlertData;~~
~~   SAFEARRAY(ALMAS_ReceiverKindType) ReceiverKinds; } ALMAS_AlertTemplateType;~~

~~ typedef struct {~~
~~   boolean Acknowledged;~~
~~   boolean Routed;~~
~~   boolean Actioned;~~
~~   boolean ReceiverIsActionee;~~
~~   SAFEARRAY(BSTR) AlternativeAction;~~
~~   BSTR ReceiverID;~~
~~   ALMAS_AlertIDType AlertID; } ALMAS_AlertReportType;~~

~~ typedef struct {~~
~~   BSTR ReceiverID;~~
~~   ALMAS_ReceiverKindType ReceiverKind; } ALMAS_AvailableAlertReceiverType;~~

~~ typedef struct {~~
~~   ALMAS_AlertIDType AlertID;~~
~~   ALMAS_DateTimeType RaisingTime;~~
~~   ALMAS_StateType CurrentState;~~
~~   BSTR ProducerID;~~
~~   ALMAS_AlertDataType AlertData;~~
~~   SAFEARRAY(ALMAS_AvailableAlertReceiverType) Receivers; } ALMAS_Alert;~~
~~#endif~~
```

~~ALMAS Client IDL~~

```
~~// Copyright 2005-2008 THALES, BAE Systems, Raytheon~~

~~import "../Alert_Data_Router/ALMAS_DataModel.idl";~~
~~#ifndef __ALMAS_Client_DEF~~
~~#define __ALMAS_Client_DEF~~

~~[object,uuid(13D0EBD4-47C0-4661-BFF6-B8220219BD66),pointer_default(unique)]~~
~~ interface IALMAS_Receiver: IUnknown {~~

~~  HRESULT StateChangeNotification  (~~
~~    [n]  ALMAS_AlertIDType AlertID,~~
~~    [in]  ALMAS_StateType NewState);~~
~~ HRESULT AlertDataNotification  (// alert D is embedded within info~~
~~    [in]  ALMAS_Alert AlertInfo,~~
~~    [in] ALMAS_AlertReportType *Report); // changed to in in.~~
~~};~~

~~ [object,uuid(2BA3B7FA-40EB-4021-8828-36243C457379),pointer_default(unique)]~~
~~ interface IALMAS_NotificationListener: IUnknown {~~

~~ HRESULT AlertDistributionNotification  (~~
~~    [in] ALMAS_AlertIDType AlertID);~~

~~ HRESULT Get_ALMAS_SystemIDNotification (~~
~~     [in] BSTR * ALMAS_SystemID);~~

~~ HRESULT GetAlertNotification(~~
~~     [in] ALMAS_Alert Alert);~~

~~ HRESULT GetAlertsNotification(~~
~~     [in] SAFEARRAY(ALMAS_Alert)AlertSet);~~

~~ HRESULT GetTemplateNotification(~~
~~     [in] ALMAS_AlertTemplateType AlertTemplate); // Corrected to return the template, not the~~
~~Template ID.~~

~~ HRESULT GetTemplatesNotification(~~
~~     [in] SAFEARRAY(ALMAS_TemplateIDType) TemplateIDSet);~~

~~};~~
~~#endi~~
```

~~ALMAS Management IDL~~

```
~~// Copyright 2005-2008 THALES, BAE Systems, Raytheon~~

~~import "../Alert_Data_Router/ALMAS_Client.idl";~~
~~import "../Alert_Data_Router/ALMAS_DataModel.idl";~~
~~#ifndef __ALMAS_Management_DEF~~
~~#define __ALMAS_Management_DEF~~


~~// typedef struct {~~
~~//   unsigned long MaxSize;~~
~~//   unsigned long LengthUsed;~~
~~//   [size_is(MaxSize), length_is(LengthUsed), unique] ALMAS_TemplateIDType *pValue;}~~
~~ALMAS_TemplateIDTypeSet;~~

~~ [object,uuid(3BC17616-F798-421A-8FB9-DDC0A8259CE3),pointer_default(unique)]~~
~~ interface IALMAS_Manager : IUnknown {~~

~~ HRESULT Get_ALMAS_SystemID(IALMAS_NotificationListener *Handle);~~

~~ // alert retrieval methods~~

~~ HRESULT GetAlert (~~
~~    [in]  ALMAS_AlertIDType AlertID,~~
~~    [in]  IALMAS_NotificationListener *Handle,~~
~~    [out] ALMAS_CallStatus *CallStatus);~~

~~ HRESULT GetAlerts (~~
~~    [in]  BSTR Filter,~~
~~    [in]  IALMAS_NotificationListener *Handle,~~
```

```
    ~~[out] ALMAS_CallStatus *CallStatus);~~

  ~~// ALMAS-wide control methods~~

  ~~HRESULT SetAlertInhibited (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  ALMAS_TemplateIDType TemplateID,~~
    ~~[in]  boolean Inhibition);~~

  ~~HRESULT UpdateDynamicMessageData (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  ALMAS_AlertIDType AlertID,~~
    ~~[in]  BSTR ObjectValue,~~
    ~~[in]  ALMAS_DynamicMessageDataType OldValue);~~

  ~~HRESULT RegisterNotificationListener (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  IALMAS_NotificationListener *Handle);~~

  ~~// Template management methods~~

  ~~HRESULT GetTemplate (~~
    ~~[in]  IALMAS_NotificationListener *Handle,~~
    ~~[in]  ALMAS_TemplateIDType TemplateID,~~
    ~~[out] ALMAS_CallStatus *CallStatus);~~

  ~~HRESULT GetAllTemplateIDs (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  BSTR Filter,~~
    ~~[in]  IALMAS_NotificationListener *Handle);~~
~~};~~

 ~~[object,uuid(6AE3866D-3EF5-4BBD-B2ED-261DBCFF2307),pointer_default(unique)]~~
 ~~interface IALMAS_ManagerExtensions : IALMAS_Manager {~~

  ~~HRESULT RemoveAlertsWithDynamicData (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  BSTR CancellerID,~~
    ~~[in]  BSTR DataType,~~
    ~~[in]  BSTR DataValue);~~

  ~~HRESULT AttachCategorisationRule (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  ALMAS_TemplateIDType TemplateID,~~
    ~~[in]  long RuleID);~~

  ~~HRESULT DetachCategorisationRule (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  ALMAS_TemplateIDType TemplateID,~~
    ~~[in]  long RuleID);~~
~~};~~

 ~~[object,uuid(32033A16-EC76-4AC5-A457-D607B5CFD0CF),pointer_default(unique)]~~
 ~~interface IALMAS_Producer : IUnknown {~~
~~// SDG Changed optional parameters to pointers~~
  ~~HRESULT RaiseAlertFromOverrides (~~
    ~~[out] ALMAS_AlertIDType *AlertID,~~
    ~~[in]  BSTR ProducerID,~~
    ~~[in]  ALMAS_TemplateIDType TemplateID,~~
    ~~[in]  ALMAS_CategoryType Category,~~
    ~~[in] boolean ValidCategory~~
    ~~[in] short Priority,~~
    ~~[in] boolean ValidPriority,~~
    ~~[in] ALMAS_StatusType AlertStatus,~~
    ~~[in] boolean ValidStatus,~~
    ~~[in] ALMAS_ScopeType Scope,~~
    ~~[in] boolean ValidScope,~~
    ~~[in] ALMAS_TimeoutType Timeout,~~
    ~~[in] boolean ValidTimeout,~~
    ~~[in] boolean ConfirmationRequired,~~
    ~~[in] boolean ValidConfirmationRequired,~~
    ~~[in] BSTR SecondaryGrouping,~~
    ~~[in] boolean ValidSecondaryGrouping,~~
    ~~[in] boolean Persistent,~~
    ~~[in] boolean ValidPersistent,~~
    ~~[in] boolean ReliablyDistributed,~~
    ~~[in] boolean ValidReliablyDistributed,~~
    ~~[in[ ALMAS_TimeoutActionType TimeoutAction,~~
    ~~[in] boolean ValidTimeoutAction,~~
    ~~[in] ALMAS_AckModelType AcknowledgementModel,~~
    ~~[in] boolean ValidAcknowledgementModel,~~
    ~~[in] SAFEARRAY(ALMAS_StaticMessageType) StaticMessages,~~
    ~~[in] boolean ValidStaticMessages,~~
    ~~[in] SAFEARRAY(ALMAS_DynamicMessageDataType) DynamicMessageData,~~
    ~~[in] boolean ValidDynamicMessageData,~~
    ~~[in] SAFEARRAY(ALMAS_ReceiverKindType) AlertReceivers,~~
    ~~[in] boolean ValidAlertReceiverSet,~~
    ~~[out] ALMAS_CallStatus *CallStatus);~~

  ~~HRESULT RaiseAlertWithDynamicData (~~
    ~~[out] ALMAS_AlertIDType *AlertID,~~
    ~~[in]  BSTR ProducerID,~~
    ~~[in]  ALMAS_TemplateIDType TemplateID,~~
    ~~[in] SAFEARRAY(ALMAS_DynamicMessageDataType) DynamicMessageData,~~
    ~~[out] ALMAS_CallStatus *CallStatus);~~

 ~~HRESULT RaiseAlertFromData (~~
    ~~[out] ALMAS_AlertIDType *AlertID,~~
    ~~[in]  BSTR ProducerID,~~
    ~~[in] ALMAS_AlertTemplateType AlertInfo,~~
    ~~[out] ALMAS_CallStatus *CallStatus);~~

 ~~HRESULT RaiseAlertFromTemplate (~~
    ~~[out] ALMAS_AlertIDType *AlertID,~~
    ~~[in]  BSTR ProducerID,~~
    ~~[in]  ALMAS_TemplateIDType TemplateID,~~
    ~~[out] ALMAS_CallStatus *CallStatus);~~

  ~~HRESULT UpdateAlertPriority (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  ALMAS_AlertIDType AlertID,~~
    ~~[in]  BSTR ProducerID,~~
    ~~[in]  short Priority);~~

  ~~HRESULT CancelAlert (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  ALMAS_AlertIDType AlertID,~~
    ~~[in]  BSTR CancellerID,~~
    ~~[in]  BSTR CancellationReason);~~
~~};~~

~~[object,uuid(BA617DFD-6DBD-4F08-ACD5-E7F489A113E5),pointer_default(unique)]~~
~~interface IALMAS_Responder : IUnknown {~~

  ~~HRESULT RegisterReceiver (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  IALMAS_Receiver *ReceiverHandle,~~
    ~~[in]  BSTR ReceiverID,~~
    ~~[in]  BSTR RKType);~~

  ~~HRESULT UnregisterReceiver (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  BSTR ReceiverID);~~

  ~~HRESULT AcknowledgeAlert (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  ALMAS_AlertIDType AlertID,~~
    ~~[in]  BSTR ReceiverID);~~

  ~~HRESULT HandleAlert (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  ALMAS_AlertIDType AlertID,~~
    ~~[in]  BSTR ReceiverID);~~

  ~~HRESULT ConfirmReceipt (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  ALMAS_AlertIDType AlertID,~~
    ~~[in]  BSTR ReceiverID);~~
~~};~~

 ~~[object,uuid(CC748587-4926-45D7-B52E-4A88000A3426),pointer_default(unique)]~~
 ~~interface IALMAS_ResponderExtensions : IALMAS_Responder {~~

  ~~HRESULT SetLanguage (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  BSTR ReceiverID,~~
    ~~[in]  BSTR Language);~~

  ~~HRESULT GetFilledMessageText (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  ALMAS_AlertIDType AlertID,~~
    ~~[in] [out] BSTR MessageText);~~
~~};~~

 ~~[object,uuid(C3B50C13-8124-4A5F-98B8-9C68D9D1BDE9),pointer_default(unique)]~~
 ~~interface IALMAS_Configuration : IUnknown {~~

  ~~HRESULT LoadReceiverHierarchy (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  BSTR Filename);~~

  ~~HRESULT LoadTemplateSet (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  BSTR Filename);~~

