TAPI UML Model

FAULT MANAGEMENT

Version 2.5.0

ONF Document Type: Technical Recommendation

Disclaimer

Open Networking Foundation
1000 El Camino Real, Suite 100, Menlo Park, CA 94025
www.opennetworking.org

Table of Contents

List of Figures

List of Tables

Document History

Version	Date	Description of Change
2.3	May 27, 2021	Model Dump *Gendoc generates documentation from Eclipse Modeling Framework (EMF) models using document templates in formats such as OpenOffice Writer (.odt), Microsoft Word (.docx), Microsoft Excel (.xlsx) and Microsoft Powerpoint (.pptx).*
2.4.0	December 2022	See high level diff document in Github
2.4.1	March 2023	See high level diff document in Github
2.5.0	October 2023	See high level diff document in Github

1 Fault Management Model

TapiFm: This module contains TAPI Fault Management Model definitions. Source: TapiFm.uml Copyright (c) 2023 Open Networking Foundation (ONF). All rights reserved. License: This module is distributed under the Apache License 2.0

1.1 Diagrams

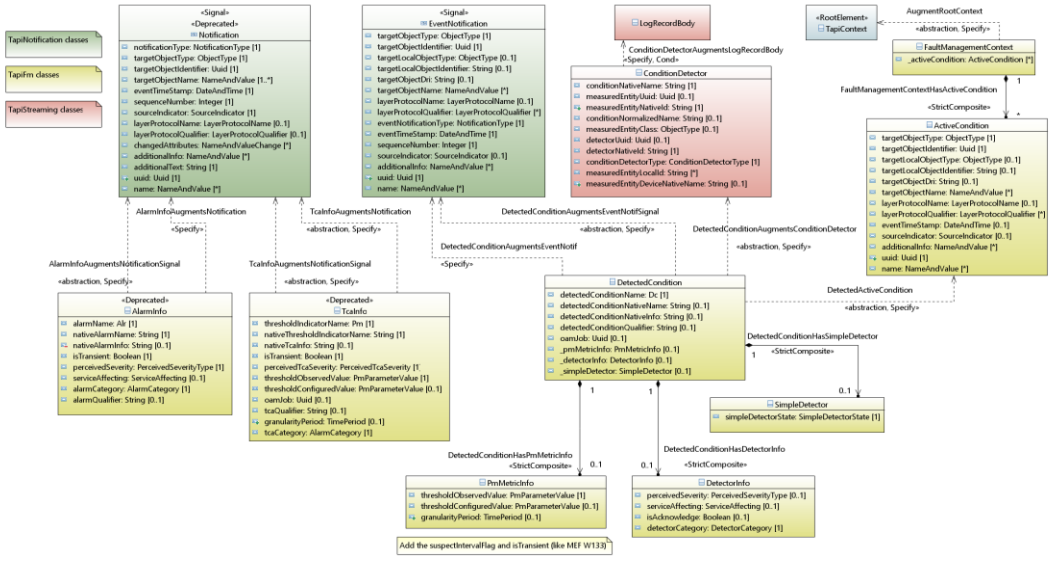

Figure 1 – Diagram *FmDetails*

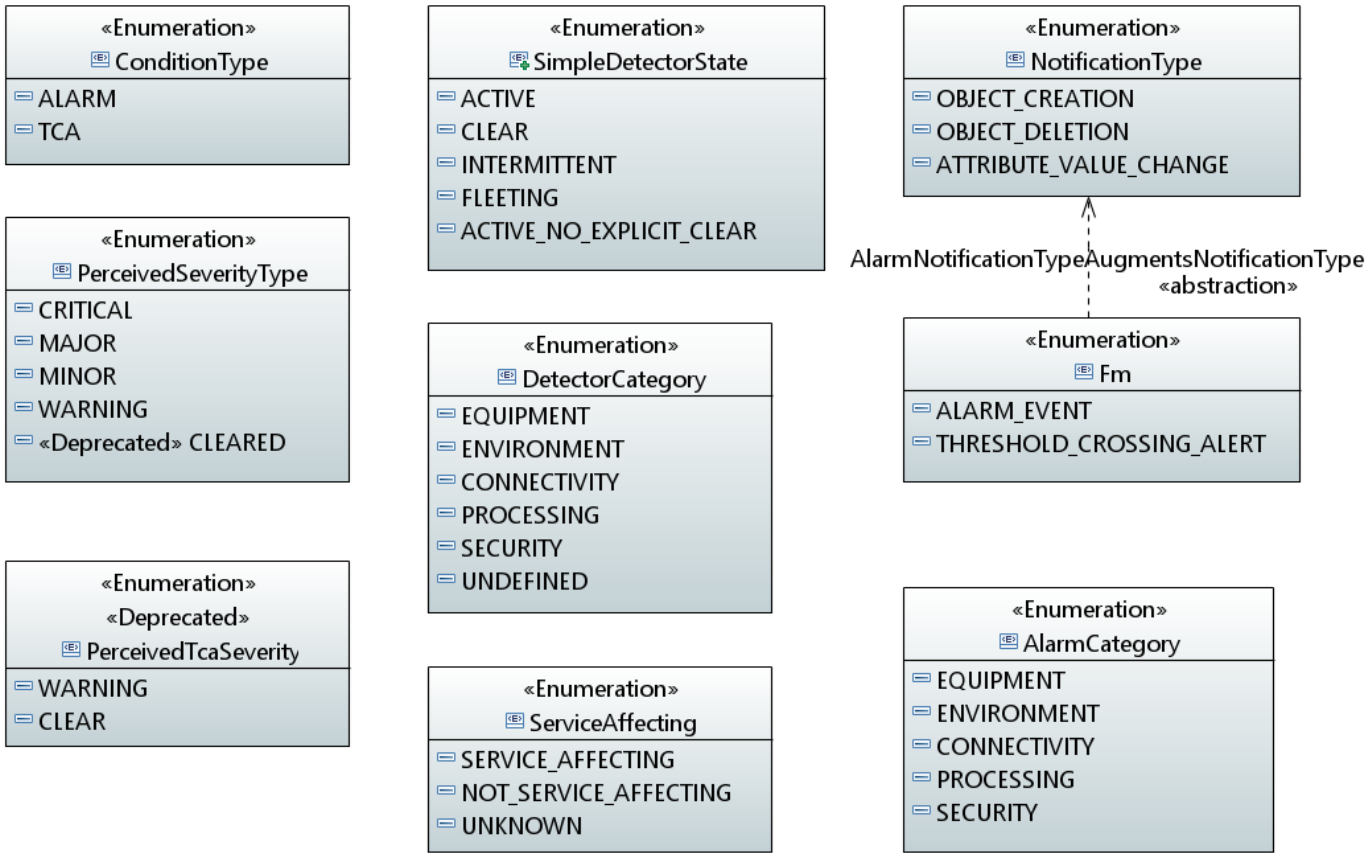

Figure 2 – Diagram *FmTypes*

1.2 Classes

1.2.1 ActiveCondition

Description:

- This object describes the current active condition (alarm or TCA) of the target object.

Applied stereotypes:

- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA
- OpenModelClass
  - support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
targetObjectType	TapiCommon::TypeDefinitions::ObjectType	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA

Attribute Name	Type	Mult.	Access	Stereotypes
	Description: The ActiveCondition instance is related to the object instance (of a global class - with UUID) with this ObjectType value. Alternatively, the ActiveCondition is related to the object instance of a local class, whose global object has this ObjectType value.			
targetObjectIdentifier	TapiCommon::TypeDefinitions::Uuid	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The ActiveCondition instance is related to the object instance (of a global class) with this UUID value. Alternatively, the ActiveCondition is related to the object instance of a local class, whose global object has this UUID value.			
targetLocalObjectType	TapiCommon::TypeDefinitions::ObjectType	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The ActiveCondition instance is related to the object instance of a local class, whose global object has targetObjectType value.			
targetLocalObjectIdentifier	PrimitiveTypes::String	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The ActiveCondition instance is related to the object instance of a local class, whose global object has targetObjectIdentifier value.			
targetObjectDri	PrimitiveTypes::String	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: Data Resource Identifier of the target object as per RFC 8040.			
targetObjectName	TapiCommon::TypeDefinitions::NameAndValue	0..*	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA

