

TIP_MPAC_IA, TIP Maintenance, Protection and Alarm Control Information Agreement

TIP_MPAC_IA

Version 1.0



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1. Introduction

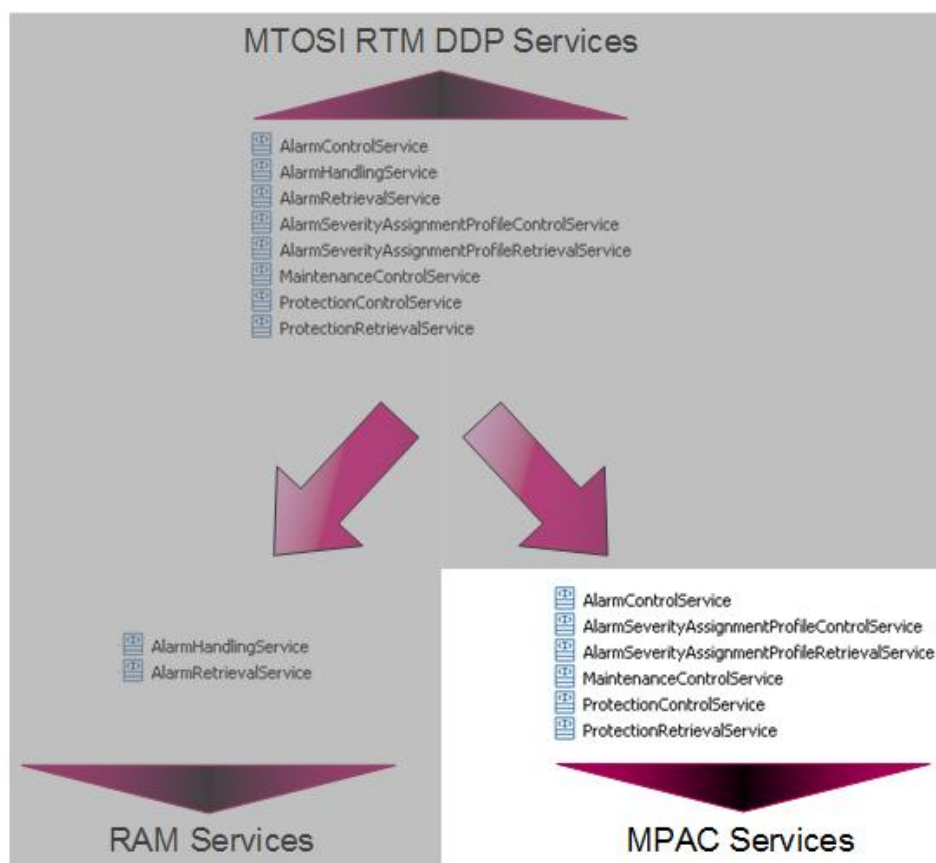
Harmonization work has been done on Alarm Management within TM Forum between OSS/J Fault Management API and MTOSI Resource Trouble Management DDP leading to the definition of the Resource Alarm Management (RAM) interface. For a true harmonization, it is needed to be able to phase out over time existing Fault Management interfaces from OSS/J and MTOSI when introducing the new one to avoid creating yet another FM interface.

During the initial migration discussions it was noted that the scope of MTOSI Resource Trouble Management DDP is slightly larger than the scope of RAM, which is only covering the Alarm Collection and Handling parts of RTM.

In order to complete the coverage of MTOSI RTM DDP and ease the migration to RAM, the missing pieces of RTM have been gathered in the Maintenance, Protection and Alarm Control (MPAC) interface.

MAPC interface is composed of :

- Maintenance Control Service
- Protection Control and Retrieval Services
- Alarm Control Service
- Alarm Severity Assignment Profile Control and Retrieval Service



Document Structure

The following sections are contained in this document:

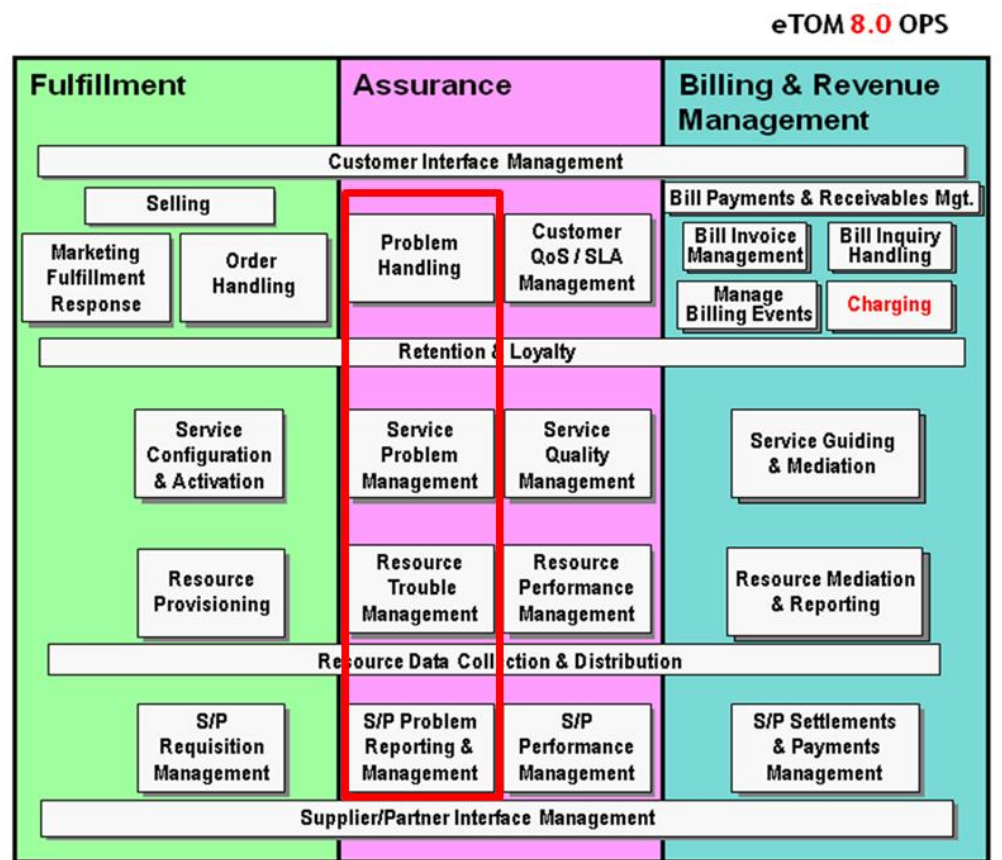
- Section 1 is the document introduction
- Section 2 provides a summary description of the interface
- Section 3 describes all the Service Interfaces contained in this interface
- Section 4 describes the Information Model used by this interface

2. Interface Summary

2.1. Context

2.1.1. Relation to eTOM

The Resource Alarm Management interface is the second interface developed to support the problem or trouble area of the Business Process Framework (eTOM) as shown in the figure below. Processes include Problem Handling, Service Problem Management, Resource Trouble Management, and S/P Problem Reporting and Management.



The specific area of interest for this interface is the eTOM level 2 process known as Resource Trouble Management (RTM). In terms of terminology.

It is important to emphasize that the eTOM defines processes and this document covers interfaces. So, the explanation that follows will indicate which of the eTOM processes has interface implications on the interface at hand.

Interface implications for the various eTOM level 3 processes with Resource Alarm Management (RAM) are as follows:

- Create Resource Trouble Report: the Alarm Control and ASAP Control interfaces are related to this process, used on the EMS or on the NE to decide to generate or not an alarm and assign its severity. These interfaces

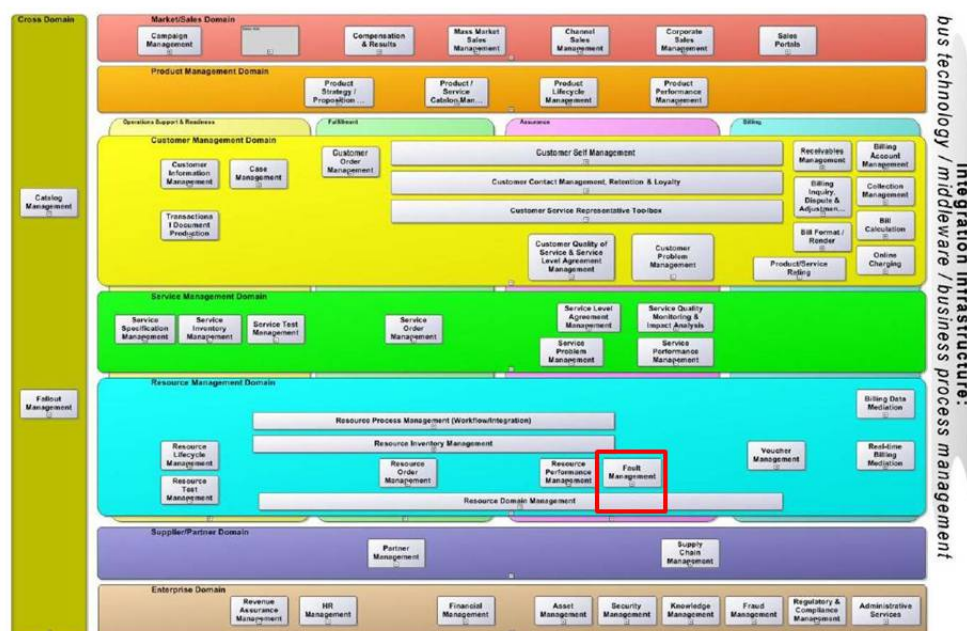
might be called to initiate the generation of alarms from the NE. The ASAP Retrieval interfaces might be used as an ancillary process here.

- Report Resource Trouble: this process appears to be out of scope for the MPAC interface..
- Survey and Analyze Resource Trouble: this process might trigger calls to Maintenance Control, Protection Control or Retrieval as part of the analysis process.
- Localize Resource Trouble: this process might trigger calls to Maintenance Control or Protection Retrieval as part of the analysis process.
- Correct and Resolve Resource Trouble: the Maintenance Control and Protection Control are related to this process as the resolution of the resource trouble might imply using these interfaces.
- Track and Manage Resource Trouble: this process might trigger calls to Maintenance Control, Protection Control or Retrieval as part of the tracking process.
- Close Resource Trouble Report: this process appears to be out of scope for the MPAC interface.

It is worth noting that the addition of RAM and MPAC covers all RTM level 3 processes.

2.1.2. Relation to TAM

In terms of the TAM 4.0, the interface fits the Resource Assurance Management and Resource Domain Management Applications areas as shown on the figure below:



The following item from the TAM Resource Domain Management Applications area is covered:

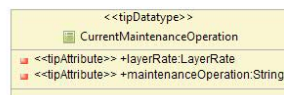
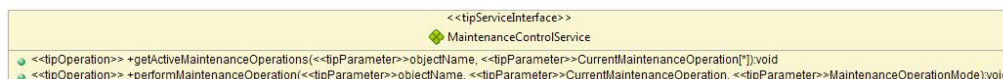
- Resource Fault and Performance Data Mediation

2.2. Maintenance Services

Maintenance Services has no SID ABE today, as there is no Information Model object.

In the implementation model, the maint package has been put under the Logical Resource package.

The following figure is showing the Maintenance Services:

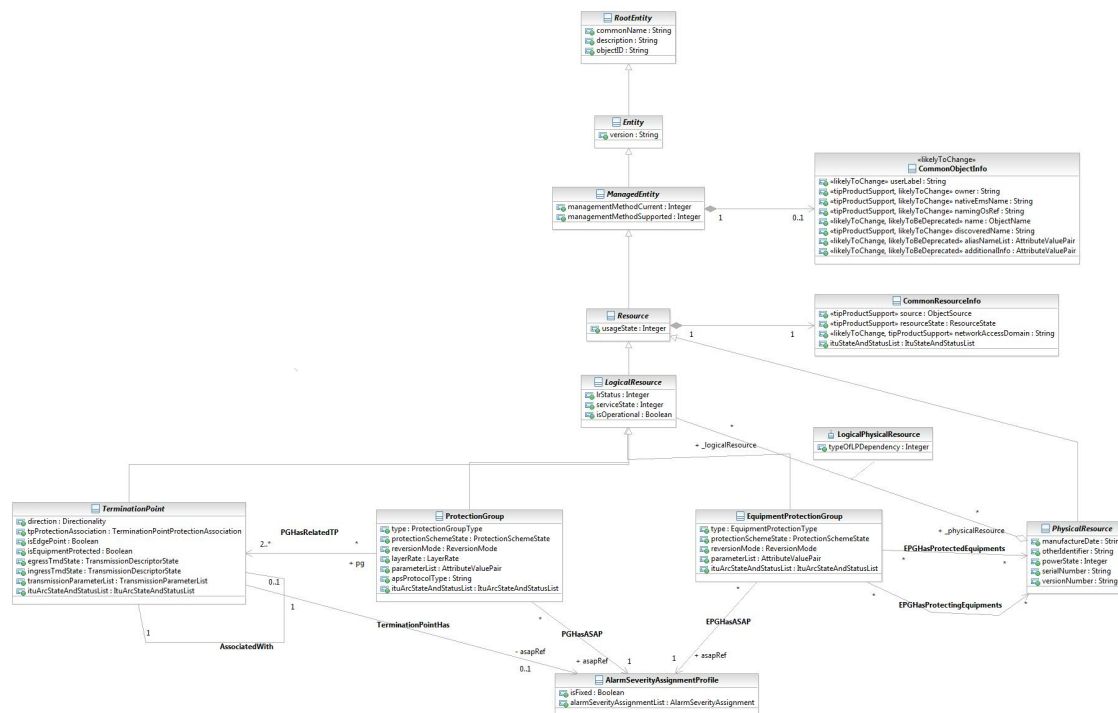


2.3. Protection Services

The information model for Protection Services is defined in the Protection ABE under the Logical Resource ABE.

