The ATM Forum

Technical Committee

Domain-based rerouting for active point-to-point calls version 1.0

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1 Introduction

This addendum to ATM Forum PNNI 1.0 “Private Network-Network Interface Specification Version 1.0” [PNNI 1.0] as amended by the ATM Forum “PNNI 1.0 Errata and PICS” [PNNI-ERR], to ATM Forum “ATM Inter-Network Interface (AINI) Specifications” [AINI], and to ATM Forum “ATM User-Network Interface (UNI) Signalling Specification Version 4.0” [UNI 4.0] contains the description and specification of the domain-based rerouting feature.

The domain-based rerouting feature specifies a mechanism to reroute existing point-to-point calls. Domain-based rerouting replaces a connection segment within a PNNI network. Rerouting of a connection is handled by the network without involving the end systems.

The domain-based rerouting feature can be used to reroute point-to-point switched virtual connections (SVCC), switched virtual paths (SVPC), soft permanent virtual connections (soft PVCC) or soft permanent virtual paths (soft PVPC).

This document specifies three domain-based rerouting services:

- Hard rerouting (break-before-make) service provides a connection recovery feature. Hard rerouting is triggered by a failure event, such as the failure of a link or the failure of a node. This document specifies asymmetric hard rerouting in which the rerouting connection is reestablished by the source node after the initial connection has been released by the network.
- Asymmetric soft rerouting (make-before-break) service can be used for path optimization, administrative rerouting, etc. The rerouting connection is established by the source node while the initial connection is still active. The initial connection is released after the rerouting connection has been established.
- Symmetric soft rerouting (make-before-break) service can be used for path optimization, administrative rerouting, rerouting of connections in a mobile environment (e.g. mobile switch), etc. The rerouting connection is established either by the source node or by the destination node while the initial connection is still active.

This document also specifies the negotiation protocol to request and activate domain-based rerouting services for a call. The negotiation protocol includes the exchange of the availability of rerouting services between the edge nodes within a rerouting domain. This document defines two methods to negotiate user requests for domain-based rerouting services. The first one is to have the network nodes to which the calling and called users are connected to be in charge of the request for rerouting services on behalf of the end systems. In this case no extension to UNI signalling is needed. The second method allows the end systems to directly request the desired domain-based rerouting services.

The additions to the AINI specification contained in this document specify the necessary enhancements which enable adjoining rerouting domains to request specific domain-based rerouting services during the establishment phase of a call. The procedures also specify how adjoining rerouting domains are notified that a requested rerouting service has been activated by one of the networks traversed by a call.

The additions to the UNI specification contained in this document specify the necessary enhancements that enable the user to request specific domain-based rerouting services during the establishment phase of a call. The procedures also specify how end systems are notified that a requested rerouting service has been granted by the network.

1.1 Scope

[Normative]

The scope of this document is to specify the domain-based rerouting support across PNNI, AINI, and private and public UNI interfaces.

The choice and management of the rerouting services made available at the AINI, at the UNI, or at the inter-domain PNNI of a given network are the result of network policy and are beyond the scope of this document.

For soft rerouting services, only the procedures which are used to coordinate the rerouting operation between the source node and destination node are specified. The required policy to initiate soft rerouting, such as triggering soft rerouting for the path optimization or determining an acceptable alternate path, is beyond the scope of this specification.

Domain-based rerouting is an optional feature of PNNI 1.0 [PNNI 1.0][PNNI-ERR], of AINI [AINI] and of UNI 4.0 [UNI 4.0].

Procedures for point-to-multipoint calls and for Leaf Initiated Join are not addressed.

A switch supporting the domain-based rerouting feature:

- shall implement the negotiation protocol for rerouting services.
- shall implement the hard rerouting service.
- shall implement the asymmetric soft rerouting service.
- can optionally implement the symmetric soft rerouting service.
- shall support the procedures for Point-to-Point calls for a virtual channel connection (SVCC, soft PVCC, provided soft PVCCs are supported) and for a virtual path connection (SVPC, provided SVPCs are supported, soft PVPC, provided soft PVPCs are supported).
- can optionally support inter-domain PNNI interface.
- can optionally implement accumulation of administrative weight.

Procedures for rerouting and preserving the QoS of an ABR call when the destination node is the rerouting node is not addressed in this specification.

There are limitations in the simultaneous support of both Modification of Traffic parameters for an Active Connection [MODIFY 2.0] and symmetric soft rerouting service for a call (see section 11.2).

2 Terminology and Acronyms

2.1 Acronyms

ABR	Available Bit Rate
ACR	Available Cell Rate
AESA	ATM End System Address
ASP	ATM Service Provider
AINI	ATM Inter-network Interface
B-LLI	Broadband Low Layer Information
CBR	Constant Bit Rate
CDV	Cell Delay Variation
CLP	Cell Loss Priority
CTD	Cell Transfer Delay
DTL	Designated Transit List
FRTT	Fixed Round Trip Time

FSM	Finite State Machine
GFR	Guaranteed Frame Rate
ICR	Initial Cell Rate
IE	Information Element
MIB	Management Information Base
NCCI	Network Call Correlation Identifier
PICS	Protocol Implementation Conformance Statement
PNNI	Private Network-to-Network Interface
PVC	Permanent Virtual Circuit
PVCC	Permanent Virtual Channel Connection
PVPC	Permanent Virtual Path Connection
QoS	Quality of Service
RM	Resource Management
SAAL	Signaling ATM Adaptation Layer
SVC	Switched Virtual Circuit
SVCC	Switched Virtual Channel Connection
SVPC	Switched Virtual Path Connection
TBE	Transient Buffer Exposure
TAS	Transported Address Stack
TLV	Type Length Value
UNI	User to Network Interface
VBR	Variable Bit Rate

2.2 Terminology

Availability of a rerouting service	A rerouting service is available at a node if the node supports the service (i.e. is capable of providing the service) and the network policy allows the service to be requested. A rerouting service is available within a rerouting domain if the service is available for a call at both the source node and the destination node of this rerouting domain.
Connection segment	A portion of a connection or an entire connection. In this document a connection segment spans an entire rerouting domain.
Destination node	The last node in a particular rerouting domain to process the original SETUP message for a particular point-to-point call/connection.
Domain-based rerouting	A rerouting mechanism that replaces a connection segment within a rerouting domain between the source node and the destination node of a connection. With the domain-based rerouting feature, connections are not rerouted across an inter-domain interface.
Edge node	The source node or the destination node of a call in a particular rerouting domain.

Hard rerouting	A rerouting operation where the original connection segment is released before the establishment of an alternative connection segment (i.e. break-before-make).
Incarnation number	Identify the instance of a rerouting connection.
Incumbent connection	An incumbent connection refers to an active connection segment that is in the process of being replaced by an alternate connection segment.
Initial connection	The first incumbent connection (no rerouting operation has ever occurred).
Inter-domain interface	An interface at the ingress or egress of a rerouting domain.
Inter-domain PNNI interface	A PNNI interface at the ingress or egress of a rerouting domain.
Inter-domain rerouting service	A rerouting service for a call across multiple rerouting domains.
Intra-domain interface	An interface within a rerouting domain.
Intra-domain rerouting service	A rerouting service for a call within a rerouting domain.
Rendezvous node	A node that terminates the rerouting request for an alternative connection segment.
Rerouting connection	A rerouting connection refers to an alternate connection segment established to replace an incumbent connection segment or to recover a failed connection segment.
Rerouting domain	A group of topologically contiguous systems that share control of domain-based rerouting. The switching systems at the edges of the rerouting domain coordinate domain-based rerouting operation for all calls/connections traversing the rerouting domain. If a call/connection is rerouted inside the rerouting domain, the domain-based rerouting operation occurs between the edges of the rerouting domain and is entirely contained within the rerouting domain. A rerouting domain must be entirely contained in a PNNI routing domain. A PNNI routing domain may contain several rerouting domains.
Rerouting node	A node that initiates the establishment of an alternate connection segment to a predetermined rendezvous node.
Soft rerouting	A rerouting operation where the original connection segment is released after the establishment of an alternate connection segment (i.e. make-before-break)
Source node	The first node in a particular rerouting domain to receive the original SETUP message for a particular point-to-point call/connection.

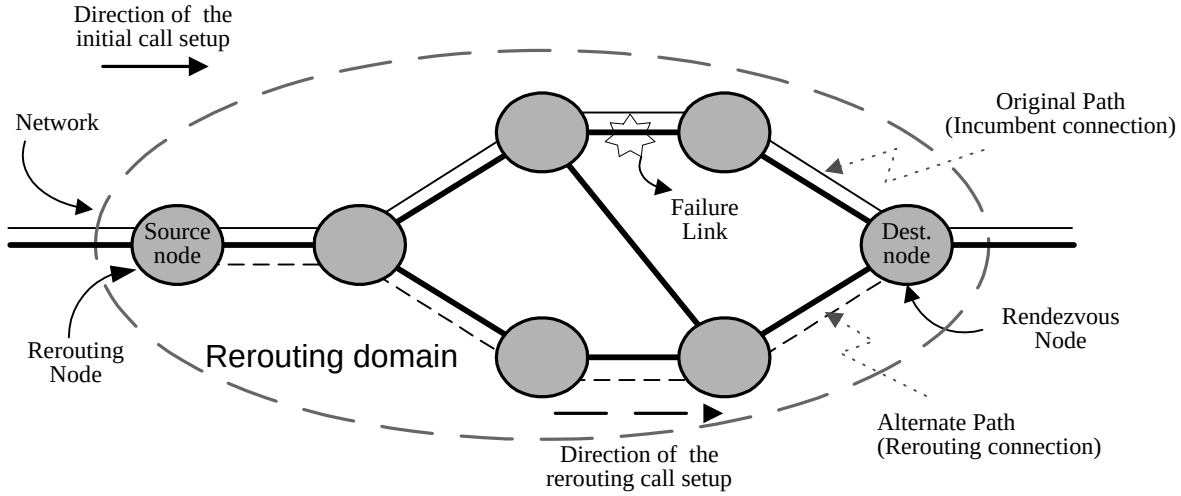


Figure 2-1: Hard rerouting example

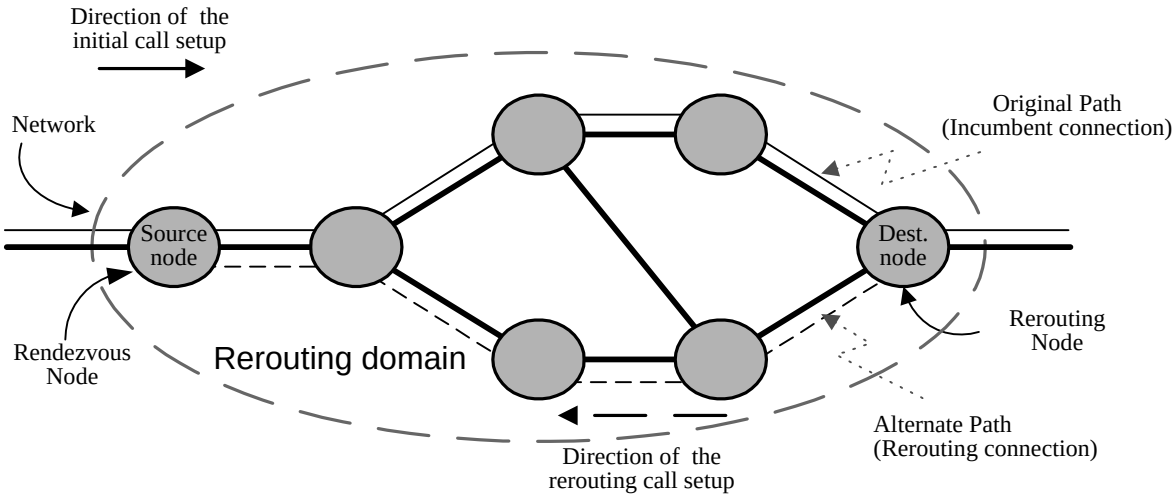


Figure 2-2: Symmetric soft rerouting example

3 References

[PNNI 1.0] "*Private Network-Network Interface Specification Version 1.0 (PNNI 1.0)*", ATM Forum af-pnni-0055.000, March 1996.

[PNNI-ERR] "*PNNI 1.0 Errata and PICS*", ATM Forum af-pnni-0081.000, May 1997

[AINI] "*ATM Inter-Network Interface (AINI) Specifications"*, ATM Forum af-cs-0125.000, April 1999

[UNI 4.0] "*ATM User-Network Interface (UNI) Signalling Specification Version 4.0"*, ATM Forum af-sig-0061.00, July 1996

[TM 4.1] "*Traffic Management specification version 4.1*", ATM Forum af-tm-0121.000, March 1999

[BCS 1.0] "*Behaviour Class Selector Signalling version 1.0*", ATM Forum, af-cs-0159.000, October 2000

[NCCI 1.0] "*Network Call Correlation Identifier version 1.0*", ATM Forum, af-cs-0140.000, March 2000

[SEC 1.1] "*ATM Security Specification version 1.1"*, ATM Forum, af-sec-0100.002, October 2000

[TRACE 1.0] "*PNNI Addendum for Path and Connection Trace version 1.0*", ATM Forum, af-cs-0141.000, March 2000

[MODIFY 2.0] "*Modification of Traffic parameters for an Active Connection Signalling Specification (PNNI, AINI, and UNI, Version 2.0*", ATM Forum, af-cs-0148.001, 2001

[GFR] "*Guaranteed Frame Rate (GFR) Signalling Specification (PNNI, AINI, and UNI), v1.0*", ATM Forum, af-cs-0167.000, 2001

[MDCR] "*UBR with MDCR, Addendum to UNI Signalling 4.0, PNNI 1.0 and AINI*", ATM Forum, af-cs-0147.000, July 2000

4 General descriptions for domain-based rerouting

[Informative]

This section provides an informative description and introduction to the domain-based rerouting feature. The normative description of the procedures is given in sections 6-9.

Section 4.1 gives an overview of the rerouting services and protocols specified in this document. Section 4.2 describes the set of information elements required to support the domain-based rerouting mechanisms, whereas, section 4.3 introduces the additional timers required for the rerouting feature. Section 4.4 provides illustrations with signalling flows of the rerouting services negotiation and illustrates the interaction between the different rerouting services.

4.1 Overview of the domain-based rerouting feature

4.1.1 Domain-based rerouting model

In domain-based rerouting, the source node and the destination node of a rerouting domain coordinate the rerouting operation. The following figure depicts the operational model of domain-based rerouting.

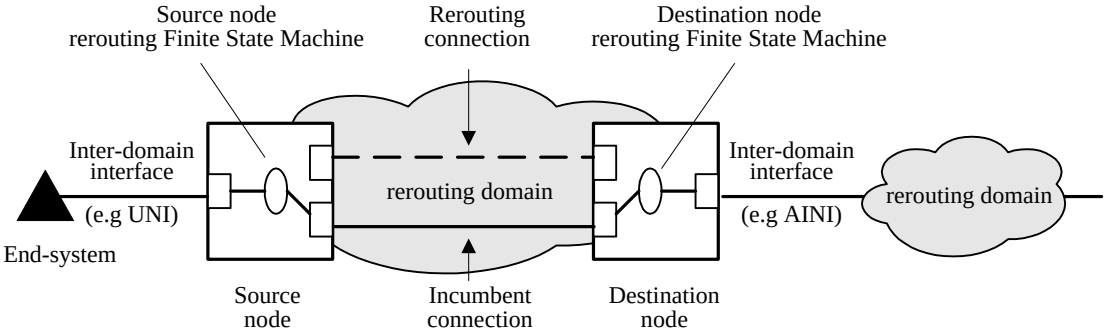


Figure 4-1: Operational model of domain-based rerouting

Note that the rerouting connection in Figure 4-1 is going through a different interface than the incumbent one, it is however possible that the rerouting connection resides at the same interface as the incumbent connection.

The protocol specification sections of this document (sections 7, 8 and 9) use the model described in section 6.1 of the PNNI 1.0 specification. This model defines the "preceding" and "succeeding" sides of an interface.

This specification augments this model by introducing "primitives" exchanged between a *Call Control* entity and a *Protocol Control* entity. Figure 4-2 illustrates their use.

- The reception of a signalling message over an interface triggers the sending of a corresponding "indication" primitive to the Call Control entity.
- The reception of a "request" primitive from the Call Control entity triggers the sending of the corresponding signalling message over the interface.

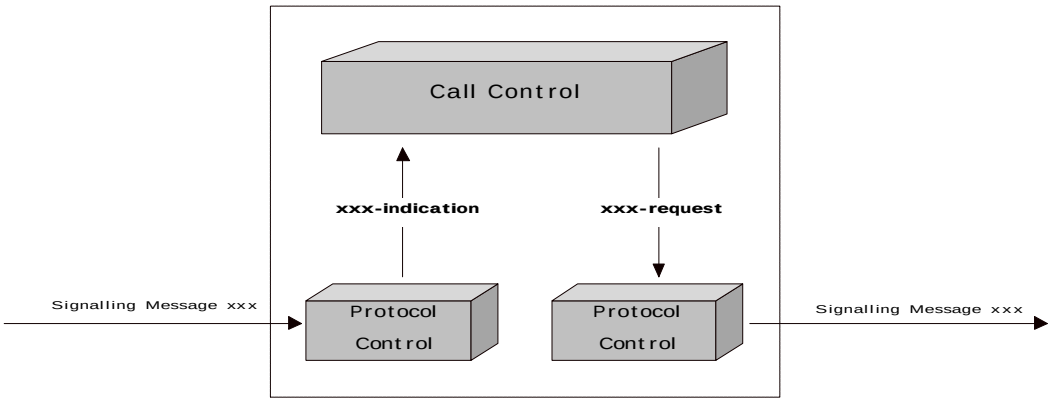


Figure 4-2: Primitives used in the Signalling specification sections

As done in other ATM Forum signalling specifications, this model associates signalling procedures with the *Protocol Control* entities located on each side of an interface.