Attribute Name	Type	Mult.	Access	Stereotypes
	Description: The ActiveCondition instance is related to the object instance with this list of names.			
layerProtocolName	TapiCommon::TypeDefinitions::LayerProtocolName	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The ActiveCondition instance is related to a resource with this layer protocol value.			
layerProtocolQualifier	TapiCommon::TypeDefinitions::LayerProtocolQualifier	0..*	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The ActiveCondition instance is related to a resource with these layer protocol qualifier values.			
eventTimeStamp	TapiCommon::TypeDefinitions::DateAndTime	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The best knowledge of the time of the event which originated this ActiveCondition instance.			
sourceIndicator	TapiNotification::TypeDefinitions::SourceIndicator	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The possible source of this ActiveCondition instance.			
additionalInfo	TapiCommon::TypeDefinitions::NameAndValue	0..*	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description:			

Attribute Name	Type	Mult.	Access	Stereotypes
uuid Inherited: *TapiCommon::ObjectClasses::GlobalClass::uuid*	TapiCommon::TypeDefinitions::Uuid	1	RW	OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: UUID: An identifier that is universally unique within an identifier space, where the identifier space is itself globally unique, and immutable. An UUID carries no semantics with respect to the purpose or state of the entity. UUID here uses string representation as defined in RFC 4122. The canonical representation uses lowercase characters. Pattern: [0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-' + '[0-9a-fA-F]{4}-[0-9a-fA-F]{12} Example of a UUID in string representation: f81d4fae-7dec-11d0-a765-00a0c91e6bf6			
name Inherited: *TapiCommon::ObjectClasses::GlobalClass::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 1 – Attributes for class *ActiveCondition*

1.2.2 AlarmInfo

Description:

- This class augments the Notification class with alarm related parameters. This class is deprecated in favor of DetectedCondition class, which unifies alarm and TCA related parameters.

Applied stereotypes:

- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA
- Deprecated
- OpenModelClass
  - support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
alarmName	TapiCommon::TypeDefinitions::Alr	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA

Attribute Name	Type	Mult.	Access	Stereotypes
	Description: The probable cause of the failure (detected fault). G.806: - fault: A fault is the inability of a function to perform a required action. This does not include an inability due to preventive maintenance, lack of external resources or planned actions. - fault cause: A single disturbance or fault may lead to the detection of multiple defects. - defect: The density of anomalies has reached a level where the ability to perform a required function has been interrupted. Defects are used as input for performance monitoring, the control of consequent actions and for the determination of fault causes. A fault cause is the result of a correlation process which is intended to identify the defect that is representative of the disturbance or fault that is causing the problem. - failure: The fault cause persisted long enough to consider the ability of an item to perform a required function to be terminated. The item may be considered as failed; a fault has now been detected. - alarm: A human-observable indication that draws attention to a failure (detected fault) usually giving an indication of the severity of the fault.			
nativeAlarmName	PrimitiveTypes::String	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The probable cause of the failure as shown by lower level controllers.			
nativeAlarmInfo	PrimitiveTypes::String	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: Additional info made available by the lower level controllers.			
isTransient	PrimitiveTypes::Boolean	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: An alarm is transient when stateless, i.e. an explicit clear notification is not foreseen.			
perceivedSeverity	PerceivedSeverityType	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The alarm severity.			

Attribute Name	Type	Mult.	Access	Stereotypes
serviceAffecting	ServiceAffecting	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The impact on the service.			
alarmCategory	AlarmCategory	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The alarm category, based on ITU-T X.733.			
alarmQualifier	PrimitiveTypes::String	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: Further information necessary to precisely/uniquely/unambiguously identify the alarm detector. For Equipment and Processing Alarm Category, e.g. the local id of the ActualNonFieldReplaceableModule which identifies exact alarm source. For Environment Alarm Category, e.g. on the same Device instance may appear more Environmental alarm notifications with same Alarn Name. For Connectivity Alarm Category in case that same CEP instance includes e.g. both OTS and OMS monitoring layers.			