ProtectionGroup and EquipmentProtectionGroup are logical resources

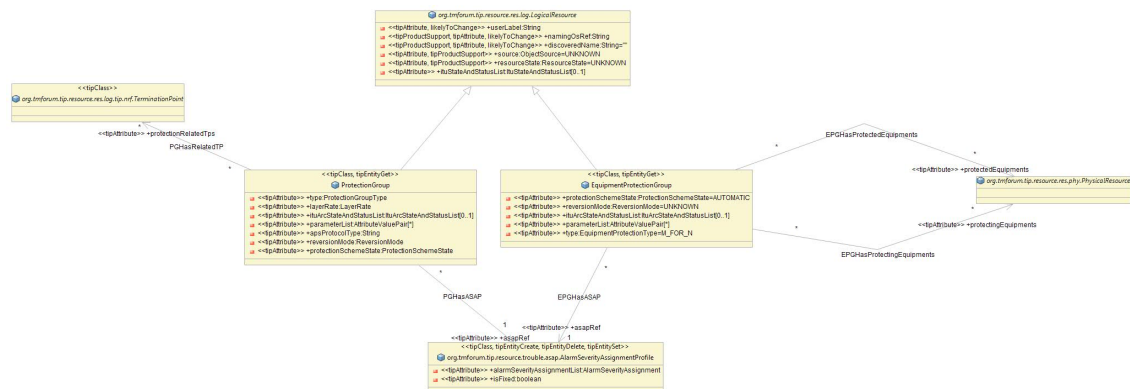
The following picture is showing the Information Model for the ProtectionGroup and EquipmentProtectionGroup objects.



Note that transformation is been applies from the Information Model to the Implementation Model:

- The upper levels of inheritance tree have been collapsed to avoid too many empty objects. So RootEntity, Entity, ManagedEntity and Resource have been collapsed in LogicalResource
- CommonObjectInfo has been collapsed in ManagedEntity and CommonResourceInfo has been collapsed in Resource, there the attributes coming from those 2 objects will be collapsed in LogicalResource.
- The values of tipProductSupport have been used to exclude the attributes of CommonObjectInfo and CommonResourceInfo that are specific to MTMN or to MTOSI.

The following figure is showing ProtectionGroup and EquipmentProtectionGroup in the Implementation Model.



The following figure is showing the overall Protection Services model.



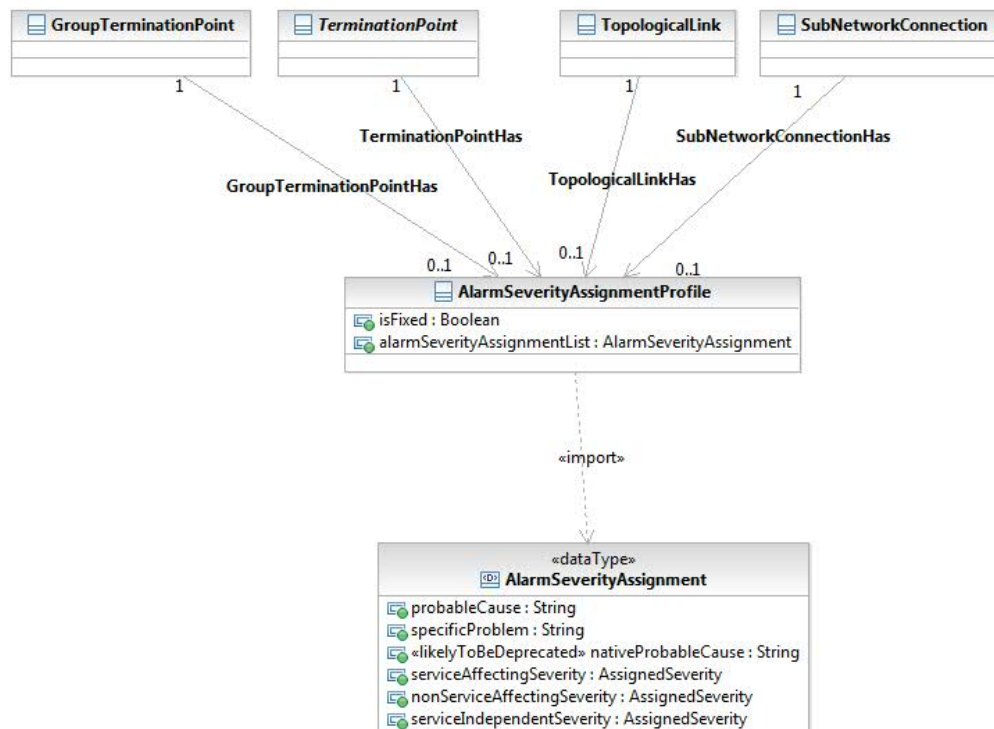
In the implementation model, the control package has been put under the Resource Trouble package.

AlarmControlService

```
<<tipOperation>> +setAlarmReporting(in <<tipParameter>>objectName, in <<tipParameter>>int=1, in <<tipParameter>>boolean):void
```

2.5. Alarm Severity Assignment Services

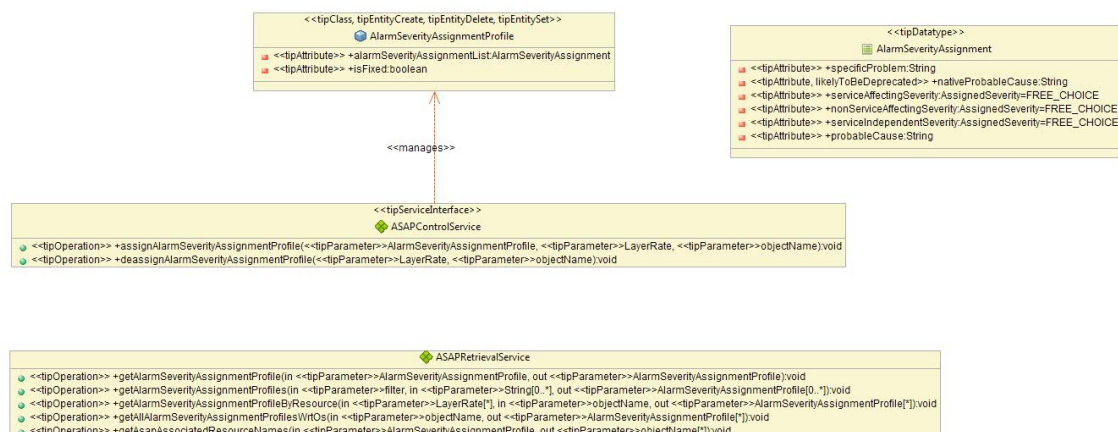
The following picture is showing the Information Model for the AlarmSeverityAssignment object.



The Alarm Severity Assignment services have been split in 2 service interfaces: ASAPControlService and ASAPRetrievalService.

Common operations have been used for create, delete and set (simple) and are used in the ASAPControlService.

The following figure is showing the Alarm Severity Assignment services:



3. Information Model

Packages available from TIP Maintenance, Protection and Alarm Control:

- org.tmforum.tip.resource.res.log.maint
- org.tmforum.tip.resource.res.log.prot
- org.tmforum.tip.resource.trouble.asap

3.1. Package org.tmforum.tip.resource.res.log.maint

3.1.1. Data Types

3.1.1.1. CurrentMaintenanceOperation

- Type: Datatype Artifact
- Package: org.tmforum.tip.resource.res.log.maint
- Description:

This data type describes the maintenance operation at a specific layer.

- Properties:

This datatype is extendable

3.1.1.1.1. Attributes

name	datatype	properties	description
layerRate	LayerRate	- multiplicity is 0..1 - unique - invariant - optional	This attribute defines the layer rate to which the maintenance operation is applied to.
maintenanceOperation	String	- multiplicity is 0..1 - unique - invariant - optional	This attribute identifies the maintenance operations as specified in the attached supporting document SD1-20_maintenanceCommands.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

3.1.2. Enumerations

3.1.2.1. MaintenanceOperationMode

- Type: Enumeration Artifact
- Package: org.tmforum.tip.resource.res.log.maint
- Properties:

3.1.2.1.1. Literals

name	datatype	properties	description
OPERATE	String	value is "OPERATE"	
RELEASE	String	value is "RELEASE"	

3.2. Package org.tmforum.tip.resource.res.log.prot

3.2.1. Entities

3.2.1.1. EquipmentProtectionGroup

- Type: Entity Artifact

- Package: org.tmforum.tip.resource.res.log.prot

- All super types:

org.tmforum.tip.resource.res.log.LogicalResource

org.tmforum.tip.internal.entity.EntityBase

- Description:

This object class represents the information about an equipment protection in a Managed Element.

- Properties:

This entity is optional

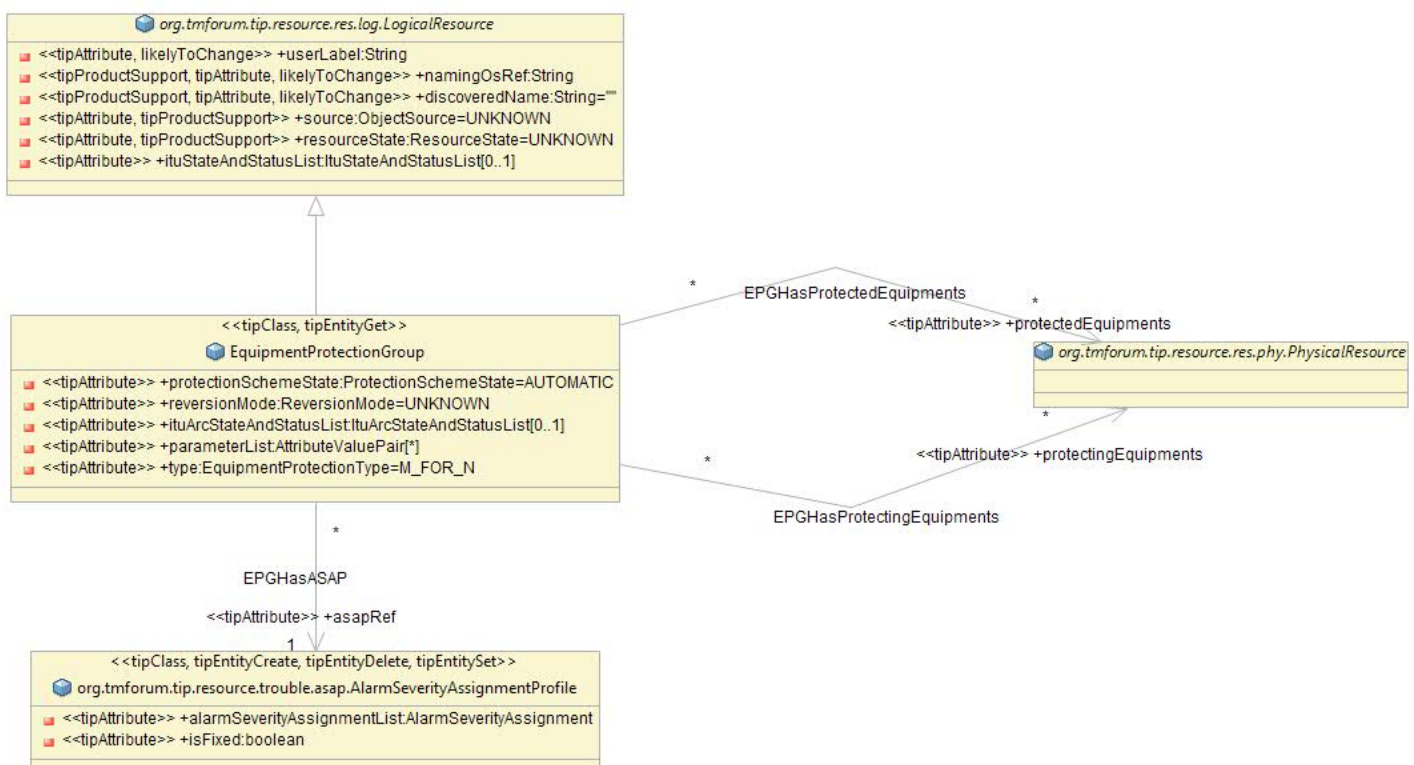
This entity is extendable

This entity generates Object Creation notifications

This entity generates Object Deletion notifications

This entity generates Object Discovery notifications

This entity supports the Common Get operation



3.2.1.1.1. Attributes

name	datatype	properties	description
protectionSchemeState	ProtectionSchemeState	<ul style="list-style-type: none"> - multiplicity is 0..1 - read only - unique - default value is 'AUTOMATIC' - optional - AVC enabled 	This attribute indicates whether the protection scheme is active or frozen locked out because of a forced switch command. This is an indicator whether the protection scheme is free to switch or is in a state where it cannot switch freely, without an explicit clear command applied to the protection scheme. FORCED_OR_LOCKED_OUT indicates that the entire group is locked; partial locking is indicated by AUTOMATIC (partial locking could be done via operation PerformProtectionCommand in CTP).
reversionMode	ReversionMode	<ul style="list-style-type: none"> - multiplicity is 0..1 - read only - unique - default value is 'UNKNOWN' - optional - AVC enabled 	This attribute defines whether the protection scheme is revertive or not.
ituArcStateAndStatusList	ItuArcStateAndStatusList	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - optional - AVC enabled 	See supporting document SD1-8_encodingX731M3100.
parameterList	AttributeValuePair	<ul style="list-style-type: none"> - multiplicity is * - read only - unique - invariant - optional - AVC disabled (NA) 	This attribute contains a name value list of the associated parameters for the equipment protection group. No equipment Protection Group parameters have been identified.
type	EquipmentProtectionType	<ul style="list-style-type: none"> - multiplicity is 0..1 - read only - unique - default value is 'M_FOR_N' - invariant - optional - AVC disabled 	This attribute defines the type of scheme this group represents (so far, only M:N equipment protection has been identified).
userLabel	String	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - optional - AVC enabled 	
namingOsRef	String	<ul style="list-style-type: none"> - multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled 	
discoveredName	String	<ul style="list-style-type: none"> - multiplicity is 0..1 - read only - unique - default value is " - invariant - optional - AVC disabled 	
source	ObjectSource	<ul style="list-style-type: none"> - multiplicity is 0..1 - read only - unique - default value is 'UNKNOWN' - optional - AVC enabled 	
resourceState	ResourceState	<ul style="list-style-type: none"> - multiplicity is 0..1 - read only - unique - default value is 'UNKNOWN' - optional - AVC enabled 	
ituStateAndStatusList	ItuStateAndStatusList	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - optional - AVC enabled 	
identifier	EntityIdentifier	<ul style="list-style-type: none"> - multiplicity is 1 - unique - invariant - mandatory - AVC enabled 	The entity instance identifier EID.
extensionInfo	Any	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - optional - AVC enabled 	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

aliasNames	CheckedCollection	<ul style="list-style-type: none"> - multiplicity is 1 - unique - optional - AVC enabled 	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implementation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.
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3.2.1.1.2. Associations

name	datatype	properties	description
asapRef	AlarmSeverityAssignmentProfile	<ul style="list-style-type: none"> - multiplicity is 0..1 - aggregation is none - navigable - unique - passed by id - optional - AVC enabled - association is EPGHasASAP 	This attribute indicates the assignment of an Alarm Severity Assignment Profile (ASAP) to the Equipment Protection Group.
protectedEquipments	PhysicalResource	<ul style="list-style-type: none"> - multiplicity is * - aggregation is none - navigable - unique - invariant - passed by id - optional - AVC disabled - association is EPGHasProtectedEquipments 	This object class represents the information about an equipment protection in a Managed Element.
protectingEquipments	PhysicalResource	<ul style="list-style-type: none"> - multiplicity is * - aggregation is none - navigable - unique - invariant - passed by id - optional - AVC disabled - association is EPGHasProtectingEquipments 	

3.2.1.1.2. ProtectionGroup

- Type: Entity Artifact
- Package: [org.tmforum.tip.resource.res.log.prot](#)
- All super types:

[org.tmforum.tip.resource.res.log.LogicalResource](#)

[org.tmforum.tip.internal.entity.EntityBase](#)

- Description:

This object class represents the information about a trail protection in a Managed Element.