  ~~HRESULT LoadConfiguration (~~
    ~~[out] ALMAS_CallStatus *CallStatus,~~
    ~~[in]  BSTR Filename);~~
~~};~~
~~#endif~~
```

This page intentionally left blank.

11 GraphQL Platform Specific Model

11.1 Rationale

The GraphQL PSM defines a single schema definition file for the ALMAS Data Model, ALMAS Management and ALMAS Client Callbacks packages defined by the PIM. Classes from the ALMAS Dtaa Model of the PIM are mapped to GraphQL types within the schema.

The detailed rules for the MDA code generation from the ALMAS Data Model PIM to the GraphQL PSM schema are as follows:

- The PIM attributes are mapped to GraphQL attributes;
- PIM attributes with multiplicity 1 are mapped to non-nullable GraphQL attributes
- Collections in the PIM are mapped to GraphQL arrays;
- Aggregation and compositions are mapped to GraphQL attributes;
- Association classes follow the equivalent mapping as the CORBA and DDS PSMs

The schema supports GraphQL clients for interfaces defined in the ALMAS Management and ALMAS Client Callbacks PIM packages. Mutations are used to invoke PIM interface methods; queries and subscriptions are used to process those invocations.

The PSM method for connecting to other components is through the underlying HTTPS web service connection. Web-sockets are used for subscription callbacks.

Specific rules for the MDA code generation from the Service Model PIM to the GraphQL PSM IDL are as follows:

- Interface method (in) parameters and return values (including out parameters) in the Service Model are each mapped to a (query) type, an input type and update type; these are for queries, mutations, and subscriptions respectively.
- To invoke a method an ALMAS client makes a mutation (with method parameter type) and subscribes or queries for the response (with the return value type).
- To process a method an ALMAS client queries or subscribes for the method parameter type and makes a mutation with the response (with the return value type).
- As per the DDS PSM, each of the parameter and return value types contain a request id; the instigator is responsible for allocating unique request ids in the scope of the ALMAS system; the processing component is responsible for labelling responses with the received request id so that the instigator can locate the corresponding response.
- The GraphQL schema Query type supports queries for any combination of interface methods in the Service Model.
- The GraphQL schema Mutation type supports invocation of single or multiple instances of any combination of interface methods in the Service Model.
- The GraphQL schema Subscription type supports subscription for any combination of interface methods in the Service Model.
- The following methods are mapped to the return (out parameter) type with a GraphQL filter condition in the query: GetAlert, GetAlerts, GetTemplate and GetAllTemplateIDs
- RegisterNotificationListener is mapped to a GraphQL subscription.

- Parameters of the operation RaiseAlertFromOverrides are implicitly defined as being optional in the PIM; in this PSM they are explicitly marked as optional using an IDL annotation.

The invocation of API methods is logged using the Open Telemetry (OTEL) standard by the implementation of the API method.

ALMAS14-6

Unknown Author
10/25/2024 16:00

~~GraphQL Schema~~

~~# Copyright 2019-2022 BAE Systems~~

~~scalar Long~~

~~scalar Short~~

~~scalar Char~~

~~schema {~~

~~query: Query~~

~~subscription : Subscription~~

~~mutation: Mutation~~

~~}~~

~~type Query {~~

~~almasFilledMessageTexts: [AlmasFilledMessageText!]!~~

~~almasFilledMessageTextForKey(requestId: Long) : [AlmasFilledMessageText!]!~~

~~almasRemoveAlertsWithDynamicMessageDatas: [AlmasRemoveAlertsWithDynamicMessageData!]!~~

~~almasRemoveAlertsWithDynamicMessageDataForKey(requestId: Long) : [AlmasRemoveAlertsWithDynamicMessageData!]!~~

~~almasAttachCategorisationRules: [AlmasAttachCategorisationRule!]!~~

~~almasAttachCategorisationRuleForKey(requestId: Long) : [AlmasAttachCategorisationRule!]!~~

~~almasDetachCategorisationRules: [AlmasDetachCategorisationRule!]!~~

~~almasDetachCategorisationRuleForKey(requestId: Long) : [AlmasDetachCategorisationRule!]!~~

~~almasAlerts: [AlmasAlert!]!~~

~~almasAlertForKey(alertId: Int) : [AlmasAlert!]!~~

~~almasAlertTemplateTypes: [AlmasAlertTemplateType!]!~~

```
~~  almasManagers: [AlmasManager!]!~~
~~  almasSetAlertInhibiteds: [AlmasSetAlertInhibited!]!~~
~~  almasSetAlertInhibitedForKey(requestId: Long) : [AlmasSetAlertInhibited!]!~~
~~  almasUpdateDynamicMessageDatas: [AlmasUpdateDynamicMessageData!]!~~
~~  almasUpdateDynamicMessageDataForKey(requestId: Long) : [AlmasUpdateDynamicMessageData!]!~~

~~  almasAlertReportTypes: [AlmasAlertReportType!]!~~
~~  almasAlertReportTypeForKey(receiverId: String, alertId: Int) : [AlmasAlertReportType!]!~~

~~  almasLoadReceiverHierarchys: [AlmasLoadReceiverHierarchy!]!~~
~~  almasLoadReceiverHierarchyForKey(requestId: Long) : [AlmasLoadReceiverHierarchy!]!~~
~~  almasLoadTemplateSets: [AlmasLoadTemplateSet!]!~~
~~  almasLoadTemplateSetForKey(requestId: Long) : [AlmasLoadTemplateSet!]!~~
~~  almasLoadConfigurations: [AlmasLoadConfiguration!]!~~
~~  almasLoadConfigurationForKey(requestId: Long) : [AlmasLoadConfiguration!]!~~

~~  almasRaiseAlertFromOverridess: [AlmasRaiseAlertFromOverrides!]!~~
~~  almasRaiseAlertFromOverridesForKey(requestId: Long) : [AlmasRaiseAlertFromOverrides!]!~~
~~  almasRaiseAlertWithDynamicDatas: [AlmasRaiseAlertWithDynamicData!]!~~
~~  almasRaiseAlertWithDynamicDataForKey(requestId: Long) : [AlmasRaiseAlertWithDynamicData!]!~~
~~  almasRaiseAlertFromDatas: [AlmasRaiseAlertFromData!]!~~
~~  almasRaiseAlertFromDataForKey(requestId: Long) : [AlmasRaiseAlertFromData!]!~~
~~  almasRaiseAlertFromTemplates: [AlmasRaiseAlertFromTemplate!]!~~
~~  almasRaiseAlertFromTemplateForKey(requestId: Long) : [AlmasRaiseAlertFromTemplate!]!~~
~~  almasUpdateAlertPrioritys: [AlmasUpdateAlertPriority!]!~~
~~  almasUpdateAlertPriorityForKey(requestId: Long) : [AlmasUpdateAlertPriority!]!~~
~~  almasCancelAlerts: [AlmasCancelAlert!]!~~
~~  almasCancelAlertForKey(requestId: Long) : [AlmasCancelAlert!]!~~

~~  almasSetLanguages: [AlmasSetLanguage!]!~~
~~  almasSetLanguageForKey(requestId: Long) : [AlmasSetLanguage!]!~~
~~  almasGetFilledMessageTexts: [AlmasGetFilledMessageText!]!~~
~~  almasGetFilledMessageTextForKey(requestId: Long) : [AlmasGetFilledMessageText!]!~~

~~  almasAcknowledgeAlerts: [AlmasAcknowledgeAlert!]!~~
~~  almasAcknowledgeAlertForKey(requestId: Long) : [AlmasAcknowledgeAlert!]!~~
~~  almasConfirmReceipts: [AlmasConfirmReceipt!]!~~
~~  almasConfirmReceiptForKey(requestId: Long) : [AlmasConfirmReceipt!]!~~
~~  almasHandleAlerts: [AlmasHandleAlert!]!~~
~~  almasHandleAlertForKey(requestId: Long) : [AlmasHandleAlert!]!~~
~~  almasRegisterReceivers: [AlmasRegisterReceiver!]!~~
~~  almasRegisterReceiverForKey(requestId: Long) : [AlmasRegisterReceiver!]!~~
~~  almasUnregisterReceivers: [AlmasUnregisterReceiver!]!~~
~~  almasUnregisterReceiverForKey(requestId: Long) : [AlmasUnregisterReceiver!]!~~

~~}~~

~~type Subscription {~~
~~  onAlmasFilledMessageText: AlmasFilledMessageTextUpdate!~~

~~  onAlmasRemoveAlertsWithDynamicMessageData: AlmasRemoveAlertsWithDynamicMessageDataUpdate!~~

~~  onAlmasAttachCategorisationRule: AlmasAttachCategorisationRuleUpdate!~~

~~  onAlmasDetachCategorisationRule: AlmasDetachCategorisationRuleUpdate!~~


```

```
~~onAlmasAlert: AlmasAlertUpdate!~~

~~onAlmasAlertTemplateType: AlmasAlertTemplateTypeUpdate!~~

~~onAlmasManager: AlmasManagerUpdate!~~

~~onAlmasSetAlertInhibited: AlmasSetAlertInhibitedUpdate!~~

~~onAlmasUpdateDynamicMessageData: AlmasUpdateDynamicMessageDataUpdate!~~


~~onAlmasAlertReportType: AlmasAlertReportTypeUpdate!~~


~~onAlmasLoadReceiverHierarchy: AlmasLoadReceiverHierarchyUpdate!~~

~~onAlmasLoadTemplateSet: AlmasLoadTemplateSetUpdate!~~

~~onAlmasLoadConfiguration: AlmasLoadConfigurationUpdate!~~


~~onAlmasRaiseAlertFromOverrides: AlmasRaiseAlertFromOverridesUpdate!~~

~~onAlmasRaiseAlertWithDynamicData: AlmasRaiseAlertWithDynamicDataUpdate!~~

~~onAlmasRaiseAlertFromData: AlmasRaiseAlertFromDataUpdate!~~

~~onAlmasRaiseAlertFromTemplate: AlmasRaiseAlertFromTemplateUpdate!~~

~~onAlmasUpdateAlertPriority: AlmasUpdateAlertPriorityUpdate!~~
```

```

~~  onAlmasCancelAlert: AlmasCancelAlertUpdate!~~


~~  onAlmasSetLanguage: AlmasSetLanguageUpdate!~~

~~  onAlmasGetFilledMessageText: AlmasGetFilledMessageTextUpdate!~~


~~  onAlmasAcknowledgeAlert: AlmasAcknowledgeAlertUpdate!~~

~~  onAlmasConfirmReceipt: AlmasConfirmReceiptUpdate!~~

~~  onAlmasHandleAlert: AlmasHandleAlertUpdate!~~

~~  onAlmasRegisterReceiver: AlmasRegisterReceiverUpdate!~~

~~  onAlmasUnregisterReceiver: AlmasUnregisterReceiverUpdate!~~


~~}~~

~~type Mutation {~~
~~  updateAlmasFilledMessageText(instance: AlmasFilledMessageTextInput!): AlmasFilledMessageText!~~

~~  updateAlmasRemoveAlertsWithDynamicMessageData(instance: AlmasRemoveAlertsWithDynamicMessageDataInput!): AlmasRemoveAlertsWithDynamicMessageData!~~

~~  updateAlmasAttachCategorisationRule(instance: AlmasAttachCategorisationRuleInput!): AlmasAttachCategorisationRule!~~

~~  updateAlmasDetachCategorisationRule(instance: AlmasDetachCategorisationRuleInput!): AlmasDetachCategorisationRule!~~


~~  updateAlmasAlert(instance: AlmasAlertInput!): AlmasAlert!~~

~~  updateAlmasAlertTemplateType(instance: AlmasAlertTemplateTypeInput!): AlmasAlertTemplateType!~~

~~  updateAlmasManager(instance: AlmasManagerInput!): AlmasManager!~~

~~  updateAlmasSetAlertInhibited(instance: AlmasSetAlertInhibitedInput!): AlmasSetAlertInhibited!~~

~~  updateAlmasUpdateDynamicMessageData(instance: AlmasUpdateDynamicMessageDataInput!): AlmasUpdateDynamicMessageData!~~


~~  updateAlmasAlertReportType(instance: AlmasAlertReportTypeInput!): AlmasAlertReportType!~~


~~  updateAlmasLoadReceiverHierarchy(instance: AlmasLoadReceiverHierarchyInput!): AlmasLoadReceiverHierarchy!~~

~~  updateAlmasLoadTemplateSet(instance: AlmasLoadTemplateSetInput!): AlmasLoadTemplateSet!~~

~~  updateAlmasLoadConfiguration(instance: AlmasLoadConfigurationInput!): AlmasLoadConfiguration!~~


~~  updateAlmasRaiseAlertFromOverrides(instance: AlmasRaiseAlertFromOverridesInput!): AlmasRaiseAlertFromOverrides!~~

```

```
~~updateAlmasRaiseAlertWithDynamicData(instance: AlmasRaiseAlertWithDynamicDataInput!): AlmasRaiseAlertWithDynamicData!~~

~~updateAlmasRaiseAlertFromData(instance: AlmasRaiseAlertFromDataInput!): AlmasRaiseAlertFromData!~~

~~updateAlmasRaiseAlertFromTemplate(instance: AlmasRaiseAlertFromTemplateInput!): AlmasRaiseAlertFromTemplate!~~

~~updateAlmasUpdateAlertPriority(instance: AlmasUpdateAlertPriorityInput!): AlmasUpdateAlertPriority!~~

~~updateAlmasCancelAlert(instance: AlmasCancelAlertInput!): AlmasCancelAlert!~~


~~updateAlmasSetLanguage(instance: AlmasSetLanguageInput!): AlmasSetLanguage!~~

~~updateAlmasGetFilledMessageText(instance: AlmasGetFilledMessageTextInput!): AlmasGetFilledMessageText!~~


~~updateAlmasAcknowledgeAlert(instance: AlmasAcknowledgeAlertInput!): AlmasAcknowledgeAlert!~~

~~updateAlmasConfirmReceipt(instance: AlmasConfirmReceiptInput!): AlmasConfirmReceipt!~~

~~updateAlmasHandleAlert(instance: AlmasHandleAlertInput!): AlmasHandleAlert!~~

~~updateAlmasRegisterReceiver(instance: AlmasRegisterReceiverInput!): AlmasRegisterReceiver!~~

~~updateAlmasUnregisterReceiver(instance: AlmasUnregisterReceiverInput!): AlmasUnregisterReceiver!~~

```

