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SERIES G: TRANSMISSION SYSTEMS AND MEDIA,  
DIGITAL SYSTEMS AND NETWORKS

Digital transmission systems – Digital networks –  
Management of transport network

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**Enterprise viewpoint for trail management**

ITU-T Recommendation G.852.6

(Previously CCITT Recommendation)

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**ENTERPRISE VIEWPOINT FOR TRAIL MANAGEMENT**

**Summary**

The trail management service provides functionality for:

- creation/deletion of trail termination points;
- association/disassociation of trail termination points with/from subnetworks or access groups;
- creation/deletion and configuration of trails between a specified set of endpoints and/or access groups at the boundary of a layer network.

**Source**

ITU-T Recommendation G.852.6 was prepared by ITU-T Study Group 4 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 26th of March 1999.

## FOREWORD

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## **Recommendation G.852.6**

### **ENTERPRISE VIEWPOINT FOR TRAIL MANAGEMENT**

*(Geneva, 1999)*

#### **1 Scope**

This Recommendation specifies the enterprise viewpoint for the trail management of a transport network.

#### **2 References**

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is published regularly.

- [1] ITU-T Recommendation G.851.1 (1996), *Management of the transport network – Application of the RM-ODP framework.*
- [2] ITU-T Recommendation G.852.2 (1999), *Enterprise viewpoint description of transport network resource model.*

#### **3 Definitions**

None.

#### **4 Abbreviations**

This Recommendation uses the following abbreviations:

Id	Identifier
QoS	Quality of Service
RM-ODP	Reference Model for Open Distributed Processing
SDH	Synchronous Digital Hierarchy
TE	Transport Entity
tm	Trail Management
TTP	Trail Termination Point
WDM	Wavelength Division Multiplexing

#### **5 Conventions**

For further study.

## **6 Community trail management**

### **6.1 Purpose**

The objective of the community is to establish, use, configure, and release a trail between a specified set of endpoints and/or access groups at the boundary of a layer network. Functionality to create and delete trail termination points and to associate and disassociate them with subnetworks and access groups are provided as well.

### **6.2 Role**

#### **tm\_caller**

This role reflects the client of the actions defined within this community. One and only one caller role occurrence must exist in the community.

#### **tm\_provider**

This role reflects the server of the actions defined within this community. One and only one provider role occurrence must exist in the community.

#### **notification receiver**

This role represents a receiver of the reporting actions defined within this community. Zero or more notification receiver role occurrences may exist in the community.

#### **layer network domain**

This role represents the layer network domain resource defined in Recommendation G.852.2. One and only one role occurrence may exist in the community.

#### **trail**

This role reflects the trail resource (as defined in Recommendation G.852.2) involved in the trail management community. Zero or more trail role occurrences may exist in the community.

#### **trail termination point**

This role reflects the trail termination point resource as defined in Recommendation G.852.2. Zero or more trail termination point role occurrences may exist within this community.

#### **subnetwork**

This role reflects the subnetwork resource as defined in Recommendation G.852.2. Zero or more subnetwork role occurrences may exist within this community.

#### **subnetwork connection**

This role reflects the subnetwork connection resource as defined in Recommendation G.852.2. Zero or more subnetwork connection role occurrences may exist within the community.

#### **access group**

This role reflects the access group resource as defined in Recommendation G.852.2. Zero or more access group role occurrences may exist in the community.



### **6.3 Community\_policy**

#### **OBLIGATION scope**

Only properties that are explicitly stated in this community are valid and can be accessed by both caller and provider of this community. Conformance to this service depends only on the explicit specification of this service. Any other modifications outside of this community are not relevant for conformance.

#### **OBLIGATION serviceRejection**

In case of service rejection, the provider shall identify the obligation or prohibition which is not fulfilled either by the caller or the provider. The provider shall give an indication about any execution infrastructure problem. In this case, the level of detail indicated by the provider shall be dependent on the shared knowledge of the infrastructure on which the community is running. For the case where any wrong parameters have been passed to the provider, the return exception shall indicate these parameters.

#### **OBLIGATION signalId**

Each resource in the community shall have the same signal identification.

#### **OBLIGATION viewingCapabilities**

The provider shall support a view of the resource properties and relationships that have been identified or permitted in the service contract with the caller.