- Properties:

This entity is optional

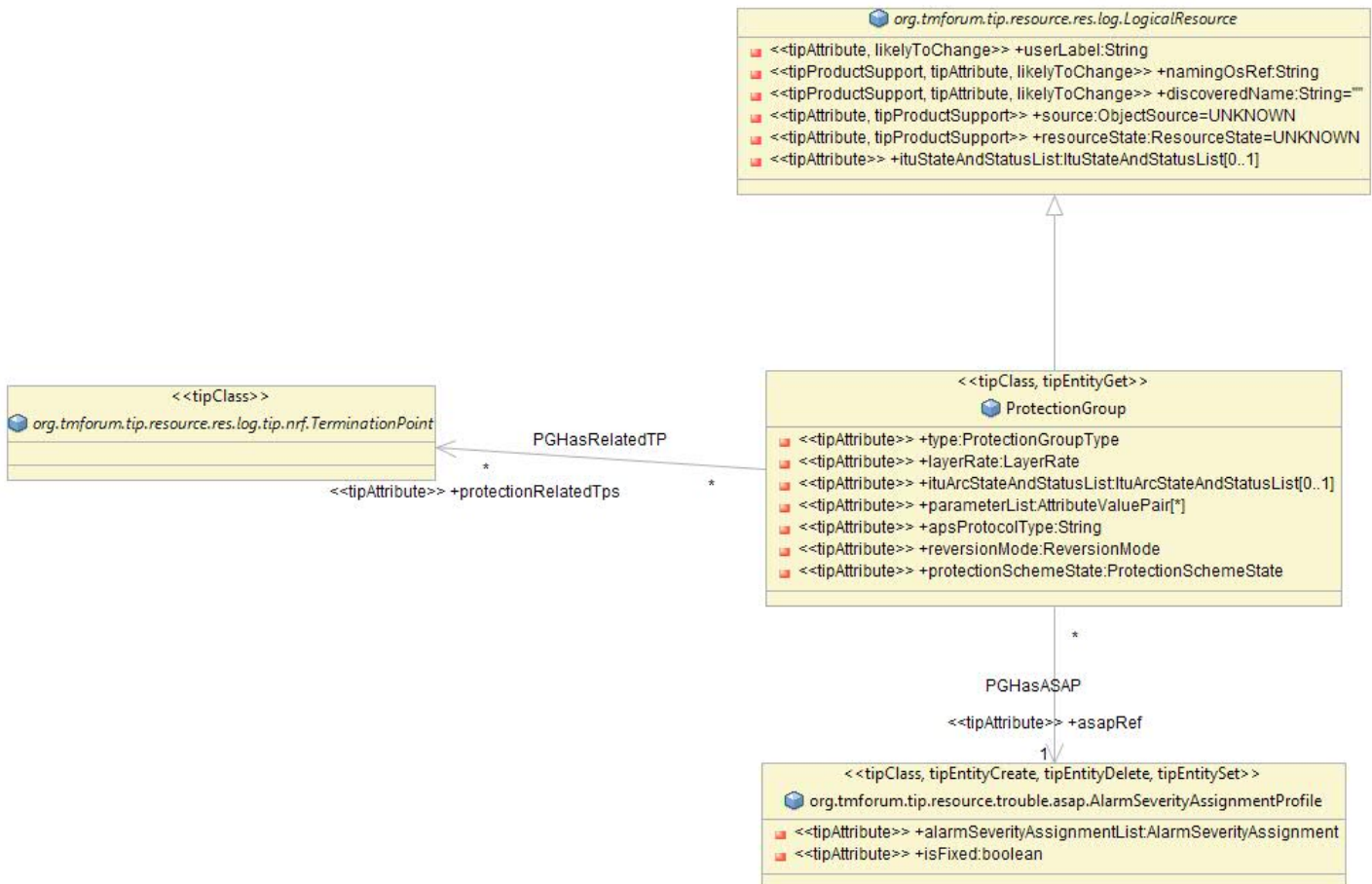
This entity is extendable

This entity generates Object Creation notifications

This entity generates Object Deletion notifications

This entity generates Object Discovery notifications

This entity supports the Common Get operation



3.2.1.2.1. Attributes

name	datatype	properties	description
type	ProtectionGroupType	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	This attribute identifies the type of the Protection Group.
layerRate	LayerRate	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	This attribute identifies the line rate of the PTPs of the Protection Group.
ituArcStateAndStatusList	ItuArcStateAndStatusList	- multiplicity is 0..1 - unique - optional - AVC enabled	See supporting document SD1-8_encodingX731M3100.
parameterList	AttributeValuePair	- multiplicity is * - read only - unique - invariant - optional - AVC disabled	This attribute identifies any protection group specific parameters. Non-applicable parameters and parameters for which the value is unknown to the target OS may be left out. See attached SD1-29_PGPParameters supporting document for values and descriptions.
apsProtocolType	String	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	This attribute defines the APS protocol on which the switching function is based on. Possible values:- "G.783" in case of K1/K2 based APS- "Legacy" in case of proprietary APS protocol, as for radio equipment. No default value
reversionMode	ReversionMode	- multiplicity is 0..1 - read only - unique - optional - AVC enabled	This attribute identifies whether the switch is revertive or not. The default value depends on the protection group implementation

protectionSchemeState	ProtectionSchemeState	- multiplicity is 0..1 - read only - unique - optional - AVC enabled	This attribute identifies the state in which the protection scheme is in. FORCED_OR_LOCKED_OUT indicates that the entire group is locked; partial locking is indicated by AUTOMATIC. Individual locks can be reported through transmission parameters on the appropriate TPs.
userLabel	String	- multiplicity is 0..1 - unique - optional - AVC enabled	
namingOsRef	String	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	
discoveredName	String	- multiplicity is 0..1 - read only - unique - default value is " - invariant - optional - AVC disabled	
source	ObjectSource	- multiplicity is 0..1 - read only - unique - default value is 'UNKNOWN' - optional - AVC enabled	
resourceState	ResourceState	- multiplicity is 0..1 - read only - unique - default value is 'UNKNOWN' - optional - AVC enabled	
ituStateAndStatusList	ItuStateAndStatusList	- multiplicity is 0..1 - unique - optional - AVC enabled	
identifer	EntityIdentifier	- multiplicity is 1 - unique - invariant - mandatory - AVC enabled	The entity instance identifier EID.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional - AVC enabled	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
aliasNames	CheckedCollection	- multiplicity is 1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.

3.2.1.2.2. Associations

name	datatype	properties	description
asapRef	AlarmSeverityAssignmentProfile	- multiplicity is 0..1 - aggregation is none - navigable - unique - passed by value - optional - AVC enabled - association is PGHasASAP	This attribute indicates the assignment of an Alarm Severity Assignment Profile (ASAP) to the Protection Group.
protectionRelatedTps	TerminationPoint	- multiplicity is * - aggregation is none - navigable - unique - invariant - passed by id - optional - AVC disabled - association is PGHasRelatedTP	This attribute contains the list of PTPs that belong in the Protection Group. The list of PTPs is partially ordered. The protecting PTP always trails its worker PTPs. The East PTPs are always contiguous in the list, as well as West PTPs. At least 2 values.

3.2.2. Data Types

3.2.2.1. EquipmentSwitchData

- Type: Datatype Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This data type identifies the current protection switch status of an Equipment Protection Group.

- Properties:

This datatype is extendable

3.2.2.1.1. Attributes

name	datatype	properties	description
equipmentSwitchReason	EquipmentSwitchReason	- multiplicity is 0..1 - unique - default value is 'NOT_APPLICABLE' - invariant - optional	This attribute contains the reason of the last switch.
epgRef	objectName	- multiplicity is 0..1 - invariant - optional	This attribute identifies the Equipment Protection Group for which the protection switch status is being reported.
switchToEquipmentRef	objectName	- multiplicity is 0..1 - invariant - optional	This attribute identifies the Equipment object that is working after the switch, or currently working if no protection switch is currently active.
equipmentProtectionType	EquipmentProtectionType	- multiplicity is 0..1 - unique - default value is 'M_FOR_N' - invariant - optional	This attribute identifies the type of equipment protection for which the switch has occurred. The attribute can take on the following value: - "M_FOR_N", means that M pieces of equipment protect N pieces of equipment.
protectedEquipmentRef	objectName	- multiplicity is 0..1 - invariant - optional	This attribute identifies the name of the protected equipment. In case of an M:N equipment protection type, protectedEquipmentRef always identifies a worker Equipment object.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

3.2.2.2. SwitchData

- Type: Datatype Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This data type identifies the current protection switch status of a Protection Group or an SNCP reliable CTP. See supporting document SD1-34_protectionSwitch.

- Properties:

This datatype is extendable

3.2.2.2.1. Attributes

name	datatype	properties	description
protectionType	ProtectionType	- multiplicity is 0..1 - unique - invariant - optional	This attribute identifies the type of the protection for which the switch has occurred.
switchReason	SwitchReason	- multiplicity is 0..1 - unique - invariant - optional	This attribute contains the reason of the last switch. During a switch notification the switch reason is known. If it is not cached in the target OS for later retrieval, then a NOT_APPLICABLE value is assigned.
layerRate	LayerRate	- multiplicity is 0..1 - unique - invariant - optional	This attribute identifies the layer at which the switch has occurred. The Layer Rate can be used to filter the switch notification.
pgRef	objectName	- multiplicity is 0..1 - invariant - optional	This attribute identifies the Protection Group in case of a trail protection switch. This is empty, if the protection type is SNCP.
protectedTpRef	objectName	- multiplicity is 0..1 - invariant - optional	This attribute contains the name of the TP that is protected. The protected (worker) and protecting TPs are fixed in a revertive Protection Group, the worker can be active or not at any point in time. In a non-revertive Protection Group, there is no fixed worker / protecting distinction. The worker TP is indeed always the active TP; after a switch, the worker and protecting TPs exchange their roles.- For an SNCP, this is always the reliable TP.- For a retrieval of a 2F BLSR, each TP is protected, and two SwitchData instances are returned.- For a retrieval of a 4FMSSPR, each worker TP is protected, and two SwitchData instances are returned.- For a retrieval of a 1:N trail protection (e.g. MSP), each worker TP is protected, and N SwitchData instances are returned.- For a retrieval of a revertive 1+1 trail protection (e.g. MSP), this is always the worker TP.- For a retrieval of a non-revertive 1+1 trail protection (e.g. MSP) switch, this is the active TP.- This TP is a CTP for SNCP and a PTP for trail protection schemes.
switchToTpRef	objectName	- multiplicity is 0..1 - invariant - optional	This attribute identifies the TP which is being switched to and is the active source after the switch. This TP is a CTP for SNCP and a PTP for trail protection schemes.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

3.2.3. Notifications

3.2.3.1. EquipmentProtectionSwitchNotification

- Type: Event Artifact
- Package: org.tmforum.tip.resource.res.log.prot
- All super types:
 - org.tmforum.tip.internal.notifications.NotificationBase
- Properties:
 - This notification is optional

3.2.3.1.1. Attributes

name	datatype	properties	description
protectionType	EquipmentProtectionType	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the type of the equipment protection.
epgRef	objectName	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the name of the Equipment Protection Group emitting the switch.

protectedEquipmentRef	objectName	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the Equipment that was protected when the switch occurred. For a M:N group, protectedEquipmentRef always identifies the worker equipment instance for which the switch occurred.
switchAwayFromEquipmentRef	objectName	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the Equipment being switched away from.
switchToEquipmentRef	objectName	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the Equipment which is being switched to.
osTime	dateTime	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute represents the time at which the event occurred at the reporting OS.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).

3.2.3.2. ProtectionSwitchNotification

- Type: Event Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- All super types:

[org.tmforum.tip.internal.notifications.NotificationBase](#)

- Properties:

This notification is optional

3.2.3.2.1. Attributes

name	datatype	properties	description
protectionType	ProtectionType	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the type of the protection.
switchReason	SwitchReason	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the reason for the switch. During a switch notification the switch reason is known. If it is not cached in the target OS for later retrieval, then a NOT_APPLICABLE value is assigned.- MANUAL indicates that a manual operation caused this switch, including MANUAL, FORCED and LOCKOUT switches.- AUTOMATIC_SWITCH is used when the switch reason for the automatic switch is not known.- SIGNAL_MISMATCH is used in the case the signal is ok, but is identified as coming from an incorrect source: Trail Trace Identifier Mismatch, Signal Label Mismatch, etc.- RESTORED is used for revertive groups to indicate a return to the normal state.
layerRate	LayerRate	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the layer at which the switch has occurred. This Layer Rate can be used to filter the switch notification.
pgRef	objectName	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the name of the Protection Group in case of a trail protection switch.

protectedTpRef	objectName	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the TP that is protected.- For a SNCP, this is always the reliable TP.- For a 2F BLSR ring switch notification, this is the TP that is/was inactive during the switch.- For a 4FMSSP ring switch notification, this is the worker TP that is/was inactive during the switch.- For a 1:N trail protection (e.g. MSP) switch notification, this is the worker TP for which the protection switch occurred.- For a revertive 1+1 trail protection (e.g. MSP) switch notification, this is always the worker TP.- For a non-revertive 1+1 trail protection (e.g. MSP) switch notification, this is the TP that was active before the switch (note that after the switch the protected TP changes).
switchAwayFromTpRef	objectName	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the TP being switched away from.- In case of 2F MSSPRING, this is the TP that switched. The East and the WEST side can switch independently. This is one of the TPs that switched.- In case of 4-Fiber rings, when a span switch occurs, this is one of the TPs in the MSP (1+1, 1:n) groups (worker or protection).- In case of a ring switch, this is the worker TP of the span that switched. For example if the EAST span switches to the WEST span then this TP is the East - Worker.- In case of SNCP, this is the TP that the traffic source switched away from.
switchToTpRef	objectName	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute identifies the TP which is being switched to. This identifies the TP that is the active source after the switch.- For a 2F BLSR, when the state returns to normal, this is the TP that had switched.- For a 4F BLSR ring switch, when the state returns to normal, this is the worker TP of the span that had switched; for example, if the East span had switched to the West span, then this is the East worker TP.
osTime	dateTime	- multiplicity is 0..1 - read only - unique - invariant - optional	This attribute represents the time at which the event occurred at the reporting OS.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).

