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

Digital transmission systems – Digital networks –
Management of transport network

Computational viewpoint for pre-provisioned adaptation management

ITU-T Recommendation G.854.8

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION G.854.8

COMPUTATIONAL VIEWPOINT FOR PRE-PROVISIONED ADAPTATION MANAGEMENT

Summary

The objective of pre-provisioned adaptation management community is to provide link capacity to client-layer(s) from a server layer. This community should be used in the case where client transport entities can be provisioned inside the link during the adaptation management. This capability of having pre-provisioned client transport entities is available in technologies such as SDH or WDM.

Source

ITU-T Recommendation G.854.8 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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The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

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As of the date of approval of this Recommendation, the ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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Recommendation G.854.8**COMPUTATIONAL VIEWPOINT FOR PRE-PROVISIONED
ADAPTATION MANAGEMENT***(Geneva, 1999)***1 Scope**

This computational viewpoint specification is related to the pre-provisioned adaptation management enterprise specification defined in Recommendation G.852.8 and the pre-provisioned adaptation management information specification defined in Recommendation G.853.8.

The computational design in clause 2 of this preliminary computational viewpoint specification covers the following enterprise communities and associated actions:

COMMUNITY pam "pre-provisioned adaptation management"

- pam "assign server transport entity to client linking entity"**
- pam "deassign server transport entity from client linking entity"**
- pam "report assignment of server transport entity"**
- pam "report deassignment of server transport entity"**
- pam "provision capacity to client linking entity"**
- pam "remove capacity from client linking entity"**
- pam "report client linking entity capacity provisioning"**
- pam "report client linking entity capacity removal"**

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 regularly published.

- [1] ITU-T Recommendation G.851.1 (1996), *Management of the transport network – Application of the RM-ODP framework*.
- [2] ITU-T Recommendation G.853.1 (1999), *Common elements of the information viewpoint for the management of a transport network*.
- [3] ITU-T Recommendation G.852.8 (1999), *Enterprise viewpoint for pre-provisioned adaptation management*.
- [4] ITU-T Recommendation G.853.8 (1999), *Information viewpoint for pre-provisioned adaptation management*.

3 Definitions

None.

4 Abbreviations

This Recommendation uses the following abbreviations:

ASN.1	Abstract Syntax Notation One
CTP	Connection Termination Point
Id	Identifier
Ifce	Interface
inv	invariant
layerND	layerNetwork Domain
LC	LinkConnection
ND	Network Domain
RM-ODP	Reference Model for Open Distributed Processing

5 Conventions

In order to increase the readability of the behaviour in the operations:

- parameters are written in **bold**;
- elements defined in the information specification are written in *italic*.

In this Recommendation, when an interface is used in an ASN.1 production, the same label will be used starting with a capital letter. The complete ASN.1 production for this Query interface (e.g. use of OBJECT IDENTIFIER, INTEGER, etc.) will be developed as part of the Engineering Viewpoint with the concerned technology.

6 Label references

Table 1/G.854.8 – Label references

Full label reference	Local label reference
<"Rec. G.854.3", INTERFACE: commonReportResourceIfce>	commonReportResourceIfce
<"Rec. G.854.3", INTERFACE: commonResourceIfce>	commonResourceIfce
<"Rec. G.853.8", ATTRIBUTE: pamAvailableLinkCapacity>	pamAvailableLinkCapacity
<"Rec. G.853.8", INFORMATION_OBJECT: pamClientLayerNetworkDomain>	pamClientLayerNetworkDomain
<"Rec. G.853.8", INFORMATION_OBJECT: pamLinkConnection>	pamLinkConnection
<"Rec. G.853.8", INFORMATION_OBJECT: pamLinkEnd>	pamLinkEnd
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: PamLinkEndHasNetworkCTPs>	pamLinkEndHasNetworkCTPs
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamLinkIsTerminatedByLinkEnd>	pamLinkIsTerminatedByLinkEnd
<"Rec. G.853.8", ATTRIBUTE: pamMaxProvisionableCapacity>	pamMaxProvisionableCapacity
<"Rec. G.853.8", INFORMATION_OBJECT: pamNetworkCTP>	pamNetworkCTP

Table 1/G.854.8 – Label references (*concluded*)

