INTERNATIONAL TELECOMMUNICATION UNION

ITU-T G.853.16

(01/2001)

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

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

Digital networks – Management of transport network

Information viewpoint for pre-provisioned route discovery

ITU-T Recommendation G.853.16

(Formerly CCITT Recommendation)

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ITU-T Recommendation G.853.16

Information viewpoint for pre-provisioned route discovery

Summary

The route discovery service identifies routes for trails, tandem connections or subnetwork connections with or without protection in a layer network. It is possible to request conditions that have to be met by the identified route. In addition to proposing routes, information is provided to help in the selection among the candidate routes on the basis of a set of properties.

A service for the notification of external notification receivers of the identified routes is provided as well.

Source

ITU-T Recommendation G.853.16 was prepared by ITU-T Study Group 4 (2001-2004) and approved under the WTSA Resolution 1 procedure on 19 January 2001.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 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

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, 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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Information viewpoint for pre-provisioned route discovery

1 Summary

The route discovery service identifies routes for trails, tandem connections or subnetwork connections with or without protection in a layer network. It is possible to request conditions that have to be met by the identified route. In addition to proposing routes information is provided to help in the selection among the candidate routes, on the basis of a set of properties.

A service for the notification of external notification receivers of the identified routes is provided as well.

2 Scope

This information viewpoint specification is related to the pre-provisioned route discovery enterprise specification defined in ITU-T G.852.16.

3 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 G.851.1 (1996), *Management of the transport network – Application of the RM-ODP framework*.

[2] ITU-T G.853.1 (1999), *Common elements of the information viewpoint for the management of a transport network*.

[3] ITU-T G.852.16 (2001), *Management of the transport network – Enterprise viewpoint for pre-provisioned route discovery*.

[4] ITU-T G.853.10 (1999), *Management of the transport network – Information viewpoint for pre-provisioned link connection management*.

4 Definitions

No new term is defined in this Recommendation.

5 Abbreviations

This Recommendation uses the following abbreviations:

CTP Connection Termination Point

Id Identifier

imp imported

ITU-T International Telecommunication Union – Telecommunication Standardization Sector

LND	Layer Network Domain
plcm	Pre-Provisioned Link Connection Management
prd	Pre-provisioned route discovery
Rec.	Recommendation
RM-ODP	Reference Model for Open Distributed Processing
TTP	Trail Termination Point
UML	Unified Modelling Language

6 Conventions

None.