3.2.3.3. EquipmentProtectionGroupAVCN

- Type: Event Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.res.log.prot.EquipmentProtectionGroup](#)

- All super types:

[org.tmforum.tip.common.notifications.AVCNotification](#)

[org.tmforum.tip.common.notifications.CommonNotification](#)

[org.tmforum.tip.internal.notifications.NotificationBase](#)

3.2.3.3.1. Attributes

name	datatype	properties	description
protectionSchemeState	ProtectionSchemeState	- multiplicity is 0..1 - optional	This attribute indicates whether the protection scheme is active or frozen locked out because of a forced switch command. This is an indicator whether the protection scheme is free to switch or is in a state where it cannot switch freely, without an explicit clear command applied to the protection scheme. FORCED_OR_LOCKED_OUT indicates that the entire group is locked; partial locking is indicated by AUTOMATIC (partial locking could be done via operation PerformProtectionCommand in CTP).
reversionMode	ReversionMode	- multiplicity is 0..1 - optional	This attribute defines whether the protection scheme is revertive or not.
ituArcStateAndStatusList	ItuArcStateAndStatusList	- multiplicity is 0..1 - optional	See supporting document SD1-8_encodingX731M3100.
userLabel	String	- multiplicity is 0..1 - optional	
source	ObjectSource	- multiplicity is 0..1 - optional	

resourceState	ResourceState	- multiplicity is 0..1 - optional	
ituStateAndStatusList	ItuStateAndStatusList	- multiplicity is 0..1 - optional	
asapRef	AlarmSeverityAssignmentProfile	- multiplicity is 0..1 - passed by id - optional	This attribute indicates the assignment of an Alarm Severity Assignment Profile (ASAP) to the Equipment Protection Group.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.3.4. EquipmentProtectionGroupOCN

- Type: Event Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.res.log.prot.EquipmentProtectionGroup](#)

- All super types:

[org.tmforum.tip.common.notifications.OCNotification](#)

[org.tmforum.tip.common.notifications.CommonNotification](#)

[org.tmforum.tip.internal.notifications.NotificationBase](#)

3.2.3.4.1. Attributes

name	datatype	properties	description
object	EquipmentProtectionGroup	- multiplicity is 0..1 - optional - passed by value	This object class represents the information about an equipment protection in a Managed Element.
aliasNames	CheckedCollection	- multiplicity is 1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implementation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.3.5. EquipmentProtectionGroupODEIN

- Type: Event Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.res.log.prot.EquipmentProtectionGroup](#)

- All super types:

[org.tmforum.tip.common.notifications.ODelNotification](#)

[org.tmforum.tip.common.notifications.CommonNotification](#)

[org.tmforum.tip.internal.notifications.NotificationBase](#)

3.2.3.5.1. Attributes

name	datatype	properties	description
object	EquipmentProtectionGroup	- multiplicity is 0..1 - optional - passed by value	This object class represents the information about an equipment protection in a Managed Element.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.3.6. EquipmentProtectionGroupODisN

- Type: Event Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.res.log.prot.EquipmentProtectionGroup](#)

- All super types:

[org.tmforum.tip.common.notifications.ODisNotification](#)

[org.tmforum.tip.common.notifications.CommonNotification](#)

[org.tmforum.tip.internal.notifications.NotificationBase](#)

3.2.3.6.1. Attributes

name	datatype	properties	description
object	EquipmentProtectionGroup	- multiplicity is 0..1 - optional - passed by value	This object class represents the information about an equipment protection in a Managed Element.
aliasNames	CheckedCollection	- multiplicity is 1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implementation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.

objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.3.7. ProtectionGroupAVCN

- Type: Event Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.res.log.prot.ProtectionGroup](#)

- All super types:

[org.tmforum.tip.common.notifications.AVCNotification](#)

[org.tmforum.tip.common.notifications.CommonNotification](#)

[org.tmforum.tip.internal.notifications.NotificationBase](#)

3.2.3.7.1. Attributes

name	datatype	properties	description
ituArcStateAndStatusList	ItuArcStateAndStatusList	- multiplicity is 0..1 - optional	See supporting document SD1-8_encodingX731M3100.
reversionMode	ReversionMode	- multiplicity is 0..1 - optional	This attribute identifies whether the switch is revertive or not. The default value depends on the protection group implementation
protectionSchemeState	ProtectionSchemeState	- multiplicity is 0..1 - optional	This attribute identifies the state in which the protection scheme is in. FORCED_OR_LOCKED_OUT indicates that the entire group is locked; partial locking is indicated by AUTOMATIC. Individual locks can be reported through transmission parameters on the appropriate TPs.
userLabel	String	- multiplicity is 0..1 - optional	
source	ObjectSource	- multiplicity is 0..1 - optional	
resourceState	ResourceState	- multiplicity is 0..1 - optional	
ituStateAndStatusList	ItuStateAndStatusList	- multiplicity is 0..1 - optional	
asapRef	AlarmSeverityAssignmentProfile	- multiplicity is 0..1 - passed by value - optional	This attribute indicates the assignment of an Alarm Severity Assignment Profile (ASAP) to the Protection Group.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.3.8. ProtectionGroupOCN

- Type: Event Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.res.log.prot.ProtectionGroup](#)

- All super types:

[org.tmforum.tip.common.notifications.OCNotification](#)

[org.tmforum.tip.common.notifications.CommonNotification](#)

[org.tmforum.tip.internal.notifications.NotificationBase](#)

3.2.3.8.1. Attributes

name	datatype	properties	description
object	ProtectionGroup	- multiplicity is 0..1 - optional - passed by value	This object class represents the information about a trail protection in a Managed Element.
aliasNames	CheckedCollection	- multiplicity is 1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.3.9. ProtectionGroupODEIN

- Type: Event Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.res.log.prot.ProtectionGroup](#)

- All super types:

[org.tmforum.tip.common.notifications.ODEINNotification](#)

[org.tmforum.tip.common.notifications.CommonNotification](#)

[org.tmforum.tip.internal.notifications.NotificationBase](#)

3.2.3.9.1. Attributes

name	datatype	properties	description
object	ProtectionGroup	- multiplicity is 0..1 - optional - passed by value	This object class represents the information about a trail protection in a Managed Element.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.

objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.3.10. ProtectionGroupODisN

- Type: Event Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.res.log.prot.ProtectionGroup](#)

- All super types:

[org.tmforum.tip.common.notifications.ODisNotification](#)

[org.tmforum.tip.common.notifications.CommonNotification](#)

[org.tmforum.tip.internal.notifications.NotificationBase](#)

3.2.3.10.1. Attributes

name	datatype	properties	description
object	ProtectionGroup	- multiplicity is 0..1 - optional - passed by value	This object class represents the information about a trail protection in a Managed Element.
aliasNames	CheckedCollection	- multiplicity is 1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.4. Enumerations

3.2.4.1. EquipmentProtectionType

- Type: Enumeration Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This enumeration attribute identifies the type of equipment protection.

- Properties:

3.2.4.1.1. Literals

name	datatype	properties	description
M_FOR_N	int	value is 1	"M_FOR_N", means that M pieces of equipment protect N pieces of equipment.

3.2.4.2. EquipmentSwitchReason

- Type: Enumeration Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This enumeration reflects the reason why a switch occurred.

- Properties:

3.2.4.2.1. Literals

name	datatype	properties	description
NOT_APPLICABLE	String	value is "NOT_APPLICABLE"	NOT_APPLICABLE is used, if a more precise value is not available.
MANUAL	String	value is "MANUAL"	MANUAL indicates a switch that was requested by the operator and includes forced switches.
EQUIPMENT_FAILURE	String	value is "EQUIPMENT_FAILURE"	EQUIPMENT_FAILURE is used when an instance of equipment has failed.

3.2.4.3. ProtectionCommand

- Type: Enumeration Artifact

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This data type identifies the protection switch commands. See ITU-T Recommendation G.841 for definitions.

- Properties:

3.2.4.3.1. Literals

name	datatype	properties	description
EXERCISER	String	value is "EXERCISER"	
FORCED_SWITCH	String	value is "FORCED_SWITCH"	
MANUAL_SWITCH	String	value is "MANUAL_SWITCH"	
LOCKOUT	String	value is "LOCKOUT"	
CLEAR	String	value is "CLEAR"	

3.2.4.4. ProtectionGroupType

- Type: Enumeration Artifact
- Package: [org.tmforum.tip.resource.res.log.prot](#)
- Description:

Note: The values "MSP_1_PLUS_1" and "MSP_1_FOR_N" are also used for trail protection.

- Properties:

3.2.4.4.1. Literals

name	datatype	properties	description
TWO_FIBER_BLSR	String	value is "TWO_FIBER_BLSR"	
FOUR_FIBER_BLSR	String	value is "FOUR_FIBER_BLSR"	
MSP_1_FOR_N	String	value is "MSP_1_FOR_N"	
MSP_1_PLUS_1	String	value is "MSP_1_PLUS_1"	

3.2.4.5. ProtectionSchemeState

- Type: Enumeration Artifact
- Package: [org.tmforum.tip.resource.res.log.prot](#)
- Properties:

3.2.4.5.1. Literals

name	datatype	properties	description
UNKNOWN	String	value is "UNKNOWN"	
FORCED_OR_LOCKED_OUT	String	value is "FORCED_OR_LOCKED_OUT"	
AUTOMATIC	String	value is "AUTOMATIC"	

3.2.4.6. ProtectionType

- Type: Enumeration Artifact
- Package: [org.tmforum.tip.resource.res.log.prot](#)
- Description:

Note: The value "MSP_APS" is also used for general trail protection.

- Properties:

3.2.4.6.1. Literals

name	datatype	properties	description
MSP_APS	String	value is "MSP_APS"	
SNCP	String	value is "SNCP"	

3.2.4.7. ReversionMode

- Type: Enumeration Artifact
- Package: `org.tmforum.tip.resource.res.log.prot`
- Properties:

3.2.4.7.1. Literals

name	datatype	properties	description
UNKNOWN	String	value is "UNKNOWN"	
NON_REVERTIVE	String	value is "NON_REVERTIVE"	
REVERTIVE	String	value is "REVERTIVE"	

3.2.4.8. SwitchReason

- Type: Enumeration Artifact
- Package: `org.tmforum.tip.resource.res.log.prot`
- Properties:

3.2.4.8.1. Literals

name	datatype	properties	description
RESTORED	String	value is "RESTORED"	RESTORED is used for revertive groups to indicate a return to the normal state.
SIGNAL_FAIL	String	value is "SIGNAL_FAIL"	
NOT_APPLICABLE	String	value is "NOT_APPLICABLE"	NOT_APPLICABLE is used upon retrieval of switch data for non-revertive groups, if a more precise value is not available.
MANUAL	String	value is "MANUAL"	MANUAL switch indicates that a manual operation caused this switch, including MANUAL, FORCED and LOCKOUT switches.
AUTOMATIC_SWITCH	String	value is "AUTOMATIC_SWITCH"	AUTOMATIC_SWITCH is used when the switch reason for the automatic switch is not known.
SIGNAL_DEGRADE	String	value is "SIGNAL_DEGRADE"	
SIGNAL_MISMATCH	String	value is "SIGNAL_MISMATCH"	SIGNAL_MISMATCH is used in the case the signal is ok, but is identified as coming from an incorrect source: TRAIL_TRACE_IDENTIFIER_MISMATCH, Signal Label Mismatch, etc..