Table 2 – Attributes for class *AlarmInfo*

1.2.3 DetectedCondition

Description:

- A record of the state of a Detector where that Detector has two underling states that are of asymmetric importance. For example, an alarm or a threshold crossing alert detected on a given resource. A Condition Detector represents any monitoring component that assesses properties of something and determines from those properties what conditions are associated with the thing. For example, a thing might be "too hot" or might be "unreliable".

Applied stereotypes:

- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA
- OpenModelClass
  - support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
detectedConditionName	TapiCommon::TypeDefinitions::Dc	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The name of the Condition, e.g. an alarm probable cause or the PM metric name which threshold crossing alert refers to. ITU-T probable cause of the failure (detected fault). G.806: - fault: A fault is the inability of a function to perform a required action. This does not include an inability due to preventive maintenance, lack of external resources or planned actions. - fault cause: A single disturbance or fault may lead to the detection of multiple defects. - defect: The density of anomalies has reached a level where the ability to perform a required function has been interrupted. Defects are used as input for performance monitoring, the control of consequent actions and for the determination of fault causes. A fault cause is the result of a correlation process which is intended to identify the defect that is representative of the disturbance or fault that is causing the problem. - failure: The fault cause persisted long enough to consider the ability of an item to perform a required function to be terminated. The item may be considered as failed; a fault has now been detected. - alarm: A human-observable indication that draws attention to a failure (detected fault) usually giving an indication of the severity of the fault.			
detectedConditionNativeName	PrimitiveTypes::String	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The name used for the Condition by the source of the information.			
detectedConditionNativeInfo	PrimitiveTypes::String	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: Additional info of the Condition provided by the source of the information.			
detectedConditionQualifier	PrimitiveTypes::String	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: Further information necessary to precisely/uniquely/unambiguously identify the Condition Detector. For Equipment and Processing Alarm Category, e.g. the local id of the ActualNonFieldReplaceableModule which identifies exact alarm source. For Environment Alarm Category, e.g. on the same Device instance may appear more Environmental alarm notifications with same Alarn Name. For Connectivity Alarm Category in case that same CEP instance includes e.g. both OTS and OMS monitoring layers.			

Attribute Name	Type	Mult.	Access	Stereotypes
oamJob	TapiCommon::TypeDefinitions::Uuid	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: Reference to the OamJob instance for which the Condition detection has been configured, e.g. configuration of PM metrics and threshold values and/or of the (alarm) Conditions. The reference is defined as simple UUID because TapiFm does not import TapiOam. MEF 35.1: Identification of the PM Session for which the TCA Function was configured.			
_pmMetricInfo *Navigable association end of:* *DetectedConditionHasPmMetricInfo*	PmMetricInfo	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The PM metric information.			
_detectorInfo *Navigable association end of:* *DetectedConditionHasDetectorInfo*	DetectorInfo	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The detector info for alarm and TCA.			
_simpleDetector *Navigable association end of:* *DetectedConditionHasSimpleDetector*	SimpleDetector	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The simple detector state.			

Table 3 – Attributes for class *DetectedCondition*

1.2.4 DetectorInfo

Description:

- (Legacy) information associated to a Condition (alarm).

Applied stereotypes:

- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

- OpenModelClass
  - support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
perceivedSeverity	PerceivedSeverityType	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The severity of the detected Condition.			
serviceAffecting	ServiceAffecting	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The impact on the service.			
isAcknowledge	PrimitiveTypes::Boolean	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: Information on operator acknowledgement.			
detectorCategory	DetectorCategory	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The Detector (alarm) category, based on ITU-T X.733.			

Table 4 – Attributes for class *DetectorInfo*

1.2.5 FaultManagementContext

Description:

- This object class represents the scope of control that a particular SDN controller has with respect to a particular network, specifically regarding the fault management description. An instance of this class includes its ActiveCondition instances.

Applied stereotypes:

- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA
- OpenModelClass
  - support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
_activeCondition *Navigable association end of:* *FaultManagementContextHasActiveCondition*	ActiveCondition	0..*	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description:			

Table 5 – Attributes for class *FaultManagementContext*

1.2.6 PmMetricInfo

Description:

- Information associated to a Threshold Crossing Alert.