```
~~  dummyMutation(enumAlmasAckModelType: AlmasAckModelType, inputAlmasAlertReportType: AlmasAlertReportTypeInput, enumAlmasCategoryType: AlmasCategoryType, inputAlmasDynamicMessageDataType: AlmasDynamicMessageDataTypeInput, enumAlmasScopeType: AlmasScopeType, enumAlmasStateType: AlmasStateType, inputAlmasStaticMessageType: AlmasStaticMessageTypeInput, enumAlmasStatusType: AlmasStatusType, enumAlmasTimeoutActionType: AlmasTimeoutActionType, inputAlmasValidAlertResponseType: AlmasValidAlertResponseTypeInput, inputAlmasAlertDataExtraAttributesType: AlmasAlertDataExtraAttributesTypeInput, inputAlmasReceiverKindType: AlmasReceiverKindTypeInput, inputAlmasAvailableAlertReceiverType: AlmasAvailableAlertReceiverTypeInput, inputAlmasAlertDataType: AlmasAlertDataTypeInput, inputAlmasAlertTemplateType: AlmasAlertTemplateTypeInput, inputAlmasAlert: AlmasAlertInput, inputAlmasManager: AlmasManagerInput, inputAlmasRaiseAlertFromTemplate: AlmasRaiseAlertFromTemplateInput, inputAlmasRegisterReceiver: AlmasRegisterReceiverInput, inputAlmasUnregisterReceiver: AlmasUnregisterReceiverInput, inputAlmasRaiseAlertWithDynamicData: AlmasRaiseAlertWithDynamicDataInput, inputAlmasRaiseAlertFromData: AlmasRaiseAlertFromDataInput, inputAlmasUpdateAlertPriority: AlmasUpdateAlertPriorityInput, inputAlmasCancelAlert: AlmasCancelAlertInput, inputAlmasAcknowledgeAlert: AlmasAcknowledgeAlertInput, inputAlmasHandleAlert: AlmasHandleAlertInput, inputAlmasConfirmReceipt: AlmasConfirmReceiptInput, inputAlmasSetLanguage: AlmasSetLanguageInput, inputAlmasGetFilledMessageText: AlmasGetFilledMessageTextInput, inputAlmasFilledMessageText: AlmasFilledMessageTextInput, inputAlmasLoadReceiverHierarchy: AlmasLoadReceiverHierarchyInput, inputAlmasLoadTemplateSet: AlmasLoadTemplateSetInput, inputAlmasLoadConfiguration: AlmasLoadConfigurationInput, inputAlmasUpdateDynamicMessageData: AlmasUpdateDynamicMessageDataInput, inputAlmasSetAlertInhibited: AlmasSetAlertInhibitedInput, inputAlmasAttachCategorisationRule: AlmasAttachCategorisationRuleInput, inputAlmasDetachCategorisationRule: AlmasDetachCategorisationRuleInput, inputAlmasRemoveAlertsWithDynamicMessageData: AlmasRemoveAlertsWithDynamicMessageDataInput, inputAlmasRaiseAlertFromOverrides: AlmasRaiseAlertFromOverridesInput,  ignored: Boolean) : Boolean~~
~~}~~

~~# Class:~~
~~# This class modelsthe conditions upon whichanalert state can transition to~~
~~# 'acknowledged'.~~
~~#~~
~~enum AlmasAckModelType {~~
~~  # Attribute:~~
~~  # No acknowledgement required~~
~~  ACK_BY_NONE~~
~~  # Attribute:~~
~~  # Any single acknowledgement is sufficient.~~
~~  ACK_BY_ANYONE~~
~~  # Attribute:~~
~~  # The alert must be acknowledged by all recipients.~~
~~  ACK_BY_ALL~~
~~}~~
~~type AlmasAlertReportTypeUpdate {~~
~~  # The instance that has been updated (or deleted if Deleted flag is true).~~
~~  instance: AlmasAlertReportType!~~
~~  # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~  deleted: Boolean!~~
~~}~~

~~# Class:~~
~~# This provides the status information for specifically delivered alert item to a~~
~~# receiver. This will contain details of whether the instance has been acknowledged~~
~~# by this receiver etc. and will also be completed with respect to any dynamic~~
~~# message data.~~
~~type AlmasAlertReportType {~~
~~  # Attribute:~~
~~  # Identified whether the alert has been acknowledged by this receiver~~
~~  acknowledged: Boolean!~~
~~  # Attribute:~~
~~  # Identified whether the alert can be confirmed to have been routed as per the~~
~~  # 'routed' alert substate~~
~~  routed: Boolean!~~
~~  # Attribute:~~
~~  # Identified whether the alert has been actioned by this receiver~~
~~  actioned: Boolean!~~
~~  # Attribute:~~
~~  # Indicates that this receiver is the chosen actionee for this alert.~~
~~  receiverIsActionee: Boolean!~~
~~  # Attribute:~~
~~  # Provides means by which an alternative action outside of the scope of ALMAS can~~
~~  # be distributed with the alert via ALMAS.~~
~~  alternativeAction: [String!]!~~

~~  receiverId: String!~~

~~  alertId: Int!~~
~~}~~

~~# Class:~~
~~# This provides the status information for specifically delivered alert item to a~~
~~# receiver. This will contain details of whether the instance has been acknowledged~~
~~# by this receiver etc. and will also be completed with respect to any dynamic~~
~~# message data.~~
~~input AlmasAlertReportTypeInput {~~
~~  # Attribute:~~
~~  # Identified whether the alert has been acknowledged by this receiver~~
~~  acknowledged: Boolean!~~
~~  # Attribute:~~
~~  # Identified whether the alert can be confirmed to have been routed as per the~~
~~  # 'routed' alert substate~~
~~  routed: Boolean!~~
~~  # Attribute:~~
~~  # Identified whether the alert has been actioned by this receiver~~
~~  actioned: Boolean!~~
~~  # Attribute:~~
~~  # Indicates that this receiver is the chosen actionee for this alert.~~
~~  receiverIsActionee: Boolean!~~
~~  # Attribute:~~
~~  # Provides means by which an alternative action outside of the scope of ALMAS can~~
~~  # be distributed with the alert via ALMAS.~~
~~  alternativeAction: [String!]!~~

~~  receiverId: String!~~

~~  alertId: Int!~~
~~}~~
~~# Class:~~
~~# The categories of alerts in terms of the expectation placed on the operator~~
~~# receiving the alert; i.e. generically, why has the alert been received and what~~
~~# type of implicit or explicit response is expected.~~
~~# ~~
~~enum AlmasCategoryType {~~
~~  # Attribute:~~
~~  # An explicit input to the system is expected as a result of receiving the alert.~~
~~  # The alert persists until its is cancelled due to the condition to which it~~
~~  # relates no longer being present (due either to explicit operator action relating~~
~~  # to the alert or action external to the ALMAS system).~~
~~  ACTION~~
~~  # Attribute:~~
```

~~# The receiver may decide to take an explicit action in mitigation to the condition~~

~~# to which the warning relates. The alert does not persist according to the~~

~~# underlying condition that the alert warns about.~~

~~WARNING~~

~~# Attribute:~~

~~# The receiver is expected to take account of this information in subsequent~~

~~# decisions. The alert does not persist according to the underlying condition that~~

~~# the alert informs about.~~

~~INFORMATION~~

~~# Attribute:~~

~~# The receiver is expected to take account of the new state of the situation in~~

~~# subsequent decisions. The alert persists until its is cancelled due to the~~

~~# condition to which it relates no longer being present (due either to explicit~~

~~# operator action relating to the alert or action external to the ALMAS system).~~

~~SITUATION~~

~~}~~

~~# Class:~~

~~# Since Alerts often have variable data fields, the DynamicMessageData class~~

~~# provides the means for inserting variable content into the Alert's MessageText~~

~~# during runtime. Replacement values for the DataTag are treated as strict string~~

~~# substitution within the MessageText of the StaticMessage associated with the~~

~~# Alert. This is used to capture the triplet of data tag type, tag position in the~~

~~# alert message and the value that this tag in the template message text should be~~

~~# replaced with. Note: if the text specified in the StaticMessage contains~~

```
~~# multiple replacement points (specified by %%t1 through %%tn) then an equal number~~
~~# of DynamicMessageData objects are required for full substitution.~~
~~type AlmasDynamicMessageDataType {~~
~~  # Attribute:~~
~~  # The type of related object e.g. freetext, track, vehicle, position, etc.~~
~~  dataType: String!~~
~~  # Attribute:~~
~~  # This identifies the insertion point for the related object in the MessageText~~
~~  # associated with the Alert.  I.e. where the MessageText is "xxxxx %t1 yyyyyyy~~
~~  # zzzz", then DataTag has the value 't1'.  It is a case sensitive, alphanumeric~~
~~  # string~~
~~  dataTag: String!~~
~~  # Attribute:~~
~~  # The value of the object instantiation. Given a type~~
~~  # of string to be general enough to support free text~~
~~  # and track/vehicle id's alike~~
~~  dataValue: String!~~
~~}~~

~~# Class:~~
~~# Since Alerts often have variable data fields, the DynamicMessageData class~~
~~# provides the means for inserting variable content into the Alert's MessageText~~
~~# during runtime. Replacement values for the DataTag are treated as strict string~~
~~# substitution within the MessageText of the StaticMessage associated with the~~
~~# Alert. This is used to capture the triplet of data tag type, tag position in the~~
~~# alert message and the value that this tag in the template message text should be~~
~~# replaced with.  Note: if the text specified in the StaticMessage contains~~
~~# multiple replacement points (specified by %%t1 through %%tn) then an equal number~~
~~# of DynamicMessageData objects are required for full substitution.~~
~~input AlmasDynamicMessageDataTypeInput {~~
~~  # Attribute:~~
~~  # The type of related object e.g. freetext, track, vehicle, position, etc.~~
~~  dataType: String!~~
~~  # Attribute:~~
~~  # This identifies the insertion point for the related object in the MessageText~~
~~  # associated with the Alert.  I.e. where the MessageText is "xxxxx %t1 yyyyyyy~~
~~  # zzzz", then DataTag has the value 't1'.  It is a case sensitive, alphanumeric~~
~~  # string~~
~~  dataTag: String!~~
~~  # Attribute:~~
~~  # The value of the object instantiation. Given a type~~
~~  # of string to be general enough to support free text~~
~~  # and track/vehicle id's alike~~
~~  dataValue: String!~~
~~}~~
~~# Class:~~
~~# This class models the scope of the alert's dissemination.~~
~~#~~
~~enum AlmasScopeType {~~
~~  # Attribute:~~
~~  # unrestricted dissemination~~
~~  PUBLIC_SCOPE~~
~~  # Attribute:~~
~~  # dissemination restricted to known functions~~
~~  RESTRICTED_SCOPE~~
~~  # Attribute:~~
~~  # dissemination restricted to specified addresses~~
~~  PRIVATE_SCOPE~~
~~}~~
~~# Class:~~
~~# The states between which an alert transitions in its lifetime.~~
~~#~~
~~enum AlmasStateType {~~
~~  # Attribute:~~
~~  # The alert has been created by the alert producer.~~
~~  RAISED~~
~~  # Attribute:~~
~~  # The alert has been routed to the receivers, but reception has not been confirmed~~
~~  # by sufficient receivers to enter the received state.~~
~~  ROUTED~~
~~  # Attribute:~~
~~  # The alert has been received by sufficient receivers.~~
~~  RECEIVED~~
~~  # Attribute:~~
~~  # All necessary acknowledgements have been made.~~
~~  ACKNOWLEDGED~~
~~  # Attribute:~~
~~  # The alert ends its lifetime through being handled by the receiver.~~
~~  HANDLED~~
~~  # Attribute:~~
~~  # The alert ends its lifetime through being cancelled by the producer.~~
~~  CANCELLED~~
~~  # Attribute:~~
~~  # The alert ends its lifetime through beingtimed-out.~~
~~  TIMED_OUT~~
~~}~~
~~# Class:~~
~~# Provides the default message text for an alert as a tuplet of the actual static~~
~~# text and the language in which the text is provided.  If the StaticMessage~~
~~# requires runtime updating, then use data tags as specified in DynamicMessageData.~~
~~type AlmasStaticMessageType {~~
~~  # Attribute:~~
~~  # This is a text string, which in an Alert or AlertTemplate is only partially~~
~~  # completed.  With the MessageText being "xxxxx %t1 yyyyyyy zzzz" in an Alert or~~
~~  # AlertTemplate, and with a DynamicMessageData with DataTag having the value 't1'~~
~~  # and DataValue having the value '123' then the resulting MessageText in response~~
~~  # to GetFilledMessageText will be 'xxxxx 123 yyyyyyy zzzz'.  All substitution~~
~~  # points are bracketed by use of "<space>%" and <space>, and are case sensitive,~~
~~  # alphanumeric strings ("t1" in the above) which should correspond to a DataTag in~~
~~  # an associated DynamicMessageData.~~
~~  messageText: String!~~
~~  # Attribute:~~
~~  # The message 'Locale'~~
~~  messageLanguage: String!~~
~~}~~