7 Class diagrams

7.1 UML class diagram representing the inheritance hierarchy

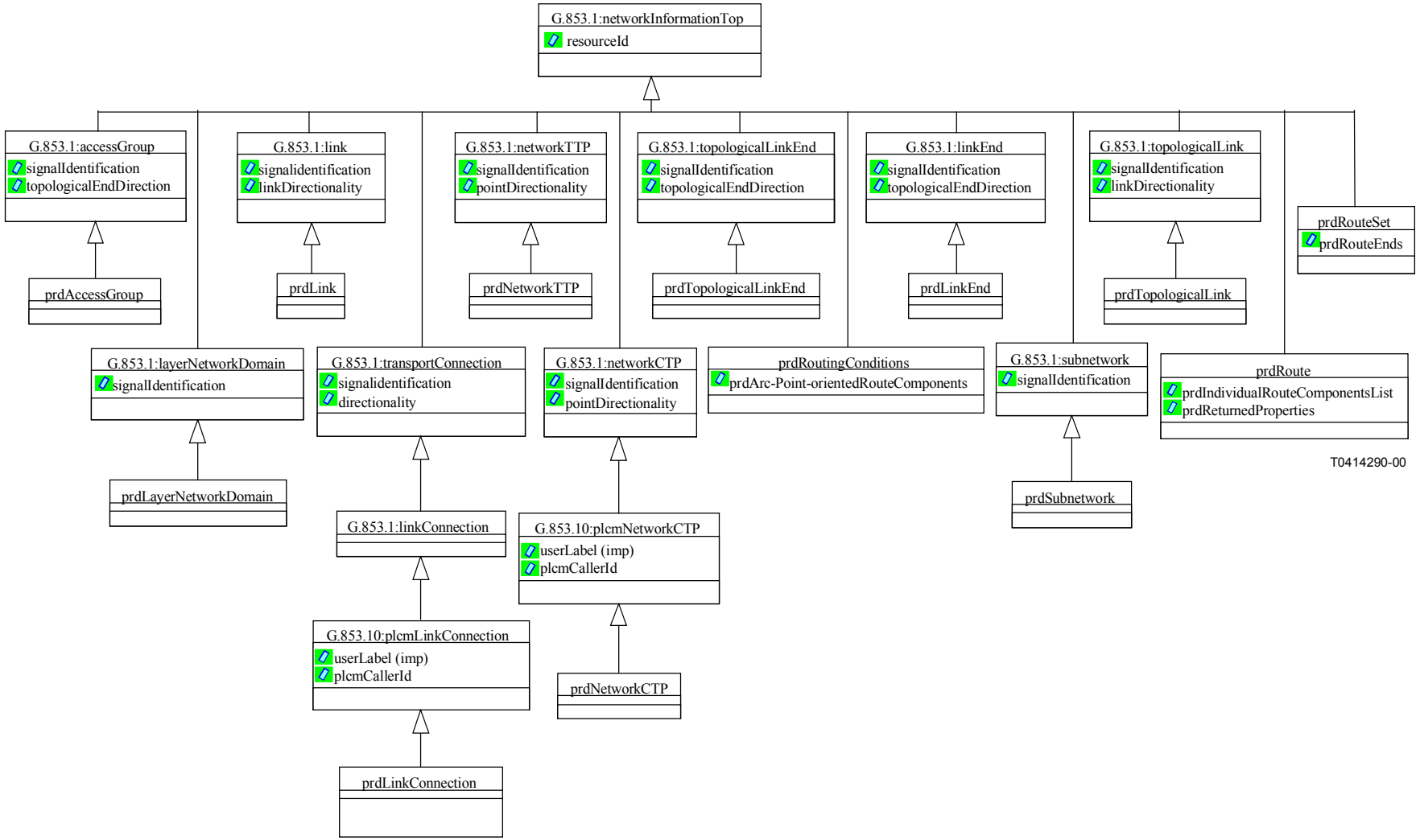

Figure 1/G.853.16 – Pre-provisioned Route Discovery, inheritance diagram

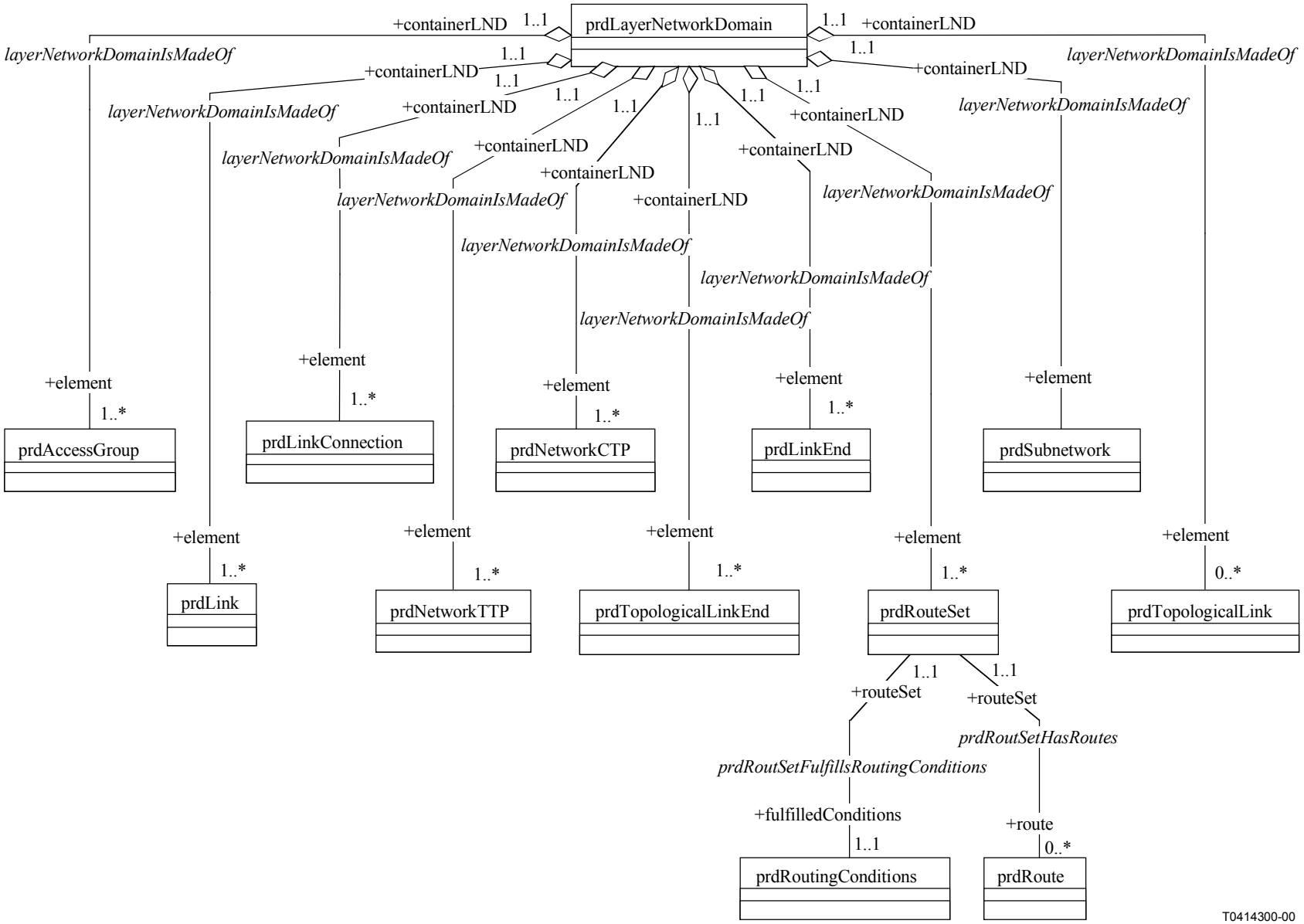

Figure 2/G.853.16 – Pre-provisioned Route Discovery, relationship diagram

8 Label references

Full label reference	Local label reference
<"Rec. G.853.1", INFORMATION_OBJECT: accessGroup>	AccessGroup
<"Rec. G.853.1", INFORMATION_OBJECT: layerNetworkDomain>	LayerNetworkDomain
<"Rec. G.853.1", INFORMATION_OBJECT: link>	Link
<"Rec. G.853.1", INFORMATION_OBJECT: linkEnd>	LinkEnd
<"Rec. G.853.1", INFORMATION_OBJECT: networkInformationTop>	NetworkInformationTop
<"Rec. G.853.1", INFORMATION_OBJECT: networkTTP>	NetworkTTP
<"Rec. G.853.10", INFORMATION_OBJECT: plcmLinkConnection>	PlcmLinkConnection
<"Rec. G.853.10", INFORMATION_OBJECT: plcmNetworkCTP>	PlcmNetworkCTP
<"Rec. G.853.1", INFORMATION_OBJECT: subnetwork>	Subnetwork
<"Rec. G.853.1", INFORMATION_OBJECT: topologicalLink>	TopologicalLink
<"Rec. G.853.1", INFORMATION_OBJECT: topologicalLinkEnd>	TopologicalLinkEnd
<"Rec. G.853.1", INFORMATION_RELATIONSHIP: layerNetworkDomainIsMadeOf>	LayerNetworkDomainIsMadeOf

9 Information object class definitions

9.1 prdAccessGroup

<COMMUNITY: pre-provisioned route discovery, ROLE: route end>

DEFINITION

"This object class is derived from <accessGroup>."