The domain-based rerouting feature introduces the management of different connection segments belonging to the same call. To correlate this management of connection segments and signalling procedures, this specification also introduces Rerouting Finite State Machines located in the source and destination nodes.

From a modeling perspective, these state machines along with the intelligence associated to them are located in the *Call Control* entity. The procedures associated with these Finite State Machines (FSMs) are specified in section 6. This is illustrated in Figure 4-3.

The PNNI, AINI and UNI procedures of sections 7, 8 and 9, are written assuming that decisions associated with the domain-based rerouting feature have been made in the *Call Control* entity. This is also illustrated in Figure 4-3.

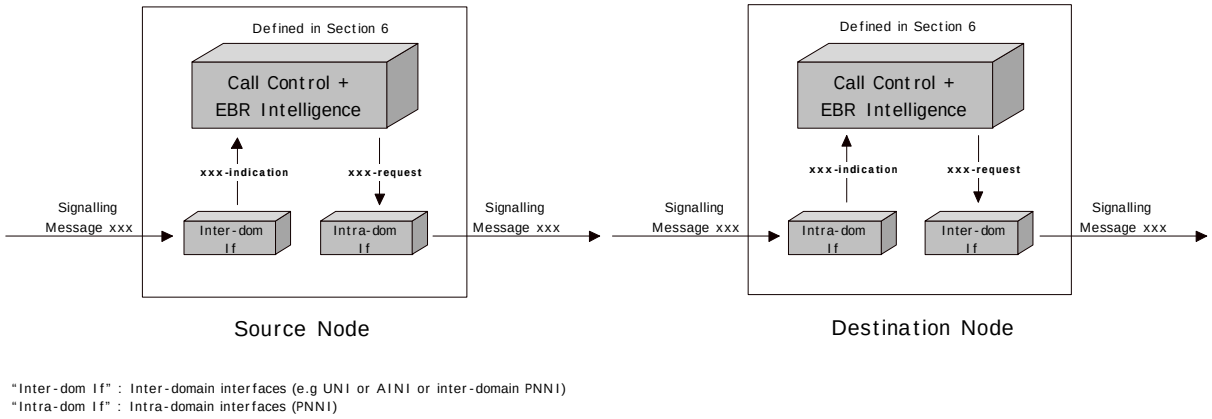


Figure 4-3: Location of domain-based rerouting intelligence

4.1.2 Negotiation of the rerouting services

The activation of rerouting services is negotiated during the initial call establishment. The edge nodes of each rerouting domain negotiate the activation of the rerouting services across the rerouting domain for each call. Once the call has been established each rerouting domain along the path of the call knows which rerouting services are activated for the call within its rerouting domain. Rerouting services cannot be re-negotiated once the call has been established. The negotiation protocol handles the request for rerouting services and the exchange of the availability of rerouting services between the edge nodes of a rerouting domain.

The negotiation allows both the calling end system and the called end system to request a rerouting service. These services are referred to as inter-domain rerouting services because the requests are transmitted across rerouting domain boundaries.

One should note that even though a rerouting service can be requested end-to-end by an end system, the service is performed on a per rerouting domain basis (i.e. between the source and destination node of each rerouting domain traversed by the call). The negotiation protocol allows the originating switch (i.e. connected to the calling end system) and the terminating switch (i.e. connected to the called end system) to request inter-domain rerouting services on behalf of their attached end systems.

Intra-domain rerouting services can also be negotiated between the source and destination nodes within a rerouting domain. The request for an intra-domain rerouting service does not cross the rerouting domain boundaries. The negotiation procedures allow both the source node and the destination node to request an intra-domain rerouting service.

The rerouting services specified in this document are the hard rerouting service, the asymmetric soft rerouting service, and the symmetric soft rerouting service. The hard rerouting service can be requested either as an inter-domain rerouting service or as an intra-domain rerouting service. Asymmetric soft rerouting and symmetric soft rerouting services can only be requested as intra-domain rerouting services.

During the negotiation of the rerouting services, the edge nodes of a rerouting domain exchange their rerouting capabilities. The request for a rerouting service can only be honored if the service is available at both edge nodes. The exchange of the rerouting capabilities allows the specification of optional rerouting services (e.g. symmetric soft rerouting) which might not be supported by all switches and provisions for the specification of future rerouting services.

The negotiation of rerouting services starts at the calling end system. The calling end system can request inter-domain rerouting services when initiating the call setup. The source node then indicates to the destination node during the setup phase which inter-domain and intra-domain rerouting services are requested along with the set of services that are available at the source node. The called end system is notified through the SETUP message if an inter-domain rerouting service is available within at least one rerouting domain along the path. The called end system can also request inter-domain rerouting services when accepting the call, provided that the service is available within at least one rerouting domain along the path. The destination node indicates to the source node during the connect phase which inter-domain and intra-domain rerouting services are activated for the call in this rerouting domain. The calling end system is notified through the CONNECT message of the inter-domain rerouting services that have been activated by at least one rerouting domain along the path.

4.1.3 Hard rerouting service

The hard rerouting service provides a failure recovery mechanism for a call. Hard rerouting is always triggered by a failure event. When a link or a node fails in the rerouting domain, the call is cleared to the edges of the rerouting domain. If the hard rerouting service has been activated for the call, the source node blocks the release and attempts to establish an alternative connection segment to the destination node. This alternative connection segment is called the rerouting connection. The destination node also blocks the release of the call and waits for the source node to establish the rerouting connection.

In the case of hard rerouting as specified in this document, the source node is always the rerouting node (i.e. the node that sets up the alternative connection), whereas, the destination node is always the rendezvous node (i.e. the node that terminates the reroute request for the alternative connection).

In the case of hard rerouting, the original connection segment is released before the establishment of an alternative connection segment (break-before-make).

4.1.4 Soft rerouting services

The soft rerouting services provide mechanisms to reroute a call for administrative reasons (e.g. path optimization, network maintenance). When a soft rerouting operation is triggered at the rerouting node, the rerouting node establishes a rerouting connection to the rendezvous node. When the rerouting connection is established (i.e. a CONNECT message has been received at the rerouting node), the rerouting node uses the rerouting connection and releases the incumbent connection. When the rendezvous node receives the release of the incumbent connection it starts to use the rerouting connection.

To simplify the rerouting procedures, a node can execute one and only one soft rerouting operation for a call at a time.

In the case of soft rerouting, the rerouting connection is established before the release of the incumbent connection (make-before-break).

4.1.4.1 Asymmetric soft rerouting service

In the case of asymmetric soft rerouting service, the soft rerouting operation is always initiated by the source node. Therefore the source node is always the rerouting node and the destination node is always the rendezvous node.

When a soft rerouting operation is initiated by the source node, the source node establishes a rerouting connection to the destination node.

4.1.4.2 Symmetric soft rerouting service

With the symmetric soft rerouting service, a soft rerouting operation can be initiated by either the source or the destination node. Therefore either the source node or the destination node can act as a rerouting node. When the source node acts as a rerouting node, the destination node is the rendezvous node. When the destination node acts as a rerouting node, the source node is the rendezvous node.

If a soft rerouting operation is initiated by the source node, the source node establishes a rerouting connection to the destination node.

If a soft rerouting operation is initiated by the destination node, the destination node establishes a rerouting connection to the source node.

4.1.5 Interaction between the rerouting services

Due to the different nature of soft rerouting versus hard rerouting, a soft rerouting operation may be interrupted by a failure on the incumbent connection. In this case, the hard rerouting operation preempts the soft rerouting operation and the source and destination nodes proceed with the hard rerouting procedures.

Similarly, when the symmetric soft rerouting service is active for a call, a soft rerouting operation may be started concurrently by the source node and by the destination node. In this case, the soft rerouting operation initiated at the source node has priority over the soft rerouting operation initiated at the destination node.

To describe the possible collision between the rerouting operations, a rerouting finite state machine is specified at each end of a connection segment to describe the protocol (see Figure 4-1).

For each call, the rerouting state machine operates in addition to the call state machines at the source and destination nodes. When a node performs the rerouting of a call, several state machines are running simultaneously: for example, three call/connection state machines (i.e. one for the connection leg on the inter-domain interface, one for the incumbent connection and one for the rerouting connection), and the rerouting state machine. The rerouting state of the call changes from Null to Rerouting idle when the call/connection state of the initial call at the ingress interface enters into the “Active” state. When the call is cleared, the rerouting state of the call changes to Null.

For the complete specifications of the state definitions and state transitions descriptions, see section 6.

4.2 Design of information elements to support rerouting operations

Three new information elements are introduced to support this rerouting feature. Additionally, a change to the Optional traffic attributes information element is introduced to support accumulation of the administrative weights. This section contains the informative description of these information elements and their usage. For the normative description of these information elements, refer to section 5.

4.2.1 Rerouting Services Information element

The Rerouting services information element is used to negotiate which rerouting services to activate for a call. The Rerouting services information element is included in both the SETUP message and the CONNECT message of the initial call establishment.

By including a Rerouting services information element in the SETUP message, the source node can request inter and intra-domain rerouting services and can inform the destination node about rerouting services that are supported but not requested.

The destination node decides which rerouting services to activate for a call. The decision is communicated back to the source node by including a Rerouting services information element in the CONNECT message. This indicates to the source node which rerouting procedures to activate for the call.

The Rerouting services information element is transported across inter-domain interfaces (i.e. UNI, AINI, inter-domain PNNI) and intra-domain interfaces (i.e. intra-domain PNNI).

The Rerouting services information element contains the following fields:

- the Inter-domain rerouting services
- the Inter-domain rerouting capabilities
- the Intra-domain rerouting services
- the Intra-domain rerouting capabilities

The Inter-domain rerouting services field and the Intra-domain rerouting services field are used to transport the rerouting service requests during the setup phase of the initial call establishment. Theses fields are used to indicate the rerouting services that have been activated for the call during the connect phase. The Inter-domain rerouting services field contains end-to-end rerouting services, whereas the Intra-domain rerouting services field contains network administrated rerouting services.

The Intra-domain rerouting capabilities field is used to exchange the availability of rerouting services between the source node and the destination node of a rerouting domain, regardless of the requested rerouting services. This field is used by the source node during the setup phase of the initial call establishment to indicate to the destination node which rerouting services are available at the source node.

The Inter-domain rerouting capabilities field is used during the setup phase to indicate which rerouting services are available in the rerouting domains along the path of the call.

4.2.1.1 Rerouting services

Two categories of rerouting services are defined, the Inter-domain rerouting services and the Intra-domain rerouting services:

- Inter-domain rerouting services are either indicated by the source or the called end system, or by the originating or the terminating switch on behalf of the end systems. The scope of the Inter-domain rerouting services field is end-to-end, the field is transported across inter-domain interfaces. One should note that even though a rerouting service can be requested end-to-end using this field, the service is performed on a per rerouting domain basis (i.e. between the source and destination node of each rerouting domain).

- Intra-domain rerouting services are indicated by the source and the destination nodes of each rerouting domain traversed by the call. The scope of the intra-domain rerouting services is within a rerouting domain. The Intra-domain rerouting services field can be either cleared or forwarded across an inter-domain interface. The forwarding of an intra-domain rerouting service across an inter-domain interface can be used to coordinate the request for a rerouting service in an administrative network that contains several rerouting domains.

In a SETUP message, the Inter-domain rerouting services and Intra-domain rerouting services fields indicate the request for rerouting services. Inter-domain rerouting services are requested either by the calling end system or by the source node of the originating rerouting domain on behalf of the end system. Intra-domain rerouting services can be requested by each of the source nodes of the rerouting domains traversed by the call.

In a CONNECT message, the Inter-domain rerouting services and Intra-domain rerouting services fields indicate the activation of rerouting services. If an inter-domain rerouting service is indicated in the CONNECT message which was not indicated in the SETUP message, it means that the service has been activated by the called end system.

4.2.1.2 Rerouting capabilities

Two categories of rerouting capabilities are defined, the Inter-domain rerouting capabilities and the Intra-domain rerouting capabilities:

- Inter-domain rerouting capabilities are originated by the destination node of the originating rerouting domain. The Inter-domain rerouting capabilities are then updated by the destination node of each subsequent rerouting domain traversed by the call. The scope of the inter-domain rerouting capability field is end-to-end, the field is transported across inter-domain interfaces. The destination node indicates an inter-domain rerouting capability if the service is available at both the source node and the destination node of this rerouting domain.
- Intra-domain rerouting capabilities are indicated by the source nodes of each rerouting domain traversed by the call. The scope of the intra-domain rerouting capabilities is within a rerouting domain. The Intra-domain rerouting capabilities field is cleared before going across an inter-domain interface.

In a SETUP message, the Intra-domain rerouting capabilities field is set by the source node of each rerouting domain traversed by the call. The capabilities indicated inform the destination node of the services available at the source node (i.e. resources have been reserved to provide this service and the rerouting domain policy allows the service to be requested).

If an inter-domain rerouting service is available at both the source node and the destination node, the destination node sets the rerouting capability in the Inter-domain rerouting capabilities field. This indicates to succeeding rerouting domains that this inter-domain rerouting service is available in at least one rerouting domain along the path of the call.

The Inter-domain rerouting capabilities and the Intra-domain rerouting capabilities fields are not used in the CONNECT message.

To activate a rerouting service between a source and a destination node, the associated rerouting capability must have been indicated as an intra-domain rerouting capability in the SETUP message by the source node and must be available at the destination node.

4.2.2 Rerouting information element

The Rerouting information element is used to exchange information between the source node and the destination node. This information element contains information to initialize the rerouting services and to control the rerouting operations. The Rerouting information element is included in both the SETUP and CONNECT messages during the initial connection establishment and in the SETUP message during the rerouting connection establishment. The Rerouting information element has a different content during the initial connection establishment and the rerouting connection establishment.

As the Rerouting information element is used to exchange information between the source and destination nodes, it is only specified for intra-domain interfaces. Edge nodes are responsible for insertion and removal of the Rerouting information element. The destination node must remove this information element from the SETUP message, prior to progressing the message to an inter-domain interface in the direction of the called party. Similarly, the source node must remove this

information element from the CONNECT message prior to progressing the message on an inter-domain interface in the direction of the calling party.

4.2.2.1 Rerouting information element in the SETUP message during the initial establishment of the connection

When symmetric soft rerouting is supported, the source node inserts a Rerouting information element in the SETUP message. The Rerouting information element contains the AESA (ATM End System Address) of the source node and an endpoint key that that uniquely identifies the call within the scope of the source node AESA. This allows the destination node to establish a rerouting connection segment to the source node.

4.2.2.2 Rerouting information element in the CONNECT message during the initial establishment of the connection

The destination node inserts a Rerouting information element in the CONNECT message. The Rerouting information element contains the AESA of the destination node and an endpoint key that that uniquely identifies the call within the scope of the destination node AESA. This allows the source node to establish a rerouting connection segment to the destination node.

For a call, the endpoint key generated by the source node and the endpoint key generated by the destination node are likely to be different.

4.2.2.3 Rerouting information element in the SETUP message during the establishment of the rerouting connection

The rerouting node inserts a Rerouting octet group in the Rerouting information element in the SETUP message to distinguish the reroute SETUP message from the initial SETUP message. This octet group contains information to synchronize the rerouting operation between the rerouting and rendezvous nodes during race conditions and instructions from the rerouting node to the rendezvous node of when to switchover to the rerouting connection during the rerouting operation. The Rerouting octet group included in a reroute SETUP contains:

- Incarnation number

  Identifies the instance of the rerouting operation initiated by the rerouting node.

- Switchover behavior indicator

  Indicates to the rendezvous node when to switchover from the incumbent connection to the rerouting connection during a rerouting operation. Two behaviors are defined:

  - switchover immediately after the CONNECT message is sent towards the rerouting node for the rerouting connection.
  - switchover when the call clearing message is received for the incumbent connection.

4.2.2.3.1 Handling race conditions using the incarnation number

Each reroute SETUP message has an incarnation number. The number is managed by the rerouting node, and is set to zero in the initial setup. However it is not included in the initial SETUP message because it is implicit that the number is zero in case of initial setup. Once the initial connection has been established, if a failure occurs in the connection, the incarnation number value is incremented by one from the previous value before sending a reroute SETUP message.

In the case of symmetric soft rerouting, the incarnation number can be different depending on the direction of the establishment of the rerouting connection. The source node and the destination node for a call each have their own incarnation number space that they use when they initiate a soft reroute setup (i.e. the incarnation numbers between the two directions of establishment of a rerouting connection are not correlated).

To explain the use of the incarnation number, the following two failure scenarios are considered:

a) The rerouting node sends a reroute SETUP message. It then receives a RELEASE message for the rerouting connection with a Crankback information element before the hard rerouting timer expires.