~~# Class:~~
~~# Provides the default message text for an alert as a tuplet of the actual static~~
~~# text and the language in which the text is provided.  If the StaticMessage~~
~~# requires runtime updating, then use data tags as specified in DynamicMessageData.~~
~~input AlmasStaticMessageTypeInput {~~
~~  # Attribute:~~
~~  # This is a text string, which in an Alert or AlertTemplate is only partially~~
~~  # completed.  With the MessageText being "xxxxx %t1 yyyyyyy zzzz" in an Alert or~~
~~  # AlertTemplate, and with a DynamicMessageData with DataTag having the value 't1'~~
~~  # and DataValue having the value '123' then the resulting MessageText in response~~
~~  # to GetFilledMessageText will be 'xxxxx 123 yyyyyyy zzzz'.  All substitution~~
~~  # points are bracketed by use of "<space>%" and <space>, and are case sensitive,~~
~~  # alphanumeric strings ("t1" in the above) which should correspond to a DataTag in~~
~~  # an associated DynamicMessageData.~~
~~  messageText: String!~~
~~  # Attribute:~~
~~  # The message 'Locale'~~
~~  messageLanguage: String!~~
~~}~~
~~# Class:~~
~~# The status of the entities with regards to the mode of use of ALMAS in comparison~~
~~# to the mode of use of receivers and producers.~~
~~#~~
~~enum AlmasStatusType {~~
~~  # Attribute:~~
~~  # Actionable by all targeted recipients~~
~~  ACTUAL~~
~~  # Attribute:~~
~~  # Actionable only by designated exercise participants~~
~~  EXERCISE~~
~~  # Attribute:~~
~~  # For entities that support alert network internal functions.~~
~~  SYSTEM~~
~~  # Attribute:~~
~~  # Technical testing only, all recipients disregard.~~
~~  TEST~~
~~}~~
~~# Class:~~
~~# This class models the possible behaviors when an alert is timed-out.~~
~~#~~
~~enum AlmasTimeoutActionType {~~
~~  # Attribute:~~
~~  # The alert is just cancelled (the alert instance's lifetime ends).~~
~~  CANCEL_ONLY~~
~~  # Attribute:~~
~~  # The alert manager is notified.~~
~~  NOTIFY_ONLY~~
~~  # Attribute:~~
~~  # The alert is cancelled (the alert instance's lifetime ends) and the alert manager~~
~~  # is notified.~~
~~  CANCEL_WITH_NOTIFY~~
~~}~~
~~# Class:~~
~~# The ValidAlertResponse is the association class that specifies the list of~~
~~# actions that a particular ReceiverKind (e.g. "role") can take in response to an~~
~~# Alert of an AlertTemplate type.  It also specifies the "pecking order" of that~~
~~# ReceiverKind among all ReceiverKinds associated with that AlertTemplate.~~
~~# The set of alternative action strings can be used by the system to provide a~~
~~# constraind set of "command-response" options to the client.  For example,~~
~~# ValidAlertResponses for an "Engagement Request Alert" might include "WILCO",~~
~~# "CANTCO", etc.~~
~~type AlmasValidAlertResponseType {~~
~~  # Attribute:~~
~~  # The 'names' of alternative actions available to the relevant actor.~~
~~  alternativeAction: [String!]!~~
~~  # Attribute:~~
~~  # The priority of the ReceiveKkind as actionee for a specifc alert kind as~~
~~  # described by its template. The highest priority actionee for an action alert~~
~~  # should be chosen as the current actionee for the alert. This will then flow into~~
~~  # the ReceiverIsActionee field of the AlertReport.~~
~~  actioneePriority: Short!~~
~~}~~

~~# Class:~~
~~# The ValidAlertResponse is the association class that specifies the list of~~
~~# actions that a particular ReceiverKind (e.g. "role") can take in response to an~~
~~# Alert of an AlertTemplate type.  It also specifies the "pecking order" of that~~
~~# ReceiverKind among all ReceiverKinds associated with that AlertTemplate.~~
~~# The set of alternative action strings can be used by the system to provide a~~
~~# constraind set of "command-response" options to the client.  For example,~~
~~# ValidAlertResponses for an "Engagement Request Alert" might include "WILCO",~~
~~# "CANTCO", etc.~~
~~input AlmasValidAlertResponseTypeInput {~~
~~  # Attribute:~~
~~  # The 'names' of alternative actions available to the relevant actor.~~
~~  alternativeAction: [String!]!~~
~~  # Attribute:~~
~~  # The priority of the ReceiveKkind as actionee for a specifc alert kind as~~
~~  # described by its template. The highest priority actionee for an action alert~~
~~  # should be chosen as the current actionee for the alert. This will then flow into~~
~~  # the ReceiverIsActionee field of the AlertReport.~~
~~  actioneePriority: Short!~~
~~}~~
~~# Class:~~
~~# This is a class representing items of alert data that are specific to particular~~
~~# clients, that require supporting in order to fulfil possible requirements of an~~
~~# alert management system (such as images or other binary data), but are not~~
~~# general enough to be defined explicitly as data types in an ALMAS. Effectively~~
~~# ALMAS provides blind delivery of the information provided by this class to the~~
~~# alert receiver without any knowledge as to its intended meaning and behaviour.~~
~~# The extra attributes are configured via the ALMAS Alert definition xml PSM~~
~~# specified in section 7.1.  If defined in the Alert definition XML provided to~~
~~# ALMAS, then ALMAS shall support the definition, receipt, storage and passing of~~
~~# this data to receivers as part of a standard implementation.~~
~~type AlmasAlertDataExtraAttributesType {~~
~~  # Attribute:~~
~~  # Name of the client specific attribute~~
~~  name: String!~~
~~  # Attribute:~~
~~  # Valid Values for this are:~~
~~  #       0 = string~~
~~  #       1 = Integer8~~
~~  #       2 = Integer16~~
~~  #       3 = Integer32~~
~~  #       4 = Float32~~
~~  #       5 = Float64~~
~~  #       6 = bytes~~
~~  typeOfByteData: Short!~~
~~  # Attribute:~~
~~  # Used to provide indicaton of the content e.g. "image (jpg)", "URL", "track~~
~~  # object", ...~~
~~  description: String!~~
~~  # Attribute:~~
~~  # Contents as a byte sequence~~
~~  value: [Short!]!~~
~~}~~

~~# Class:~~
~~# This is a class representing items of alert data that are specific to particular~~
~~# clients, that require supporting in order to fulfil possible requirements of an~~
~~# alert management system (such as images or other binary data), but are not~~
~~# general enough to be defined explicitly as data types in an ALMAS. Effectively~~
~~# ALMAS provides blind delivery of the information provided by this class to the~~
~~# alert receiver without any knowledge as to its intended meaning and behaviour.~~
~~# The extra attributes are configured via the ALMAS Alert definition xml PSM~~
~~# specified in section 7.1.  If defined in the Alert definition XML provided to~~
~~# ALMAS, then ALMAS shall support the definition, receipt, storage and passing of~~
~~# this data to receivers as part of a standard implementation.~~
~~input AlmasAlertDataExtraAttributesTypeInput {~~
~~  # Attribute:~~
~~  # Name of the client specific attribute~~
~~  name: String!~~
~~  # Attribute:~~
~~  # Valid Values for this are:~~
~~  #       0 = string~~
~~  #       1 = Integer8~~
~~  #       2 = Integer16~~
~~  #       3 = Integer32~~
~~  #       4 = Float32~~
~~  #       5 = Float64~~
~~  #       6 = bytes~~
~~  typeOfByteData: Short!~~
~~  # Attribute:~~
~~  # Used to provide indicaton of the content e.g. "image (jpg)", "URL", "track~~
~~  # object", ...~~
~~  description: String!~~
~~  # Attribute:~~
~~  # Contents as a byte sequence~~
~~  value: [Short!]!~~
~~}~~
~~# Class:~~
~~# The descriptor of an alert receiver.  This could for example be an operator role.~~
~~#  ReceiverKind objects are used in many places in ALMAS including the~~
~~# specification of what operators/clients will receive which Alerts.~~
~~# o  These are used to show all possible receivers of an Alert, when used in an~~
~~# AlertTemplate;~~
~~# o  These are used during runtime to identify the actual receivers for an active~~
~~# alert.~~
~~type AlmasReceiverKindType {~~
~~  # Attribute:~~
~~  # String identifier of the kind of receiver, for example the role of a receiving~~
~~  # operator.~~
~~  rkType: String!~~
~~  # Attribute:~~
~~  # The hierarchical parent receiver kind name that this one “belongs to”.  This is~~
~~  # used by ALMAS to resolve cases where a specific RK is not available but handing~~
~~  # is required by an appropriate receiver.  Note that a lack of a Parent is~~
~~  # indicated by an empty string.~~
~~  rkParentType: String!~~

~~  validResponse: AlmasValidAlertResponseType~~
~~}~~

~~# Class:~~
~~# The descriptor of an alert receiver.  This could for example be an operator role.~~
~~#  ReceiverKind objects are used in many places in ALMAS including the~~
~~# specification of what operators/clients will receive which Alerts.~~
~~# o  These are used to show all possible receivers of an Alert, when used in an~~
~~# AlertTemplate;~~
~~# o  These are used during runtime to identify the actual receivers for an active~~
~~# alert.~~
~~input AlmasReceiverKindTypeInput {~~
~~  # Attribute:~~
~~  # String identifier of the kind of receiver, for example the role of a receiving~~
~~  # operator.~~
~~  rkType: String!~~
~~  # Attribute:~~
~~  # The hierarchical parent receiver kind name that this one “belongs to”.  This is~~
~~  # used by ALMAS to resolve cases where a specific RK is not available but handing~~
~~  # is required by an appropriate receiver.  Note that a lack of a Parent is~~
~~  # indicated by an empty string.~~
~~  rkParentType: String!~~

~~  validResponse: AlmasValidAlertResponseTypeInput~~
~~}~~
~~# Class:~~
~~# The class used to identify a receiver of alerts.  A registered receiver of~~
~~# alerts.  The AvailableAlertReceiver is registered with ALMAS through the~~
~~# ALMASResponder API.  The AvailableAlertReceiver is directly associated with an~~
~~# ALMASReceiver through the ReceiverID attribute, which is provided at registration~~
~~# time to ALMAS using the RegisterReceiver method.~~
~~type AlmasAvailableAlertReceiverType {~~
~~  # Attribute:~~
~~  # Unique identifier for the receiver.~~
~~  receiverId: String!~~
~~  # Attribute:~~
~~  # The kind of the receiver as an explicit attribute link to the Receiver Kind~~
~~  # class.~~
~~  receiverKind: AlmasReceiverKindType~~
~~}~~
```

```
~~# Class:~~
~~# The class used to identify a receiver of alerts.  A registered receiver of~~
~~# alerts.  The AvailableAlertReceiver is registered with ALMAS through the~~
~~# ALMASResponder API.  The AvailableAlertReceiver is directly associated with an~~
~~# ALMASReceiver through the ReceiverID attribute, which is provided at registration~~
~~# time to ALMAS using the RegisterReceiver method.~~
~~input AlmasAvailableAlertReceiverTypeInput {~~
~~  # Attribute:~~
~~  # Unique identifier for the receiver.~~
~~  receiverId: String!~~
~~  # Attribute:~~
~~  # The kind of the receiver as an explicit attribute link to the Receiver Kind~~
~~  # class.~~
~~  receiverKind: AlmasReceiverKindTypeInput~~
~~}~~
~~# Class:~~
~~# This represents the set of data shared between the alert template and alert~~
~~# classes. All fields have default values which can be changed when alerts are~~
~~# raised/updated. This may be set up through the use of templates as specified~~
~~# through the XML PSM, which initialises AlertTemplate and its associated classes.~~
~~type AlmasAlertDataType {~~
~~  # Attribute:~~
~~  # A unique identifier for template which owns this alert data (or that was used to~~
~~  # create the alert if this is referenced from Alert).  Valid range from 1 upwards.~~
~~  templateId: Int!~~
~~  # Attribute:~~
~~  # This enumeration can take the value Action / Warning / Information / Situation~~
~~  category: AlmasCategoryType~~
~~  # Attribute:~~
~~  # Alert priority as an integer value in the range 1-99.  The priority is open for~~
~~  # client use and not intended for interpretation by ALMAS.~~
~~  priority: Short!~~
~~  # Attribute:~~
~~  # Corresponds to the OASIS CAP Status field.~~
~~  # "Actual" - Actionable by all targeted recipients~~
~~  # "Exercise"- Actionable only by designated exercise participants;  exercise~~
~~  # identifier should appear in an Alert Data Extra Attributes element~~
~~  # "System" - For messages that support alert network internal functions~~
~~  # "Test" - Technical testing only, all recipients disregard~~
~~  status: AlmasStatusType~~
~~  # Attribute:~~
~~  # Corresponds to CAP scope.~~
~~  scope: AlmasScopeType~~
~~  # Attribute:~~
~~  # Specifies the time, in seconds, required to elapse before the alert will timeout~~
~~  # and perform its default timeout action. 0 implies there is no timeout.~~
~~  timeout: Int!~~
~~  # Attribute:~~
~~  # This is set if confirmation of receipt is required~~
~~  #  i.e. that it has been distributed. If this is set to true the~~
~~  # producer has registered for receipt of the distribution notification.~~
~~  confirmationRequired: Boolean!~~
~~  # Attribute:~~
~~  # This is an additional field to support client specific filtering mechanisms.~~
~~  secondaryGrouping: String!~~
~~  # Attribute:~~
~~  # Indicates whether the alert data is required to be persistent in the event of a~~
~~  # system restart~~
~~  persistent: Boolean!~~
~~  # Attribute:~~
~~  # A flag which, when true, indicates that the alert should have guaranteed~~
~~  # delivery.~~
~~  reliablyDistributed: Boolean!~~
~~  # Attribute:~~
~~  # When the alert times-out, ALMAS acts according to this attribute.~~
~~  timeoutAction: AlmasTimeoutActionType~~
~~  # Attribute:~~
~~  # Sets the conditions upon which the alert state can~~
~~  # transition to 'acknowledged'.~~
~~  # This has the options of {none, anyone, all}~~
~~  acknowledgementModel: AlmasAckModelType~~