Full label reference	Local label reference
<"Rec. G.853.8", INFORMATION_OBJECT: pamNetworkTTP>	pamNetworkTTP
<"Rec. G.853.8", ATTRIBUTE: pamPotentialLinkCapacity>	pamPotentialLinkCapacity
<"Rec. G.853.8", ATTRIBUTE: pamProvisionedLinkCapacity>	pamProvisionedLinkCapacity
<"Rec. G.853.8-xx", INFORMATION_OBJECT: pamServerLayerNetworkDomain>	pamServerLayerNetworkDomain
<"Rec. G.853.8", INFORMATION_OBJECT: pamSubnetwork>	pamSubnetwork
"Rec. G.853.8", INFORMATION_OBJECT: pamSubnetworkTP	pamSubnetworkTP
<"Rec. G.853.8", INFORMATION_OBJECT: pamTopologicalLink>	pamTopologicalLink
<"Rec. G.853.8", INFORMATION_OBJECT: pamTopologicalLinkEnd>	pamTopologicalLinkEnd
<"Rec. G.853.8", INFORMATION_OBJECT: pamTrail>	pamTrail
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamTopologicalLinkIsSupportedByTrail>	pamTopologicalLinkIsSupportedByTrail
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamTopologicalLinkEndIsSupportedByNetworkTTP>	pamTopologicalLinkEndIsSupportedByNetworkTTP
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamLayerNetworkDomainIsMadeOf>	pamLayerNetworkDomainIsMadeOf
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamLinkHasLinkConnections>	pamLinkHasLinkConnections
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamLinkEndHasNetworkCTPs>	pamLinkEndHasNetworkCTPs
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamNetworkTTPAdaptsNetworkCTP>	pamNetworkTTPAdaptsNetworkCTP
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamSubnetworkIsDelimitedBy>	pamSubnetworkIsDelimitedBy
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamSubnetworkTPIsRelatedToExtremity>	pamSubnetworkTPIsRelatedToExtremity
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamLinkConnectionIsSupportedByTrail>	pamLinkConnectionIsSupportedByTrail
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamLinkBinds>	pamLinkBinds
<"Rec. G.853.8", INFORMATION_RELATIONSHIP: pamLayerNetworkDomainCanServeLnds>	pamLayerNetworkDomainCanServeLnds

Full ASN.1 production reference	Local label reference
<"Rec. X.721: 1992: Attribute-ASN1Module": SimpleNameType>	SimpleNameType

7 Interfaces

7.1 Query interfaces

This Recommendation refers to interfaces that allow get access to identification and properties of resources involved in the "pre-provisioned adaptation management community". As the invocation of contained operations does not modify any state, there is no interest to develop them explicitly. Their exact signature will be developed as part of the engineering viewpoint, with the concerned technology. These interfaces are listed in Table 2 with the information they allow to access.

Table 2/G.854.8 – Correspondence between Interface names, Information objects, Attributes and relationships

Interface name	Information object	Attributes and relationships
pamLayerNetworkDomainQueryIfce	<pamLayerNetworkDomain>	<resourceId> <signalIdentification> <pamLayerNetworkDomainIsMadeOf, ROLE : element> <pamLayerNetworkDomainCanServeLnds, ROLE : Client> <pamLayerNetworkDomainCanServeLnds, ROLE : Server>
pamLinkConnectionQueryIfce	<pamLinkConnection>	<resourceId> <signalIdentification> <pamLayerNetworkDomainIsMadeOf, ROLE : containerND> <linkHasLinkConnections, ROLE : containerLink> <linkConnectionIsSupportedByTrail, ROLE : serverTrail>
pamLinkEndlQueryIfce	<pamLinkEnd>	<resourceId> <signalIdentification> <pamLinkEndHasNetworkCTPs, ROLE : elementCTP> <pamLinkIsTerminatedByLinkEnd, ROLE : transferCapacityLink> <pamTopologicalLinkEndIsSupportedByNetworkTTP, ROLE : server> <pamLayerNetworkDomainIsMadeOf, ROLE : containerND> <pamAvailableLinkCapacity> <pamMaxProvisionableCapacity> <pamPotentialLinkCapacity> <pamProvisionedLinkCapacity>
pamNetworkCTPQueryIfce	<pamNetworkCTP>	<resourceId> <signalIdentification> <pamLinkEndHasNetworkCTPs, ROLE : containerLE> <networkTTPAdaptsNetworkCTP, ROLE : serverTP>
pamNetworkTTPQueryfce	<pamNetworkTTP>	<resourceId> <signalIdentification> <pamTopologicalLinkEndIsSupportedByNetworkTTP, ROLE : client> <pamLayerNetworkDomainIsMadeOf, ROLE : containerND> <networkTTPAdaptsNetworkCTP, ROLE : clientTP>

**Table 2/G.854.8 – Correspondence between Interface names,
Information objects, Attributes and relationships (concluded)**