This indicates that a crankback has happened during the establishment of the rerouting connection. In this case, the SETUP message does not reach the rendezvous node and there is no race condition. Therefore, the rerouting node can execute the normal crankback procedures to find an alternate path without incrementing the incarnation number.

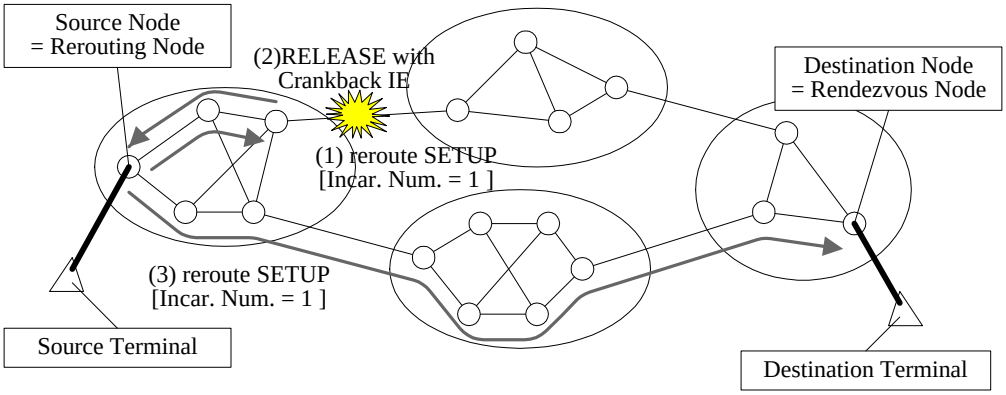


Figure 4-4: Crankback case

b) The rerouting node sends a reroute SETUP message. It then receives a RELEASE message for the rerouting connection without the Crankback information element before it receives a CONNECT message, and before the hard rerouting timer expires.

This indicates that one intermediate link or node failed after the reroute SETUP message was forwarded. In this case the rendezvous node may receive the reroute SETUP message. If the rerouting node attempts to reroute the connection segment on an alternate path, it must increment the incarnation number by one. The incarnation number indicates to the rendezvous node which reroute SETUP message is the latest.

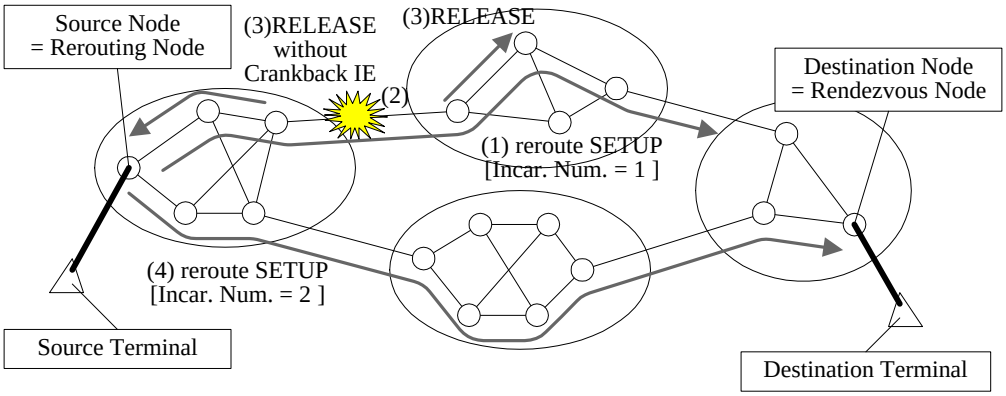


Figure 4-5: Example of race condition

4.2.2.3.2 Use of the Switchover behavior indicator

The Switchover behavior indicator is used by the rerouting node to indicate to the rendezvous node when to switch from the incumbent connection to the rerouting connection.

The Switchover behavior indicator is also used by the rerouting node to indicate the type of the rerouting operation when it is initiated. If the Switchover behavior indicator is set to "*switchover immediately*", the rerouting operation is a hard rerouting operation. If the Switchover behavior indicator is set to "*switchover when receiving the call clearing message for the incumbent connection*", the rerouting operation is a soft rerouting operation.

To minimize data loss during a soft rerouting operation, it is important to synchronize the switchover between the rendezvous node and the rerouting node. In order to achieve this, the Switchover behavior indicator is set to "*switchover*

when receiving the call clearing message for the incumbent connection" by the rerouting node. However, in the future, the rerouting mechanism could be improved to support seamless rerouting. A new switchover behavior would then be introduced.

The incumbent connection may fail during a soft rerouting operation. As a result, the incumbent connection is released prior to the rendezvous node sending the CONNECT message to the rerouting node. If the hard rerouting service is activated for the call, the rendezvous node ignores the signaled switchover behavior indicator and switches to the rerouting connection as soon as possible in order to minimize the data loss.

In summary, the Switchover behavior indicator is considered by the rendezvous node only when the incumbent connection is still active.

4.2.2.4 Preserving traffic characteristics and QoS

A rerouting operation only reroutes the segment of the initial connection located between the source and the destination node of a rerouting domain. Since end users must not be aware that a rerouting operation has occurred on a call, special care must be taken to guarantee that the QoS provided by the rerouting connection is at least as good as QoS commitments provided by the network on the initial connection.

To achieve this, the rerouting node must compute a path for the rerouting connection with the constraint that the QoS of the rerouting connection is at least as good as the QoS commitments provided by the network on the initial connection. Special handling of information elements containing traffic and QoS related parameters is therefore necessary at the source and destination nodes, both during the initial call establishment and during a rerouting operation.

For the ATM traffic parameters of a given direction, the reroute SETUP message sent by the rerouting node must contain the same values that were provided by the network for that direction on the initial connection. When negotiation of traffic parameters took place during the initial call establishment, the SETUP sent for the rerouting connection must contain the negotiated values. In addition, if the rerouting connection is established by the destination node (in the case of symmetric soft rerouting), the destination node has to swap the “forward” and the “backward” parameters because the "forward" direction of the initial call is now the "backward" direction for the rerouting connection and vice versa.

Rerouting a segment of an ABR connection is unpredictable with respect to preserving QoS because ABR traffic parameters are always negotiated during a call setup, including when a rerouting connection is established. There is no signalling mechanism to guarantee that the traffic parameters negotiated for the rerouting connection are as good as the parameters that applied to the initial call. The limitations about rerouting ABR calls are discussed in Annex A.

For CBR, rt-VBR and nrt-VBR calls, the path of the rerouting connection must provide a forward maximum cell transfer delay that is less than or equal to the committed forward maximum cell transfer delay for the initial connection between the source and the destination nodes. For CBR and rt-VBR the path of the rerouting connection must provide a forward cell delay variation and a backward cell delay variation that are less than or equal to the committed forward cell delay variation and the committed backward cell delay variation for the initial connection between the source and the destination nodes. As a result, during the initial call establishment, the source and destination node must compute and record the "acceptable" values that apply to the connection segment that may be rerouted. To achieve this, the source node and the destination node need to exchange cumulative QoS parameters (i.e. Cumulative Forward Max CTD, Cumulative Forward CDV, Cumulative Backward CDV) to compute the QoS commitment associated with the segment of the initial connection spanning between the source and the destination nodes.

The following provides an overview of the procedures needed to maintain the QoS of a call

a) During the initial establishment of the call:

   1. When the source node receives the SETUP message from an inter-domain interface, it records the cumulative QoS parameters and the cell loss ratios as received. The recorded cumulative values must not take into account increases due to user data transfer within the source node that depend on the outgoing interface used to progress the call.

      The source node then encodes the recorded values into the Rerouting information element.

2. When the destination node receives the SETUP message, the cumulative QoS parameters from the SETUP message are recorded as the local cumulative QoS parameters. The destination node also records the cell loss ratios. The local cumulative values must be adjusted to take into account increases due to user data transfer that depend on the incoming interface on which the call was received and any "padding"[1] to provide flexibility when rerouting the connection.

   For example, the destination node may compute the amount of padding from the rerouting domain theoretical or measured "max CTD or CDV". The destination node can compute the partial max CTD and CDV of a call within the rerouting domain by subtracting the cumulative QoS parameters that are provided by the source node in the Rerouting information element from the local cumulative QoS parameters. Other means of generating padding are not precluded.

   The cumulative values contained in the SETUP message forwarded in the direction of the called party must reflect the padding, if any.

   If the destination node chooses to activate symmetric soft rerouting for this call, the destination node computes the differences between the local cumulative QoS parameters and the cumulative QoS parameters that are provided by the source node in the Rerouting information element. The destination node records the resulting delta as the acceptable values that will apply for rerouting operations on this call.

3. When the destination node forwards the CONNECT message towards the source node, it inserts its local cumulative QoS parameters values into the Rerouting information element.

4. When the source node receives the CONNECT message, it computes the differences between the recorded cumulative QoS parameters values and those received in the Rerouting information element of the CONNECT message. The source node then records the resulting delta as the acceptable values that will apply for rerouting operations on this call.

b) During the establishment of a rerouting connection:

1. When the rerouting node receives the reroute request, the rerouting node uses the delta values of the cumulative QoS parameters computed during the initial call establishment and the recorded cell loss ratios as its routing constraints for the path computation of the rerouting connection.

   The rerouting node sets the "cumulative" values of the QoS parameters to 0 and the "acceptable" values of the QoS parameters to the corresponding delta values computed during the initial call establishment in the reroute SETUP message. It also sets the “acceptable” cell loss ratios to the values recorded during the initial call establishment.

4.2.3 Rerouting Cause Information Element

The Rerouting cause information element is used in the RELEASE message to coordinate the release of a connection segment between the edge nodes of a rerouting domain. The Rerouting release cause field in this information element provides the reason for the clearing of the connection segment by the peer edge node.

The Rerouting release cause information element is not included in the RELEASE message when a failure occurs within the rerouting domain.

When the source node or the destination node receive a RELEASE message from an intra-domain interface, it examines the cause in the Rerouting cause information element, if any, to determine the proper action.

[1] The path of the initial connection is usually the nominal (i.e. shortest) network path. When rerouting occurs, since the path of the rerouting connection will often be longer than the path of the initial connection, it may be difficult to meet stringent requirements on Max CTD or CDV. For this reason, the values recorded by the destination node may be padded by a network specific amount, providing flexibility to the rerouting node when it must select the path for the rerouting connection.

4.2.3.1 Special consideration for not triggering rerouting

As the current rerouting mechanism is limited to the domain-based rerouting, when a failure occurs outside of the rerouting domain, no rerouting operation can be performed. A specific indication is required to instruct the remote edge switch not to trigger a hard rerouting operation if the hard rerouting service is activated for the call.

When an ingress or egress edge switch of a rerouting domain receives a RELEASE message coming from an inter-domain interface for a call for which the hard rerouting service is activated, it inserts the Rerouting cause information element with the Rerouting release cause set to #1 "*release received from outside any rerouting domain*" in the RELEASE message forwarded towards its peer edge switch. When the peer edge switch receives this RELEASE message with the Rerouting cause information element set to cause #1, it recognizes that it must not initiate a hard rerouting operation.

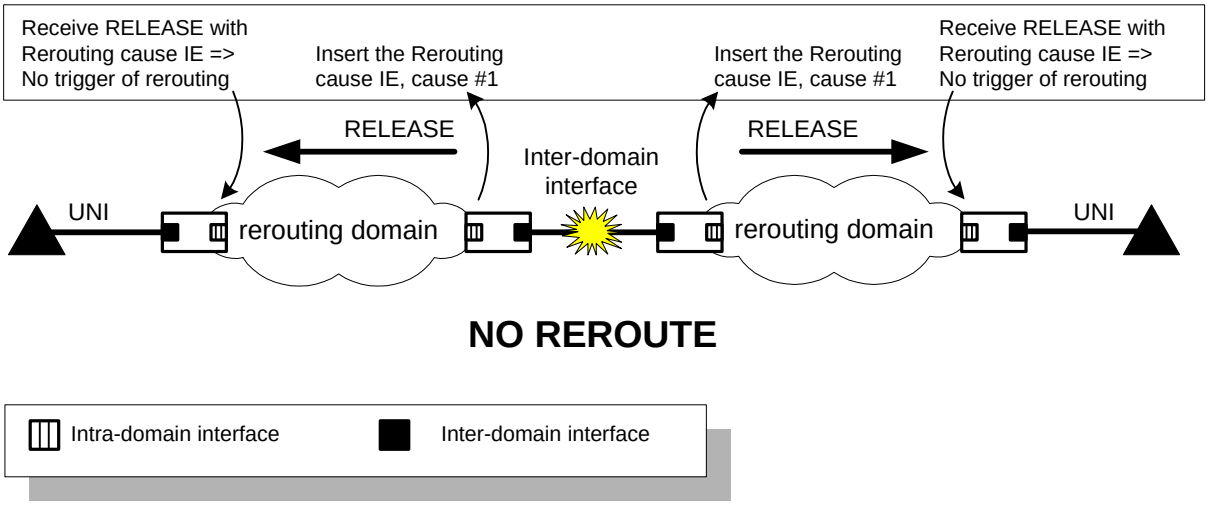


Figure 4-6: Edge switch inserts the Rerouting cause information element to indicate no trigger for rerouting

4.2.4 Optional Traffic Attributes Information Element

The Optional traffic attributes information element with Cumulative Administrative Weights is used to collect cumulative forward and backward administrative weights for the path taken by the initial and rerouting connection within the rerouting domain. The Optional traffic attributes information element with Cumulative Administrative Weights may be included in both the SETUP and the CONNECT messages for the initial and the rerouting connections.

4.2.4.1 Optional traffic attributes information element in the SETUP message during the establishment of the initial connection

The source node may add an Optional traffic attributes information element with Cumulative Administrative Weights to collect cumulative administrative weights for the path the call takes within the rerouting domain. As the SETUP message is progressed from the source node to the destination node, each node along the path that supports administrative weight accumulation uses this information element to gather the forward and backward administrative weights for the initial connection. Nodes along the path that do not support the accumulation of administrative weights will discard the information element.

4.2.4.2 Optional traffic attributes information element in the CONNECT message during the establishment of the initial connection

The destination node may insert an Optional traffic attributes information element with Cumulative Administrative Weights in the CONNECT message, if the information element was received in the initial SETUP message and the node supports administrative weight accumulation. The information element is used to convey to the source node the administrative weight values accumulated during initial SETUP message processing. This information can be used, along with local policy, at the source node when performing a soft reroute. If the source node does not receive the Optional traffic attributes

information element with Cumulative Administrative Weights in the CONNECT message, it indicates that at least one node along the path does not support the accumulation of administrative weights, and hence no accurate measurement of the path cost can be obtained.

4.2.4.3 Optional traffic attributes information element in the SETUP message during the establishment of the rerouting connection

The rerouting node may add an Optional traffic attributes information element with Cumulative Administrative Weights to the SETUP message to collect cumulative administrative weights for the path the call takes within the rerouting domain. As the SETUP message is progressed from the rerouting node to the rendezvous node, each node along the path that supports administrative weight accumulation uses this octet group to gather the forward and backward administrative weights for the rerouting connection.

4.2.4.4 Optional traffic attributes information element in the CONNECT message during the establishment of the rerouting connection

The rendezvous node may insert an Optional traffic attributes information element with Cumulative Administrative Weights in the CONNECT message, if the information element was received in the rerouting SETUP message and the node supports administrative weight accumulation. The information element is used to convey to the source node the administrative weight values accumulated during rerouting SETUP message processing. This information can be used, along with local policy, at the rerouting node when performing a soft reroute operation.

4.2.5 Summary of the information elements defined for the different ATM interfaces

Table 4-1: Rerouting related information elements for different interface types

Information Element	Signalling Message	UNI	AINI	Inter-domain PNNI	Intra-domain PNNI
Rerouting services	Initial SETUP & CONNECT	*	*	*	*
Rerouting	Initial SETUP & CONNECT Rerouting SETUP & CONNECT				*
Rerouting cause	RELEASE	*	*	*	*
Optional traffic attributes	Initial SETUP & CONNECT Rerouting SETUP & CONNECT				*

Note: "*" means that the information element is defined at this interface.

4.3 Hard rerouting timer

The hard rerouting timer is used during the hard rerouting operation to ensure the connection is recovered in time. The hard rerouting timer is used by the rerouting FSMs at each node (i.e. source node and destination node) to keep track of the progress of the rerouting connection establishment. Note that no rerouting timer is specified for soft rerouting operations.

The hard rerouting timer starts when the RELEASE message for the incumbent connection is received at either the source node or the destination node. The timer stops when

- the source node or the destination node reaches the Rerouting Idle state
- the hard rerouting operation is being terminated by the user or by the network before completing

4.4 Illustrations of domain-based rerouting operations

This section illustrates the domain-based rerouting feature by means of signalling flows for the most common cases.

Sections 4.4.1 to 4.4.6 illustrate the domain-based rerouting from the initial call establishment to the performing of a rerouting operation, for a call that is contained within a single rerouting domain. In particular, the scenarios consider that both the hard rerouting service and the asymmetric soft rerouting service are available at the edge nodes.

Illustrated scenarios of the negotiation of the rerouting services for a call can be found in Appendix D. The figures show how to insert the rerouting related information elements during the initial call establishment phase for a call that spans one or more rerouting domains. In particular, it provides scenarios where not all the edge nodes of the network support the rerouting feature.