3.3. Package `org.tmforum.tip.resource.trouble.asap`

3.3.1. Entities

3.3.1.1. AlarmSeverityAssignmentProfile

- Type: Entity Artifact
- Package: org.tmforum.tip.resource.trouble.asap
- All super types:

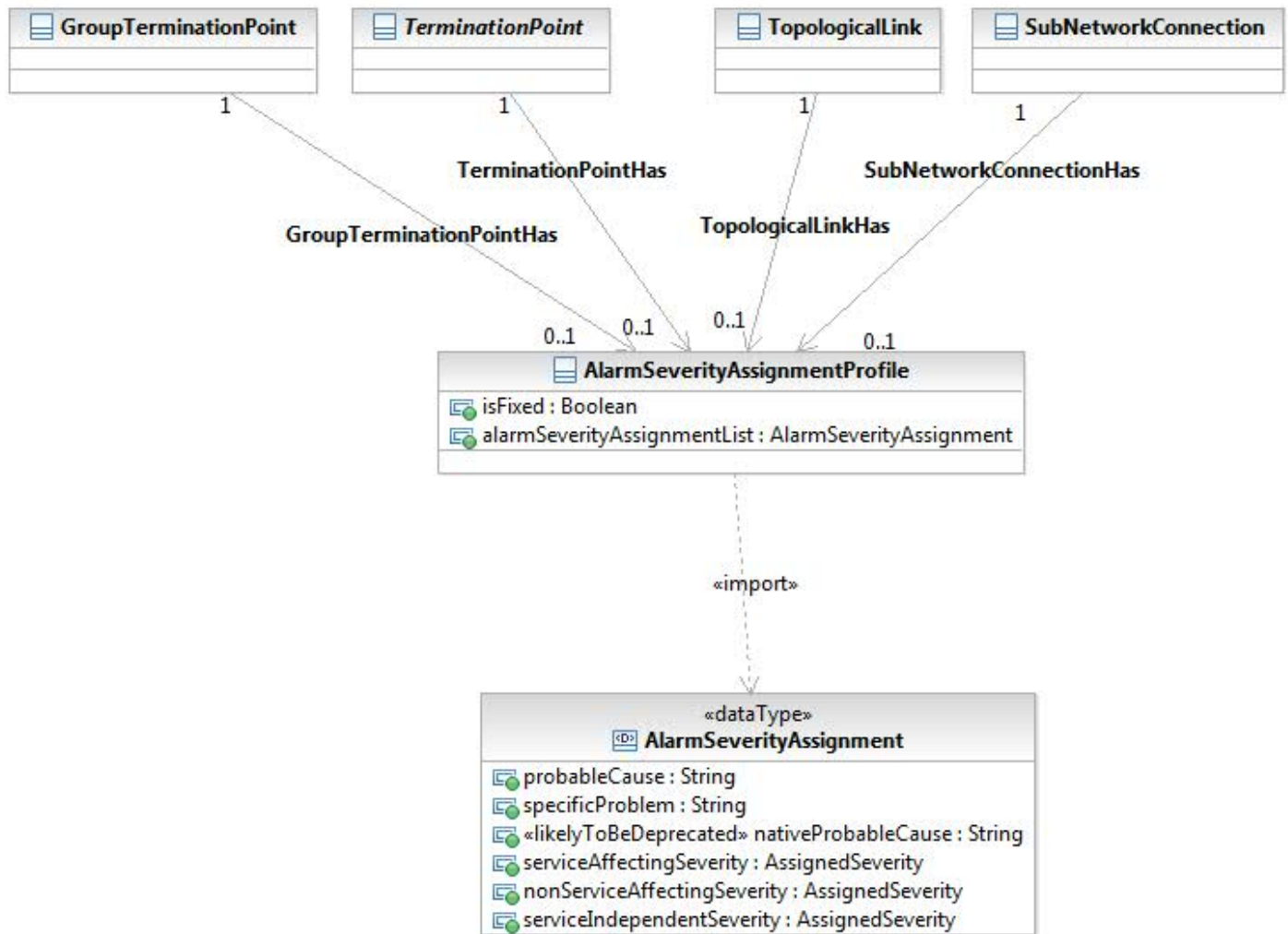
org.tmforum.tip.internal.entity.EntityBase

- Description:

This object class models the (flexible) severity assignment to specified probable causes. So the ASAP object includes a table, with each row specifying the probable cause (plus optionally the probableCauseQualifier and / or the nativeProbableCause) and the assigned severity for "service affecting", "non service affecting" and "service independent or unknown" alarms. Probable cause, probableCauseQualifier and nativeProbableCause are the coordinates of the ASAP entries, so there must not be two ASAP entries with the same coordinates. It is the responsibility of the EMS to enforce this. Alarms against entities that are not modeled by the interface are reported using the "AID" objectType. For these "AID" alarms the ASAP mechanism is not applicable. Typically the ASAP function is implemented in the OS or NE where the alarm is originated. I. e. the severity will usually be assigned directly by the NE, so it is up to the EMS to download the defined ASAP to the NE. Other alarms, e.g. on arcs like SNCs, may be generated by the target OS. An alarm becomes reportable by NE/target OS:- when for PTP, CTP, FTP: AlarmReporting changes from "off" to "on"- when for SNC, TopologicalLink, Equipment, EquipmentHolder, GTP: alarmReportingIndicator changes from false to true. Alarms are always reportable for all other objects as they do not have any alarm reporting attribute. When an alarm becomes reportable the ASAPs are applied (accessed via the asapPointer). The severity of the alarm is adopted from the ASAP entry that matches for all of the following:- same probableCause- same probableCauseQualifier (an empty string is a match)- same nativeProbableCause (an empty string is a match). For example, if the reportable alarm has LOS probableCause and an ASAP entry is found with LOS probableCause and both probableCauseQualifier and nativeProbableCause are empty strings, then the search is successful. If there is a matching ASAP, then the severities are adopted on the following basis:- the alarm is service affecting: the severity specified in the serviceAffecting field is assigned- the alarm is service non affecting: the severity specified in the serviceNonAffecting field is assigned- the alarm is service independent or NE/target OS is not equipped to determine if the alarm affects service or not: the severity specified in the serviceIndependentOrUnknown field is assigned. If the assigned severity specified in the ASAP is:- "FREE_CHOICE" then the NE/target OS are free to determine the severity. If there is no local mechanism on the ME/EMS to determine severity then the severity "INDETERMINATE" should be assigned.- "NOTALARMED" then the EMS should not emit an alarm over the EML-NML interface. If there is no ASAP that matches, then the NE/target OS is free to determine the severity. If there is no local mechanism on the NE/target OS to determine severity then the severity "INDETERMINATE" should be assigned. Once a severity has been assigned, the alarm notification is emitted (other than for "NOTALARMED"). Note: Any operation of alarm retrieval will not include "NOTALARMED" alarms.

- Properties:

- This entity is optional
- This entity is extendable
- This entity generates Object Creation notifications
- This entity generates Object Deletion notifications
- This entity generates Object Discovery notifications
- This entity supports the Common Set operation
- This entity supports the Common Create operation
- This entity supports the Common Delete operation



3.3.1.1.1. Attributes

name	datatype	properties	description
alarmSeverityAssignmentList	AlarmSeverityAssignment	- multiplicity is 0..1 - unique - optional - AVC enabled	This attribute identifies a list of Alarm Severity Assignments (ASA). Each record of this sequence specifies the probable cause (plus optionally the probableCauseQualifier and / or the nativeProbableCause) and the severities to be assigned.
isFixed	boolean	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	This attribute defines if the Alarm Severity Assignment Profile (ASAP) is fixed or not. If true, then this ASAP instance is fixed, i.e. is an ASAP which is defined at NE or target OS level and can be neither modified nor deleted through the interface, but only assigned/de-assigned. If false, otherwise.
identifier	EntityIdentifier	- multiplicity is 1 - unique - invariant - mandatory - AVC enabled	The entity instance identifier EID.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional - AVC enabled	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
aliasNames	CheckedCollection	- multiplicity is 1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implementation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.

3.3.1.1.2. Associations

There are no associations (local or inherited) available.

3.3.2. Data Types

3.3.2.1. SetDataForAlarmSeverityAssignmentProfile

- Type: Datatype Artifact

- Package: [org.tmforum.tip.resource.trouble.asap](#)

- Description:

This datatype contains all the attributes of the AlarmSeverityAssignmentProfile that are settable after object creation.

3.3.2.1.1. Attributes

name	datatype	properties	description
alarmSeverityAssignmentList	AlarmSeverityAssignment	- multiplicity is 0..1 - unique - optional - AVC enabled	This attribute identifies a list of Alarm Severity Assignments (ASA). Each record of this sequence specifies the probable cause (plus optionally the probableCauseQualifier and / or the nativeProbableCause) and the severities to be assigned.
aliasNames	CheckedCollection	- multiplicity is 1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implementation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.

3.3.2.2. RemoveDataForAlarmSeverityAssignmentProfile

- Type: Datatype Artifact

- Package: [org.tmforum.tip.resource.trouble.asap](#)

- Description:

This datatype contains all the attributes of the AlarmSeverityAssignmentProfile that are settable after object creation and are set-valued (multiplicity *, or 1..*).

3.3.2.2.1. Attributes

There are no attributes (local or inherited or implicit) available.

3.3.2.3. AddDataForAlarmSeverityAssignmentProfile

- Type: Datatype Artifact

- Package: [org.tmforum.tip.resource.trouble.asap](#)

- Description:

This datatype contains all the attributes of the AlarmSeverityAssignmentProfile that are settable after object creation and are set-valued (multiplicity *, or 1..*).

3.3.2.3.1. Attributes

There are no attributes (local or inherited or implicit) available.

3.3.2.4. CreateDataForAlarmSeverityAssignmentProfile

- Type: Datatype Artifact

- Package: org.tmforum.tip.resource.trouble.asap

- Description:

This datatype contains all the attributes of the AlarmSeverityAssignmentProfile that are settable at time of object creation.

3.3.2.4.1. Attributes

name	datatype	properties	description
alarmSeverityAssignmentList	AlarmSeverityAssignment	- multiplicity is 0..1 - unique - optional - AVC enabled	This attribute identifies a list of Alarm Severity Assignments (ASA). Each record of this sequence specifies the probable cause (plus optionally the probableCauseQualifier and / or the nativeProbableCause) and the severities to be assigned.
isFixed	boolean	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	This attribute defines if the Alarm Severity Assignment Profile (ASAP) is fixed or not. If true, then this ASAP instance is fixed, i.e. is an ASAP which is defined at NE or target OS level and can be neither modified nor deleted through the interface, but only assigned/de-assigned. If false, otherwise.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional - AVC enabled	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
aliasNames	CheckedCollection	- multiplicity is 1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implementation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.

3.3.2.5. AlarmSeverityAssignment

- Type: Datatype Artifact

- Package: org.tmforum.tip.resource.trouble.asap

- Description:

This data type provides three values for severity to cover the three cases of service affecting conditions, non- service affecting conditions and conditions where the service impact is unknown. The structure identifies the specific case of alarm that it applies to using three probable cause identifiers in combination.

See also attached supporting document for further details on the values of the strings probableCause, probableCauseQualifier and nativeProbableCause.

- Properties:

This datatype is not extendable

3.3.2.5.1. Attributes

name	datatype	properties	description
specificProblem	String	- multiplicity is 0..1 - unique - invariant - optional	This attribute identifies a qualifier of the probable cause that is used to achieve uniqueness in some cases where the probable cause is not sufficient.

nativeProbableCause	String	- multiplicity is 0..1 - unique - invariant - optional	This attribute identifies the probable cause used on the NE/target OS. This may also be used to qualify the probable cause to achieve uniqueness in some cases where the probable cause is not sufficient.
serviceAffectingSeverity	AssignedSeverity	- multiplicity is 0..1 - unique - default value is 'FREE_CHOICE' - invariant - optional	This attribute identifies the severity assigned to the probable cause when service affecting.
nonServiceAffectingSeverity	AssignedSeverity	- multiplicity is 0..1 - unique - default value is 'FREE_CHOICE' - invariant - optional	This attribute identifies the severity assigned to the probable cause when not service affecting.
serviceIndependentSeverity	AssignedSeverity	- multiplicity is 0..1 - unique - default value is 'FREE_CHOICE' - invariant - optional	This attribute identifies the severity assigned to the probable cause when the reportable alarm is service independent or the service impact is not known.
probableCause	String	- multiplicity is 0..1 - unique - invariant - optional	This attribute identifies the probable cause of the alarm to which the severities should be applied to. See attached supporting document SD1-33_ProbableCauses.

3.3.3. Notifications

3.3.3.1. AlarmSeverityAssignmentProfileAVCN

- Type: Event Artifact

- Package: [org.tmforum.tip.resource.trouble.asap](#)

- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.trouble.asap.AlarmSeverityAssignmentProfile](#)

- All super types:

[org.tmforum.tip.common.notifications.AVCNotification](#)

[org.tmforum.tip.common.notifications.CommonNotification](#)

[org.tmforum.tip.internal.notifications.NotificationBase](#)

3.3.3.1.1. Attributes

name	datatype	properties	description
alarmSeverityAssignmentList	AlarmSeverityAssignment	- multiplicity is 0..1 - optional	This attribute identifies a list of Alarm Severity Assignments (ASA). Each record of this sequence specifies the probable cause (plus optionally the probableCauseQualifier and / or the nativeProbableCause) and the severities to be assigned.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.3.3.2. AlarmSeverityAssignmentProfileOCN

- Type: Event Artifact

- Package: [org.tmforum.tip.resource.trouble.asap](#)

- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.trouble.asap.AlarmSeverityAssignmentProfile](#)

- All super types:

[org.tmforum.tip.common.notifications.OCNotification](#)

[org.tmforum.tip.common.notifications.CommonNotification](#)

[org.tmforum.tip.internal.notifications.NotificationBase](#)

3.3.3.2.1. Attributes

name	datatype	properties	description
object	AlarmSeverityAssignmentProfile	<ul style="list-style-type: none"> - multiplicity is 0..1 - optional - passed by value 	<p>This object class models the (flexible) severity assignment to specified probable causes. So the ASAP object includes a table, with each row specifying the probable cause (plus optionally the probableCauseQualifier and / or the nativeProbableCause) and the assigned severity for "service affecting", "non service affecting" and "service independent or unknown" alarms. Probable cause, probableCauseQualifier and nativeProbableCause are the coordinates of the ASAP entries, so there must not be two ASAP entries with the same coordinates. It is the responsibility of the EMS to enforce this. Alarms against entities that are not modeled by the interface are reported using the "AID" objectType. For these "AID" alarms the ASAP mechanism is not applicable. Typically the ASAP function is implemented in the OS or NE where the alarm is originated. I. e. the severity will usually be assigned directly by the NE, so it is up to the EMS to download the defined ASAP to the NE. Other alarms, e.g. on arcs like SNCs, may be generated by the target OS. An alarm becomes reportable by NE/target OS:- when for PTP, CTP, FTP: AlarmReporting changes from "off" to "on"- when for SNC, TopologicalLink, Equipment, EquipmentHolder, GTP: alarmReportingIndicator changes from false to true. Alarms are always reportable for all other objects as they do not have any alarm reporting attribute. When an alarm becomes reportable the ASAPs are applied (accessed via the asapPointer). The severity of the alarm is adopted from the ASAP entry that matches for all of the following:- same probableCause- same probableCauseQualifier (an empty string is a match)- same nativeProbableCause (an empty string is a match). For example, if the reportable alarm has LOS probableCause and an ASAP entry is found with LOS probableCause and both probableCauseQualifier and nativeProbableCause are empty strings, then the search is successful. If there is a matching ASAP, then the severities are adopted on the following basis:- the alarm is service affecting: the severity specified in the serviceAffecting field is assigned- the alarm is service non affecting: the severity specified in the serviceNonAffecting field is assigned- the alarm is service independent or NE/target OS is not equipped to determine if the alarm affects service or not: the severity specified in the serviceIndependentOrUnknown field is assigned. If the assigned severity specified in the ASAP is:- "FREE_CHOICE" then the NE/target OS are free to determine the severity. If there is no local mechanism on the ME/EMS to determine severity then the severity "INDETERMINATE" should be assigned.- "NOTALARMED" then the EMS should not emit an alarm over the EML-NML interface. If there is no ASAP that matches, then the NE/target OS is free to determine the severity. If there is no local mechanism on the NE/target OS to determine severity then the severity "INDETERMINATE" should be assigned. Once a severity has been assigned, the alarm notification is emitted (other than for "NOTALARMED"). Note: Any operation of alarm retrieval will not include "NOTALARMED" alarms.</p>

aliasNames	CheckedCollection	- multiplicity is 1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implementation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.3.3.3. AlarmSeverityAssignmentProfileODEIN