Interface name	Information object	Attributes and relationships
pamSubnetworkQueryIfce	<pamSubnetwork>	<resourceId> <signalIdentification> <pamSubnetworkIsDelimitedBy, ROLE : elementSNTP>
pamSubnetworkTPQueryIfce	<pamSubnetworkTP>	<resourceId> <signalIdentification> <pamSubnetworkIsDelimitedBy, ROLE : containerSN> <subnetworkTPsRelatedToExtremity, ROLE : extremity>
pamTopologicalLinkQueryIfce	<pamTopologicalLink>	<resourceId> <signalIdentification> <pamTopologicalLinkIsSupportedByTrail, ROLE : serverTrail> <pamLayerNetworkDomainIsMadeOf, ROLE : element> <linkHasLinkConnections, ROLE : elementLC> <linkBinds, ROLE : a_endTopological> <linkBinds, ROLE : z_endTopological> <pamAvailableLinkCapacity> <pamMaxProvisionableCapacity> <pamPotentialLinkCapacity> <pamProvisionedLinkCapacity>
pamTrailQueryIfce	<pamTrail>	<resourceId> <signalIdentification> <pamTopologicalLinkIsSupportedByTrail, ROLE : clientTL> <pamLayerNetworkDomainIsMadeOf, ROLE : element> <linkConnectionIsSupportedByTrail, ROLE : clientLC>

7.2 Operational interfaces

COMPUTATIONAL_INTERFACE <commonResourceIfce>

COMPUTATIONAL_INTERFACE preProvisionedAdaptationManagementArcIfce

```

OPERATION {
    associateTrailWithTopologicalLink;
    disassociateTrailFromTopologicalLink;
    addCapacityToLink;
    removeCapacityFromLink
}
```

COMPUTATIONAL_INTERFACE preProvisionedAdaptationManagementPointIfce

```

OPERATION {
    associateNetworkTTPWithTopologicalLinkEnd;
    disassociateNetworkTTPFromTopologicalLinkEnd;
    addCapacityToLinkEnd;
    removeCapacityFromLinkEnd
}
```

7.2.1 Associate trail with topologicalLink

<COMMUNITY: pre-provisioned adaptation management, ACTION: assign server transport entity to client linking entity>

OPERATION associateTrailWithTopologicalLink {

INPUT_PARAMETERS

link: LinkId;
clientLayerNetworkDomain: LayerNetworkDomainId
trail: TrailId;

OUTPUT_PARAMETERS

potentialCapacity: Capacity;
resultingLinkConnections: LinkConnectionList;
-- *The resultingLinkConnections parameter value is provided when the*
-- *<PERMISSION:returnClientTransportEntities> is supported.*

RAISED_EXCEPTIONS

incorrectLink: LinkId
incorrectTrail: TrailId
linkAndTrailsNotCompatible: NULL;
initialCapacitiesFailure: SEQUENCE {
 availableLinkCapacity Capacity;
 maxProvisionableCapacity Capacity;
 potentialLinkCapacity Capacity;
 ProvisionedLinkCapacity Capacity};
trailAlreadyAssociated: NULL;
finalCapacitiesFailure: SEQUENCE {
 availableLinkCapacity Capacity;
 maxProvisionableCapacity Capacity;
 potentialLinkCapacity Capacity;
 ProvisionedLinkCapacity Capacity};
consistencyFailure: NULL;
failureToAssociate: NULL;

BEHAVIOUR

PARAMETER_MATCHING

link: <INFORMATION OBJECT:pamTopologicalLink>;
clientLayerNetworkDomain: <INFORMATION OBJECT:pamClientLayerNetworkDomain>;
trail: <INFORMATION OBJECT:pamTrail>;
potentialCapacity: <ATTRIBUTE:pamPotentialLinkCapacity>;
resultingLinkConnections ELEMENTS: <INFORMATION OBJECT:pamLinkConnection>
incorrectLink: <INFORMATION OBJECT:pamTopologicalLink>;
incorrectTrail: <INFORMATION OBJECT:pamTrail>;
availableLinkCapacity: <ATTRIBUTE:pamAvailableLinkCapacity>;
maxProvisionableCapacity: <ATTRIBUTE:pamMaxProvisionableCapacity>;
potentialLinkCapacity: <ATTRIBUTE:pamPotentialLinkCapacity>;
ProvisionedLinkCapacity: <ATTRIBUTE:pamProvisionedLinkCapacity>;

PRE_CONDITIONS

inv_LinkExists

"The **link** refers to element of a <pamClientlayerNetworkDomainIsMadeOf> where the container refers to **clientLayerNetworkDomain**."

inv_TrailExists

"The **trail** refers to element of a <pamServerlayerNetworkDomainIsMadeOf> where the container is <pamServerLayerNetworkDomain>."