Applied stereotypes:

- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA
- OpenModelClass
  - support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
thresholdObservedValue	TapiCommon::TypeDefinitions::PmParameterValue	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The observed value of PM metric to which TCA refers to.			
thresholdConfiguredValue	TapiCommon::TypeDefinitions::PmParameterValue	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The configured threshold value of PM metric to which TCA refers to.			

Attribute Name	Type	Mult.	Access	Stereotypes
granularityPeriod	TapiCommon::TypeDefinitions::TimePeriod	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The granularity period or measurement interval time. This parameter may be necessary when the reference to the OAM Job is not included, e.g. in case the OAM job is not visible at the management interface.			

Table 6 – Attributes for class *PmMetricInfo*

1.2.7 SimpleDetector

Description:

- Information regarding the (simple) state of the Detector.

Applied stereotypes:

- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA
- OpenModelClass
  - support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
simpleDetectorState	SimpleDetectorState	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The (simple) state of the Detector. The Detector state accounts for the time characteristics of the detected Condition.			

Table 7 – Attributes for class *SimpleDetector*

1.2.8 TcaInfo

Description:

- This class augments the Notification class with threshold crossing alert related parameters. This class is deprecated in favor of DetectedCondition class, which unifies alarm and TCA related parameters.

Applied stereotypes:

- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA
- Deprecated

- OpenModelClass
  - support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
thresholdIndicatorName	TapiCommon::TypeDefinitions::Pm	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: PM metric name which TCA refers to.			
nativeThresholdIndicatorName	PrimitiveTypes::String	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: PM metric name which TCA refers to as shown by lower level controllers.			
nativeTcaInfo	PrimitiveTypes::String	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Additional info made available by the lower level controllers.			
isTransient	PrimitiveTypes::Boolean	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: A threshold crossing alert is transient when stateless, i.e. an explicit clear notification is not foreseen.			
perceivedTcaSeverity	PerceivedTcaSeverity	1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The threshold crossing alert severity.			

Attribute Name	Type	Mult.	Access	Stereotypes
thresholdObservedValue	TapiCommon::TypeDefinitions::PmParameterValue	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The observed value of PM metric to which TCA refers to.			
thresholdConfiguredValue	TapiCommon::TypeDefinitions::PmParameterValue	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The configured threshold value of PM metric to which TCA refers to.			
oamJob	TapiCommon::TypeDefinitions::Uuid	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Reference to the OamJob instance for which the PM metric and threshold values were configured. The reference is defined as simple UUID because TapiFm does not import TapiOam. MEF 35.1: Identification of the PM Session for which the TCA Function was configured.			
tcaQualifier	PrimitiveTypes::String	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Further information necessary to precisely/uniquely/unambiguously identify the TCA detector.			
granularityPeriod	TapiCommon::TypeDefinitions::TimePeriod	0..1	R	OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY OpenInterfaceModelAttribute • AVC: NA
	Description: The granularity period or measurement interval time. This parameter may be necessary when the reference to the OAM Job is not included, e.g. in case the OAM job is not visible at the management interface.			

Attribute Name	Type	Mult.	Access	Stereotypes
tcaCategory	AlarmCategory	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The TCA category, based on ITU-T X.733.			

Table 8 – Attributes for class *TcaInfo*

1.3 Signals

1.4 Associations

1.4.1 DetectedConditionHasDetectorInfo

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_detectorInfo	composite	Yes	DetectorInfo	0..1
detectedcondition	none	No	DetectedCondition	1

Table 9 – Member ends for association *DetectedConditionHasDetectorInfo*

1.4.2 DetectedConditionHasPmMetricInfo

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_pmMetricInfo	composite	Yes	PmMetricInfo	0..1
detectedcondition	none	No	DetectedCondition	1

Table 10 – Member ends for association *DetectedConditionHasPmMetricInfo*

1.4.3 DetectedConditionHasSimpleDetector

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_simpleDetector	composite	Yes	SimpleDetector	0..1
detectedcondition	none	No	DetectedCondition	1

Table 11 – Member ends for association *DetectedConditionHasSimpleDetector*

1.4.4 FaultManagementContextHasActiveCondition

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_activeCondition	composite	Yes	ActiveCondition	0..*
faultmanagementcontext	none	No	FaultManagementContext	1