- Type: Event Artifact
- Package: [org.tmforum.tip.resource.trouble.asap](#)
- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.trouble.asap.AlarmSeverityAssignmentProfile](#)

- All super types:
 - [org.tmforum.tip.common.notifications.ODEINotification](#)
 - [org.tmforum.tip.common.notifications.CommonNotification](#)
 - [org.tmforum.tip.internal.notifications.NotificationBase](#)

3.3.3.3.1. Attributes

name	datatype	properties	description
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object	AlarmSeverityAssignmentProfile	<ul style="list-style-type: none"> - multiplicity is 0..1 - optional - passed by value 	<p>This object class models the (flexible) severity assignment to specified probable causes. So the ASAP object includes a table, with each row specifying the probable cause (plus optionally the probableCauseQualifier and / or the nativeProbableCause) and the assigned severity for "service affecting", "non service affecting" and "service independent or unknown" alarms. Probable cause, probableCauseQualifier and nativeProbableCause are the coordinates of the ASAP entries, so there must not be two ASAP entries with the same coordinates. It is the responsibility of the EMS to enforce this. Alarms against entities that are not modeled by the interface are reported using the "AID" objectType. For these "AID" alarms the ASAP mechanism is not applicable. Typically the ASAP function is implemented in the OS or NE where the alarm is originated. I. e. the severity will usually be assigned directly by the NE, so it is up to the EMS to download the defined ASAP to the NE. Other alarms, e.g. on arcs like SNCs, may be generated by the target OS. An alarm becomes reportable by NE/target OS:- when for PTP, CTP, FTP: AlarmReporting changes from "off" to "on"- when for SNC, TopologicalLink, Equipment, EquipmentHolder, GTP: alarmReportingIndicator changes from false to true. Alarms are always reportable for all other objects as they do not have any alarm reporting attribute. When an alarm becomes reportable the ASAPs are applied (accessed via the asapPointer). The severity of the alarm is adopted from the ASAP entry that matches for all of the following:- same probableCause- same probableCauseQualifier (an empty string is a match)- same nativeProbableCause (an empty string is a match). For example, if the reportable alarm has LOS probableCause and an ASAP entry is found with LOS probableCause and both probableCauseQualifier and nativeProbableCause are empty strings, then the search is successful. If there is a matching ASAP, then the severities are adopted on the following basis:- the alarm is service affecting: the severity specified in the serviceAffecting field is assigned- the alarm is service non affecting: the severity specified in the serviceNonAffecting field is assigned- the alarm is service independent or NE/target OS is not equipped to determine if the alarm affects service or not: the severity specified in the serviceIndependentOrUnknown field is assigned. If the assigned severity specified in the ASAP is:- "FREE_CHOICE" then the NE/target OS are free to determine the severity. If there is no local mechanism on the ME/EMS to determine severity then the severity "INDETERMINATE" should be assigned.- "NOTALARMED" then the EMS should not emit an alarm over the EML-NML interface. If there is no ASAP that matches, then the NE/target OS is free to determine the severity. If there is no local mechanism on the NE/target OS to determine severity then the severity "INDETERMINATE" should be assigned. Once a severity has been assigned, the alarm notification is emitted (other than for "NOTALARMED"). Note: Any operation of alarm retrieval will not include "NOTALARMED" alarms.</p>
sourceTime	time	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - mandatory 	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - mandatory 	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - mandatory 	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - optional 	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.3.3.4. AlarmSeverityAssignmentProfileODisN

- Type: Event Artifact
- Package: [org.tmforum.tip.resource.trouble.asap](#)
- Description:

This is a notification generated from the entity [org.tmforum.tip.resource.trouble.asap.AlarmSeverityAssignmentProfile](#)

- All super types:
 - [org.tmforum.tip.common.notifications.ODisNotification](#)
 - [org.tmforum.tip.common.notifications.CommonNotification](#)
 - [org.tmforum.tip.internal.notifications.NotificationBase](#)

3.3.3.4.1. Attributes

name	datatype	properties	description
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object	AlarmSeverityAssignmentProfile	<ul style="list-style-type: none"> - multiplicity is 0..1 - optional - passed by value 	<p>This object class models the (flexible) severity assignment to specified probable causes. So the ASAP object includes a table, with each row specifying the probable cause (plus optionally the probableCauseQualifier and / or the nativeProbableCause) and the assigned severity for "service affecting", "non service affecting" and "service independent or unknown" alarms. Probable cause, probableCauseQualifier and nativeProbableCause are the coordinates of the ASAP entries, so there must not be two ASAP entries with the same coordinates. It is the responsibility of the EMS to enforce this. Alarms against entities that are not modeled by the interface are reported using the "AID" objectType. For these "AID" alarms the ASAP mechanism is not applicable. Typically the ASAP function is implemented in the OS or NE where the alarm is originated. I. e. the severity will usually be assigned directly by the NE, so it is up to the EMS to download the defined ASAP to the NE. Other alarms, e.g. on arcs like SNCs, may be generated by the target OS. An alarm becomes reportable by NE/target OS:- when for PTP, CTP, FTP: AlarmReporting changes from "off" to "on"- when for SNC, TopologicalLink, Equipment, EquipmentHolder, GTP: alarmReportingIndicator changes from false to true. Alarms are always reportable for all other objects as they do not have any alarm reporting attribute. When an alarm becomes reportable the ASAPs are applied (accessed via the asapPointer). The severity of the alarm is adopted from the ASAP entry that matches for all of the following:- same probableCause- same probableCauseQualifier (an empty string is a match)- same nativeProbableCause (an empty string is a match). For example, if the reportable alarm has LOS probableCause and an ASAP entry is found with LOS probableCause and both probableCauseQualifier and nativeProbableCause are empty strings, then the search is successful. If there is a matching ASAP, then the severities are adopted on the following basis:- the alarm is service affecting: the severity specified in the serviceAffecting field is assigned- the alarm is service non affecting: the severity specified in the serviceNonAffecting field is assigned- the alarm is service independent or NE/target OS is not equipped to determine if the alarm affects service or not: the severity specified in the serviceIndependentOrUnknown field is assigned. If the assigned severity specified in the ASAP is:- "FREE_CHOICE" then the NE/target OS are free to determine the severity. If there is no local mechanism on the ME/EMS to determine severity then the severity "INDETERMINATE" should be assigned.- "NOTALARMED" then the EMS should not emit an alarm over the EML-NML interface. If there is no ASAP that matches, then the NE/target OS is free to determine the severity. If there is no local mechanism on the NE/target OS to determine severity then the severity "INDETERMINATE" should be assigned. Once a severity has been assigned, the alarm notification is emitted (other than for "NOTALARMED"). Note: Any operation of alarm retrieval will not include "NOTALARMED" alarms.</p>
aliasNames	CheckedCollection	<ul style="list-style-type: none"> - multiplicity is 1 - unique - optional - AVC enabled 	<p>The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implementation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.</p>
sourceTime	time	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - mandatory 	<p>The time at which the event was reported by the source system (NE, EMS or OS).</p>
objectId	EntityIdentifier	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - mandatory 	<p>The identifier of the object associated with the event, as internal opaque identifier.</p>
objectType	String	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - mandatory 	<p>The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.</p>
extensionInfo	Any	<ul style="list-style-type: none"> - multiplicity is 0..1 - unique - optional 	<p>A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.</p>

3.3.4. Enumerations

3.3.4.1. AssignedSeverity

- Type: Enumeration Artifact
- Package: [org.tmforum.tip.resource.trouble.asap](#)
- Description:

The assigned severity is allocated to a probable cause using the alarm severity assignment profile. The identified probable cause should be raised with the assigned severity. The assignment of severities is extended beyond PerceivedSeverity to cover the case where:- no alarm should be raised: "NOT_ALARMED"- the target OS/NE is free to make a choice based upon its local criteria: "FREE_CHOICE".

- Properties:

3.3.4.1.1. Literals

name	datatype	properties	description
MINOR	String	value is "MINOR"	
MAJOR	String	value is "MAJOR"	
FREE_CHOICE	String	value is "FREE_CHOICE"	
WARNING	String	value is "WARNING"	
CRITICAL	String	value is "CRITICAL"	
INDETERMINATE	String	value is "INDETERMINATE"	
NOT_ALARMED	String	value is "NOT_ALARMED"	

4. Service Interfaces

Service interfaces available from TIP Maintenance, Protection and Alarm Control model:

- ASAPControlService
- ASAPRetrievalService
- AlarmControlService
- MaintenanceControlService
- ProtectionControlService
- ProtectionRetrievalService

4.1. ASAPControlService

- Type: Session Artifact (Service Interface)
- Package: [org.tmforum.tip.resource.trouble.asap](#)
- Description:

This service interface provides the operations related to the control of Alarm Severity Assignment Profiles (ASAP). Common operations are used on the ASAP entity.

- Operations exposed:

[assignAlarmSeverityAssignmentProfile](#)
[deassignAlarmSeverityAssignmentProfile](#)

- Common Operations

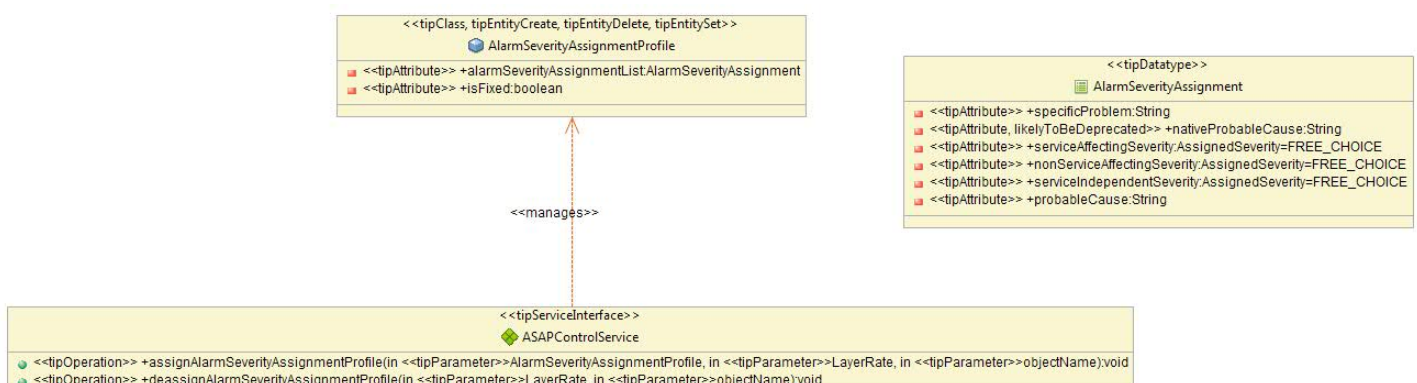
[deleteAlarmSeverityAssignmentProfiles](#)
[setAlarmSeverityAssignmentProfile](#)
[createAlarmSeverityAssignmentProfile](#)

- Managed entities:

[org.tmforum.tip.resource.trouble.asap.AlarmSeverityAssignmentProfile](#)

- Properties:

This service interface is optional



4.1.1. assignAlarmSeverityAssignmentProfile

- Type: Operation

- Description:

This operation assigns the addressed ASAP to the addressed resource, i.e. the asapRef attribute is updated accordingly. The formerly referenced ASAP, if any, is deassigned. For TPs, it is necessary to indicate also the Layer Rate the ASAP will apply to. For a TP with multiple layers, the operation can be used repeatedly to assign an ASAP to each layer as appropriate. This operation causes an Alarm re-evaluation of the already detected defects according to the following rules.

If Alarms are reportable (*):- if the severity changes from any of critical, major, minor, warning, to not alarmed, then an Alarm notification with cleared is sent and the Alarm is no longer available for any Alarm retrieval operation- if the severity changes from not alarmed to any of critical, major, minor, warning, then an Alarm notification with the new perceivedSeverity is sent (with the current target OS/NE time) and the alarm is available for any Alarm retrieval operation- if the severity changes from any of critical, major, minor, warning, to any of critical, major, minor, warning, then the Alarm re-evaluation process is not performed.

(*) Note that an alarm is reportable by NE/target OS:- when either the AlarmReporting layered parameter = "on"- or the alarmReportingIndicator attribute = true- or always for all other objects which do not have any Alarm reporting layered parameter or attribute.

Note that the clear notification is not send in case of transient events. If the addressed resource originates Alarms from within the NE, then this operation could imply the "activation" of the ASAP instance and functionality over the proper NE. E.g. the target OS will download the ASAP to a given NE only once the ASAP is assigned for the first time to a resource of that NE.

- Properties:

This operation is extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.1.1.1. Arguments

name	datatype	properties	description
asapRef	AlarmSeverityAssignmentProfile	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	This parameter contains the name of the ASAP object to be assigned.
layerRate	LayerRate	- input parameter - multiplicity is 0..1 - unique - optional	This parameter contains the TP Layer Rate the ASAP object is assigned to. If the resource is not a TP, then the Layer Rate value shall be LR_Not_Applicable.
resourceRef	objectName	- input parameter - multiplicity is 0..1 - unique - optional	This parameter contains the name of the resource to assign the ASAP to.
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

4.1.2. deassignAlarmSeverityAssignmentProfile

- Type: Operation

- Description:

This operation deassigns the ASAP from the addressed resource, i.e. the asapRef attribute of the resource is updated to no name. For TPs, it is necessary to indicate also the Layer Rate, in order to identify the ASAP to be deassigned. This operation causes an Alarm re-evaluation of the already detected defects according to the same rules as ASAP assignment, considering as "newly assigned ASAP" the default alarm severity assignment. If the addressed resource originates Alarms from within the Network Element (NE), then this operation could imply the "deactivation" of the ASAP instance and functionality over the proper NE. E.g. the target OS will remove the ASAP from a given NE only when the ASAP is no longer assigned to any resource of that NE.