~~  staticMessages: [AlmasStaticMessageType!]!~~

~~  dynamicMessages: [AlmasDynamicMessageDataType!]!~~

~~  extraAttributes: [AlmasAlertDataExtraAttributesType!]!~~
~~}~~

~~# Class:~~
~~# This represents the set of data shared between the alert template and alert~~
~~# classes. All fields have default values which can be changed when alerts are~~
~~# raised/updated. This may be set up through the use of templates as specified~~
~~# through the XML PSM, which initialises AlertTemplate and its associated classes.~~
~~input AlmasAlertDataTypeInput {~~
~~  # Attribute:~~
~~  # A unique identifier for template which owns this alert data (or that was used to~~
~~  # create the alert if this is referenced from Alert).  Valid range from 1 upwards.~~
~~  templateId: Int!~~
~~  # Attribute:~~
~~  # This enumeration can take the value Action / Warning / Information / Situation~~
~~  category: AlmasCategoryType~~
~~  # Attribute:~~
~~  # Alert priority as an integer value in the range 1-99.  The priority is open for~~
~~  # client use and not intended for interpretation by ALMAS.~~
~~  priority: Short!~~
~~  # Attribute:~~
~~  # Corresponds to the OASIS CAP Status field.~~
~~  # "Actual" - Actionable by all targeted recipients~~
~~  # "Exercise"- Actionable only by designated exercise participants; exercise~~
~~  # identifier should appear in an Alert Data Extra Attributes element~~
~~  # "System" - For messages that support alert network internal functions~~
~~  # "Test" - Technical testing only, all recipients disregard~~
~~  status: AlmasStatusType~~
~~  # Attribute:~~
~~  # Corresponds to CAP scope.~~
~~  scope: AlmasScopeType~~
~~  # Attribute:~~
~~  # Specifies the time, in seconds, required to elapse before the alert will timeout~~
~~  # and perform its default timeout action. 0 implies there is no timeout.~~
```

```
~~timeout: Int!~~
~~# Attribute:~~
~~# This is set if confirmation of receipt is required -~~
~~# i.e. that it has been distributed. If this is set to true the~~
~~# producer has registered for receipt of the distribution notification.~~
~~confirmationRequired: Boolean!~~
~~# Attribute:~~
~~# This is an additional field to support client specific filtering mechanisms.~~
~~secondaryGrouping: String!~~
~~# Attribute:~~
~~# Indicates whether the alert data is required to be persistent in the event of a~~
~~# system restart~~
~~persistent: Boolean!~~
~~# Attribute:~~
~~# A flag which, when true, indicates that the alert should have guaranteed~~
~~# delivery.~~
~~reliablyDistributed: Boolean!~~
~~# Attribute:~~
~~# When the alert times-out, ALMAS acts according to this attribute.~~
~~timeoutAction: AlmasTimeoutActionType~~
~~# Attribute:~~
~~# Sets the conditions upon which the alert state can~~
~~# transition to 'acknowledged'.~~
~~# This has the options of {none, anyone, all}~~
~~acknowledgementModel: AlmasAckModelType~~

~~staticMessages: [AlmasStaticMessageTypeInput!]!~~

~~dynamicMessages: [AlmasDynamicMessageDataTypeInput!]!~~

```

```
~~  extraAttributes: [AlmasAlertDataExtraAttributesTypeInput!]!~~
~~}~~
~~type AlmasAlertTemplateTypeUpdate {~~
~~  # The instance that has been updated (or deleted if Deleted flag is true).~~
~~  instance: AlmasAlertTemplateType!~~
~~  # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~  deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Retrieves an existing alert template from ALMAS by providing the template ID.~~
~~# Interface:~~
~~# The ALMASManager interface provides the minimal set of APIs necessary to track~~
~~# ALMAS activity.  Additionally, the ALMASManager provides the interface in ALMAS~~
~~# for retrieving Alerts and AlertTemplates, and registering for the notification of~~
~~# delivery of Alerts.   Note that the registration of receivers is done via the~~
~~# ALMAS Responder class.~~
~~# Note: The methods found in the ALMASProducer interface allow the system to update~~
~~# the status or attributes of an alert during runtime.~~
~~# Class:~~
~~# An AlertTemplate specifys the generic characteristics of a specific alert type~~
~~# "at rest" (e.g. the general characteristics of a collision warning alert). This~~
~~# includes the category of alert, such as Action etc.  An AerltTemplate uses an~~
~~# associated AlertData object to specify the contents of the template.  An~~
~~# AlertTemplate can be used to specify the properties of commonly used within a~~
~~# system.  At the time of raising an Alert from a template, the user/system~~
~~# provides the relevant instance data of that alert~~
~~type AlmasAlertTemplateType {~~
  ~~  # Attribute:~~
  ~~  # The inhibition status of that alert type. If this is 'true' then attempts to~~
  ~~  # raise an alert of that type will fail.~~
  ~~  inhibited: Boolean!~~
  ~~  # Attribute:~~
  ~~  # Indicates that the alert should be~~
  ~~  # raised to all available receivers rather~~
  ~~  # than specified ones.~~
  ~~  raiseToAll: Boolean!~~

  ~~  alertData: AlmasAlertDataType~~

  ~~  receiverKinds: [AlmasReceiverKindType!]!~~
  ~~}~~

~~# Operation:~~
~~# Retrieves an existing alert template from ALMAS by providing the template ID.~~
~~# Interface:~~
~~# The ALMASManager interface provides the minimal set of APIs necessary to track~~
~~# ALMAS activity.  Additionally, the ALMASManager provides the interface in ALMAS~~
~~# for retrieving Alerts and AlertTemplates, and registering for the notification of~~
~~# delivery of Alerts.   Note that the registration of receivers is done via the~~
~~# ALMAS Responder class.~~
~~# Note: The methods found in the ALMASProducer interface allow the system to update~~
~~# the status or attributes of an alert during runtime.~~
~~# Class:~~
~~# An AlertTemplate specifys the generic characteristics of a specific alert type~~
~~# "at rest" (e.g. the general characteristics of a collision warning alert). This~~
~~# includes the category of alert, such as Action etc.  An AerltTemplate uses an~~
~~# associated AlertData object to specify the contents of the template.  An~~
~~# AlertTemplate can be used to specify the properties of commonly used within a~~
~~# system.  At the time of raising an Alert from a template, the user/system~~
~~# provides the relevant instance data of that alert~~
~~input AlmasAlertTemplateTypeInput {~~
~~  # Attribute:~~
~~  # The inhibition status of that alert type. If this is 'true' then attempts to~~
~~  # raise an alert of that type will fail.~~
~~  inhibited: Boolean!~~
~~  # Attribute:~~
~~  # Indicates that the alert should be~~
~~  # raised to all available receivers rather~~
~~  # than specified ones.~~
~~  raiseToAll: Boolean!~~

~~  alertData: AlmasAlertDataTypeInput~~

~~  receiverKinds: [AlmasReceiverKindTypeInput!]!~~
~~}~~
~~type AlmasAlertUpdate {~~
~~  # The instance that has been updated (or deleted if Deleted flag is true).~~
~~  instance: AlmasAlert!~~
~~  # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~  deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Retrieves data for a specific raised alert from ALMAS given the passed AlertID.~~
~~# Assumes the requestor knows the AlertID to retrieve.~~
~~# Interface:~~
~~# The ALMASManager interface provides the minimal set of APIs necessary to track~~
~~# ALMAS activity.  Additionally, the ALMASManager provides the interface in ALMAS~~
~~# for retrieving Alerts and AlertTemplates, and registering for the notification of~~
~~# delivery of Alerts.   Note that the registration of receivers is done via the~~
~~# ALMAS Responder class.~~
~~# Note: The methods found in the ALMASProducer interface allow the system to update~~
~~# the status or attributes of an alert during runtime.~~
~~# Class:~~
~~# An active alert within ALMAS.  The Alert class provides the main entity that~~
~~# ALMAS uses for tracking the state of an alert.  The specific data such as message~~
~~# and other attributes for an active alert is provided in the AlertData class which~~
~~# is a member attribute of the Alert~~
~~type AlmasAlert {~~
~~  # Attribute:~~
~~  # The instance id for the specific instance of the alert.~~
~~  alertId: Int!~~
~~  # Attribute:~~
~~  # The time at which the alert was raised.~~
~~  raisingTime: Long!~~
~~  # Attribute:~~
~~  # Holds the current state of the alert, valid states are determined by the category~~
~~  # of the alert, (Raised, Routed, Received, Acknowledged, Handled, Cancelled,~~
~~  # Timed_Out). Note that Handled is not a valid state for Information and Warning~~
~~  # Alerts.~~
~~  currentState: AlmasStateType~~
~~  # Attribute:~~
~~  # The producer freetext ID - corresponds to CAP source~~
~~  producerId: String!~~

~~  alertData: AlmasAlertDataType~~

~~  receivers: [AlmasAvailableAlertReceiverType!]!~~
~~}~~

~~# Operation:~~
~~# Retrieves data for a specific raised alert from ALMAS given the passed AlertID.~~
~~# Assumes the requestor knows the AlertID to retrieve.~~
~~# Interface:~~
~~# The ALMASManager interface provides the minimal set of APIs necessary to track~~
~~# ALMAS activity.  Additionally, the ALMASManager provides the interface in ALMAS~~
~~# for retrieving Alerts and AlertTemplates, and registering for the notification of~~
~~# delivery of Alerts.   Note that the registration of receivers is done via the~~
~~# ALMAS Responder class.~~
~~# Note: The methods found in the ALMASProducer interface allow the system to update~~
~~# the status or attributes of an alert during runtime.~~
~~# Class:~~
~~# An active alert within ALMAS.  The Alert class provides the main entity that~~
~~# ALMAS uses for tracking the state of an alert.  The specific data such as message~~
~~# and other attributes for an active alert is provided in the AlertData class which~~
~~# is a member attribute of the Alert~~
~~input AlmasAlertInput {~~
~~  # Attribute:~~
~~  # The instance id for the specific instance of the alert.~~
~~  alertId: Int!~~
~~  # Attribute:~~
~~  # The time at which the alert was raised.~~
~~  raisingTime: Long!~~
~~  # Attribute:~~
~~  # Holds the current state of the alert, valid states are determined by the category~~
~~  # of the alert, {Raised, Routed, Received, Acknowledged, Handled, Cancelled,~~
~~  # Timed_Out}. Note that Handled is not a valid state for Information and Warning~~
~~  # Alerts.~~
~~  currentState: AlmasStateType~~
~~  # Attribute:~~
~~  # The producer freetext ID - corresponds to CAP source~~
~~  producerId: String!~~

~~  alertData: AlmasAlertDataTypeInput~~

~~  receivers: [AlmasAvailableAlertReceiverTypeInput!]!~~
~~}~~
~~type AlmasManagerUpdate {~~
~~  # The instance that has been updated (or deleted if Deleted flag is true).~~
~~  instance: AlmasManager!~~
~~  # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~  deleted: Boolean!~~
~~}~~

~~# Class:~~
~~# Need a singleton topic for ALMAS_Manager since it has attributes~~
~~type AlmasManager {~~
~~  systemId: String!~~
~~}~~

~~# Class:~~
~~# Need a singleton topic for ALMAS_Manager since it has attributes~~
~~input AlmasManagerInput {~~
~~  systemId: String!~~
~~}~~
~~type AlmasRaiseAlertFromTemplateUpdate {~~
~~  # The instance that has been updated (or deleted if Deleted flag is true).~~
~~  instance: AlmasRaiseAlertFromTemplate!~~
~~  # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~  deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Raise an alert without any of the optional parameters for optimal use in the~~
~~# normal case.~~
~~# Interface:~~
```

~~# Provides the API by which system objects producing alerts can create and update~~

~~# alerts that are generated. A CallStatus object will be returned to indicate~~

~~# whether the request has been accepted by ALMAS. If a system wished to track the~~

~~# lifecycle of the alert, they must implement the NotificationListener~~

~~# functionality to receive updates.~~

~~# Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~

~~# interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~

~~# allow the system to raise an alert by simply specifying the alert ID, template ID~~

~~# and their own ProducerID, one of these also allows the over-ride of any~~

~~# placeholders that may be present in the 'Message' attribute of the alert data~~

~~# class associated with that template. The raiser may also optionally override any~~

~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~

~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~

~~# AcknowledgementModel.~~

~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~

~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~

~~# support alert templates depending on their size, complexity and level of alert~~

~~# usage, in which case that system can always use RaiseAlertFromData without need~~

~~# to instantiate any templates at any point during operation.~~

~~# The status or attributes of an alert can be updated during runtime by calling the~~

~~# UpdateAlert method found in the ALMASProducer interface. The ALMASProducer then~~

~~# works with the ALMAS system to ensure state and data is properly maintained in~~

~~# the system.~~

```
~~type AlmasRaiseAlertFromTemplate {~~
~~    requestId: Long!~~

~~    producerId: String!~~

~~    templateId: Int!~~
~~}~~

~~# Operation:~~
~~# Raise an alert without any of the optional parameters for optimal use in the~~
~~# normal case.~~
~~# Interface:~~
~~# Provides the API by which system objects producing alerts can create and update~~
~~# alerts that are generated. A CallStatus object will be returned to indicate~~
~~# whether the request has been accepted by ALMAS.  If a system wished to track the~~
~~# lifecycle of the alert, they must implement the NotificationListener~~
~~# functionality to receive updates.~~
~~# Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~
~~# interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~
~~# allow the system to raise an alert by simply specifying the alert ID, template ID~~
~~# and their own ProducerID, one of these also allows the over-ride of any~~
~~# placeholders that may be present in the 'Message' attribute of the alert data~~
~~# class associated with that template. The raiser may also optionally override any~~
~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~
~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~
~~# AcknowledgementModel.~~
~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~
~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~
~~# support alert templates depending on their size, complexity and level of alert~~
~~# usage, in which case that system can always use RaiseAlertFromData without need~~
~~# to instantiate any templates at any point during operation.~~
~~# The status or attributes of an alert can be updated during runtime by calling the~~
~~# UpdateAlert method found in the ALMASProducer interface.  The ALMASProducer then~~
~~# works with the ALMAS system to ensure state and data is properly maintained in~~
~~# the system.~~
~~input AlmasRaiseAlertFromTemplateInput {~~
~~    requestId: Long!~~