4.4.1 Initial connection establishment over a single rerouting domain

The following figures illustrate the establishment of the initial connection for a rerouting domain when both the source and the destination nodes support the rerouting feature.

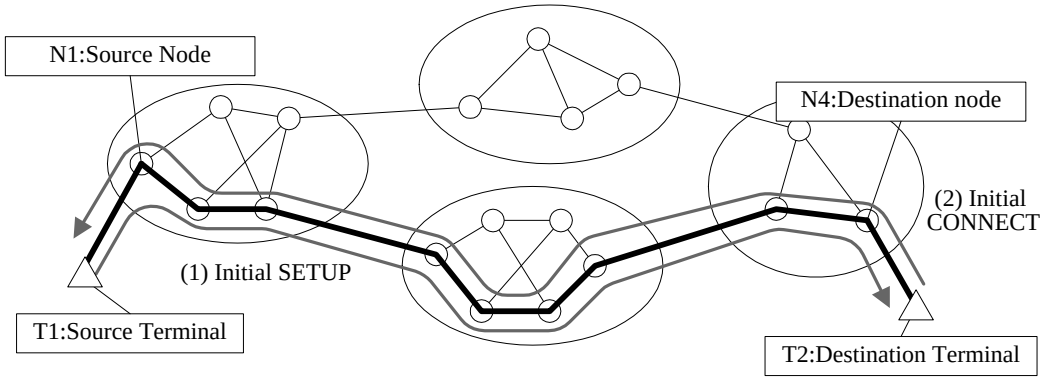


Figure 4-7: Initial connection establishment over a single rerouting domain

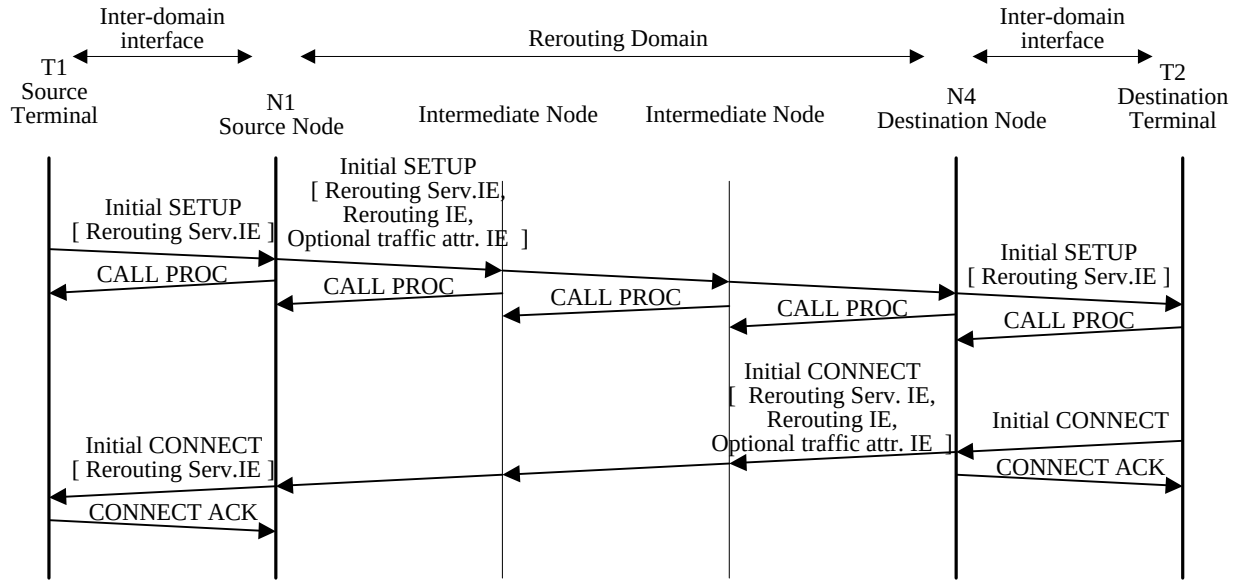


Figure 4-8: Flow Sequence during the initial connection establishment over a single rerouting domain

Table 4-2: Parameters during the initial connection establishment over a single rerouting domain

Message	Rerouting related Information Element	Information Field	UNI (Calling party side)	Intra-domain PNNI	UNI (Called party side)
Initial SETUP	Called Party Number	AESA	T2	T2	T2
	Rerouting Services	Pass along request	n/a[2]	pass along request	n/a
		Inter-domain rerouting services	• Hard rerouting	• Hard rerouting	• Hard rerouting
		Inter-domain rerouting capabilities	-[3]	-	• Hard rerouting avail.
		Intra-domain rerouting services	n/a	• Asymmetric soft rerouting	n/a
		Intra-domain rerouting capabilities	n/a	• Hard rerouting avail. • Asymmetric soft rerouting avail.	n/a
	Rerouting	Pass along request	n/a	pass along request	n/a
		Edge node AESA	n/a	N1	n/a
		Endpoint key	n/a	K1[4]	n/a
	Optional traffic attributes (optional)	Cumulative administrative weights	n/a	Forward and backward cumulative administrative weights for a path from N1 up to N4 (no pass along request)	n/a
Initial CONNECT	Rerouting Services	Pass along request	n/a	pass along request	n/a
		Inter-domain rerouting services	• Hard rerouting	• Hard rerouting	-
		Inter-domain rerouting capabilities	n/a	n/a	n/a
		Intra-domain rerouting services	n/a	• Asymmetric soft rerouting • Hard rerouting	n/a
		Intra-domain rerouting capabilities	n/a	n/a	n/a
	Rerouting	Pass along request	n/a	pass along request	n/a
		Edge node AESA	n/a	N4	n/a
		Endpoint key	n/a	K2[5]	n/a
		Cumulative QoSs (see Note)	n/a	Cumulative value from T1 to N4	n/a
	Optional traffic attributes (optional)	Cumulative administrative weights	n/a	Forward and backward cumulative administrative weights for a path from N1 up to N4 (no pass along request)	n/a

Note: "Cumulative forward/backward peak-to-peak cell delay variation" and "PNNI Cumulative forward maximum cell transfer delay "

[2] Not available: Indicates that the field is undefined

[3] Indicates that no rerouting service is indicated

[4] Endpoint key generated by source node N1 for this call

[5] Endpoint key generated by destination node N4 for this call

4.4.2 Hard rerouting operation

The following figures illustrate the hard rerouting procedures.

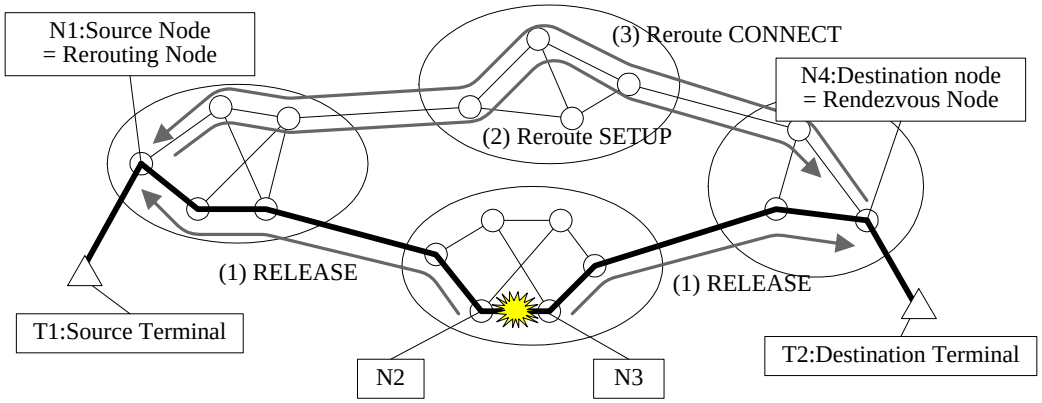
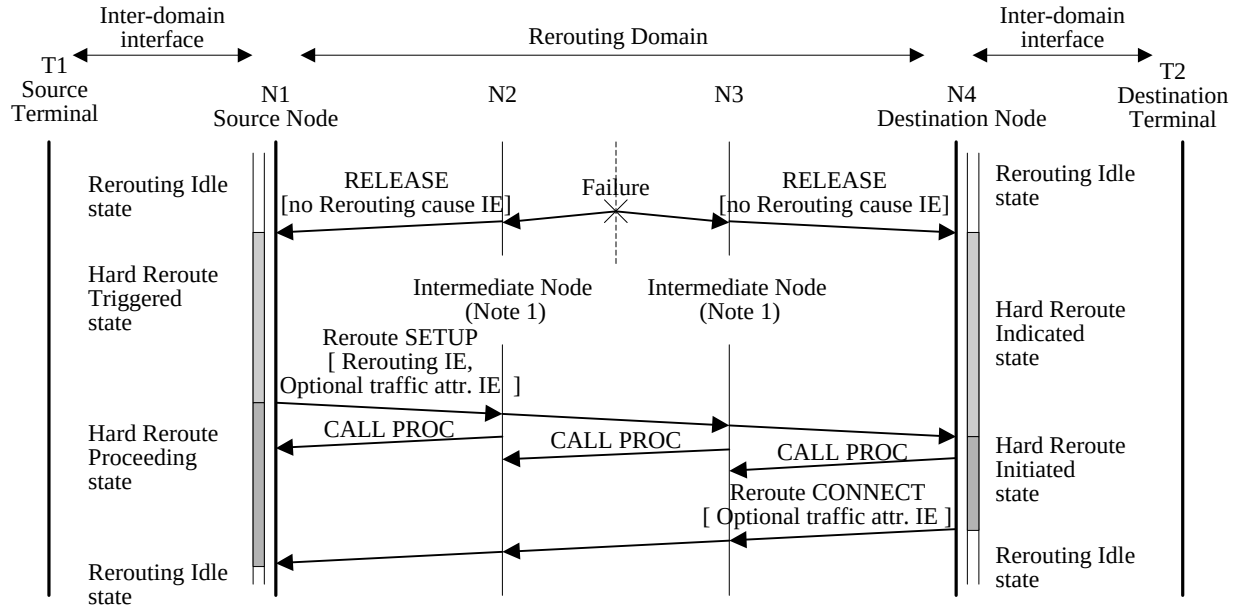


Figure 4-9: Hard rerouting operation



Note 1: Intermediate Node which is part of the "rerouting" connection path.

Figure 4-10: Flow Sequence during hard rerouting

Table 4-3: Parameters for a hard rerouting operation

Message	Rerouting related Information Element	Information Field	UNI (Calling party side)	PNNI	UNI (Called party side)
RELEASE	none				
Reroute SETUP	Called Party Number	AESA		N4	
	Rerouting	Pass along request		pass along request	
		Endpoint key		K2	
		Incarnation number		previous value+1	
		Switchover behavior indicator		"*switchover immediately*"	
	Optional traffic attributes (optional)	Cumulative administrative weights		Forward and backward cumulative administrative weights for a path from N1 up to N4	
Reroute CONNECT	Optional traffic attributes (optional)	Cumulative administrative weights		Forward and backward cumulative administrative weights for a path from N1 up to N4	

4.4.3 Soft rerouting operation

The following figures illustrate the soft rerouting procedures.

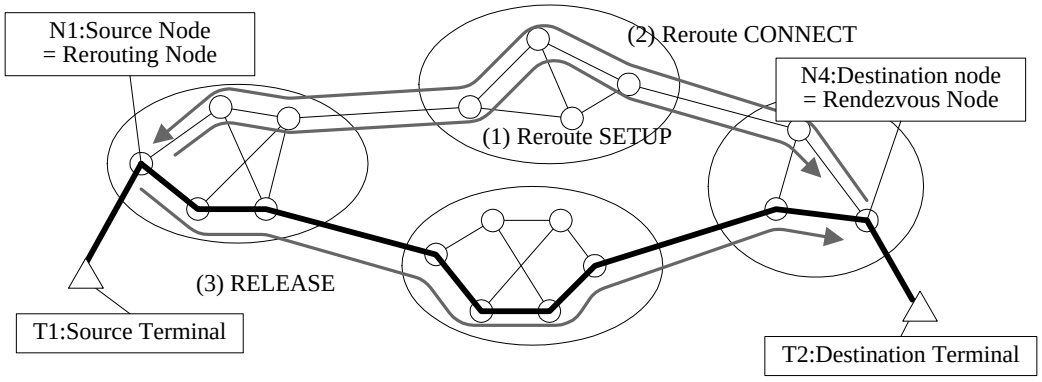
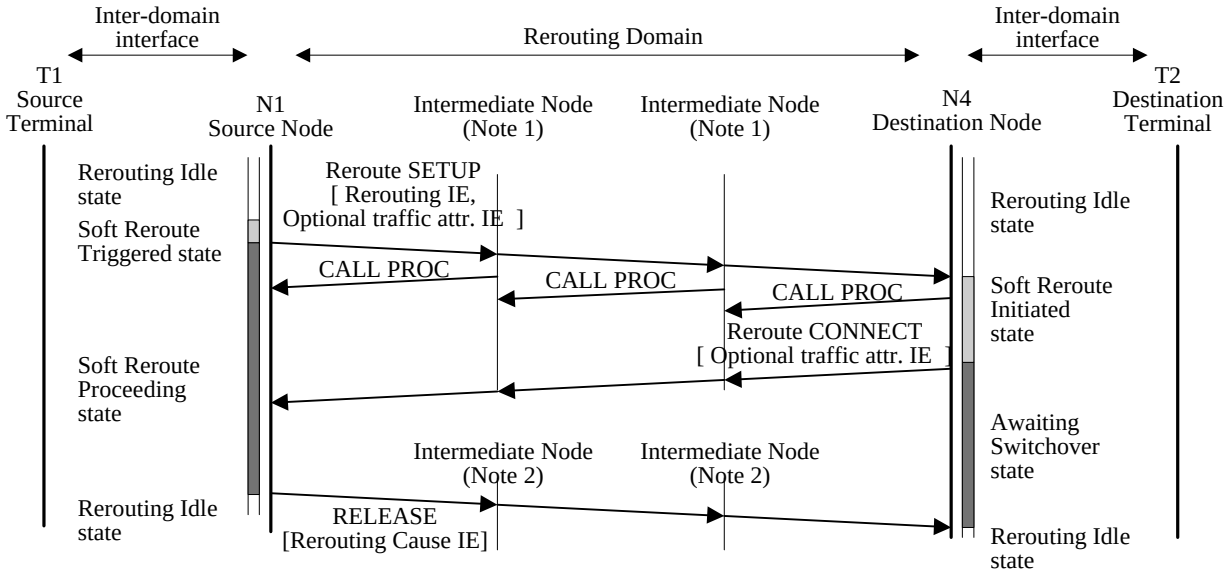


Figure 4-11: Soft rerouting operation



Note 1: Intermediate Node which is part of the "rerouting"connection path
Note 2: Intermediate Node which is part of the " incumbent" connection path

Figure 4-12: Flow Sequence during soft rerouting

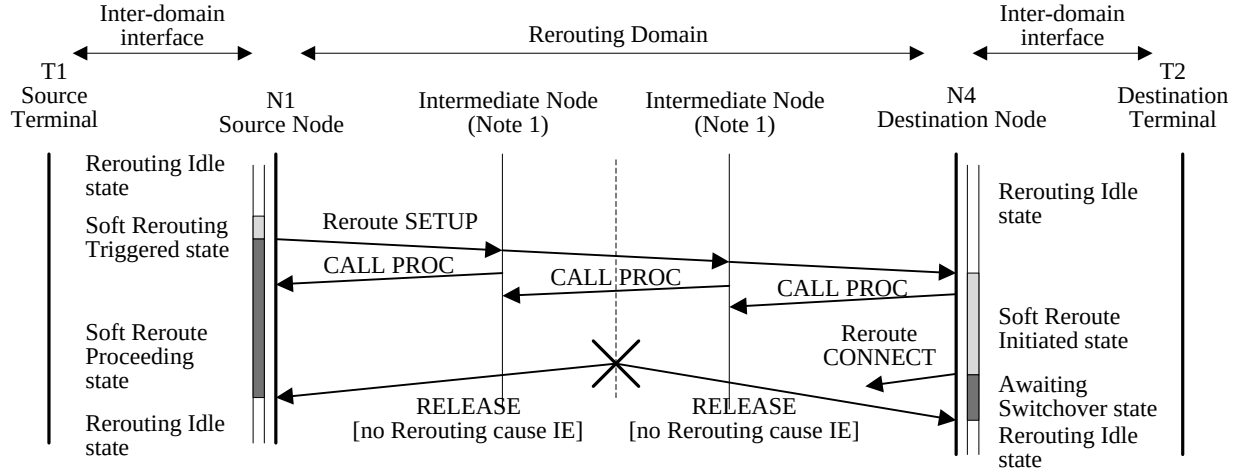
Table 4-4: Parameters for a soft rerouting operation

Message	Rerouting related Information Element	Information Field	UNI (Calling party side)	PNNI	UNI (Called party side)
Reroute SETUP	Called Party Number	AESA		N4	
	Rerouting	Pass along request		pass along request	
		Endpoint key		K2	
		Incarnation number		previous value+1	
		Switchover behavior indicator		*"switchover when receiving call clearing message for incumbent connection"*	
	Optional traffic attributes (optional)	Cumulative administrative weights		Forward and backward cumulative administrative weights for a path from N1 up to N4	
Reroute CONNECT	Optional traffic attributes (optional)	Cumulative administrative weights		Forward and backward cumulative administrative weights for a path from N1 up to N4	
RELEASE	Rerouting Cause	Cause value		Rerouting operation complete	

4.4.4 Failure during soft rerouting operation

The following figure illustrates a failure occurring during a soft rerouting operation. The reroute CONNECT message sent by the destination node does not reach the source node.