#### **OBLIGATION belongingConstraints**

All resources managed in the community actions shall belong to the community.

#### **OBLIGATION architecturalConstraints**

All the modifications performed on the resources in the community shall respect the architectural constraints expressed in Recommendation G.852.2.

#### **PERMISSION changeUserLabel**

The caller may change the user-defined label of the trail and the trail termination point.

#### **OBLIGATION notifyUserLabelChange**

If PERMISSION changeUserLabel is used by the caller, any change of the user-defined label of a trail or a trail termination point shall be notified to the notification receiver.

### **6.4 Action**

#### **6.4.1 Set up point-to-point trail**

With this action, the caller has the ability to request the immediate (the trail will be active once it is set up) setting-up of a trail between two identified trail termination points or access groups in the same layer network.

#### **ACTION\_POLICY**

#### **OBLIGATION supplyTrailTerminationPoints/AccessGroups**

The caller shall identify a trail termination point or an access group at each end of the trail in the same layer network.

#### OBLIGATION trailTerminationPointsInUse

The provider shall reject the request if at least one of the supplied trail termination points, or all the trail termination points of at least one of the supplied access groups (if access groups were identified) are already terminating a trail. In the case of failure, the provider shall return the identifier of the trail termination point in error.

#### PERMISSION routingConstraints

The caller may specify routing constraints for the requested transport service.

#### OBLIGATION routingConstraintsNotFulfilled

- If PERMISSION routingConstraints is used and the routing constraints specified could not be fulfilled by the provider, the request has to be rejected.
- The routing constraints are technology dependent and will be established outside the trail management community.

#### PERMISSION trafficCharacteristics

The caller may specify the characteristics of a traffic descriptor to be associated with the requested transport service (e.g. service type, cell delay variation, burst size, peak rate, sustainable rate, QoS class, etc.). These characteristics are contract and technology specific.

#### OBLIGATION trafficCharacteristicsNotFulfilled

If PERMISSION trafficCharacteristics is used and the provider cannot support the required traffic characteristics, it shall reject the request.

#### PERMISSION inputUserId

The caller may provide a user identifier for the requested trail.

#### OBLIGATION rejectUserIdNotUnique

If PERMISSION inputUserId is part of the contracted service and if the user identifier is not unique in the provider context, then the provider shall reject the action.

#### OBLIGATION providerUserId

If PERMISSION inputUserId is part of the contracted service, then the provider shall use the user identifier as the unique trail identifier when communicating with the caller.

#### OBLIGATION returnTrailAndTTPIs

The provider shall, upon success of this action, return the unique identifiers for the trail and the actual trail termination points supplied or chosen from the access group.

#### PERMISSION inputUserLabel

The caller may provide a user-defined label for the requested trail.

### **6.4.2 Modify trail**

This action is used to modify the characteristics of a trail.

#### **ACTION\_POLICY**

#### OBLIGATION supplyTrailId

The caller shall uniquely identify the trail of which the characteristics have to be modified.

#### OBLIGATION noExistingTrailId

This action will fail if the supplied trail identifier does not exist within the layer network domain. In the case of failure, the provider shall return the identifier of the trail in error.

#### OBLIGATION requestTrailModification

The provider shall give the possibility to modify the data rate on an established active trail without the need to deactivate the trail.

#### PERMISSION renegotiateParameters

A caller may request the renegotiation (up or down) of the QoS on an active trail which may result in the modification of some Connectivity Service parameters affecting the overall QoS.

#### OBLIGATION maintainInitialCharacteristics

The initial characteristics shall be maintained if the requested modifications cannot be fulfilled.

#### OBLIGATION reportRenegotiatedResult

The outcome of the renegotiation shall be reported to the caller.

### 6.4.3 Release trail

This action releases a trail.

#### **ACTION\_POLICY**

#### OBLIGATION supplyTrailId

The caller shall specify the trail which has to be released.

#### OBLIGATION noExistingTrailId

This action will fail if the supplied trail identifier does not exist within the layer network domain. In the case of failure, the provider shall return the identifier in error.

#### OBLIGATION returnTrailId

In case of a successful release, the provider shall inform the caller of the identifier of the released trail.

### 6.4.4 Create trail termination point

This action is used for the creation of a trail termination point. The caller has the ability to provide a unique user identifier to identify the trail termination point that has been created.