Table 12 – Member ends for association *FaultManagementContextHasActiveCondition*

1.5 Abstractions

1.5.1 AlarmInfoAugmentsNotification

Augmenting Class	Augmented Class	Comment
AlarmInfo	TapiNotification::Notifications::Notification	
target: "/TapiCommon:Context:_context/TapiNotification:NotificationContext:_notificationContext/TapiNotification:NotificationContext:_notification"		

Table 13 – Member ends for class abstraction *AlarmInfoAugmentsNotification*

1.5.2 AlarmInfoAugmentsNotificationSignal

Augmenting Class	Augmented Class	Comment
AlarmInfo	TapiNotification::Notifications::Notification	
target: "/TapiNotification:Notifications:Notification"		

Table 14 – Member ends for class abstraction *AlarmInfoAugmentsNotificationSignal*

1.5.3 AlarmNotificationTypeAugmentsNotificationType

Augmenting Enumeration	Augmented Enumeration
Fm - ALARM_EVENT - THRESHOLD_CROSSING_ALERT	NotificationType - ATTRIBUTE_VALUE_CHANGE - OBJECT_CREATION - OBJECT_DELETION
Comment Enumeration Augment.	

Table 15 – Member ends for enum abstraction *AlarmNotificationTypeAugmentsNotificationType*

1.5.4 AugmentRootContext

Augmenting Class	Augmented Class	Comment
Diagrams	TapiFm::Diagrams	Augments the base TAPI Context with FaultManagementContext model.
target: "/TapiCommon:Context:_context"		

Table 16 – Member ends for class abstraction *AugmentRootContext*

1.5.5 DetectedActiveCondition

Augmenting Class	Augmented Class	Comment
DetectedCondition	TapiFm::ObjectClasses::ActiveCondition	
target: "/TapiCommon:Context: context/TapiFm:FaultManagementContext: faultManagementContext/TapiFm:FaultManagementContext: activeCondition"		

Table 17 – Member ends for class abstraction *DetectedActiveCondition*

1.5.6 DetectedConditionAugmentsConditionDetector

Augmenting Class	Augmented Class	Comment
DetectedCondition	TapiStreaming::ObjectClasses::ConditionDetector	
target: "/TapiStreaming:StreamRecord:_streamRecord/TapiStreaming:StreamRecord:_logRecord/TapiStreaming:LogRecord:_logRecordBody/TapiStreaming:LogRecordBody:_conditionDetector"		

Table 18 – Member ends for class abstraction *DetectedConditionAugmentsConditionDetector*

1.5.7 DetectedConditionAugmentsEventNotif

Augmenting Class	Augmented Class	Comment
DetectedCondition	TapiNotification::Notifications::EventNotification	
target: "/TapiCommon:Context:_context/TapiNotification:NotificationContext:_notificationContext/TapiNotification:NotificationContext:_eventNotification"		

Table 19 – Member ends for class abstraction *DetectedConditionAugmentsEventNotif*

1.5.8 DetectedConditionAugmentsEventNotifSignal

Augmenting Class	Augmented Class	Comment
DetectedCondition	TapiNotification::Notifications::EventNotification	
target: "/TapiNotification:Notifications:EventNotification"		

Table 20 – Member ends for class abstraction *DetectedConditionAugmentsEventNotifSignal*

1.5.9 TcaInfoAugmentsNotification

Augmenting Class	Augmented Class	Comment
TcaInfo	TapiNotification::Notifications::Notification	
target: "/TapiCommon:Context:_context/TapiNotification:NotificationContext:_notificationContext/TapiNotification:NotificationContext:_notification"		

Table 21 – Member ends for class abstraction *TcaInfoAugmentsNotification*

1.5.10 TcaInfoAugmentsNotificationSignal

Augmenting Class	Augmented Class	Comment
TcaInfo	TapiNotification::Notifications::Notification	
target: "/TapiNotification:Notifications:Notification"		

Table 22 – Member ends for class abstraction *TcaInfoAugmentsNotificationSignal*

1.6 Data Types

1.7 Enumerations

1.7.1 AlarmCategory

Contains Enumeration Literals:

- EQUIPMENT
- ENVIRONMENT
- CONNECTIVITY
- PROCESSING
- SECURITY

1.7.2 ConditionType

Description:

- The types of the Condition.