When the rerouting connection fails, the incumbent connection remains active.

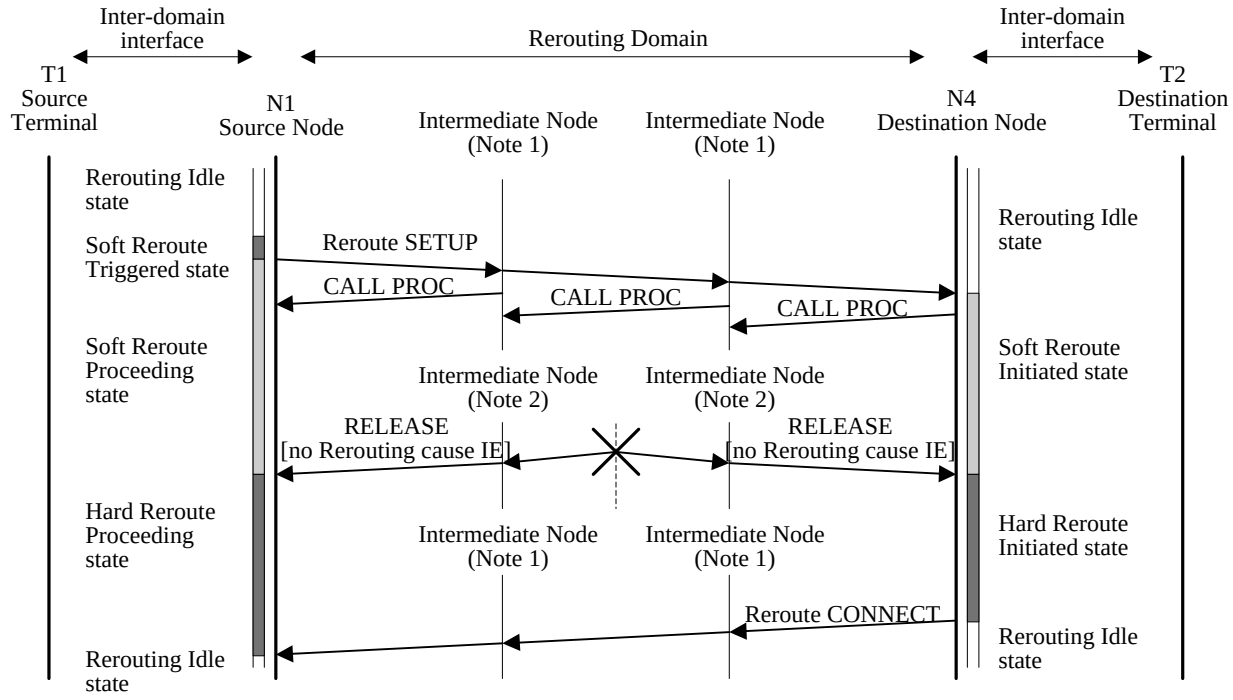


Note 1: Intermediate Node which is part of the "rerouting" connection path

Figure 4-13: "Rerouting" connection failed during soft rerouting

4.4.5 Collision scenarios between soft rerouting and hard rerouting operations

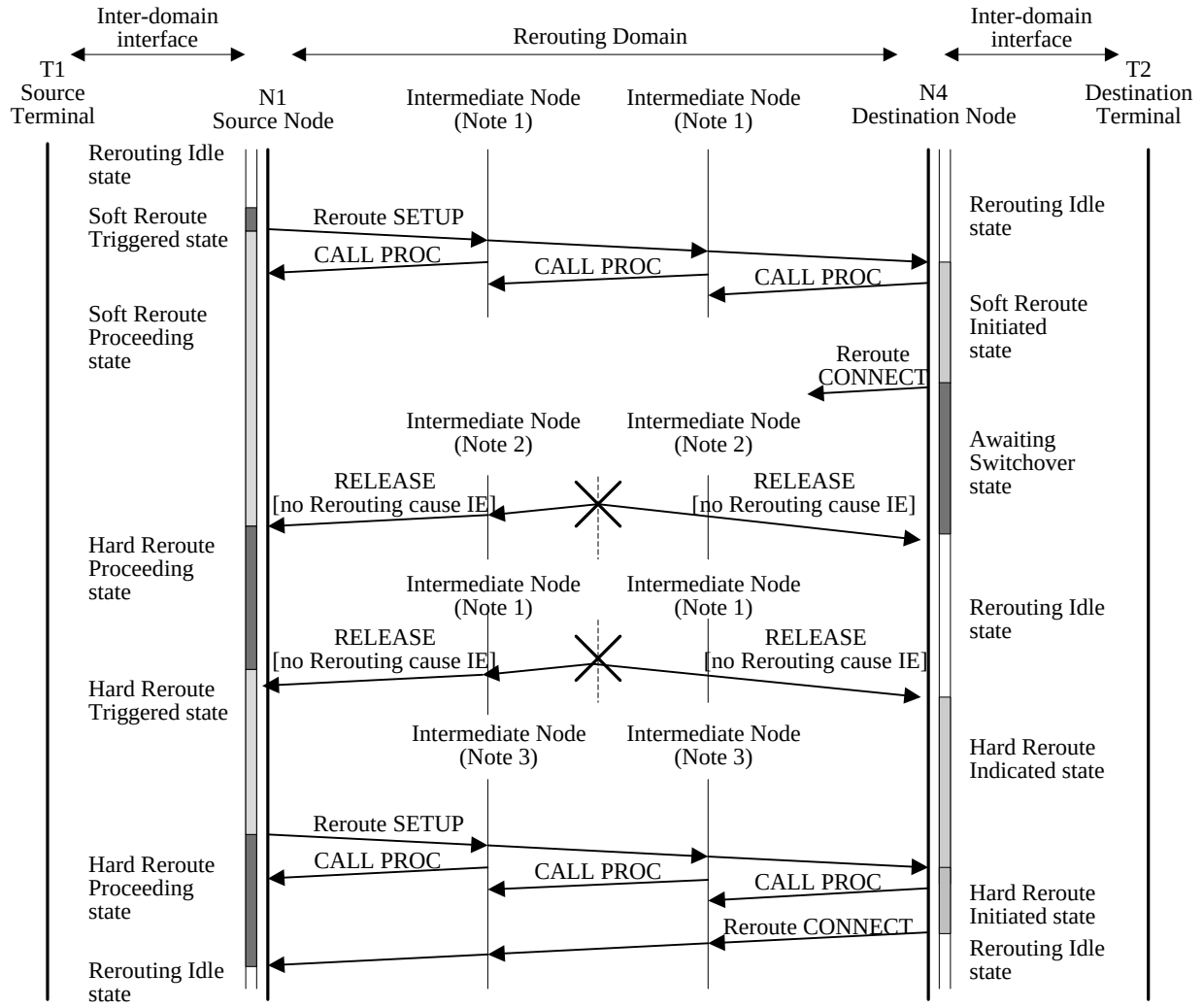
This section illustrates some common collision scenarios between soft rerouting and hard rerouting operations. These examples are not exhaustive.



Note 1: Intermediate Node which is part of the "rerouting" connection path
Note 2: Intermediate Node which is part of the "incumbent" connection path

Figure 4-14: "Incumbent" connection failed during soft rerouting

In some cases it is possible that the incumbent and the rerouting connection traverse a common link, therefore a failure of this link could cause the release of both connections. This scenario is illustrated in Figure 4-15.

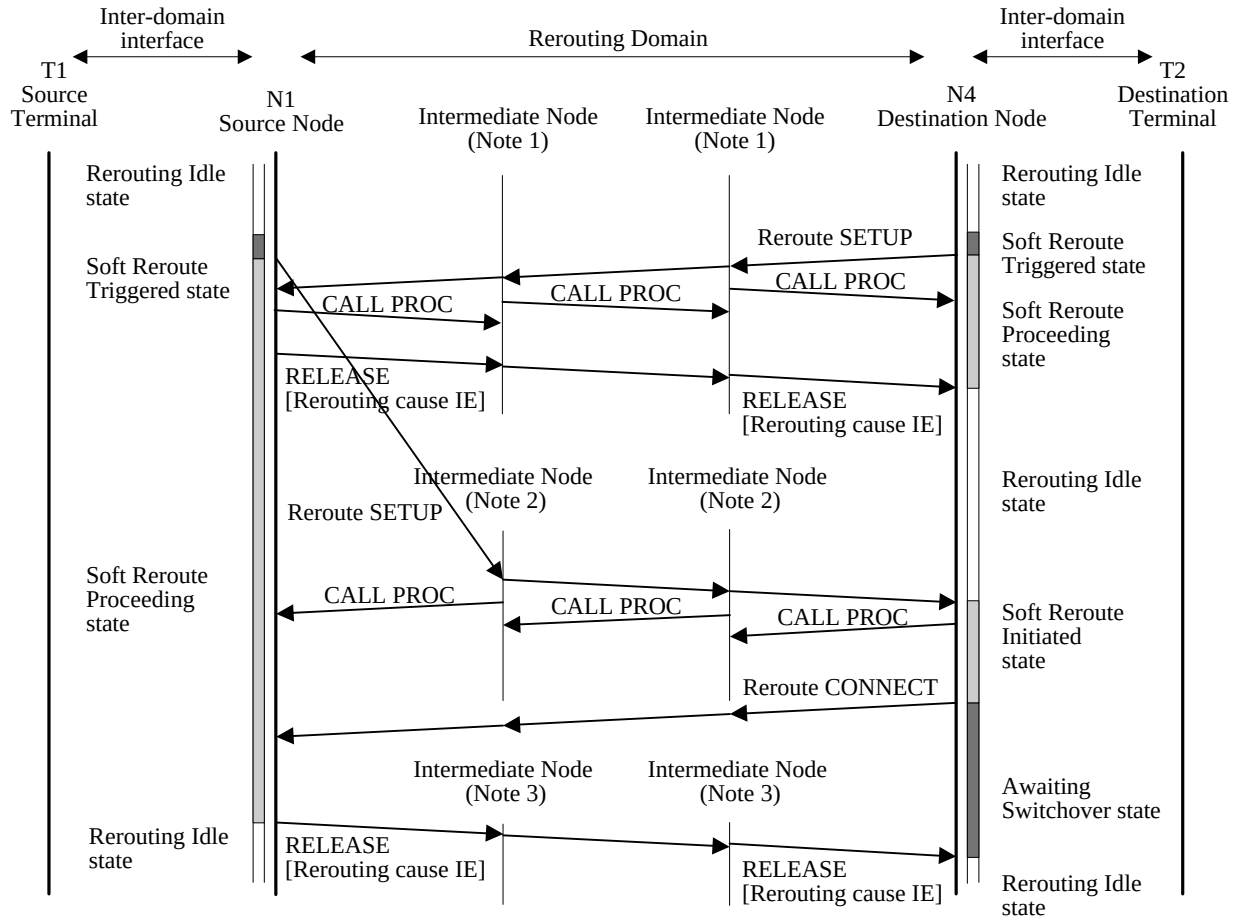


Note 1: Intermediate Node which is part of the "rerouting" connection path
Note 2: Intermediate Node which is part of the "incumbent" connection path
Note 3: Intermediate Node which is part of the other new"rerouting" connection path

Figure 4-15: "Rerouting" connection failed after "Incumbent" connection failed during soft rerouting

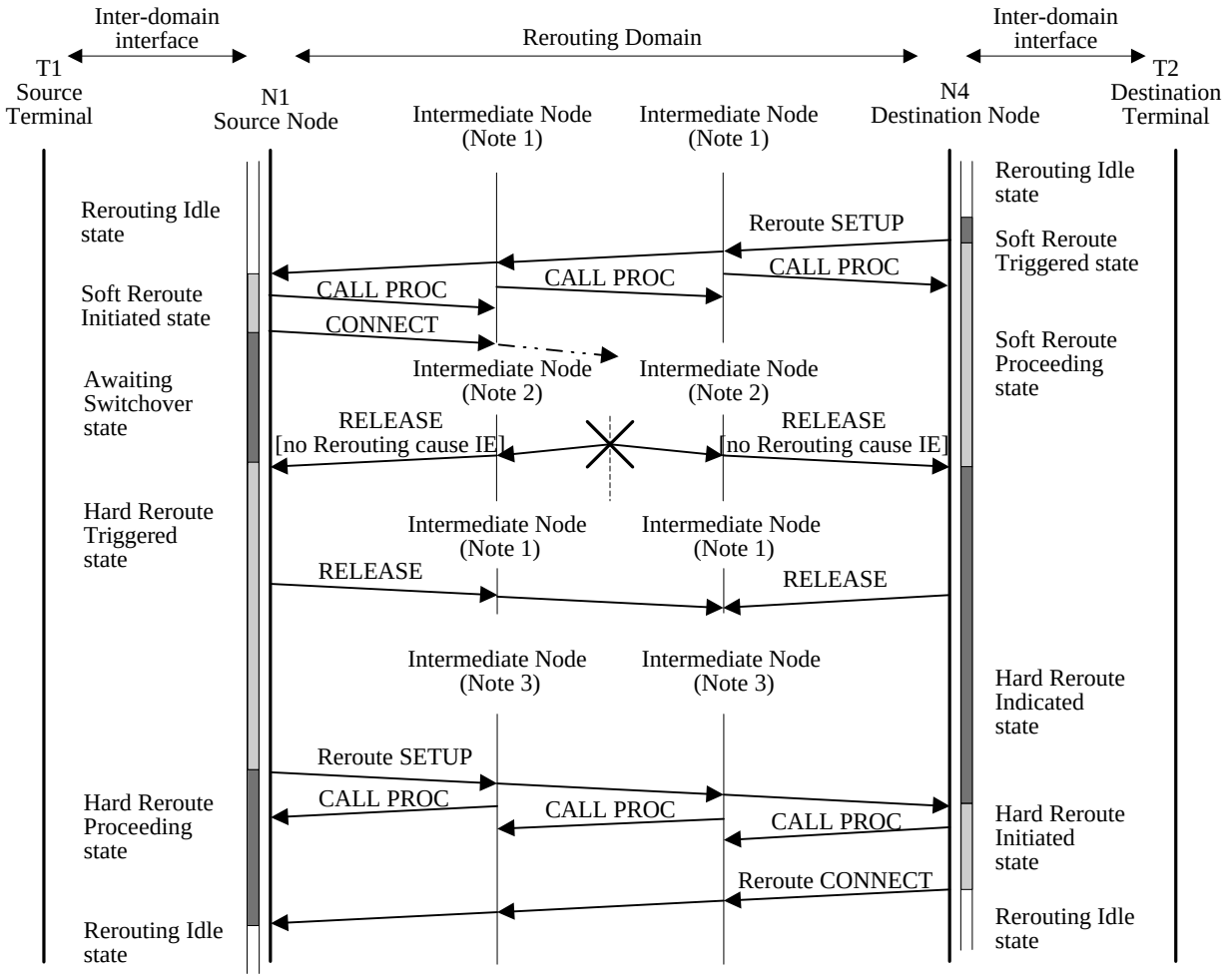
4.4.6 Collision scenarios when supporting symmetric soft rerouting.

This section illustrates some collision scenarios during symmetric soft rerouting operations. These examples are not exhaustive.



Note 1: Intermediate Node which is part of the destination initiated"rerouting" connection path
Note 2: Intermediate Node which is part of the source initiated "rerouting" connection path
Note 3: Intermediate Node which is part of the "incumbent" connection path

Figure 4-16: A destination initiated soft rerouting operation is preempted by a source initiated soft rerouting operation.



Note 1: Intermediate Node which is part of the "rerouting" connection path
Note 2: Intermediate Node which is part of the "incumbent" connection path
Note 3: Intermediate Node which is part of the second "rerouting" connection path

Figure 4-17: A destination initiated soft rerouting operation is preempted by a hard rerouting operation.

5 Domain-based rerouting information elements encoding

[Normative]

5.1 Rerouting services information element

The Rerouting services information element is used to negotiate the set of rerouting services requested/activated for the call and to exchange the availability of rerouting services between the source node and the destination node of a rerouting domain. The Rerouting services information element is present in both the SETUP and the CONNECT messages during the initial call establishment.

The Inter-domain rerouting services field is defined as a set of rerouting classes. The field of each rerouting class is defined as a numerical value that represents a rerouting service within the class. The Inter-domain rerouting services field therefore indicates one and only one rerouting service for each rerouting class.

The Inter-domain rerouting capabilities field is defined in terms of a bitmap. Each bit represents the availability of a particular rerouting service.

The Intra-domain rerouting services field is defined as a set of rerouting classes. The field of each rerouting class is defined as a numerical value that represents a rerouting service within the class. The Intra-domain rerouting services field therefore indicates one and only one rerouting service for each rerouting class.