- Properties:

This operation is extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.1.2.1. Arguments

name	datatype	properties	description
layerRate	LayerRate	- input parameter - multiplicity is 0..1 - unique - optional	This parameter contains the TP Layer Rate from which the ASAP shall be deassigned. If the resource is not a TP, then the Layer Rate value shall be LR_Not_Applicable.
resourceRef	objectName	- input parameter - multiplicity is 0..1 - unique - optional	This parameter contains the name of the resource to deassign the ASAP from.
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

4.1.3. deleteAlarmSeverityAssignmentProfiles

- Type: Operation

- Description:

This operation deletes the addressed ASAP. The operation fails if at least one resource is pointing to this ASAP. Moreover the Target OS could refuse this operation, in case the addressed ASAP is fixed.

- Properties:

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss
 InternalError
 InvalidInput
 NotImplemented
 UnableToComply

4.1.3.1. Arguments

name	datatype	properties	description
objectsToDelete	EntityIdentifier	-input parameter -multiplicity is 1..* -unique -passed by Id -mandatory	objects to delete, identified by EntityIdentifier
failedIds	AlarmSeverityAssignmentProfile	-output parameter -multiplicity is 0..* -unique -passed by id -optional	failed objects that could not be deleted(by id)
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

4.1.4. setAlarmSeverityAssignmentProfile

- Type: Operation

- Description:

This operation modifies the addressed ASAP according to the input parameters. This operation does not modify any current ASAP assignment. The specified alarmSeverityAssignmentList will completely replace the current one. The target OS could refuse this operation in case the addressed ASAP is fixed.

- Properties:

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.1.4.1. Arguments

name	datatype	properties	description
objectToSet	AlarmSeverityAssignmentProfile	-input parameter -multiplicity is 1 -unique -passed by Id -mandatory	object to set,passed as an EntityIdentifier
valuesToBeSet	SetDataForAlarmSeverityAssignmentProfile	-input parameter -multiplicity is 0..1 -unique -optional	values to be added, using datatype build by generators.Note that at least one of the parameter valuesToBeSet, valuesToAdd and valuesToRemove should be present
valuesToAdd	AddDataForAlarmSeverityAssignmentProfile	-input parameter -multiplicity is 0..1 -unique -optional	values to add, using datatype build by generators.Note that at least one of the parameter valuesToBeSet, valuesToAdd and valuesToRemove should be present

valuesToRemove	RemoveDataForAlarmSeverityAssignmentProfile	-input parameter -multiplicity is 0..1 -unique -optional	values to remove, using datatype build by generators. Note that at least one of the parameter valuesToBeSet, valuesToAdd and valuesToRemove should be present
modifiedObject	AlarmSeverityAssignmentProfile	-output parameter -multiplicity is 1 -unique -passed by value -mandatory	modified object by value

4.1.5. createAlarmSeverityAssignmentProfile

- Type: Operation

- Description:

This operation creates a new ASAP object, named by the target OS, with the values described by the input parameters. The operation fails if the maximum number of ASAPs for the target OS has been reached.

- Properties:

This operation is optional

- Return:

void

- Exceptions:

Duplicate

CapacityExceeded

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.1.5.1. Arguments

name	datatype	properties	description
referenceObject	AlarmSeverityAssignmentProfile	-input parameter -multiplicity is 0..1 -unique -passed by Id -optional	It specifies an existing instance of a managed object of the same class as the new object to be created
createData	CreateDataForAlarmSeverityAssignmentProfile	-input parameter -multiplicity is 1 -unique -mandatory	create data using the datatype generated
createdObject	AlarmSeverityAssignmentProfile	-output parameter -multiplicity is 1 -unique -passed by value -mandatory	created object

4.2. ASAPRetrievalService

- Type: Session Artifact (Service Interface)

- Package: [org.tmforum.tip.resource.trouble.asap](#)

- Description:

This service interface provides the operations related to the retrieval of Alarm Severity Assignment Profiles (ASAP).

- Operations exposed:

[getAlarmSeverityAssignmentProfile](#)
[getAlarmSeverityAssignmentProfiles](#)
[getAlarmSeverityAssignmentProfileByResource](#)
[getAllAlarmSeverityAssignmentProfilesWrtOs](#)
[getAsapAssociatedResourceNames](#)

- Common Operations

- Properties:

This service interface is optional

ASAPRetrievalService	
<<tipOperation>>	+getAlarmSeverityAssignmentProfile(in <<tipParameter>>AlarmSeverityAssignmentProfile, out <<tipParameter>>AlarmSeverityAssignmentProfile):void
<<tipOperation>>	+getAlarmSeverityAssignmentProfiles(in <<tipParameter>>filter, in <<tipParameter>>String[0..*], out <<tipParameter>>AlarmSeverityAssignmentProfile[0..*]):void
<<tipOperation>>	+getAlarmSeverityAssignmentProfileByResource(in <<tipParameter>>LayerRate[*], in <<tipParameter>>objectName, out <<tipParameter>>AlarmSeverityAssignmentProfile[*]):void
<<tipOperation>>	+getAllAlarmSeverityAssignmentProfilesWrtOs(in <<tipParameter>>objectName, out <<tipParameter>>AlarmSeverityAssignmentProfile[*]):void
<<tipOperation>>	+getAsapAssociatedResourceNames(in <<tipParameter>>AlarmSeverityAssignmentProfile, out <<tipParameter>>objectName[*]):void

4.2.1. getAlarmSeverityAssignmentProfile

- Type: Operation

- Description:

This operation returns an ASAP instance given its name.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

[EntityNotFound](#)

[AccessDenied](#)

[CommunicationLoss](#)

[InternalError](#)

[InvalidInput](#)

[NotImplemented](#)

[UnableToComply](#)

4.2.1.1. Arguments

name	datatype	properties	description
objectToGet	AlarmSeverityAssignmentProfile	<ul style="list-style-type: none"> - input parameter - multiplicity is 1 - unique - passed by id - mandatory 	object to get, by entity identifier
object	AlarmSeverityAssignmentProfile	<ul style="list-style-type: none"> - output parameter - multiplicity is 1 - unique - passed by value - mandatory 	object returned by value

4.2.2. getAlarmSeverityAssignmentProfiles

- Type: Operation

- Description:

This operation returns the ASAP instances matching a filter.

- Properties:

This operation uses iterator bulk transfer pattern

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

FilterNotSupported

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.2.2.1. Arguments

name	datatype	properties	description
filter	filter	- input parameter - multiplicity is 1 - unique - query filter - mandatory	input filter
attributeSelector	String	- input parameter - multiplicity is 0..* - unique - optional	Allow to specify which attributes to return. It allows to return only a subset of the object instead of the full object. If empty, the whole object is returned.
objects	AlarmSeverityAssignmentProfile	- output parameter - multiplicity is 0..* - unique - passed by value - bulk potential - mandatory	objects returned by value

4.2.3. getAlarmSeverityAssignmentProfileByResource

- Type: Operation

- Description:

This operation retrieves the ASAP(s) which are assigned to the addressed resource. The ASAP list can have zero or more elements, as all resources but TPs can refer to at most one ASAP. TPs can refer to more ASAPs, at most as many as the number of encapsulated layer rates.

- Properties:

This operation uses iterator bulk transfer pattern

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.2.3.1. Arguments

name	datatype	properties	description
layerRateList	LayerRate	- input parameter - multiplicity is * - unique - optional	
resourceRef	objectName	- input parameter - multiplicity is 0..1 - unique - optional	
asapList	AlarmSeverityAssignmentProfile	- output parameter - multiplicity is * - unique - passed by value - bulk potential - optional	

4.2.4. getAllAlarmSeverityAssignmentProfilesWrtOs

- Type: Operation

- Description:

This operation returns the data structure for each ASAP associated with a given subordinate OS. Note that Wrt in the name of the operation stands for "with respect to".

- Properties:

This operation uses iterator bulk transfer pattern

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.2.4.1. Arguments

name	datatype	properties	description
osRef	objectName	- input parameter - multiplicity is 1 - unique - mandatory	
asapList	AlarmSeverityAssignmentProfile	- output parameter - multiplicity is * - unique - passed by value - bulk potential - mandatory	

4.2.5. getAsapAssociatedResourceNames

- Type: Operation

- Description:

This operation retrieves the names of all the resources (could be TPs, SNCs, etc.) which point to the addressed ASAP instance.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.2.5.1. Arguments

name	datatype	properties	description
asapRef	AlarmSeverityAssignmentProfile	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	
resourceRefList	objectName	- output parameter - multiplicity is * - unique - mandatory	

4.3. AlarmControlService

- Type: Session Artifact (Service Interface)

- Package: [org.tmforum.tip.resource.trouble.control](#)

- Description:

do we need to add the specific methods per resource and TP


- Operations exposed:

[setAlarmReporting](#)

- Common Operations

- Properties:

This service interface is optional

AlarmControlService
 <<tipOperation>> +setAlarmReporting(in <<tipParameter>>objectName, in <<tipParameter>>int=1, in <<tipParameter>>boolean):void

4.3.1. setAlarmReporting

- Type: Operation

- Description:

This operation allows a requesting OS to activate and deactivate (allow/not allow, or turn on/off) alarm reporting for all object classes which are able to issue alarms. Alarm reporting for multi layer object classes can be activated/deactivated at a specific layerRate provided by the requesting OS.

The following object classes are able to issue alarms:- Equipment- Equipment Holder- Equipment Protection Group- Flow Domain- Flow Domain Fragment- Group Termination Point- Managed Element- Management Domain- Matrix Flow Domain- Multi-Layer Subnetwork- Operations System- Protection Group- Subnetwork Connection- Termination Point (and subclasses)- Topological Link.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.3.1.1. Arguments

name	datatype	properties	description
resourceRef	objectName	- input parameter - multiplicity is 1 - unique - mandatory	This parameter contains the name of the resource who's alarm reporting shall be set.
layerRate	int	- input parameter - multiplicity is 0..1 - unique - default value is '1' - optional	This parameter defines the layer rate of the object class who's alarm reporting shall be set.
mustReportAlarms	boolean	- input parameter - multiplicity is 1 - unique - mandatory	This parameter indicates that the Alarms have to be turned on (True) or turned off (False).

4.4. MaintenanceControlService

- Type: Session Artifact (Service Interface)
- Package: [org.tmforum.tip.resource.res.log.maint](#)
- Description:

This service interface provides the services related to Maintenance, getting available maintenance operations and performing them.

- Operations exposed:

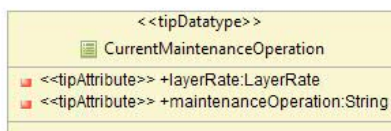
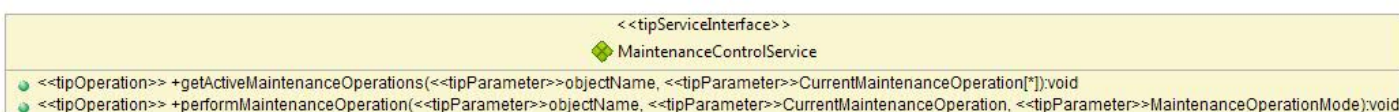
[getActiveMaintenanceOperations](#)

[performMaintenanceOperation](#)

- Common Operations

- Properties:

This service interface is optional



4.4.1. getActiveMaintenanceOperations

- Type: Operation

- Description:

This operation retrieves all persistent maintenance commands that are currently enabled on the provided resource.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

[AccessDenied](#)

[CommunicationLoss](#)

[InternalError](#)

[InvalidInput](#)

[NotImplemented](#)

[UnableToComply](#)

4.4.1.1. Arguments

name	datatype	properties	description
resourceRef	objectName	- input parameter - multiplicity is 1 - unique - mandatory	This parameter contains the name of the resource.
currentMaintenanceOperationList	CurrentMaintenanceOperation	- output parameter - multiplicity is * - unique - bulk potential - mandatory	This parameter returns all persistent maintenance commands that have been invoked for the given resource and Layer Rate if applicable.

4.4.2. performMaintenanceOperation

- Type: Operation

- Description:

This operation performs maintenance commands on the provided resource.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.4.2.1. Arguments

name	datatype	properties	description
resourceRef	objectName	- input parameter - multiplicity is 0..1 - unique - optional	This parameter contains the name of the resource.
maintenanceOperation	CurrentMaintenanceOperation	- input parameter - multiplicity is 0..1 - unique - optional	This parameter contains information on the maintenance operation to perform.
maintenanceOperationMode	MaintenanceOperationMode	- input parameter - multiplicity is 0..1 - unique - optional	This parameter indicates whether the maintenance operation should be operated or released.

4.5. ProtectionControlService

- Type: Session Artifact (Service Interface)

- Package: [org.tmforum.tip.resource.res.log.prot](#)

- Description:

This service interface includes operations to perform protection services.