Contains Enumeration Literals:

- ALARM
- TCA
    - Threshold Crossing Alert

1.7.3 DetectorCategory

Description:

- The Detector (alarm) category, based on ITU-T X.733.

Contains Enumeration Literals:

- EQUIPMENT
- ENVIRONMENT

- CONNECTIVITY
- PROCESSING
- SECURITY
- UNDEFINED

1.7.4 Fm

Description:
- The list of alarm specific notification types.

Contains Enumeration Literals:
- ALARM_EVENT
  - The notification of a detected condition event, specifically an alarm detected on a given resource.
- THRESHOLD_CROSSING_ALERT
  - The notification of a detected condition event, specifically a threshold crossing alert detected on a given resource.

1.7.5 PerceivedSeverityType

Description:
- The types of perceived severity. ITU-T G.7710: Failures may have been categorized to indicate the severity or urgency of the fault.

Contains Enumeration Literals:
- CRITICAL
  - ITU-T G.7710/X.733/M.3100: Indication for a service-affecting condition. Immediate corrective action is required.
- MAJOR
  - ITU-T G.7710/X.733/M.3100: Indication for a service-affecting condition. Urgent corrective action is required.
- MINOR
  - ITU-T G.7710/X.733/M.3100: Indication for a non-service-affecting condition. Corrective action should be taken in order to prevent more serious fault.
- WARNING
  - ITU-T G.7710/X.733/M.3100: Indication for a potential or impending service-affecting fault. Further diagnosis should be made.
- CLEARED
  - Included only for some possible backward compatibility purpose. It should not be used to assign a severity to a failure. ITU-T G.7710: The severities "cleared" and "indeterminate" defined by [ITU-T X.733] are not included in Table 2, as it is assumed that these are not to be used to assign a failure.

    - Applied stereotype:
      - Deprecated

1.7.6 PerceivedTcaSeverity

Description:

- The types of perceived severity of threshold crossing alerts.

Applied stereotype:

- Deprecated

Contains Enumeration Literals:

- WARNING
  - ITU-T G.7710/X.733/M.3100: Indication for a potential or impending service-affecting fault. Further diagnosis should be made.
- CLEAR
  - Included only for some possible backward compatibility purpose. It should not be used to assign a severity to a failure. ITU-T G.7710: The severities "cleared" and "indeterminate" defined by [ITU-T X.733] are not included in Table 2, as it is assumed that these are not to be used to assign a failure.

1.7.7 ServiceAffecting

Description:

- The possible impact on the service.

Contains Enumeration Literals:

- SERVICE_AFFECTING
  - The service is affected by the detected Condition.
- NOT_SERVICE_AFFECTING
  - The service is not affected by the detected Condition.
- UNKNOWN
  - The impact on the service is unknown.

1.7.8 SimpleDetectorState

Description:

- The states of the detector.

Contains Enumeration Literals:

- ACTIVE
  - The detector is indicating the operation of the monitored entity is not within acceptable bounds with respect to the specific condition measured. If INTERMITTENT is supported there may be a requirement for persisted unacceptable operation after a problem occurs before ACTIVE is declared. An alternative may be to declare INTERMITTENT. Where INTERMITTENT is supported, ACTIVE indicates the stable presence of a problem.
- CLEAR
  - The detector is indicating the operation of the monitored entity is within acceptable bounds with respect to the specific condition measured.
- INTERMITTENT
  - The detector is indicating the operation of the monitored entity is intermittently not within acceptable bounds with respect to the specific condition measured. INTERMITTENT support

is optional. Where it is supported there may be a requirement for persisted unacceptable operation after a problem occurs before ACTIVE or INTERMITTENT is declared.

- FLEETING
  - Event has a very short life (Active-Clear), hence is notified/streamed after its occurrence.
- ACTIVE_NO_EXPLICIT_CLEAR
  - Same as Active, but an explicit transition to Clear is not foreseen. This e.g. applies to PM metrics which can only increase (counters), hence the "clear" criteria is conventionally the end of a measurement period.

1.8 Primitives