The Intra-domain rerouting capabilities field is defined in terms of a bitmap. Each bit represents the availability of a particular rerouting service. More than one rerouting service can be indicated as available at one time.

The Inter-domain rerouting services, the Inter-domain rerouting capabilities fields, and Intra-domain rerouting services field have relevance at both intra and inter-domain interfaces. The Intra-domain rerouting capabilities field is only used at intra domain interfaces.

8	7	6	5	4	3	2	1	Octet
Rerouting Services Information Element identifier								1
1	1	1	1	0	0	1	0	
ext.	Coding			IE Instruction Field				2
1	Standard							
Length of Rerouting Services contents								3
Length of Rerouting Services contents (Cont'd)								4
Inter-domain rerouting services								5
Spare						Hard rerouting class		
Inter-domain rerouting capabilities								6 (Note 1)
Spare							Hard rerouting	
Intra-domain rerouting services								7
Spare				Soft rerouting class		Hard rerouting class		
Intra-domain rerouting capabilities								8 (Note 1)
Spare					Asymmetric soft rerouting	Symmetric soft rerouting	Hard rerouting	

Note 1: The bits in these octets shall be set to zero on transmission and ignored on reception in a CONNECT message.

Figure 5-1: Rerouting services information element

* Coding standard (octet 2)

Bits 7 6	Meaning
1 1	ATM Forum Specific

* Inter-domain rerouting services (octet 5) (Note 2)

Bit 2-1	Meaning (Hard Rerouting Class)
00	no hard rerouting service
01	hard rerouting service

All other values are reserved

Note 2: Can be set by the calling end system or by the source node of a rerouting domain in the SETUP message. Indicates a service request.
Can be set by called end system or by the destination node of a rerouting domain in the CONNECT message. Indicates a service activation.

* Inter-domain rerouting capabilities (octet 6) (Note 3)

Bit 1	Meaning
0	hard rerouting not available
1	hard rerouting available

Note 3: Can be set by the source node of a rerouting domain in the SETUP message. Indicates the availability of a rerouting service. This field shall be set to zero on transmission and ignored on reception in a CONNECT message.

* Intra-domain rerouting services (octet 7) (Note 4)

Bit 2-1	Meaning (Hard Rerouting Class)
00	no hard rerouting service
01	hard rerouting service

All other values are reserved

Bit 4-3	Meaning (Soft Rerouting Class)
00	no soft rerouting service
01	Asymmetric soft rerouting service
10	Symmetric soft rerouting service
11	Reserved

Note 4: Can be set by the user, the source node, or the destination node of each rerouting domain in the SETUP message. Indicates a service request.
Can be set by the destination node of each rerouting domain in the CONNECT message. Indicates a service activation within the rerouting domain.

* Intra-domain rerouting capabilities (octet 8) (Note 5)

Bit 1	Meaning
0	hard rerouting not available
1	hard rerouting available

Bit 2	Meaning
0	Symmetric soft rerouting not available
1	Symmetric soft rerouting available

Bit 3	Meaning
0	Asymmetric soft rerouting not available
1	Asymmetric soft rerouting available

Note 5: Can be set by the source node of each rerouting domain in the SETUP message. Indicates the availability of a rerouting service.
This field shall be set to zero on transmission and ignored on reception in a CONNECT message.

5.2 Rerouting information element

The Rerouting information element contains information exchanged between the source and destination nodes to initialize the rerouting mechanism. It is also used between the rerouting node and the rendezvous node to control a rerouting operation. The Rerouting information element is present in both the SETUP and the CONNECT messages during the initial connection establishment and in the SETUP message during the rerouting connection establishment. The content of the Rerouting information element depends on the context in which it is used. The context (signalling message, rerouting state) in which a Rerouting information element is used determines which octet groups are included and their significance.

Octet groups are Type Length Value (TLV) encoded, with an octet group identifier (T) of one octet, an octet group length (L) of one octet, and an octet group value (V) of 'length' octets. This encoding allows octet groups that are not recognized to be skipped, as specified in sections 6.2.8 and 6.3.8.

Table 5-1: Usage context and octet groups in the Rerouting information element

Context		**Octet groups**		
Signalling message	**Connection type**	**Octet group name**	**Octet group identifier**	**Value of the octet group length field**
SETUP	Initial	Edge node (Note 8)	00000001	20
		Endpoint Key (Note 8)	00000011	4
		PNNI Cumulative Forward Maximum Cell Transfer Delay (Note 1)	00000100	3
		Cumulative Forward Peak-to-peak Cell Delay Variation (Note 2)	00000101	3
		Cumulative Backward Peak-to-peak Cell Delay Variation (Note 3)	00000110	3
	Rerouting	Rerouting control (Note 7)	00000010	5
		Endpoint Key (Note 7)	00000011	4
CONNECT	Initial	Edge node (Note 7)	00000001	20
		Endpoint Key (Note 7)	00000011	4
		PNNI Cumulative Forward Maximum Cell Transfer Delay (Note 4)	00000100	3
		Cumulative Forward Peak-to-peak Cell Delay Variation (Note 5)	00000101	3
		Cumulative Backward Peak-to-peak Cell Delay Variation (Note 6)	00000110	3

Note 1: Shall be included when the PNNI Cumulative Forward Maximum Cell Transfer Delay of the End-to-end transit delay information element is present in the received SETUP message.

Note 2: Shall be included when the Cumulative Forward Peak-to-peak Cell Delay Variation of the Extended QoS parameters information element is present in the received SETUP message.

Note 3: Shall be included when the Cumulative Backward Peak-to-peak Cell Delay Variation of the Extended QoS parameters information element is present in the received SETUP message.

Note 4: Shall be included when the PNNI Cumulative Forward Maximum Cell Transfer Delay of the End-to-end transit delay information element is present in the received SETUP message.

Note 5: Shall be included when the Cumulative Forward Peak-to-peak Cell Delay Variation of the Extended QoS parameters information element is present in the received SETUP message.

Note 6: Shall be included when the Cumulative Backward Peak-to-peak Cell Delay Variation of the Extended QoS parameters information element is present in the received SETUP message.

Note 7: Shall always be included

Note 8: Shall be included when symmetric soft rerouting is advertised as available.

8	7	6	5	4	3	2	1	Octet
Rerouting Information Element identifier								1
1	1	1	1	0	0	1	1	
ext.	Coding		IE Instruction Field					2
1	Standard							
Length of rerouting IE contents								3
Length of rerouting IE contents (Cont'd)								4
0	0	0	0	0	0	0	1	5*
Edge node identifier								
Length of Edge node contents								5.1*
Edge node AESA								5.2* to 5.21*
0	0	0	0	0	0	1	1	6*
Endpoint key identifier								
Length of Endpoint key contents								6.1*
Endpoint key								6.2* to 6.5*
0	0	0	0	0	0	1	0	7*
Rerouting control identifier								
Length of rerouting control contents								7.1*
Switchover behavior indicator								7.2*
Incarnation number								7.3* to 7.4*
0	0	0	0	0	1	0	0	8* (Note 1)
PNNI Cumulative Forward Maximum Cell Transfer Delay identifier								
Length of PNNI Cumulative Forward Maximum Cell Transfer Delay contents								8.1*
PNNI Cumulative Forward Maximum Cell Transfer Delay								8.2* to 8.4*
0	0	0	0	0	1	0	1	9* (Note 2)
Cumulative Forward Peak-to-peak Cell Delay Variation identifier								
Length of Cumulative Forward Peak-to-peak Cell Delay Variation contents								9.1*
Cumulative Forward Peak-to-peak Cell Delay Variation								9.2* to 9.4*
0	0	0	0	0	1	1	0	10* (Note 3)
Cumulative Backward Peak-to-peak Cell Delay Variation identifier								
Length of Cumulative Backward Peak-to-peak Cell Delay Variation contents								10.1*
Cumulative Backward Peak-to-peak Cell Delay Variation								10.2* to 10.4*

Figure 5-2: Rerouting information element

* Coding standard (octet 2)

Bits 7 6	Meaning
1 1	ATM Forum Specific

* Edge Node AESA (octets 5.2 to 5.21)

An AESA that identifies the entity within the edge node responsible for rerouting services for this call. The peer edge node sets the called party address to this address when initiating a rerouting connection.

* Endpoint Key (octets 6.2 to 6. 5)

Contains a value (or key) that uniquely identifies the call at the edge node within the scope of the edge node AESA. This value is used to correlate an incoming reroute SETUP message with an existing call.

* Switchover behavior indicator (octet 7.2)

Instruction is given by the rerouting node to the rendezvous node to indicate the behavior for switching from the incumbent connection to the rerouting connection during the rerouting.

Bits 87654321	Meaning
00000000	switchover immediately (Note 9)
00000001	switchover when receiving the call clearing message for the incumbent connection (Note 10)

All other values are reserved

Note 9: This switching behavior characterizes a hard rerouting operation (i.e. hard reroute setup)

Note 10: This switching behavior characterizes a soft rerouting operation (i.e. soft reroute setup)

* Incarnation number (octets 7.3 to 7.4)

A sequence number that identifies a particular instance of the connection segment.

* PNNI Cumulative Forward Maximum Cell Transfer Delay (octets 8.2 to 8.4)

Contains the PNNI cumulative forward maximum cell transfer delay value recorded at the edge node. The format of this field is specified in section 6.4.5.24/PNNI 1.0.

* Cumulative Forward Peak-to-peak cell Delay Variation (octets 9.2 to 9.4)

Contains the cumulative forward peak-to-peak cell delay variation values recorded at the edge node. The format of this field is specified in section 6.4.5.25/PNNI 1.0.

* Cumulative Backward Peak-to-peak cell Delay Variation (octets 10.2 to 10.4)

Contains the cumulative backward peak-to-peak cell delay variation values recorded at the edge node. The format of this field is specified in section 6.4.5.25/PNNI 1.0.

5.3 Rerouting cause information element

The Rerouting cause information element is used to convey the cause of the RELEASE message that is specifically related to a rerouting operation.

8	7	6	5	4	3	2	1	Octet
Rerouting Cause Information Element identifier								1
1	1	1	1	0	1	0	0	
ext.	Coding		IE Instruction Field					2
1	Standard							
Length of Rerouting Cause contents								3
Length of Rerouting Cause contents (Cont'd)								4
Rerouting release cause								5

Figure 5-3: Rerouting Cause Information Element

* Coding standard (octet 2)

Bits 7 6	Meaning
1 1	ATM Forum Specific

* Rerouting Release Cause (octet 5)

Bits 87654321	Value	Meaning
00000001	1	release received from outside any rerouting domain
00000010	2	failed to recover the connection using domain-based rerouting
00000011	3	unrecognized endpoint key for rerouting (note 1)
00000100	4	rerouting operation complete (note 1)
00000101	5	old incarnation number (note 1)
00000110	6	rerouting operation already in progress (note 1)
00000111	7	violation of the rerouting domain boundary
00001000	8	unsupported switchover behavior (note 1)

All other values are reserved

Note 1: Only supported at intra-domain interfaces.

5.4 Optional traffic attributes information element

The Optional traffic attributes information element [BCS 1.0] is used to accumulate the forward and backward administrative weights of the path within a rerouting domain.

The error handling procedures of section 2/BCS 1.0 shall apply.

The following octet group is added to Figure 2-1 in section 2/BCS 1.0:

8	7	6	5	4	3	2	1	Octets
Cumulative Administrative Weights Identifier								7* (Note 1)
0	0	0	0	0	0	1	0	
Cumulative Forward Administrative Weight								7.1-7.4*
Cumulative Backward Administrative Weight								7.5-7.8*

Note 1 - If this octet group is present no other optional octet group may be present.

Figure 5-4: Additional octet group to the Optional traffic attributes information element

* Cumulative Forward Administrative Weight (octets 7.1-7.4)

Contains the cumulative forward direction administrative weight for the path the call has taken from the source/rerouting node to the destination/rendezvous node.

* Cumulative Backward Administrative Weight (octets 7.5-7.8)

Contains the cumulative backward direction administrative weight for the path the call has taken from the source/rerouting node to the destination/rendezvous node.

When the Cumulative Administrative Weights octet group is present in the Optional traffic attributes information element, the Origin field (octet 5) shall be set to "Network generated".

6 Call control procedures for Domain-based rerouting

[Normative]

This section describes the call control procedures to support domain-based rerouting for a point-to-point call. It specifies the procedures to negotiate and initialize the rerouting services during the establishment of the call within a rerouting domain and between rerouting domains. It also specifies the rerouting operations between the two edge nodes after the call has been established.

A rerouting Finite State Machine is used to specify the procedures for the rerouting services. The source node and the destination node have different responsibilities during the rerouting operation and the state transitions are therefore different between the two edge nodes during the rerouting operation. The procedures contained in this section are divided into those for the source node and those for the destination node.

Procedures specific to the optional implementation of the symmetric soft rerouting services are marked with **[SYM SOFT]**.

Appendix B contains a table format of the source node and destination node FSMs when both the hard rerouting service and the asymmetric soft rerouting service are activated for a call.

Appendix C contains a table format of the source node and destination node FSMs when both the hard rerouting service and the symmetric soft rerouting service are activated for a call

6.1 Receipt of a setup indication at an Domain-based rerouting capable node

To specify the signalling procedures at an domain-based rerouting capable node, the following cases apply:

Case 1

- The call control entity receives a setup indication from an intra-domain interface, and
- The setup indication contains the Rerouting information element, and
- The Rerouting information element contains a Rerouting control octet group, and
- The call is to be progressed to an inter-domain interface

then:

The setup indication shall be rejected with a Rerouting cause information element set to the Rerouting release cause #7 "*violation of the rerouting domain boundary*" and a Crankback information element set to the crankback cause #63 "Service or option not available, unspecified". The cause in the Cause information element shall be set to cause #63 "Service or option not available, unspecified". The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1.

Case 2

- The call control entity receives a setup indication from an inter-domain interface, and
- The setup indication contains the Rerouting information element, and
- The Rerouting information element contains a Rerouting control octet group

then:

Actions of section 6.1 - Case 1 apply.

Case 3

- The call control entity receives a setup indication from an intra-domain interface, and
- The called party address in the setup indication is an edge node AESA assigned to this node, and
- The setup indication contains the Rerouting information element, and
- The Rerouting information element contains a Rerouting control octet group

then:

This setup indication is treated as a reroute setup indication.

If the Rerouting information element does not contain an Endpoint key or the endpoint key in the Rerouting information element of the received setup indication cannot be matched to any existing connection, the setup indication shall be rejected with a Rerouting cause information element set to the Rerouting release cause #3 "*unrecognized endpoint key for rerouting*". The cause code of the Cause information element shall be coded as specified in section 6.6.

The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1.

If the endpoint key in the Rerouting information element of the received SETUP matches an existing connection then:

- If this node is the destination node procedures in section 6.3.5 apply.
- If this node is the source node procedures in section 6.2.7 apply. **[SYM SOFT]**

Case 4

- ❖ The call control entity receives a setup indication from an inter-domain interface, and
- ❖ The call is to be progressed to an intra-domain interface, and
- ❖ The setup indication does contain the Rerouting information element, and
- ❖ The Rerouting information element does not contain a Rerouting control octet group

then:

This node is a source node for this call and the setup indication is a setup indication for the initial call establishment. The call control entity shall discard the Rerouting information element and apply the procedures in section 6.2.1.

Case 5

- ❖ The call control entity receives a setup indication from an inter-domain interface, and
- ❖ The call is to be progressed to an intra-domain interface, and
- ❖ The setup indication does not contain the Rerouting information element

then:

This node is a source node for this call and the setup indication is a setup indication for the initial call establishment. The procedures in section 6.2.1 apply.

Case 6

- ❖ The call control entity receives a setup indication from an intra-domain interface, and
- ❖ The call is to be progressed to an inter-domain interface or the called party address in the setup indication is an edge node AESA assigned to this node, and
- ❖ At least one of the following is true
  1. The setup indication does not contain the Rerouting information element, or
  2. The setup indication does contain the Rerouting information element, and the Rerouting information element does not contain a Rerouting control octet group

then:

This node is a destination node for this call and this setup indication is a setup indication for the initial call establishment. The procedures in section 6.3.1 apply.

Case 7

- ❖ The call control entity receives a setup indication from an intra-domain interface, and
- ❖ The call is to be progressed to an intra-domain interface

then:

The procedures in section 6.4 apply.

Case 8

- ❖ The call control entity receives a setup indication from an inter-domain interface, and
- ❖ The call is to be progressed to an inter-domain interface

then:

The procedures in section 6.5 apply.

6.2 Procedures at the source node

6.2.1 Processing the setup indication during the initial call establishment

See section 6.1 – Case 4 and Case 5.

If the call control entity support the accumulation of administrative weights, and an Optional traffic attributes information element with Cumulative Administrative Weights is present in the received setup indication, the information element shall be discarded and procedures of section 6.2.9.1 shall apply.

If the setup indication contains a Rerouting services information element, the call control entity shall clear the Intra-domain rerouting capabilities fields. The Inter-domain rerouting services and the Inter-domain rerouting capabilities fields indicated in the Rerouting services information element shall be passed on. The IE instruction field of the Rerouting services information element shall be coded as specified in section 10.1.