~~    producerId: String!~~

~~    templateId: Int!~~
~~}~~
~~type AlmasRegisterReceiverUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasRegisterReceiver!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# This registers a receiver with ALMAS, the parameters are ReceiverHandle (for~~
~~# callback); ReceiverID (for use in all other methods, including~~
~~# UnregisterReceiver) and RKType to provide link to RK hierarchy.~~
~~# Interface:~~
~~# Provides the API for systems to respond to and provide feedback to ALMAS about~~
~~# alertsreceived.   Embedded in this class are the methods to register and~~
~~# un-register your system-specific receiver.~~
~~# The system notifies ALMAS through this interface of significant events that have~~
~~# occurred to change the state of an alert.~~
~~type AlmasRegisterReceiver {~~
~~    requestId: Long!~~

~~    receiverId: String!~~

~~    rkType: String!~~
~~}~~

~~# Operation:~~
~~# This registers a receiver with ALMAS, the parameters are ReceiverHandle (for~~
~~# callback); ReceiverID (for use in all other methods, including~~
~~# UnregisterReceiver) and RKType to provide link to RK hierarchy.~~
~~# Interface:~~
~~# Provides the API for systems to respond to and provide feedback to ALMAS about~~
~~# alertsreceived.   Embedded in this class are the methods to register and~~
~~# un-register your system-specific receiver.~~
~~# The system notifies ALMAS through this interface of significant events that have~~
~~# occurred to change the state of an alert.~~
~~input AlmasRegisterReceiverInput {~~
~~    requestId: Long!~~
```

```

    ~~receiverId: String!~~

    ~~rkType: String!~~
~~}~~
~~type AlmasUnregisterReceiverUpdate {~~
    ~~# The instance that has been updated (or deleted if Deleted flag is true).~~
    ~~instance: AlmasUnregisterReceiver!~~
    ~~# True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
    ~~deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Removes a registered receiver from ALMAS, indicating that they are no longer~~
~~# avail-able for receipt of alert data.~~
~~# Interface:~~
~~# Provides the API for systems to respond to and provide feedback to ALMAS about~~
~~# alertsreceived.  Embedded in this class are the methods to register and~~
~~# un-register your system-specific receiver.~~
~~# The system notifies ALMAS through this interface of significant events that have~~
~~# occurred to change the state of an alert.~~
~~type AlmasUnregisterReceiver {~~
    ~~requestId: Long!~~

    ~~receiverId: String!~~
~~}~~

~~# Operation:~~
~~# Removes a registered receiver from ALMAS, indicating that they are no longer~~
~~# avail-able for receipt of alert data.~~
~~# Interface:~~
~~# Provides the API for systems to respond to and provide feedback to ALMAS about~~
~~# alertsreceived.   Embedded in this class are the methods to register and~~
~~# un-register your system-specific receiver.~~
~~# The system notifies ALMAS through this interface of significant events that have~~
~~# occurred to change the state of an alert.~~
~~input AlmasUnregisterReceiverInput {~~
~~    requestId: Long!~~

~~    receiverId: String!~~
~~}~~
~~type AlmasRaiseAlertWithDynamicDataUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasRaiseAlertWithDynamicData!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# This will cause an alert based on a known alert template~~
~~# to be created and raised, whilst only specifying the dynamic data content that~~
~~# differs from the template definition.~~
~~# All parameters are mandatory~~
~~# Return parameter indicates success or failure reason.~~
~~# Interface:~~
~~# Provides the API by which system objects producing alerts can create and update~~
~~# alerts that are generated. A CallStatus object will be returned to indicate~~
~~# whether the request has been accepted by ALMAS.  If a system wished to track the~~
~~# lifecycle of the alert, they must implement the NotificationListener~~
~~# functionality to receive updates.~~
~~# Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~
~~# interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~
~~# allow the system to raise an alert by simply specifying the alert ID, template ID~~
~~# and their own ProducerID, one of these also allows the over-ride of any~~
~~# placeholders that may be present in the 'Message' attribute of the alert data~~
~~# class associated with that template. The raiser may also optionally override any~~
~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~
~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~
~~# AcknowledgementModel.~~
~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~
~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~
~~# support alert templates depending on their size, complexity and level of alert~~
~~# usage, in which case that system can always use RaiseAlertFromData without need~~
~~# to instantiate any templates at any point during operation.~~
~~# The status or attributes of an alert can be updated during runtime by calling the~~
~~# UpdateAlert method found in the ALMASProducer interface.  The ALMASProducer then~~
~~# works with the ALMAS system to ensure state and data is properly maintained in~~
~~# the system.~~
~~type AlmasRaiseAlertWithDynamicData {~~
~~    requestId: Long!~~

~~    producerId: String!~~

~~    templateId: Int!~~

~~    dynamicMessages: [AlmasDynamicMessageDataType!]!~~
~~}~~

~~# Operation:~~
~~# This will cause an alert based on a known alert template~~
~~# to be created and raised, whilst only specifying the dynamic data content that~~
~~# differs from the template definition.~~
~~# All parameters are mandatory~~
~~# Return parameter indicates success or failure reason.~~
~~# Interface:~~
~~# Provides the API by which system objects producing alerts can create and update~~
~~# alerts that are generated. A CallStatus object will be returned to indicate~~
~~# whether the request has been accepted by ALMAS.  If a system wished to track the~~
~~# lifecycle of the alert, they must implement the NotificationListener~~
~~# functionality to receive updates.~~
~~# Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~
~~# interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~
~~# allow the system to raise an alert by simply specifying the alert ID, template ID~~
~~# and their own ProducerID, one of these also allows the over-ride of any~~
~~# placeholders that may be present in the 'Message' attribute of the alert data~~
~~# class associated with that template. The raiser may also optionally override any~~
~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~
~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~
~~# AcknowledgementModel.~~
~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~
~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~
~~# support alert templates depending on their size, complexity and level of alert~~
~~# usage, in which case that system can always use RaiseAlertFromData without need~~
~~# to instantiate any templates at any point during operation.~~
~~# The status or attributes of an alert can be updated during runtime by calling the~~
~~# UpdateAlert method found in the ALMASProducer interface.  The ALMASProducer then~~
~~# works with the ALMAS system to ensure state and data is properly maintained in~~
~~# the system.~~
~~input AlmasRaiseAlertWithDynamicDataInput {~~
~~    requestId: Long!~~

~~    producerId: String!~~

~~    templateId: Int!~~

~~    dynamicMessages: [AlmasDynamicMessageDataTypeInput!]!~~
~~}~~
~~type AlmasRaiseAlertFromDataUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
```

~~instance: AlmasRaiseAlertFromData!~~

~~# True if the instance has been deleted, false otherwise (i.e. on creation or update).~~

~~deleted: Boolean!~~

~~}~~

~~# Operation:~~

~~# Raises an alert not present in the ALMAS template~~

~~# database. A temporary AlertTemaplate is created (whose TemplateID is ignored),~~

~~# to facilitate the creation.~~

~~# Return parameter indicates success or failure reason.~~

~~# Interface:~~

~~# Provides the API by which system objects producing alerts can create and update~~

~~# alerts that are generated. A CallStatus object will be returned to indicate~~

~~# whether the request has been accepted by ALMAS. If a system wished to track the~~

~~# lifecycle of the alert, they must implement the NotificationListener~~

~~# functionality to receive updates.~~

~~# Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~

~~# interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~

~~# allow the system to raise an alert by simply specifying the alert ID, template ID~~

~~# and their own ProducerID, one of these also allows the over-ride of any~~

~~# placeholders that may be present in the 'Message' attribute of the alert data~~

~~# class associated with that template. The raiser may also optionally override any~~

~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~

~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~

~~# AcknowledgementModel.~~

~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~

~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~

~~# support alert templates depending on their size, complexity and level of alert~~

~~# usage, in which case that system can always use RaiseAlertFromData without need~~

~~# to instantiate any templates at any point during operation.~~

~~# The status or attributes of an alert can be updated during runtime by calling the~~

~~# UpdateAlert method found in the ALMASProducer interface. The ALMASProducer then~~

~~# works with the ALMAS system to ensure state and data is properly maintained in~~

~~# the system.~~

~~type AlmasRaiseAlertFromData {~~

~~requestId: Long!~~

~~producerId: String!~~

~~alertInfo: AlmasAlertTemplateType~~

~~}~~

~~# Operation:~~

~~# Raises an alert not present in the ALMAS template~~

~~# database. A temporary AlertTemaplate is created (whose TemplateID is ignored),~~

~~# to facilitate the creation.~~

~~# Return parameter indicates success or failure reason.~~

~~# Interface:~~

~~# Provides the API by which system objects producing alerts can create and update~~

~~# alerts that are generated. A CallStatus object will be returned to indicate~~

```
~~# whether the request has been accepted by ALMAS.  If a system wished to track the~~
~~# lifecycle of the alert, they must implement the NotificationListener~~
~~# functionality to receive updates.~~
~~# Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~
~~# interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~
~~# allow the system to raise an alert by simply specifying the alert ID, template ID~~
~~# and their own ProducerID, one of these also allows the over-ride of any~~
~~# placeholders that may be present in the 'Message' attribute of the alert data~~
~~# class associated with that template. The raiser may also optionally override any~~
~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~
~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~
~~# AcknowledgementModel.~~
~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~
~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~
~~# support alert templates depending on their size, complexity and level of alert~~
~~# usage, in which case that system can always use RaiseAlertFromData without need~~
~~# to instantiate any templates at any point during operation.~~
~~# The status or attributes of an alert can be updated during runtime by calling the~~
~~# UpdateAlert method found in the ALMASProducer interface.  The ALMASProducer then~~
~~# works with the ALMAS system to ensure state and data is properly maintained in~~
~~# the system.~~
~~input AlmasRaiseAlertFromDataInput {~~
~~    requestId: Long!~~
~~~~
  ~~    producerId: String!~~
  ~~~~
  ~~    alertInfo: AlmasAlertTemplateTypeInput~~
  ~~  }~~
~~  type AlmasUpdateAlertPriorityUpdate {~~
  ~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
  ~~    instance: AlmasUpdateAlertPriority!~~
  ~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
  ~~    deleted: Boolean!~~
  ~~  }~~
  ~~~~
~~  # Operation:~~
~~  # Update an existing raised alert instance's priority.~~
~~  # Interface:~~
~~  # Provides the API by which system objects producing alerts can create and update~~
~~  # alerts that are generated. A CallStatus object will be returned to indicate~~
~~  # whether the request has been accepted by ALMAS.  If a system wished to track the~~
~~  # lifecycle of the alert, they must implement the NotificationListener~~
~~  # functionality to receive updates.~~
~~  # Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~
~~  # interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~
~~  # allow the system to raise an alert by simply specifying the alert ID, template ID~~
~~  # and their own ProducerID, one of these also allows the over-ride of any~~
~~  # placeholders that may be present in the 'Message' attribute of the alert data~~
~~  # class associated with that template. The raiser may also optionally override any~~
```

```
~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~
~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~
~~# AcknowledgementModel.~~
~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~
~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~
~~# support alert templates depending on their size, complexity and level of alert~~
~~# usage, in which case that system can always use RaiseAlertFromData without need~~
~~# to instantiate any templates at any point during operation.~~
~~# The status or attributes of an alert can be updated during runtime by calling the~~
~~# UpdateAlert method found in the ALMASProducer interface.  The ALMASProducer then~~
~~# works with the ALMAS system to ensure state and data is properly maintained in~~
~~# the system.~~
~~type AlmasUpdateAlertPriority {~~
~~    requestId: Long!~~

~~    producerId: String!~~

~~    alertId: Int!~~

~~    priority: Short!~~
~~}~~

~~# Operation:~~
~~# Update an existing raised alert instance's priority.~~
~~# Interface:~~
```

~~# Provides the API by which system objects producing alerts can create and update~~

~~# alerts that are generated. A CallStatus object will be returned to indicate~~

~~# whether the request has been accepted by ALMAS. If a system wished to track the~~

~~# lifecycle of the alert, they must implement the NotificationListener~~

~~# functionality to receive updates.~~

~~# Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~

~~# interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~

~~# allow the system to raise an alert by simply specifying the alert ID, template ID~~

~~# and their own ProducerID, one of these also allows the over-ride of any~~

~~# placeholders that may be present in the 'Message' attribute of the alert data~~

~~# class associated with that template. The raiser may also optionally override any~~

~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~

~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~

~~# AcknowledgementModel.~~

~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~

~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~

~~# support alert templates depending on their size, complexity and level of alert~~

~~# usage, in which case that system can always use RaiseAlertFromData without need~~

~~# to instantiate any templates at any point during operation.~~

~~# The status or attributes of an alert can be updated during runtime by calling the~~

~~# UpdateAlert method found in the ALMASProducer interface. The ALMASProducer then~~