- Operations exposed:

[performProtectionCommand](#)

- Common Operations

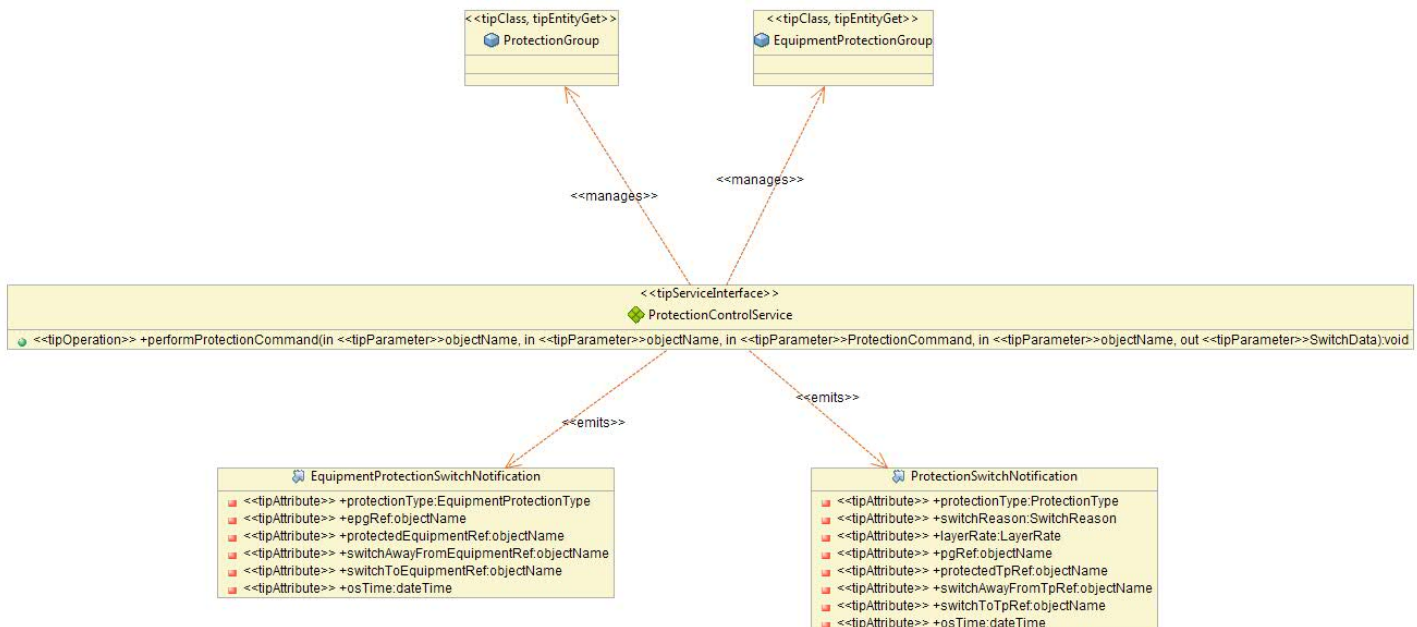
- Emitted events:

[org.tmforum.tip.resource.res.log.prot.EquipmentProtectionSwitchNotification](#)

[org.tmforum.tip.resource.res.log.prot.ProtectionSwitchNotification](#)

- Properties:

This service interface is optional



4.5.1. performProtectionCommand

- Type: Operation

- Description:

This operation is used to execute a protection switch. The protection switch may be performed via a protection switch command, on a protection group or on a CTP/FTP involved in an SNCP. It performs a specified protection command or clears all outstanding persistent protection commands. Note: At a PGP, for 4-fiber SONET/SDH SPRINGS, the span switch is performed on the MSP_1_FOR_N protection group, and the ring switch on the FOUR_FIBER_BLSR group.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

[AccessDenied](#)

[CommunicationLoss](#)

[InternalError](#)

[InvalidInput](#)

[NotImplemented](#)

[UnableToComply](#)

4.5.1.1. Arguments

name	datatype	properties	description
fromTPRef	objectName	- input parameter - multiplicity is 0..1 - unique - optional	This parameter contains the present source of the traffic.
toTPRef	objectName	- input parameter - multiplicity is 0..1 - unique - optional	This parameter contains the requested source of the traffic after the command.
protectionCommand	ProtectionCommand	- input parameter - multiplicity is 0..1 - unique - optional	This parameter contains the command to be performed. See ITU-T Recommendation G.841 for definitions.
resourceRef	objectName	- input parameter - multiplicity is 0..1 - unique - optional	This parameter contains the name of the resource on which the protection command has to be performed.
switchData	SwitchData	- output parameter - multiplicity is 0..1 - unique - optional	This parameter contains the protection switch status of the CTP provided after the execution of the command.

4.6. ProtectionRetrievalService

- Type: Session Artifact (Service Interface)

- Package: `org.tmforum.tip.resource.res.log.prot`

- Operations exposed:

`getAllEquipmentProtectionGroups`
`getAllNonPreemptibleUnprotectedTpNames`
`getAllPreemptibleTerminationPointNames`
`getAllProtectedTerminationPointNames`
`getAllProtectionGroups`
`getContainingProtectionGroupNames`
`retrieveEquipmentSwitchData`
`retrieveSwitchData`

- Common Operations

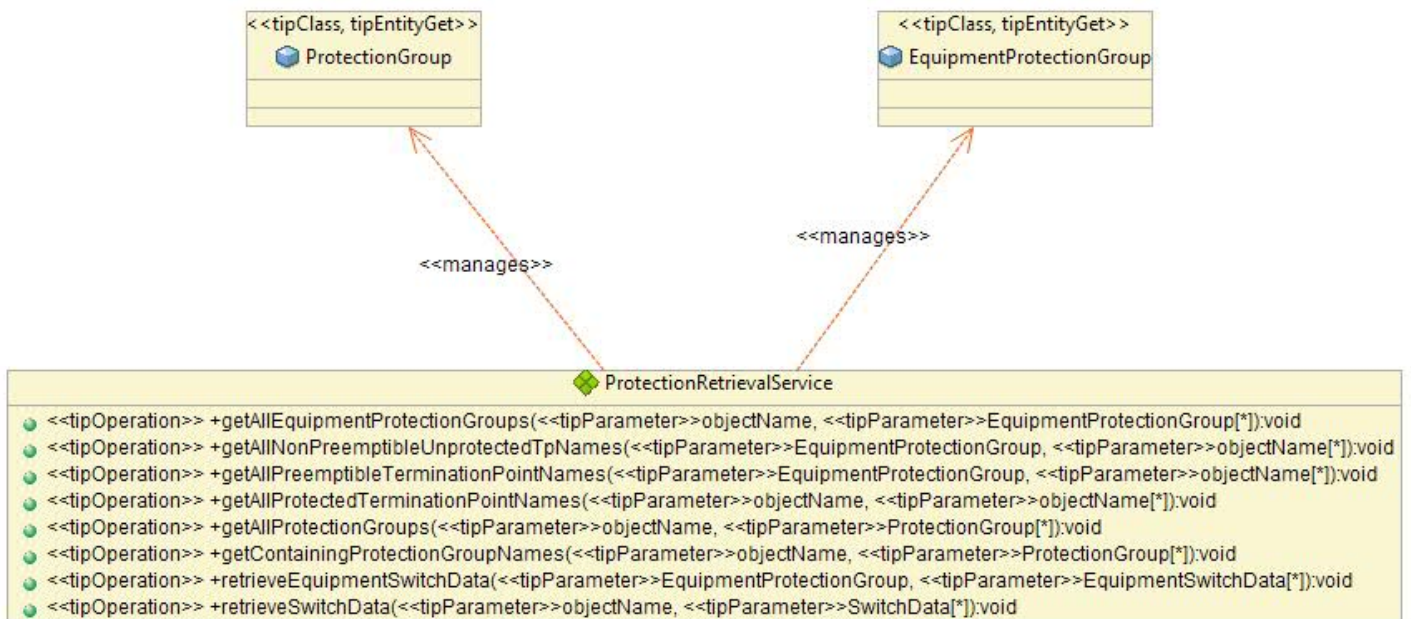
`getProtectionGroup`
`getEquipmentProtectionGroup`

- Managed entities:

`org.tmforum.tip.resource.res.log.prot.ProtectionGroup`
`org.tmforum.tip.resource.res.log.prot.EquipmentProtectionGroup`

- Properties:

This service interface is optional



4.6.1. getAllEquipmentProtectionGroups

- Type: Operation

- Description:

This operation discovers all the Equipment Protection Groups currently in operation for the Managed Element.

- Properties:

This operation uses iterator bulk transfer pattern

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.6.1.1. Arguments

name	datatype	properties	description
meRef	objectName	- input parameter - multiplicity is 1 - unique - mandatory	This parameter provides the name of the Managed Element containing the Equipment Protection Groups to be retrieved.
epgList	EquipmentProtectionGroup	- output parameter - multiplicity is * - unique - passed by value - bulk potential - mandatory	This parameter returns the list of Equipment Protection Group objects.

4.6.2. getAllNonPreemptibleUnprotectedTpNames

- Type: Operation
- Description:
- Properties:
 - This operation is not extendable
 - This operation is optional
- Return:
 - void
- Exceptions:
 - AccessDenied
 - CommunicationLoss
 - InternalError
 - InvalidInput
 - NotImplemented
 - UnableToComply

4.6.2.1. Arguments

name	datatype	properties	description
pgRef	EquipmentProtectionGroup	<ul style="list-style-type: none"> - input parameter - multiplicity is 1 - unique - passed by id - mandatory 	This parameter provides the name of the Protection Group.
ctpRefList	objectName	<ul style="list-style-type: none"> - output parameter - multiplicity is * - unique - mandatory 	This parameter returns the names of the CTPs that have NUT turned on.

4.6.3. getAllPreemptibleTerminationPointNames

- Type: Operation
- Description:

This operation discovers which of the CTPs in a Protection Group provide pre-emptible (and unprotected) services.
- Properties:
 - This operation is not extendable
 - This operation is optional
- Return:
 - void
- Exceptions:
 - AccessDenied
 - CommunicationLoss
 - InternalError
 - InvalidInput
 - NotImplemented
 - UnableToComply

4.6.3.1. Arguments

name	datatype	properties	description
pgRef	EquipmentProtectionGroup	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	This parameter provides the name of the Protection Group.
ctpRefList	objectName	- output parameter - multiplicity is * - unique - mandatory	This parameter returns the names of the CTPs that can carry preemptible extra traffic.

4.6.4. getAllProtectedTerminationPointNames

- Type: Operation

- Description:

This operation discovers which of the CTPs in a Protection Group provide protected services.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.6.4.1. Arguments

name	datatype	properties	description
ptpRef	objectName	- input parameter - multiplicity is 1 - unique - mandatory	This parameter provides the name of the Physical Termination Point.
pgRefList	objectName	- output parameter - multiplicity is * - unique - mandatory	This parameter returns the names of the containing Protection Groups.

4.6.5. getAllProtectionGroups

- Type: Operation

- Description:

- Properties:

This operation uses iterator bulk transfer pattern

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.6.5.1. Arguments

name	datatype	properties	description
meRef	objectName	- input parameter - multiplicity is 1 - unique - mandatory	This parameter provides the name of the Managed Element containing the Equipment Protection Groups to be retrieved.
pgList	ProtectionGroup	- output parameter - multiplicity is * - unique - passed by value - bulk potential - mandatory	This parameter returns the list of Protection Group objects.

4.6.6. getContainingProtectionGroupNames

- Type: Operation

- Description:

This operation allows the requesting OS to retrieve the names of the Protection Groups containing a given Physical Termination Point.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.6.6.1. Arguments

name	datatype	properties	description
ptpRef	objectName	- input parameter - multiplicity is 1 - unique - mandatory	This parameter provides the name of the Physical Termination Point.

pgRefList	ProtectionGroup	<ul style="list-style-type: none"> - output parameter - multiplicity is * - unique - passed by value - bulk potential - mandatory 	This parameter returns the names of the containing Protection Groups.
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4.6.7. retrieveEquipmentSwitchData

- Type: Operation

- Description:

This operation is used to retrieve the latest switch status on a Protection Group.- When used on a 1+1 trail protection (e.g. MSP), a single SwitchData data type with the relevant data is returned.- When used on a 1:N trail protection (e.g. MSP), a SwitchData data type per worker TP is presented with the protected TP being the worker TP Name and the switchToTpRef identifying the present source of the traffic.- When used on a 2F BLSR, two SwitchData data types are returned, one per TP. The protected TP and the switchToTpRef are all the same in an unswitched state and in the switched state, the switchToTpRef is the TP in the other direction. The switchFromTpRef is Null.- When used on a 4F BLSR (as an input group), two SwitchData data types are returned each one identifying a span with the protected TP being the worker TP, the switchToTpRef identifying the present source, the switchFromTpRef is Null.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.6.7.1. Arguments

name	datatype	properties	description
epgRef	EquipmentProtectionGroup	<ul style="list-style-type: none"> - input parameter - multiplicity is 1 - unique - passed by id - mandatory 	This parameter provides the name of the Equipment Protection Group whose switch status is to be retrieved.
equipmentSwitchDataList	EquipmentSwitchData	<ul style="list-style-type: none"> - output parameter - multiplicity is * - unique - mandatory 	This parameter returns the current protection switch status of the Equipment Protection Group.

4.6.8. retrieveSwitchData

- Type: Operation

- Description:

This operation is used to retrieve the latest switch status on a Protection Group.- When used on a 1+1 trail protection (e.g. MSP), a single SwitchData data type with the relevant data is returned.- When used on a 1:N trail protection (e.g. MSP), a SwitchData data

type per worker TP is presented with the protected TP being the worker TP Name and the switchToTpRef identifying the present source of the traffic.- When used on a 2F BLSR, two SwitchData data types are returned, one per TP. The protected TP and the switchToTpRef are all the same in an unswitched state and in the switched state, the switchToTpRef is the TP in the other direction. The switchFromTpRef is Null.- When used on a 4F BLSR (as an input group), two SwitchData data types are returned each one identifying a span with the protected TP being the worker TP, the switchToTpRef identifying the present source, the switchFromTpRef is Null.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.6.8.1. Arguments

name	datatype	properties	description
ctpOrPgRef	objectName	- input parameter - multiplicity is 1 - unique - mandatory	This parameter provides the name of the reliable CTP or the Protection Group whose switch status is to be retrieved.
switchDataList	SwitchData	- output parameter - multiplicity is * - unique - mandatory	This parameter returns the current protection switch status of the CTP or Protection Group.

4.6.9. getProtectionGroup

- Type: Operation

- Description:

This operation is used to retrieve the details of a Protection Group.

- Properties:

This operation is extendable

This operation is optional

- Return:

void

- Exceptions:

EntityNotFound

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.6.9.1. Arguments

name	datatype	properties	description
objectToGet	ProtectionGroup	-input parameter -multiplicity is 1 -unique -passed by Id -mandatory	object to get, identified by EntityIdentifier
object	ProtectionGroup	-output parameter -multiplicity is 1 -unique -passed by value -mandatory	object returned by value
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

4.6.10. getEquipmentProtectionGroup

- Type: Operation

- Description:

This operation is used to retrieve the details of an Equipment Protection Group.

- Properties:

This operation is extendable

This operation is optional

- Return:

void

- Exceptions:

EntityNotFound

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.6.10.1. Arguments

name	datatype	properties	description
objectToGet	EquipmentProtectionGroup	-input parameter -multiplicity is 1 -unique -passed by Id -mandatory	object to get, identified by EntityIdentifier
object	EquipmentProtectionGroup	-output parameter -multiplicity is 1 -unique -passed by value -mandatory	object returned by value
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.