If the setup indication does not contain a Rerouting services information element and if the source node wishes to request one or more inter-domain rerouting services, one or more intra-domain rerouting services, or advertise the availability of intra or inter-domain rerouting services, it shall add a Rerouting services information element to the forwarded setup request. The Inter-domain rerouting capabilities field shall be set to zero. The IE instruction field of the Rerouting services information element shall be coded as specified in section 10.1.

Based on subscription, the source node can request inter-domain rerouting services on behalf of the calling end system. The request for inter-domain rerouting services shall be coded in the Inter-domain rerouting services field of the Rerouting services information element as described in section 5.1.

The source node can request any of the defined intra-domain rerouting services. It may take the received intra-domain rerouting services into account in determining whether to request any intra-domain rerouting services. The request for intra-domain rerouting services shall be coded in the Intra-domain rerouting services field of the Rerouting services information element as described in section 5.1. If an intra-domain rerouting service is not requested, the corresponding bits of the Intra-domain rerouting services field shall be set to zero.

The call control entity shall indicate in the intra-domain rerouting capabilities all the rerouting services that are available (i.e. the source node supports the service, the network policy allows the services to be requested and resources have been allocated to activate the rerouting service if the service is requested). An intra-domain rerouting capability can be indicated even though the associated rerouting service is not requested. This allows the destination node or the called end system to request the service for the call.

The call control entity may remove the Rerouting services information element from the forwarded setup request if the information element is empty (the information element does not indicate at least one inter-domain rerouting service, or one inter-domain rerouting capability, or one intra-domain rerouting service or one intra-domain rerouting capability).

A rerouting service may only be activated if the service is made available at the source node for this call and the service is made available at the destination node for this call.

If one or more rerouting services are indicated as available in the Intra-domain rerouting capabilities field in the Rerouting services information element the call control entity shall do the following:

1. The initial incarnation number LocalIncarnationNumber associated with the call shall be set to zero, although it is not explicitly signalled to the destination edge node.

2. Depending on the ATM service category of the call, procedures of Annex A shall apply. When applicable, the call control entity shall insert the recorded cumulative QoS values in the Rerouting information element.

3. In addition to the information recorded in step 2 above, extra information may need to be recorded by the call control entity to ensure proper operations of other network capabilities (see section 11 for examples).

[SYM SOFT]

If the symmetric soft rerouting service is indicated as available in the Rerouting services information element the call control entity shall also do the following:

4. The call control entity shall add a Rerouting information element to the SETUP message. The IE instruction field of the information element shall be coded as specified in section 10.1.

5. The Rerouting information element shall contain the Edge node octet group as described in section 5.2. The edge node AESA shall be set to an AESA that identifies the entity within the edge node responsible for rerouting services for this call.

6. The call control entity shall generate an endpoint key that uniquely identifies the call within the scope of the edge node AESA. Endpoint key values should be allocated such that they are not re-used for another call at least within the hard reroute timer interval (HardReroutingTime). The Endpoint key octet group in the Rerouting information element shall contain the generated endpoint key value.

7. A Rerouting control octet group shall not be included in the Rerouting IE.

8. The incarnation number RemoteIncarnationNumber associated with the call shall be set to zero.

6.2.2 Processing the connect indication during the initial call establishment

When a call control entity receives a connect indication from an intra-domain interface and the connect indication is to be progressed over an inter-domain interface it shall do the following:

If the connect indication contains a Rerouting information element and no Rerouting services information element, the call shall be cleared with a cause set to #96 “mandatory information element is missing”. The diagnostic field in the Cause information element shall be set to the identifier of the Rerouting services information element.

If the connect indication does not contain a Rerouting services information element, no extra processing is required. All the rerouting information that has been stored in the call setup phase for rerouting services may be discarded.

- If the connect indication contains a Rerouting services information element, the Intra-domain rerouting services field indicates which rerouting services to activate for this call in this rerouting domain.

If the call control entity supports administrative weight accumulation, and the Optional traffic attributes information element with Cumulative Administrative Weights is present in the connect indication, the call control entity may record the Cumulative Forward and the Cumulative Backward Administrative Weight values. The call control entity shall not forward the Optional traffic attributes information element with Cumulative Administrative Weight in the connect request.

If one or more rerouting services are activated for this call, the call control entity shall do the following:

1. The call control entity shall record the destination node AESA, contained in the Edge node octet group of the Rerouting information element.

2. The call control entity shall record the destination node endpoint key, contained in the Endpoint key octet group of the Rerouting information element.

3. Depending on the ATM service category of the call, procedures of Annex A shall apply.

4. The rerouting state of the call shall change from Null to Rerouting idle.

If no rerouting service is activated for this call, all the rerouting information stored during the call setup phase may be discarded.

Prior to progressing the connect request, the call control entity shall remove the Rerouting information element and clear the Intra-domain rerouting services field in the Rerouting services information element. The inter-domain rerouting services indicated in the Rerouting services information element shall be passed on.

6.2.3 Rerouting states at the source node

The following rerouting states are defined at the source node:

* Null
  - Rerouting services not activated for this call.
* Rerouting Idle
  - No rerouting operation is in progress, and.
  - At least one rerouting service is activated for the call, and
  - The call/connection state of the connection at both the ingress and the egress of the source node is Active
* Hard Reroute Triggered
  - The call/connection state of the incumbent connection at the egress of the source node is Release request, Release indication or Null, and
  - The source node is in the process of constructing an outgoing setup request for the rerouting connection.
* Hard Reroute Proceeding
  - The call/connection state of the incumbent connection at the egress of the source node is Release request, Release indication or Null, and
  - The call/connection state of the rerouting connection at the egress of the source node is Call Present or Call Proceeding Received.
* Soft Reroute Triggered
  - The call/connection state of the incumbent connection at the egress of the source node is Active, and
  - The call/connection state of the rerouting connection at the egress of the source node is Null, and the source node is in the process of constructing an outgoing setup request for the rerouting connection.
* Soft Reroute Proceeding
  - The call/connection state of the incumbent connection at the egress of the source node is Active, and
  - The call/connection state of the rerouting connection at the egress of the source node is Call Present or Call Proceeding Received.

Support for symmetric soft rerouting requires the following additional states **[SYM SOFT]**:

* Soft Reroute Initiated
  - The call/connection state of the incumbent connection at the egress of the source node is Active, and
  - The call/connection state of the rerouting connection at the egress of the source node is Call Initiated or Call Proceeding Sent.
* Awaiting Switchover
  - The call/connection state of the incumbent connection at the egress of the source node is Active, and
  - The call/connection state of the rerouting connection at the egress of the source node is Active, and

- The source node is awaiting the release indication for the incumbent connection to switchover from the incumbent connection to the rerouting connection.

6.2.4 Receipt of release indication

A release indication can be received for various reasons, including a RELEASE or RELEASE COMPLETE message, the expiry of timer T310, the final expiry of timer T303, SAAL failure, RESTART message, STATUS message with incompatible state, or other protocol errors. Except for the receipt of a RELEASE or RELEASE COMPLETE message, the release indication does not contain a Rerouting cause information element.

6.2.4.1 Receipt of release indication in the Null state

To specify the procedures in this section, the following cases apply:

Case 1

- The call control entity receives a release indication from the direction of the calling party, and
- The hard rerouting service was indicated as available for the call in this rerouting domain, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the called party for the incumbent connection. The call control entity shall insert the Rerouting cause information element with the Rerouting release cause set to #1 "*release received from outside any rerouting domain*" in the release request. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1.

Case 2

- The call control entity receives a release indication from the direction of the called party, and
- The release indication contains a Crankback information element, and
- The source node finds an alternate path for which the next hop is an inter-domain interface.

then:

Procedures of section 6.5 shall apply in addition to normal crankback procedures.

Otherwise,

The call control entity shall apply the normal call clearing or crankback procedures as appropriate.

6.2.4.2 Receipt of release indication in the Rerouting Idle state

To specify the procedures in this section, the following cases apply:

Case 1

- The call control entity receives a release indication from the direction of the calling party, and
- At least one of the following is true:
  1. The hard rerouting service is NOT activated for the call in this rerouting domain, or
  2. The release indication does contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the called party for the incumbent connection. If present, the Rerouting cause IE shall be forwarded without modification in the release request. The rerouting state of the call shall change to Null.

Case 2

- The call control entity receives a release indication from the direction of the calling party, and
- The hard rerouting service is activated for the call in this rerouting domain, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the called party for the incumbent connection. The call control entity shall insert the Rerouting cause information element with the Rerouting release cause set to #1 ” *release received from outside any rerouting domain*” in the release request. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1.

The rerouting state of the call shall change to Null.

Case 3

- The call control entity receives a release indication from the direction of the called party for the incumbent connection, and
- At least one of the following is true:
  1. The hard rerouting service is NOT activated for the call in this rerouting domain, or
  2. The release indication contains the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the calling party. If the Rerouting cause IE is present and contains the Rerouting release cause #1 ”*release received from outside any rerouting domain*”, it shall be forwarded without modification in the release request. If the Rerouting cause IE is present and contains any other cause than #1 ”*release received from outside any rerouting domain*”, the Rerouting cause IE shall be forwarded with the Rerouting release cause set to #2 “*failed to recover the connection using domain-based rerouting*” in the release request. The rerouting state of the call shall change to Null.

Case 4

- The call control entity receives a release indication from the direction of the called party for the incumbent connection, and
- The hard rerouting service is activated for the call in this rerouting domain, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The rerouting state of the call shall change to Hard Reroute Triggered. The content of the Cause information element contained in the release indication shall be saved for further processing if the hard reroute operation fails. The call control entity shall start the hard rerouting timer with initial value HardReroutingTime and proceed with the hard rerouting procedures according to the section 6.2.5.1.

6.2.4.3 Receipt of release indication in the Hard Reroute Triggered state

To specify the procedures in this section, the following cases apply:

Case 1

- The call control entity receives a release indication from the direction of the calling party.

then:

The hard rerouting timer shall be cleared. The rerouting state of the call shall change to Null.

6.2.4.4 Receipt of release indication in the Hard Reroute Proceeding state

To specify the procedures in this section, the following cases apply:

Case 1

- The call control entity receives a release indication from the direction of the calling party, and
- The release indication does contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the called party for the rerouting connection. The Rerouting cause IE shall be forwarded without modification in the release request. The hard rerouting timer shall be cleared. The rerouting state of the call shall change to Null.

Case 2

- The call control entity receives a release indication from the direction of the calling party, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the called party for the rerouting connection. The call control entity shall insert the Rerouting cause information element with the Rerouting release cause set to #1 "*release received from outside any rerouting domain*" in the release request. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The hard rerouting timer shall be cleared. The rerouting state of the call shall change to Null.

Case 3

- The call control entity receives a release indication from the direction of the called party for the rerouting connection, and
- The release indication contains the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the calling party. If the Rerouting cause IE contains the Rerouting release cause #1 "*release received from outside any rerouting domain*", it shall be forwarded without modification in the release request. If the Rerouting cause IE contains any other cause than #1 "*release received from outside any rerouting domain*", the Rerouting cause IE shall be forwarded with the Rerouting release cause set to #2 "*failed to recover the connection using domain-based rerouting*" in the release request. The content of the Cause information element shall contain the content assigned at the point of failure on the incumbent connection. The hard rerouting timer shall be cleared. The rerouting state of the call shall change to Null.

Case 4

- The call control entity receives a release indication from the direction of the called party for the rerouting connection, and
- The release indication does NOT contain the Rerouting cause information element, and
- The release indication contains a Crankback information element and an alternate path is found.

then:

The normal crankback procedures shall be applied (see Annex 8/PNNI 1.0). If the call control entity supports administrative weight accumulation, the call control entity shall perform the procedures for the Optional traffic attributes information element with Cumulative Administrative Weights described in section 6.2.9.1. The hard rerouting timer shall continue to run. The rerouting state of the call shall remain in Hard Reroute Proceeding.

Case 5

- The call control entity receives a release indication from the direction of the called party for the rerouting connection, and
- The release indication does NOT contain the Rerouting cause information element, and
- The release indication contains a Crankback information element but no alternate path is found.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the calling party. The hard rerouting timer shall be cleared. The call control entity shall insert the Rerouting cause information element with Rerouting release cause #2 "*failed to recover the connection using domain-based rerouting*". The content of the Cause information element shall contain the content assigned at the point of failure on the incumbent connection. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The rerouting state of the call shall change to Null.

Case 6

- The call control entity receives a release indication from the direction of the called party for the rerouting connection, and
- The release indication does NOT contain the Rerouting cause information element, and
- The release indication does not contain a Crankback information element.
-

then:

The call control entity may initiate another setup request according to the procedures in section 6.2.5.1. In this case, the hard rerouting timer shall continue to run. The rerouting state of the call shall change to Hard Reroute Triggered.

If the call control entity does not initiate another setup request, then the actions of this section – Case 5 apply.

6.2.4.5 Receipt of release indication in the Soft Reroute Triggered state

Section 6.2.4.1 applies.

6.2.4.6 Receipt of release indication in the Soft Reroute Proceeding state

To specify the procedures in this section, the following cases apply:

Case 1

- The call control entity receives a release indication from the direction of the calling party, and
- At least one of the following is true:
  1. The hard rerouting service is NOT activated for the call in this rerouting domain, or
  2. The release indication does contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the called party for both the incumbent and the rerouting connections. If present, the Rerouting cause IE shall be forwarded without modification in both release requests. The rerouting state of the call shall change to Null.

Case 2

- The call control entity receives a release indication from the direction of the calling party, and
- The hard rerouting service is activated for the call in this rerouting domain, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The call control entity shall apply the call clearing procedures in the direction of the called party for both the incumbent and the rerouting connections. The call control entity shall insert the Rerouting cause information element with the Rerouting release cause set to #1 "*release received from outside any rerouting domain*" in both release requests. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The rerouting state of the call shall change to Null.

Case 3

- The call control entity receives a release indication from the direction of the called party for the incumbent connection, and

- At least one of the following is true:
  1. The hard rerouting service is NOT activated for the call in this rerouting domain, or
  2. The release indication contains the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the calling party. If the Rerouting cause IE is present and contains the Rerouting release cause #1 "*release received from outside any rerouting domain*", it shall be forwarded without modification in the release request. If the Rerouting cause IE is present and contains any other cause than #1 "*release received from outside any rerouting domain*", the Rerouting cause IE shall be forwarded with the Rerouting release cause set to #2 "*failed to recover the connection using domain-based rerouting*" in the release request. It shall apply the normal call clearing procedures in the direction of the called party for the rerouting connection. The rerouting state of the call shall change to Null.

Case 4

- The call control entity receives a release indication from the direction of the called party for the incumbent connection, and
- The hard rerouting service is activated for the call in this rerouting domain, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The rerouting state of the call shall change to Hard Reroute Proceeding. The hard rerouting timer shall be started with initial value HardReroutingTime. The existing rerouting operation shall not be disturbed, therefore, no new reroute setup request shall be initiated.

Case 5

- The call control entity receives a release indication from the direction of the called party for the rerouting connection, and
- The release indication contains a Crankback information element and an alternate path is found.

then:

The normal crankback procedures shall be applied (see Annex 8/PNNI 1.0). If the call control entity supports administrative weight accumulation, the call control entity shall perform the procedures for the Optional traffic attributes information element with Cumulative Administrative Weights described in section 6.2.9.1.

Case 6

- The call control entity receives a release indication from the direction of the called party for the rerouting connection, and
- At least one of the following is true:
  1. The release indication contains a Crankback information element but no alternate path is found, or
  2. The release indication does not contain a Crankback information element.

then:

The call control entity shall abort the soft rerouting operation. The rerouting state of the call shall change to Rerouting Idle. The call/connection state of the incumbent connection remains unchanged.

6.2.4.7 Receipt of release indication in the Soft Reroute Initiated state [SYM SOFT]

To specify the procedures in this section, the following cases apply:

Case 1

Section 6.2.4.6 – Case 1 applies.

Case 2

Section 6.2.4.6 – Case 2 applies.

Case 3

Section 6.2.4.6 – Case 3 applies.

Case 4

- The call control entity receives a release indication from the direction of the called party for the incumbent connection, and
- The hard rerouting service is activated for the call in this rerouting domain, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The call control entity shall clear the rerouting connection with cause #21 *"call rejected"* in the direction of the called party. The content of the Cause information element contained in the release indication shall be saved for further processing if the hard reroute operation fails. The call control entity shall start the hard rerouting timer with initial value HardReroutingTime. The rerouting state of the call shall change to Hard Reroute Triggered and the call control entity shall proceed with the hard rerouting procedures according to the section 6.2.5.1.

Case 5

- The call control entity receives a release indication from the direction of the called party for the rerouting connection.

then:

Actions of section 6.2.4.6 - Case 6 apply.

6.2.4.8 Receipt of release indication in the Awaiting Switchover state [SYM SOFT]

To specify the procedures in this section, the following cases apply:

Case 1

Section 6.2.4.6 – Case 1 applies.

Case 2

Section 6.2.4.6 – Case 2 applies.

Case 3

- The call control entity receives a release indication from the direction of the called party for the incumbent connection, and
- The release indication contains the Rerouting cause information element with the Rerouting release cause NOT set to #4 "*rerouting operation complete*".

then:

Actions of section 6.2.4.6 - Case 3 applies.