~~# works with the ALMAS system to ensure state and data is properly maintained in~~

```
~~# the system.~~
~~input AlmasUpdateAlertPriorityInput {~~
~~    requestId: Long!~~

~~    producerId: String!~~

~~    alertId: Int!~~

~~    priority: Short!~~
~~}~~
~~type AlmasCancelAlertUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasCancelAlert!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Cancel a specific alert within ALMAS~~
~~# Return parameter indicates success or failure reason.~~
~~# Interface:~~
~~# Provides the API by which system objects producing alerts can create and update~~
~~# alerts that are generated. A CallStatus object will be returned to indicate~~
~~# whether the request has been accepted by ALMAS.  If a system wished to track the~~
~~# lifecycle of the alert, they must implement the NotificationListener~~
~~# functionality to receive updates.~~
~~# Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~
~~# interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~
~~# allow the system to raise an alert by simply specifying the alert ID, template ID~~
~~# and their own ProducerID, one of these also allows the over-ride of any~~
~~# placeholders that may be present in the ‘Message’ attribute of the alert data~~
~~# class associated with that template. The raiser may also optionally override any~~
~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~
~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~
~~# AcknowledgementModel.~~
~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~
~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~
~~# support alert templates depending on their size, complexity and level of alert~~
~~# usage, in which case that system can always use RaiseAlertFromData without need~~
~~# to instantiate any templates at any point during operation.~~
~~# The status or attributes of an alert can be updated during runtime by calling the~~
~~# UpdateAlert method found in the ALMASProducer interface.  The ALMASProducer then~~
~~# works with the ALMAS system to ensure state and data is properly maintained in~~
~~# the system.~~
~~type AlmasCancelAlert {~~
~~    requestId: Long!~~

~~    cancellerId: String!~~

~~    alertId: Int!~~

```

~~cancellationReason: String!~~

~~}~~

~~# Operation:~~

~~# Cancel a specific alert within ALMAS~~

~~# Return parameter indicates success or failure reason.~~

~~# Interface:~~

~~# Provides the API by which system objects producing alerts can create and update~~

~~# alerts that are generated. A CallStatus object will be returned to indicate~~

~~# whether the request has been accepted by ALMAS. If a system wished to track the~~

~~# lifecycle of the alert, they must implement the NotificationListener~~

~~# functionality to receive updates.~~

~~# Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~

~~# interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~

~~# allow the system to raise an alert by simply specifying the alert ID, template ID~~

~~# and their own ProducerID, one of these also allows the over-ride of any~~

~~# placeholders that may be present in the 'Message' attribute of the alert data~~

~~# class associated with that template. The raiser may also optionally override any~~

~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~

~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~

~~# AcknowledgementModel.~~

~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~

~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~

~~# support alert templates depending on their size, complexity and level of alert~~

```
~~# usage, in which case that system can always use RaiseAlertFromData without need~~
~~# to instantiate any templates at any point during operation.~~
~~# The status or attributes of an alert can be updated during runtime by calling the~~
~~# UpdateAlert method found in the ALMASProducer interface.  The ALMASProducer then~~
~~# works with the ALMAS system to ensure state and data is properly maintained in~~
~~# the system.~~
~~input AlmasCancelAlertInput {~~
~~    requestId: Long!~~

~~    cancellerId: String!~~

~~    alertId: Int!~~

~~    cancellationReason: String!~~
~~}~~
~~type AlmasAcknowledgeAlertUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasAcknowledgeAlert!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Indication from an alert receiver that they have acknowledged receipt of the~~
~~# alert and no longer require distribution of its information.~~
~~# Interface:~~
~~# Provides the API for systems to respond to and provide feedback to ALMAS about~~
~~# alertsreceived.   Embedded in this class are the methods to register and~~
~~# un-register your system-specific receiver.~~
~~# The system notifies ALMAS through this interface of significant events that have~~
~~# occurred to change the state of an alert.~~
~~type AlmasAcknowledgeAlert {~~
~~  requestId: Long!~~

~~  alertId: Int!~~

~~  receiverId: String!~~
~~}~~

~~# Operation:~~
~~# Indication from an alert receiver that they have acknowledged receipt of the~~
~~# alert and no longer require distribution of its information.~~
~~# Interface:~~
~~# Provides the API for systems to respond to and provide feedback to ALMAS about~~
~~# alertsreceived.   Embedded in this class are the methods to register and~~
~~# un-register your system-specific receiver.~~
~~# The system notifies ALMAS through this interface of significant events that have~~
~~# occurred to change the state of an alert.~~
~~input AlmasAcknowledgeAlertInput {~~
~~  requestId: Long!~~

~~  alertId: Int!~~

~~  receiverId: String!~~
~~}~~
```

```
~~type AlmasHandleAlertUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasHandleAlert!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Indication from an Alert Receiver that they have performed the appropriate action~~
~~# required by an Action alert and that the alert can therefore be removed from~~
~~# ALMAS as no longer applicable.~~
~~# Interface:~~
~~# Provides the API for systems to respond to and provide feedback to ALMAS about~~
~~# alertsreceived.   Embedded in this class are the methods to register and~~
~~# un-register your system-specific receiver.~~
~~# The system notifies ALMAS through this interface of significant events that have~~
~~# occurred to change the state of an alert.~~
~~type AlmasHandleAlert {~~
~~    requestId: Long!~~

~~    alertId: Int!~~

~~    receiverId: String!~~
~~}~~

~~# Operation:~~
~~# Indication from an Alert Receiver that they have performed the appropriate action~~
~~# required by an Action alert and that the alert can therefore be removed from~~
~~# ALMAS as no longer applicable.~~
~~# Interface:~~
~~# Provides the API for systems to respond to and provide feedback to ALMAS about~~
~~# alertsreceived.   Embedded in this class are the methods to register and~~
~~# un-register your system-specific receiver.~~
~~# The system notifies ALMAS through this interface of significant events that have~~
~~# occurred to change the state of an alert.~~
~~input AlmasHandleAlertInput {~~
~~    requestId: Long!~~

~~    alertId: Int!~~

~~    receiverId: String!~~
~~}~~
~~type AlmasConfirmReceiptUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasConfirmReceipt!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Confirmation by an alert receiver that they have successfully received the alert~~
~~# to ensure reliable distribution.  The ReceiverID field enables action & situation~~
~~# alerts to transition when sufficient confirmations have been received.~~
~~# 'Sufficient' is the 'actionee' for action alerts, and anyone for situation~~
~~# alerts.  It can also be used for logging purposes.~~
~~# Interface:~~
~~# Provides the API for systems to respond to and provide feedback to ALMAS about~~
~~# alertsreceived.   Embedded in this class are the methods to register and~~
~~# un-register your system-specific receiver.~~
~~# The system notifies ALMAS through this interface of significant events that have~~
~~# occurred to change the state of an alert.~~
~~type AlmasConfirmReceipt {~~
~~    requestId: Long!~~

~~    alertId: Int!~~

~~    receiverId: String!~~
~~}~~

~~# Operation:~~
~~# Confirmation by an alert receiver that they have successfully received the alert~~
~~# to ensure reliable distribution.  The ReceiverID field enables action & situation~~
~~# alerts to transition when sufficient confirmations have been received.~~
~~# 'Sufficient' is the 'actionee' for action alerts, and anyone for situation~~
~~# alerts.  It can also be used for logging purposes.~~
~~# Interface:~~
~~# Provides the API for systems to respond to and provide feedback to ALMAS about~~
~~# alertsreceived.   Embedded in this class are the methods to register and~~
~~# un-register your system-specific receiver.~~
~~# The system notifies ALMAS through this interface of significant events that have~~
~~# occurred to change the state of an alert.~~
~~input AlmasConfirmReceiptInput {~~
~~    requestId: Long!~~

~~    alertId: Int!~~

~~    receiverId: String!~~
~~}~~
~~type AlmasSetLanguageUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasSetLanguage!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Sets the language that this specific receiver should see their message text~~
~~# displayed in where appropriate.~~
~~# Interface:~~
~~# Optional extensions to the alert responder functionality.~~
~~type AlmasSetLanguage {~~
~~    requestId: Long!~~

~~    receiverId: String!~~

~~    language: String!~~
~~}~~

~~# Operation:~~
~~# Sets the language that this specific receiver should see their message text~~
~~# displayed in where appropriate.~~
~~# Interface:~~
~~# Optional extensions to the alert responder functionality.~~
~~input AlmasSetLanguageInput {~~
~~    requestId: Long!~~

~~    receiverId: String!~~

~~    language: String!~~
~~}~~
~~type AlmasGetFilledMessageTextUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasGetFilledMessageText!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# returns the message text post related info substitutions.~~
~~# This is an optional helper function as the client could derive this itself.~~
~~# Interface:~~
~~# Optional extensions to the alert responder functionality.~~
~~type AlmasGetFilledMessageText {~~
~~    requestId: Long!~~

~~    alertId: Int!~~

~~    receiverId: String!~~
```

```
~~}~~

~~# Operation:~~
~~# returns the message text post related info substitutions.~~
~~# This is an optional helper function as the client could derive this itself.~~
~~# Interface:~~
~~# Optional extensions to the alert responder functionality.~~
~~input AlmasGetFilledMessageTextInput {~~
~~    requestId: Long!~~

~~    alertId: Int!~~

~~    receiverId: String!~~
~~}~~
~~type AlmasFilledMessageTextUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasFilledMessageText!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~type AlmasFilledMessageText {~~
~~    requestId: Long!~~

~~    messages: [String!]!~~
~~}~~

~~input AlmasFilledMessageTextInput {~~
~~    requestId: Long!~~
```

```
~~~~
~~    messages: [String!]!~~
~~}~~
~~type AlmasLoadReceiverHierarchyUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasLoadReceiverHierarchy!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~
~~~~
~~# Operation:~~
~~# Loads the receiver hierarchy as provided by the client via xml conforming to the~~
~~# relevant xml schema document.~~
~~# Interface:~~
~~# Provides an API by which systems can configure ALMAS to behave in a more tailored~~
~~# manner in order to satisfy very specific requirements.  There are three~~
~~# categories of configuration file that can be used by ALMAS: the receiver~~
~~# hierarchy, templates, and configuration information.  The string filename is~~
~~# expected to resolve to either a local file accessible to ALMAS, or a URL~~
~~# accessible to ALMAS.  The returned CallStatus object from each of the methods~~
~~# provides an indication of success/failure and any additional relevant rationale~~
~~# describing that status.~~
~~type AlmasLoadReceiverHierarchy {~~
~~    requestId: Long!~~
~~~~
~~    filename: String!~~
~~}~~
```

```
~~# Operation:~~
~~# Loads the receiver hierarchy as provided by the client via xml conforming to the~~
~~# relevant xml schema document.~~
~~# Interface:~~
~~# Provides an API by which systems can configure ALMAS to behave in a more tailored~~
~~# manner in order to satisfy very specific requirements.  There are three~~
~~# categories of configuration file that can be used by ALMAS: the receiver~~
~~# hierarchy, templates, and configuration information.  The string filename is~~
~~# expected to resolve to either a local file accessible to ALMAS, or a URL~~
~~# accessible to ALMAS.  The returned CallStatus object from each of the methods~~
~~# provides an indication of success/failure and any additional relevant rationale~~
~~# describing that status.~~
~~input AlmasLoadReceiverHierarchyInput {~~
~~    requestId: Long!~~

~~    filename: String!~~
~~}~~
~~type AlmasLoadTemplateSetUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasLoadTemplateSet!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Loads a template set into the ALMAS database.~~
```

~~# Multiple calls to this method result in the union of the new templates with the~~

~~# existing templates in ALMAS.~~

~~# Interface:~~

~~# Provides an API by which systems can configure ALMAS to behave in a more tailored~~

~~# manner in order to satisfy very specific requirements. There are three~~

~~# categories of configuration file that can be used by ALMAS: the receiver~~

~~# hierarchy, templates, and configuration information. The string filename is~~

~~# expected to resolve to either a local file accessible to ALMAS, or a URL~~

~~# accessible to ALMAS. The returned CallStatus object from each of the methods~~

~~# provides an indication of success/failure and any additional relevant rationale~~

~~# describing that status.~~

~~type AlmasLoadTemplateSet {~~

~~requestId: Long!~~

~~filename: String!~~

~~}~~

~~# Operation:~~

~~# Loads a template set into the ALMAS database.~~

~~# Multiple calls to this method result in the union of the new templates with the~~

~~# existing templates in ALMAS.~~

~~# Interface:~~

~~# Provides an API by which systems can configure ALMAS to behave in a more tailored~~

~~# manner in order to satisfy very specific requirements. There are three~~

~~# categories of configuration file that can be used by ALMAS: the receiver~~

~~# hierarchy, templates, and configuration information. The string filename is~~

~~# expected to resolve to either a local file accessible to ALMAS, or a URL~~

```
~~# accessible to ALMAS.  The returned CallStatus object from each of the methods~~
~~# provides an indication of success/failure and any additional relevant rationale~~
~~# describing that status.~~
~~input AlmasLoadTemplateSetInput {~~
~~  requestId: Long!~~

~~  filename: String!~~
~~}~~
~~type AlmasLoadConfigurationUpdate {~~
~~  # The instance that has been updated (or deleted if Deleted flag is true).~~
~~  instance: AlmasLoadConfiguration!~~
~~  # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~  deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Loads the ALMAS configuration file as provided by the client~~
~~# Interface:~~
~~# Provides an API by which systems can configure ALMAS to behave in a more tailored~~
~~# manner in order to satisfy very specific requirements.  There are three~~
~~# categories of configuration file that can be used by ALMAS: the receiver~~
~~# hierarchy, templates, and configuration information.  The string filename is~~
~~# expected to resolve to either a local file accessible to ALMAS, or a URL~~
~~# accessible to ALMAS.  The returned CallStatus object from each of the methods~~
~~# provides an indication of success/failure and any additional relevant rationale~~
~~# describing that status.~~
```