#### **ACTION\_POLICY**

#### OBLIGATION inputDirectionality

The caller shall specify the directionality of the trail termination point to be created.

#### PERMISSION inputUserId

The caller may provide a user identifier for the requested trail termination point.

#### OBLIGATION rejectUserIdNotUnique

If PERMISSION inputUserId is part of the contracted service and if the user identifier is not unique in the provider context, then the provider shall reject the action.

OBLIGATION provideUserId

If PERMISSION inputUserId is part of the contracted service, then the provider shall use the user identifier as the unique identifier when communicating with the caller.

OBLIGATION successReturnId

If PERMISSION inputUserId is not part of the contracted service, the provider shall, upon success of this action return, the unique identifier for the created trail termination point.

PERMISSION inputUserLabel

The caller may provide a user label for the requested trail termination point.

#### **6.4.5 Delete trail termination point**

This action is used to delete a trail termination point. The trail termination point specified by the caller must not be associated with a subnetwork or an access group, nor may the trail termination point terminate a trail.

#### **ACTION\_POLICY**

OBLIGATION inputTTPId

The caller shall provide the identifier of the trail termination point which shall be deleted.

OBLIGATION noExistingTTPId

This action will fail if the supplied trail termination point identifier does not exist within the layer network domain. In the case of failure, the provider shall return the identifier of the trail termination point in error.

OBLIGATION noTrail

The action fails if the trail termination point identified is still the extremity of a trail.

OBLIGATION notAssociatedWithSubnetwork

The action fails if the trail termination point is still associated with a subnetwork.

OBLIGATION notAssociatedWithAccessGroup

The action fails if the trail termination point is still associated with an access group.

OBLIGATION successTTPDeleted

In case of success, the provider shall indicate to the caller that the action was successful.

#### **6.4.6 Associate trail termination point with access group**

This action is used to make an association between a trail termination point and an access group.

#### **ACTION\_POLICY**

OBLIGATION inputTTPId

The caller shall identify the trail termination point that shall be associated with an access group.

OBLIGATION noExistingTTPId

This action will fail if the supplied trail termination point identifier does not exist within the layer network domain. In the case of failure, the provider shall return the identifier of the trail termination point in error.

**OBLIGATION inputAccessGroupId**

The caller shall identify the access group to which the TTP shall be associated.

**OBLIGATION noExistingAccessGroupId**

This action will fail if the supplied access group identifier does not exist within the layer network domain. In the case of failure, the provider shall return the identifier of the access group in error.

**OBLIGATION tTPNotAlreadyAssociated**

The provider shall reject the request if the trail termination point identified by the caller is already associated with an access group.

**OBLIGATION successTTPAssociated**

In case of success, the provider shall indicate to the caller that the action was successful.

**6.4.7 Disassociate trail termination point from access group**

This action is used to disassociate a trail termination point from an access group.

**ACTION\_POLICY**

**OBLIGATION inputTTPId**

In the request, the caller shall identify the trail termination point that shall be disassociated.

**OBLIGATION noExistingTTPId**

This action will fail if the supplied trail termination point identifier does not exist within the layer network domain. In the case of failure, the provider shall return the identifier of the trail termination point in error.

**OBLIGATION inputAccessGroupId**

In the request, the caller shall identify the access group from which the trail termination point shall be disassociated.

**OBLIGATION noExistingAccessGroupId**

This action will fail if the supplied access group identifier does not exist within the layer network domain. In the case of failure, the provider shall return the identifier of the access group in error.

**OBLIGATION successTTPDisassociated**

In case of success, the provider shall indicate to the caller that the action was successful.

**6.4.8 Associate trail termination point with subnetwork**

This action is used to make an association between a trail termination point and a subnetwork. This action makes the trail termination point available for connection across this subnetwork.

**ACTION\_POLICY**

**OBLIGATION inputTTPId**

The caller shall identify the trail termination point that shall be associated.

**OBLIGATION noExistingTTPId**

This action will fail if the supplied trail termination point identifier does not exist within the layer network domain. In the case of failure, the provider shall return the identifier of the trail termination point in error.

OBLIGATION inputSubnetworkId

The caller shall identify the subnetwork to which the TTP shall be associated.