ATTRIBUTE

-- none additional

RELATIONSHIP

<layerNetworkDomainIsMadeOf>

9.2 prdLayerNetworkDomain

<COMMUNITY: pre-provisioned route discovery, ROLE: layer network domain>

DEFINITION

"This object class is derived from <layerNetworkDomain>."

ATTRIBUTE

-- none additional

RELATIONSHIP

<layerNetworkDomainIsMadeOf>

9.3 prdLink

<COMMUNITY: pre-provisioned route discovery, ROLE: route end>

DEFINITION
"This object class is derived from <link>. The relationship with the trails in the server layer is undefined."

ATTRIBUTE
-- none additional

RELATIONSHIP
<layerNetworkDomainIsMadeOf>

9.4 prdLinkConnection

<COMMUNITY: pre-provisioned route discovery, ROLE: route component>
<COMMUNITY: pre-provisioned route discovery, ROLE: route end>

DEFINITION
"This object class is derived from <plcmLinkConnection>."

ATTRIBUTE
-- none additional

RELATIONSHIP
<layerNetworkDomainIsMadeOf>

9.5 prdLinkEnd

<COMMUNITY: pre-provisioned route discovery, ROLE: route end>

DEFINITION
"This object class is derived from <linkEnd>. The relationship with the networkTTPs in the server layer is undefined."

ATTRIBUTE
-- none additional

RELATIONSHIP
<layerNetworkDomainIsMadeOf>

9.6 prdNetworkCTP

<COMMUNITY: pre-provisioned route discovery, ROLE: route component>
<COMMUNITY: pre-provisioned route discovery, ROLE: route end>

DEFINITION
"This object class is derived from <plcmNetworkCTP>."

ATTRIBUTE
-- none additional

RELATIONSHIP
<layerNetworkDomainIsMadeOf>

9.7 prdNetworkTTP

<COMMUNITY: pre-provisioned route discovery, ROLE: route end>

DEFINITION
"This object class is derived from <networkTTP>."

ATTRIBUTE
-- none additional

RELATIONSHIP
<layerNetworkDomainIsMadeOf>

9.8 prdRoute

<COMMUNITY: pre-provisioned route discovery, ROLE: route>

DEFINITION

"The prdRoute information object represents one of the routes in the prdRouteSet for an unprotected or a protected scheme. The prdRoutes information object is derived from <networkInformationTop>."

ATTRIBUTE

<prdIndividualRouteComponentsList>

<prdReturnedProperties>

RELATIONSHIP
<layerNetworkDomainIsMadeOf>
<prdRouteSetHasRoutes>

9.9 prdRouteSet

<COMMUNITY: pre-provisioned route discovery, ROLE: route set>

DEFINITION

"The prdRouteSet information object represents a set of routes for an unprotected or a protected scheme fulfilling a set of routing conditions.
The prdRouteSet information object is derived from <networkInformationTop>."

ATTRIBUTE

<prdRouteEnds>

RELATIONSHIP
<layerNetworkDomainIsMadeOf>
<prdRouteSetHasRoutes>
<prdRouteSetFulfillsRoutingConditions>

9.10 prdRoutingConditions

<COMMUNITY: pre-provisioned route discovery, ACTION: discover routes, PERMISSION: supplyRoutingConditions>
<COMMUNITY: pre-provisioned route discovery, ACTION: discover routes, OBLIGATION: arcVersusPointOrientedRouteComponents>

DEFINITION "This object class contains the request to return either arc-oriented or point-oriented route components and it reflects the optionally supplied conditions that has to be met by the returned routes. This class will be refined based on technology dependent characteristics (the enterprise viewoint recommendation contains a list of examples).
The prdRoutingConditions information object is derived from <networkInformationTop>."

ATTRIBUTE
<prdArc-Point-orientedRouteComponents>

RELATIONSHIP
<prdRouteSetFulfillsRoutingConditions>

9.11 prdSubnetwork

<COMMUNITY: pre-provisioned route discovery, ROLE: route end>

DEFINITION
"This object class is derived from <subnetwork>."