```
~~type AlmasLoadConfiguration {~~
~~    requestId: Long!~~

~~    filename: String!~~
~~}~~

~~# Operation:~~
~~# Loads the ALMAS configuration file as provided by the client~~
~~# Interface:~~
~~# Provides an API by which systems can configure ALMAS to behave in a more tailored~~
~~# manner in order to satisfy very specific requirements.  There are three~~
~~# categories of configuration file that can be used by ALMAS: the receiver~~
~~# hierarchy, templates, and configuration information.  The string filename is~~
~~# expected to resolve to either a local file accessible to ALMAS, or a URL~~
~~# accessible to ALMAS.  The returned CallStatus object from each of the methods~~
~~# provides an indication of success/failure and any additional relevant rationale~~
~~# describing that status.~~
~~input AlmasLoadConfigurationInput {~~
~~    requestId: Long!~~

~~    filename: String!~~
~~}~~
~~type AlmasUpdateDynamicMessageDataUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasUpdateDynamicMessageData!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~
```

~~# Operation:~~

~~# Indicates a change to the value of a related object for the provided alert ID.~~

~~# Old value is necessary in order to clearly indicate which dynamic message data~~

~~# should be changed~~

~~# Interface:~~

~~# The ALMASManager interface provides the minimal set of APIs necessary to track~~

~~# ALMAS activity. Additionally, the ALMASManager provides the interface in ALMAS~~

~~# for retrieving Alerts and AlertTemplates, and registering for the notification of~~

~~# delivery of Alerts. Note that the registration of receivers is done via the~~

~~# ALMAS Responder class.~~

~~# Note: The methods found in the ALMASProducer interface allow the system to update~~

~~# the status or attributes of an alert during runtime.~~

~~type AlmasUpdateDynamicMessageData {~~

~~requestId: Long!~~

~~alertId: Int!~~

~~dataValue: String!~~

~~oldData: AlmasDynamicMessageDataType~~

~~}~~

~~# Operation:~~

~~# Indicates a change to the value of a related object for the provided alert ID.~~

~~# Old value is necessary in order to clearly indicate which dynamic message data~~

```
~~# should be changed~~
~~# Interface:~~
~~# The ALMASManager interface provides the minimal set of APIs necessary to track~~
~~# ALMAS activity.  Additionally, the ALMASManager provides the interface in ALMAS~~
~~# for retrieving Alerts and AlertTemplates, and registering for the notification of~~
~~# delivery of Alerts.   Note that the registration of receivers is done via the~~
~~# ALMAS Responder class.~~
~~# Note: The methods found in the ALMASProducer interface allow the system to update~~
~~# the status or attributes of an alert during runtime.~~
~~input AlmasUpdateDynamicMessageDataInput {~~
~~    requestId: Long!~~

~~    alertId: Int!~~

~~    dataValue: String!~~

~~    oldData: AlmasDynamicMessageDataTypeInput~~
~~}~~
~~type AlmasSetAlertInhibitedUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasSetAlertInhibited!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Sets the inhibition status of a specific alert template to suppress or allow the~~
~~# raising of all alerts of that template.~~
~~# Interface:~~
~~# The ALMASManager interface provides the minimal set of APIs necessary to track~~
~~# ALMAS activity.  Additionally, the ALMASManager provides the interface in ALMAS~~
~~# for retrieving Alerts and AlertTemplates, and registering for the notification of~~
~~# delivery of Alerts.   Note that the registration of receivers is done via the~~
~~# ALMAS Responder class.~~
~~# Note: The methods found in the ALMASProducer interface allow the system to update~~
~~# the status or attributes of an alert during runtime.~~
~~type AlmasSetAlertInhibited {~~
~~    requestId: Long!~~

~~    templateId: Int!~~

~~    inhibition: Boolean!~~
~~}~~

~~# Operation:~~
~~# Sets the inhibition status of a specific alert template to suppress or allow the~~
~~# raising of all alerts of that template.~~
~~# Interface:~~
~~# The ALMASManager interface provides the minimal set of APIs necessary to track~~
~~# ALMAS activity.  Additionally, the ALMASManager provides the interface in ALMAS~~
~~# for retrieving Alerts and AlertTemplates, and registering for the notification of~~
~~# delivery of Alerts.   Note that the registration of receivers is done via the~~
~~# ALMAS Responder class.~~
~~# Note: The methods found in the ALMASProducer interface allow the system to update~~
~~# the status or attributes of an alert during runtime.~~
~~input AlmasSetAlertInhibitedInput {~~
~~    requestId: Long!~~

~~    templateId: Int!~~

~~    inhibition: Boolean!~~
~~}~~
~~type AlmasAttachCategorisationRuleUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasAttachCategorisationRule!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Associates a categorisation rule with an AlertTemplate~~
~~# Interface:~~
~~# This class contains optional extensions to the alert manager functionality.~~
~~# These extensions may or may not be implemented in simple ALMAS implementations.~~
~~type AlmasAttachCategorisationRule {~~
~~    requestId: Long!~~

~~    ruleId: Int!~~

~~    templateId: Int!~~
```

```
~~}~~

~~# Operation:~~
~~# Associates a categorisation rule with an AlertTemplate~~
~~# Interface:~~
~~# This class contains optional extensions to the alert manager functionality.~~
~~# These extensions may or may not be implemented in simple ALMAS implementations.~~
~~input AlmasAttachCategorisationRuleInput {~~
~~    requestId: Long!~~

~~    ruleId: Int!~~

~~    templateId: Int!~~
~~}~~
~~type AlmasDetachCategorisationRuleUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasDetachCategorisationRule!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Disassociates a categorisation rule from an AlertTemplate~~
~~# Interface:~~
~~# This class contains optional extensions to the alert manager functionality.~~
~~# These extensions may or may not be implemented in simple ALMAS implementations.~~
~~type AlmasDetachCategorisationRule {~~
```

```
~~    requestId: Long!~~

~~    ruleId: Int!~~

~~    templateId: Int!~~
~~}~~

~~# Operation:~~
~~# Disassociates a categorisation rule from an AlertTemplate~~
~~# Interface:~~
~~# This class contains optional extensions to the alert manager functionality.~~
~~# These extensions may or may not be implemented in simple ALMAS implementations.~~
~~input AlmasDetachCategorisationRuleInput {~~
~~    requestId: Long!~~

~~    ruleId: Int!~~

~~    templateId: Int!~~
~~}~~
~~type AlmasRemoveAlertsWithDynamicMessageDataUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasRemoveAlertsWithDynamicMessageData!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~}~~

~~# Operation:~~
~~# Indicates to ALMAS that a specific real world object has been removed, and~~
~~# therefore all associated alerts are no longer valid. These alerts shall then be~~
~~# deleted from ALMAS.~~
~~# Implementation is optional~~
~~# Interface:~~
~~# This class contains optional extensions to the alert manager functionality.~~
~~# These extensions may or may not be implemented in simple ALMAS implementations.~~
~~type AlmasRemoveAlertsWithDynamicMessageData {~~
~~    requestId: Long!~~

~~    cancellerId: String!~~

~~    dataType: String!~~

~~    dataValue: String!~~
~~}~~

~~# Operation:~~
~~# Indicates to ALMAS that a specific real world object has been removed, and~~
~~# therefore all associated alerts are no longer valid. These alerts shall then be~~
~~# deleted from ALMAS.~~
~~# Implementation is optional~~
~~# Interface:~~
~~# This class contains optional extensions to the alert manager functionality.~~
~~# These extensions may or may not be implemented in simple ALMAS implementations.~~
~~input AlmasRemoveAlertsWithDynamicMessageDataInput {~~
~~    requestId: Long!~~

~~    cancellerId: String!~~
~~~~
~~    dataType: String!~~
~~~~
~~    dataValue: String!~~
~~  }~~
~~  type AlmasRaiseAlertFromOverridesUpdate {~~
~~    # The instance that has been updated (or deleted if Deleted flag is true).~~
~~    instance: AlmasRaiseAlertFromOverrides!~~
~~    # True if the instance has been deleted, false otherwise (i.e. on creation or update).~~
~~    deleted: Boolean!~~
~~  }~~
~~~~
~~  # Operation:~~
~~  # This will cause an alert based on a known alert template~~
~~  # to be created and raised.~~
~~  # ProducerID, TemplateID and the out parameter AlertID~~
~~  # are mandatory, all other parameters are optional~~
~~  # Return parameter indicates success or failure reason.~~
~~  # Interface:~~
~~  # Provides the API by which system objects producing alerts can create and update~~
~~  # alerts that are generated. A CallStatus object will be returned to indicate~~
~~  # whether the request has been accepted by ALMAS.  If a system wished to track the~~
~~  # lifecycle of the alert, they must implement the NotificationListener~~
~~  # functionality to receive updates.~~
~~  # Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~
~~  # interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~
```

```
~~# allow the system to raise an alert by simply specifying the alert ID, template ID~~
~~# and their own ProducerID, one of these also allows the over-ride of any~~
~~# placeholders that may be present in the 'Message' attribute of the alert data~~
~~# class associated with that template. The raiser may also optionally override any~~
~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~
~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~
~~# AcknowledgementModel.~~
~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~
~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~
~~# support alert templates depending on their size, complexity and level of alert~~
~~# usage, in which case that system can always use RaiseAlertFromData without need~~
~~# to instantiate any templates at any point during operation.~~
~~# The status or attributes of an alert can be updated during runtime by calling the~~
~~# UpdateAlert method found in the ALMASProducer interface.  The ALMASProducer then~~
~~# works with the ALMAS system to ensure state and data is properly maintained in~~
~~# the system.~~
~~type AlmasRaiseAlertFromOverrides {~~
~~    requestId: Long!~~

~~    producerId: String!~~

~~    templateId: Int!~~

~~    category: AlmasCategoryType~~
~~    priority: Short~~

~~    status: AlmasStatusType~~

~~    scope: AlmasScopeType~~

~~    timeout: Int~~

~~    confirmationRequired: Boolean~~

~~    secondaryGrouping: String~~

~~    persistent: Boolean~~

~~    reliablyDistributed: Boolean~~

~~    timeoutAction: AlmasTimeoutActionType~~

~~    acknowledgementModel: AlmasAckModelType~~

~~    staticMessages: [AlmasStaticMessageType!]~~

~~    dynamicMessages: [AlmasDynamicMessageDataType!]~~
~~}~~

~~# Operation:~~
~~# This will cause an alert based on a known alert template~~
~~# to be created and raised.~~
~~# ProducerID, TemplateID and the out parameter AlertID~~
~~# are mandatory, all other parameters are optional~~
```

~~# Return parameter indicates success or failure reason.~~

~~# Interface:~~

~~# Provides the API by which system objects producing alerts can create and update~~

~~# alerts that are generated. A CallStatus object will be returned to indicate~~

~~# whether the request has been accepted by ALMAS. If a system wished to track the~~

~~# lifecycle of the alert, they must implement the NotificationListener~~

~~# functionality to receive updates.~~

~~# Three mechanisms by which alerts can be raised are provided by the ALMASProducer~~

~~# interface class. Two variants RaiseAlertFromTemplate and RaiseAlertFromOverrides~~

~~# allow the system to raise an alert by simply specifying the alert ID, template ID~~

~~# and their own ProducerID, one of these also allows the over-ride of any~~

~~# placeholders that may be present in the 'Message' attribute of the alert data~~

~~# class associated with that template. The raiser may also optionally override any~~

~~# of the following parameters: Message, MessageLanguage, Category, Status, Scope,~~

~~# Timeout, ConfirmationRequired, AlertReceiverSet, Priority, TimeoutAction and~~

~~# AcknowledgementModel.~~

~~# The RaiseAlertFromData method allows the raiser to specify a completely new alert~~

~~# with no basis on any existing templates. Systems using ALMAS may not wish to~~

~~# support alert templates depending on their size, complexity and level of alert~~

~~# usage, in which case that system can always use RaiseAlertFromData without need~~

~~# to instantiate any templates at any point during operation.~~

~~# The status or attributes of an alert can be updated during runtime by calling the~~

```
~~# UpdateAlert method found in the ALMASProducer interface.  The ALMASProducer then~~
~~# works with the ALMAS system to ensure state and data is properly maintained in~~
~~# the system.~~
~~input AlmasRaiseAlertFromOverridesInput {~~
~~  requestId: Long!~~

~~  producerId: String!~~

~~  templateId: Int!~~

~~  category: AlmasCategoryType!~~

~~  priority: Short~~

~~  status: AlmasStatusType!~~

~~  scope: AlmasScopeType!~~

~~  timeout: Int~~

~~  confirmationRequired: Boolean~~

~~  secondaryGrouping: String~~

~~  persistent: Boolean~~

~~  reliablyDistributed: Boolean~~

~~  timeoutAction: AlmasTimeoutActionType!~~

~~    acknowledgementModel: AlmasAckModelType!~~

~~    staticMessages: [AlmasStaticMessageTypeInput!]~~

~~    dynamicMessages: [AlmasDynamicMessageDataTypeInput!]~~
~~}~~
```

ALMAS14-20

Unknown Author
10/26/2024 12:24