OBLIGATION noExistingSubnetworkId

This action will fail if the supplied subnetwork identifier does not exist within the layer network domain. In the case of failure, the provider shall return the identifier of the subnetwork in error.

OBLIGATION tTPNotAlreadyAssociated

The provider shall reject the request if the trail termination point identified by the caller is already associated with a subnetwork.

OBLIGATION successTTPAssociated

In case of success, the provider shall indicate to the caller that the action was successful.

#### **6.4.9 Disassociate trail termination point from subnetwork**

This action is used to disassociate a trail termination point from a subnetwork. This makes the trail termination point unavailable for connections across this subnetwork.

#### **ACTION\_POLICY**

OBLIGATION inputTTPIId

The caller shall identify the trail termination point that shall be disassociated.

OBLIGATION noExistingTTPIId

This action will fail if the supplied trail termination point identifier does not exist within the layer network domain. In the case of failure, the provider shall return the identifier of the trail termination point in error.

OBLIGATION inputSubnetworkId

The caller shall identify the subnetwork from which the trail termination point shall be disassociated.

OBLIGATION noExistingSubnetworkId

This action will fail if the supplied subnetwork identifier does not exist within the layer network domain. In the case of failure, the provider shall return the identifier of the subnetwork in error.

OBLIGATION tTPNotDisassociated

The provider shall reject the request if the trail termination point identified by the caller is not associated with the subnetwork.

OBLIGATION successTTPAssociated

In case of success, the provider shall indicate to the caller that the action was successful.

#### **6.4.10 Report trail set-up**

This action is used by the provider to report to the notification receiver the set-up of a trail.

#### **ACTION\_POLICY**

OBLIGATION informTrailSetUp

The notification receiver shall be informed by the provider of the identifier of the trail which has been set up and of the identifiers of its delimiting trail termination points.

#### **6.4.11 Report trail modification**

This action is used by the provider to report to the notification receiver the modification of a trail.

##### **ACTION\_POLICY**

OBLIGATION informTrailModification

The notification receiver shall be informed by the provider of the identifier of the trail which has been modified and of the modifications made.

#### **6.4.12 Report trail release**

This action is used by the provider to report to the notification receiver the deletion of a trail.

##### **ACTION\_POLICY**

OBLIGATION informTrailRelease

The notification receiver shall be informed by the provider of the identifier of the trail which has been released.

#### **6.4.13 Report trail termination point creation**

This action is used by the provider to report to the notification receiver the creation of a trail termination point.

OBLIGATION informTTPCreate

The notification receiver shall be informed by the provider of the identifier of the trail termination point which has been created.

#### **6.4.14 Report trail termination point deletion**

This action is used by the provider to report to the notification receiver the deletion of a trail termination point.

##### **ACTION\_POLICY**

OBLIGATION informTTPDelete

The notification receiver shall be informed by the provider of the identifier of the trail termination point which has been deleted.

#### **6.4.15 Report association of trail termination point with access group**

This action is used by the provider to report to the notification receiver the association of a trail termination point with an access group.

##### **ACTION\_POLICY**

OBLIGATION informTTP&AccessGroupAssociation

The notification receiver shall be informed by the provider of the identifiers of the trail termination point and the access group that have been associated.

#### **6.4.16 Report disassociation of trail termination point from access group**

This action is used by the provider to report to the notification receiver the disassociation of a trail termination point from an access group.

## **ACTION\_POLICY**

OBLIGATION informTTP&AccessGroupDisassociation

The notification receiver shall be informed by the provider of the identifiers of the trail termination point and the access group that have been disassociated.

### **6.4.17 Report association of trail termination point with subnetwork**

This action is used by the provider to report to the notification receiver the association of a trail termination point with a subnetwork.

## **ACTION\_POLICY**

OBLIGATION informTTP&SubnetworkAssociation

The notification receiver shall be informed by the provider of the identifiers of the trail termination point and the subnetwork that have been associated.

### **6.4.18 Report disassociation of trail termination point from subnetwork**

This action is used by the provider to report to the notification receiver the disassociation of a trail termination point from a subnetwork.

## **ACTION\_POLICY**

OBLIGATION informTTP&SubnetworkDisassociation

The notification receiver shall be informed by the provider of the identifiers of the trail termination point and the subnetwork that have been disassociated.



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