ATTRIBUTE
-- none additonal

RELATIONSHIP
<layerNetworkDomainIsMadeOf>

9.12 prdTopologicalLink

<COMMUNITY: pre-provisioned route discovery, ROLE: route end>

DEFINITION
"This object class is derived from <topologicalLink>."

ATTRIBUTE
-- *none additional*

RELATIONSHIP
<layerNetworkDomainIsMadeOf>

9.13 prdTopologicalLinkEnd

<COMMUNITY: pre-provisioned route discovery, ROLE: route end>

DEFINITION
"This object class is derived from <topologicalLinkEnd>. "

ATTRIBUTE
-- *none additional*

RELATIONSHIP
<layerNetworkDomainIsMadeOf>

10 Information relationship definitions

10.1 prdRouteSetFulfillsRoutingConditions

<COMMUNITY: pre-provisioned route discovery, ACTION: discover routes, PERMISSION: supplyRoutingConditions>

DEFINITION
"The prdRouteSetFulfillsRoutingConditions relationship describes the association between the routeSet and the related conditions that are met by the contained routes."

ROLE
routeSet
"Played by an instance of the <prdRouteSet> information object class."
fulfilledConditions
"Played by an instance of the <prdRoutingConditions> object class."

INVARIANT
inv_1
"Only one object playing the routeSet role must be involved in the relationship."
inv_2
"Only one object playing the routingConditions role must be involved in the relationship."

10.2 PrdRouteSetHasRoutes

<COMMUNITY: pre-provisioned route discovery, ROLE: route set>

DEFINITION

"The prdRouteSetHasRoutes relationship describes the association between a routeSet and all its potential routes having the same routeEnds."

ROLE

routeSet

"Played by an instance of the <prdRouteSet> information object class."

route

"Played by instances of the <prdRoute> object class."

INVARIANT

inv_1

"One or more objects playing the role route may be involved in the relationship."

inv_2

"Only one object playing the role routeSet must be involved in the relationship."

11 Static schemas

-- none

12 Dynamic schemas

-- none

13 Attributes

13.1 prdArc-Point-orientedRouteComponents

<COMMUNITY: pre-provisioned route discovery, ACTION: discover routes, PERMISSION: arcVersusPointOrientedRouteComponents>

DEFINITION

"This attribute reflects the request to either return arc-oriented or point-oriented route components."

13.2 prdReturnedProperties

<COMMUNITY: pre-provisioned route discovery, ACTION: discover routes, PERMISSION: returnedProperties>

DEFINITION

"This attribute reflects the properties optionally associated with a returned route. It has to be refined based on technology dependent characteristics."

13.3 prdRouteEnds

<COMMUNITY: pre-provisioned route discovery, ACTION: discover routes, OBLIGATION: supply routeEnds>

<COMMUNITY: pre-provisioned route discovery, ACTION: discover routes, OBLIGATION: returnIds>

<COMMUNITY: pre-provisioned route discovery, ACTION: report route discovery, OBLIGATION: informRouteDiscovery>

DEFINITION

"This attribute contains the identifiers of the route ends of the prdRouteSet. The route ends may represent
- linkConnection information objects,
- networkTTP information objects,
- networkCTP information objects,
- accessGroup information objects,
- link information objects,
- topologicalLink information objects,
- linkEnd information objects,
- topologicalLinkEnd information objects or
- subnetwork information objects."

prdIndividualRouteComponentsList

<COMMUNITY: pre-provisioned route discovery, ACTION: discover routes, OBLIGATION: returnIds>
<COMMUNITY: pre-provisioned route discovery, ACTION: report route discovery, OBLIGATION: informRouteDiscovery>

DEFINITION

"This attribute contains all the individual route components of a route. They may belong to several individual routes when the caller have asked for a route which can be used in a protection scheme (the number of individual routes corresponds to the protection scheme requested)."

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Geneva, 2001