Case 4

- The call control entity receives a release indication from the direction of the called party for the incumbent connection, and
- At least one of the following is true:
  1. The release indication does NOT contain the Rerouting cause information element, or
  2. The release indication contains the Rerouting cause information element with the Rerouting release cause set to #4 "*rerouting operation complete*".

then:

The call control entity shall switch the connection point, which is connecting to the inter-domain interface (i.e. in the direction of the calling party), from the incumbent connection to the rerouting connection. If the call control entity supports administrative weight accumulation, the call control entity shall use the rerouting connection's cumulative forward and backward administrative weights recorded in section 6.2.7.1 for the administrative weights of the connection within this rerouting domain. The rerouting state of the call shall return to Rerouting Idle.

Case 5

- The call control entity receives a release indication from the direction of the called party for the rerouting connection, and
- the release indication contains the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the calling party. If the Rerouting cause IE contains the Rerouting release cause #1 "*release received from outside any rerouting domain*", it shall be forwarded without modification in the release request. If the Rerouting cause IE is present and contains any other cause than #1 "*release received from outside any rerouting domain*", the Rerouting cause IE shall be forwarded with the Rerouting release cause set to #2 "*failed to recover the connection using domain-based rerouting*" in the release request. It shall also apply the normal call clearing procedures for the incumbent connection in the direction of the called party. The rerouting state of the call shall change to Null.

Case 6

- The call control entity receives a release indication from the direction of the called party for the rerouting connection, and
- The release indication does NOT contain the Rerouting cause information element.

then:

Actions of section 6.2.4.6 - Case 6 apply.

6.2.5 Initiating a reroute setup request

6.2.5.1 Procedures for the hard reroute setup request

The call control entity shall attempt to reroute the connection segment towards the destination node using the edge node AESA as indicated in the Rerouting information element of the connect indication which was received during the initial call establishment phase. When applicable, the call control entity shall also use the previously recorded cumulative QoS parameters information of the destination node and itself to select an alternate path towards the destination node (see Annex A).

If no alternate path is found, the call control entity shall apply normal call clearing procedures in the direction of the calling party. The call control entity shall insert the Rerouting cause information element with Rerouting release cause #2 "*failed to recover the connection using domain-based rerouting*". The content of the Cause information element shall contain the content assigned at the point of failure on the incumbent connection. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The hard rerouting timer shall be cleared. The rerouting state of the call shall change to Null. The remaining procedures of this section do not apply.

If an alternate path is found, the call control entity shall increment by one the incarnation number LocalIncarnationNumber,and build a hard reroute setup request that contains the following information elements:

- The Called party number information element set to the destination node AESA.
- QoS and traffic related information elements as defined in Annex A.
- Other mandatory information elements (e.g Broadband bearer capability information element)
- The Rerouting information element with a Rerouting control octet group that contains
  - the incarnation number LocalIncarnationNumber

- the switchover behavior indicator set to "*switchover immediately*"

- The Rerouting information element with an Endpoint key octet group that contains
  - the destination node endpoint key.

- If the call control entity supports administrative weight accumulation, the call control entity may include an Optional traffic attributes information element with Cumulative Administrative Weights as described in section 6.2.9.1.
- Unrecognized information elements with the instruction indicator flag set to "Follow explicit instructions" and the "pass along request bit" set to "pass along request" that were present in the original setup.
- Inclusion of other information elements is not precluded (see Appendix A).

The IE instruction field of the Rerouting information element shall be coded as specified in section 10.1.

The reroute setup request shall be progressed in the direction of the destination node. The rerouting state of the call shall change to Hard Reroute Proceeding.

6.2.5.2 Hard rerouting timer expiry

Upon expiry of the hard rerouting timer before the receipt of a connect or a release indication for the rerouting connection, the following procedures shall apply.

1. If the rerouting state is Hard Reroute Triggered, the call control entity shall initiate normal call clearing procedures in the direction of the calling party. The call control entity shall insert the Rerouting cause information element with the Rerouting release cause set to #2 "*failed to recover the connection using domain-based rerouting*". The content of the Cause information element shall contain the content assigned at the point of failure on the incumbent connection. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The rerouting state of the call shall change to Null.

2. If the rerouting state is Hard Reroute Proceeding, the call control entity shall initiate normal call clearing procedures in the direction of the calling party. It shall also initiate call clearing procedures in the direction of the called party for the rerouting connection. The call control entity shall insert the Rerouting cause information element with the Rerouting release cause set to #2 "*failed to recover the connection using domain-based rerouting* " in both release requests. The content of the Cause information element shall contain the content assigned at the point of failure on the incumbent connection. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The rerouting state of the call shall change to Null.

6.2.5.3 Procedures for the soft reroute setup request

Case 1

- ❖ The rerouting state of the call is Rerouting Idle, and
- ❖ A soft reroute operation is triggered

then:

The call control entity shall attempt to establish an alternate path for the call towards the destination node as identified by the edge node AESA which was received in the Rerouting information element of the connect indication during the initial call establishment phase. When applicable, the call control entity shall also use the previously recorded cumulative QoS parameters information of the destination node and itself to select an alternate path towards the destination node (see Annex A).

The rerouting connection may be routed on the same path as the incumbent connection in some switches between the source node and the destination node.

If no alternate path can be found, the reroute trigger shall be disregarded. The rerouting state of the call shall remain in Rerouting Idle. The remaining procedures of this section do not apply.

If an alternate path is found, the call control entity shall increment by one the incarnation number LocalIncarnationNumber and build a soft reroute setup request that contains the following information elements:

- The Called party number information element set to the destination node AESA.
- QoS and traffic related information elements as defined in Annex A.
- Other mandatory information elements (e.g Broadband bearer capability information element)
- The Rerouting information element shall be added with a Rerouting control octet group which contains
  - the incarnation number LocalIncarnationNumber
  - the switchover behavior indicator set to "*switchover when receiving the call clearing message for the incumbent connection*"
- The Rerouting information element shall also include a Endpoint key octet group which contains
  - the destination node endpoint key.
- If the call control entity supports administrative weight accumulation, the call control entity may include an Optional traffic attributes information element with Cumulative Administrative Weights as described in section 6.2.9.1.
- Unrecognized information elements with the instruction indicator flag set to "Follow explicit instructions" and the "pass along request bit" set to "pass along request" that were present in the original setup.
- Inclusion of other information elements is not precluded (see Appendix A).

The IE instruction field of the Rerouting information element shall be coded as specified in section 10.1.

The reroute setup request shall be progressed in the direction of the destination node. The rerouting state of the call shall change to Soft Reroute Proceeding.

Case 2

- ❖ The rerouting state of the call is in any other state but Rerouting Idle, and
- ❖ A soft reroute operation is triggered

then:

The reroute trigger shall be disregarded.

6.2.6 Receipt of a reroute connect indication

6.2.6.1 Receipt of a reroute connect indication in the Hard Reroute Proceeding state

The call control entity shall switch the connection point, which is connecting to the inter-domain interfaceto the rerouting connection. The hard rerouting timer shall be cleared. The rerouting state of the call shall return to Rerouting Idle.

If the call control entity supports administrative weight accumulation, and the Optional traffic attributes information element with Cumulative Administrative Weights is present in the connect indication, the call control entity shall record the cumulative forward and backward administrative weights. The call control entity shall use the rerouting connection's cumulative forward and backward administrative weights as recorded above for the administrative weights of the connection within this rerouting domain.

6.2.6.2 Receipt of a reroute connect indication in the Soft Reroute Proceeding state

Upon receiving the connect indication, the call control entity either releases the incumbent connection, or rejects the rerouting connection. The procedures for both are defined below.

If the call control entity rejects the rerouting connection based on the local policy, the call control entity shall release the rerouting connection in the direction of the called party. The release request shall NOT contain the Rerouting cause information element. The cause code of the Cause information element shall be coded to cause code #21 *"call rejected"*. The rerouting state of the call shall return to Rerouting Idle. The rest of the procedures in this section shall not apply.

The call control entity shall switch the connection point, which is connecting to the inter-domain interface, from the incumbent connection to the rerouting connection. The call control entity shall release the incumbent connection in the direction of the called party. The release request shall contain the Rerouting cause information element with the Rerouting release cause set to #4 "*rerouting operation complete*". The cause code of the Cause information element shall be coded as specified in section 6.6. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The rerouting state of the call shall return to Rerouting Idle.

If the call control entity supports administrative weight accumulation, and the Optional traffic attributes information element with Cumulative Administrative Weights is present in the connect indication, the call control entity shall record the cumulative forward and backward administrative weights. The call control entity shall use the rerouting connection's cumulative forward and backward administrative weights as recorded above for the administrative weights of the connection within this rerouting domain.

6.2.7 Receipt of reroute setup indication at the source node [SYM SOFT]

See section 6.1 – Case 3.

If the Rerouting control octet group in the Rerouting information element contains an unrecognized switchover behavior indicator or a switchover behavior indicator set to "*switchover immediately"*, the setup indication shall be rejected with a Rerouting cause information element set to the Rerouting release cause #8 "*unsupported switchover behavior*". The cause code of the Cause information element shall be coded as specified in section 6.6. The remaining procedures of this section do not apply.

The incarnation number in the Rerouting information element shall be verified. If this incarnation number is NOT greater than the current incarnation number RemoteIncarnationNumber, the setup indication shall be rejected with a Rerouting cause information element set to the Rerouting release cause #5 "*old incarnation number*". The cause code of the Cause information element shall be coded as specified in section 6.6. The remaining procedures of this section do not apply.

Otherwise, the incarnation number RemoteIncarnationNumber is updated with the value given by the Rerouting information element.

The procedures for received traffic parameters specified in Annex A shall apply.

If the switchover behavior indicator is set to "*switchover when receiving the call clearing message for the incumbent connection*", the setup indication is a soft reroute setup indication.

One of the following procedures shall apply.

6.2.7.1 Receipt of a reroute setup indication in the Rerouting Idle state

If a soft reroute setup indication is received the rerouting state of the call shall change to Soft Reroute Initiated.

If the call control entity supports administrative weight accumulation, and the Optional traffic attributes information element with Cumulative Administrative Weights is present in the setup indication, then the call control entity shall add the administrative weight of the link over which the SETUP message was received and the node's administrative weight from the egress port to the ingress port to the Cumulative Backward Administrative Weight. The call control entity shall add the node's administrative weight from the ingress port to the egress port to the Cumulative Forward Administrative Weight. The administrative weights used shall be the values associated with the service category of the call. The call control entity shall record the cumulative forward administrative weight as contained in the Cumulative Backward Administrative Weight field, and shall record the cumulative backward administrative weight as contained in the Cumulative Forward Administrative Weight field.

The procedures in section 6.2.7.8 shall then apply.

6.2.7.2 Receipt of a reroute setup indication in the Hard Reroute Triggered state

If a soft reroute setup indication is received, the reroute setup indication shall be rejected with a Rerouting cause information element set to the Rerouting release cause #6 "*rerouting operation already in progress*". The cause code of the Cause information element shall be coded as specified in section 6.6. The rerouting state of the call remains unchanged.

6.2.7.3 Receipt of a reroute setup indication in the Hard Reroute Proceeding state

The procedures in section 6.2.7.2 apply.

6.2.7.4 Receipt of a reroute setup indication in the Soft Reroute Triggered state

The procedures in section 6.2.7.2 apply.

6.2.7.5 Receipt of a reroute setup indication in the Soft Reroute Proceeding state

The procedures in section 6.2.7.2 apply.

6.2.7.6 Receipt of a reroute setup indication in the Soft Reroute Initiated state

The call control entity shall release the older reroute setup indication in the direction of the calling party. The procedures of section 6.2.7.1 shall then apply.

6.2.7.7 Receipt of a reroute setup indication in the Awaiting Switchover state

The procedures in section 6.2.7.6 apply.

6.2.7.8 Sending a reroute connect request in the Soft Reroute Initiated state

A connect request shall be sent in the direction of the called party for the rerouting connection. The rerouting state of the call shall change to Awaiting Switchover. The call/connection state of the incumbent connection remains unchanged.

If the call control entity supports administrative weight accumulation, and the Optional traffic attributes information element with Cumulative Administrative Weights was present in the reroute setup indication, the call control entity shall add an Optional traffic attributes information element with Cumulative Administrative Weights to the connect request. The Cumulative Forward and Cumulative Backward Administrative Weight fields shall be set to the values stored in section 6.2.7.1.

6.2.8 Content validation of information elements

6.2.8.1 Content validation of the Rerouting services information element

If a Rerouting services information element is received and the information element contains an undefined value in one of the rerouting class subfield (e.g. hard rerouting class, soft rerouting class) of the Inter-domain rerouting services field, this value shall be interpreted as the null value and passed on unmodified.

If a Rerouting services information element is received and the information element contains an undefined value in one of the rerouting class subfield (e.g. hard rerouting class, soft rerouting class) of the Intra-domain rerouting services field, this value shall be interpreted as the null value.

6.2.8.2 Content validation of the Rerouting information element

If a Rerouting information element is received and the information element contains unrecognized octet group code points, the switching system shall consider that the unrecognized octet groups are Type Length Value (TLV) encoded. The unrecognized octet groups shall be ignored, provided that the Rerouting information element complies with maximum information element length. Action shall be taken on the message and the Rerouting information element with those octet groups which are recognized and have valid content.

6.2.9 Accumulation of administrative weights

6.2.9.1 Procedures for sending a setup request

The call control entity may add an Optional traffic attributes information element with Cumulative Administrative Weights to the setup request. The Cumulative Forward Administrative Weight shall be set to the sum of the administrative weight of the link the call is to be forwarded over and the node's administrative weight from the ingress port to the egress port. The Cumulative Backward Administrative Weight shall be initialized to the node's administrative weight from the egress port to the ingress port. The administrative weights used shall be the values associated with the service category of the call. The IE instruction field of the Optional traffic attributes information element with Cumulative Administrative Weights information element shall be coded as specified in section 10.1.

6.3 Procedures at the destination node

6.3.1 Processing the setup indication during the initial call establishment

See section 6.1 – Case 6.

If the setup indication contains a Rerouting information element and no Rerouting services information element, the call shall be rejected with a cause set to #96 “mandatory information element is missing”. The diagnostic field in the Cause information element shall be set to the identifier of the Rerouting services information element.

If the setup indication contains neither a Rerouting information element nor a Rerouting services information element, no extra processing is required.

If the call control entity supports administrative weight accumulation, and the Optional traffic attributes information element with Cumulative Administrative Weights is present in the setup indication, then

- The call control entity shall add the administrative weight of the link over which the SETUP message was received and the node’s administrative weight from the egress port to the ingress port to the Cumulative Backward Administrative Weight. The call control entity shall add the node’s administrative weight from the ingress port to the egress port to the Cumulative Forward Administrative Weight. The administrative weights used shall be the values associated with the service category of the call. The call control entity shall record the cumulative forward administrative weight as contained in the Cumulative Forward Administrative Weight field and shall record the cumulative backward administrative weight as contained in the Cumulative Backward Administrative Weight field.

- The call control entity shall discard the Optional traffic attributes information element with Cumulative Administrative Weights prior to progressing the setup request.

The call control entity shall record the Rerouting services information element for further processing in the connect indication.

A rerouting service may only be activated if the service is made available at the source node for this call and the service is made available at the destination node for this call.

If one or more rerouting services are available at both the destination node and the source node (indicated in the Intra-domain rerouting capabilities field of the Rerouting services information element), the call control entity shall do the following:

1. If the rerouting service available is associated with an inter-domain rerouting service, the call control entity may indicate the availability of this service in the Inter-domain rerouting capabilities field of the Rerouting services information element in the setup request to be forwarded, as described in section 5.1. This indicates that this rerouting service is available within at least one rerouting domain along the path.

2. The incarnation number RemoteIncarnationNumber associated with the call shall be set to zero.

3. Depending on the ATM service category of the call, procedures of Annex A shall apply.

Prior to progressing the setup request, the call control entity shall remove the Rerouting information element and clear the Intra-domain rerouting capabilities field in the Rerouting services information element. The call control entity may clear or forward the Intra-domain rerouting services field in the Rerouting services information element. The inter-domain rerouting services and the inter-domain rerouting capabilities indicated in the Rerouting services information element shall be passed on, as modified in step 1.

The call control entity shall remove the Rerouting services information element from the setup request if the information element is empty (the information element does not indicate at least one inter-domain rerouting service, one inter-domain rerouting capability, or one intra-domain rerouting service).

[SYM SOFT]

If the symmetric soft rerouting service is available at both the source node and the destination node, the call control entity shall also do the following:

4. The call control entity shall record the source node AESA, contained in the Edge node octet group of the Rerouting information element.

5. The call control entity shall record the source node endpoint key, contained in the Endpoint key octet group of the Rerouting information element.

6. Depending on the ATM service category of the call, procedures of Annex A shall apply.

7. The incarnation number LocalIncarnationNumber associated with the call shall be set to zero.

6.3.2 Processing the connect indication during the initial call establishment

When a call control entity receives a connect indication from a inter-domain interface it shall do the following:

If the connect indication contains a Rerouting information element, the call control entity shall discard it.

If the call control entity supports administrative weight accumulation, and the Optional traffic attributes information element with Cumulative Administrative Weights is present in the received connect indication, the information element shall be removed.

If the connect indication contains a Rerouting services information element, the call control entity shall clear the Intra-domain rerouting services and the Intra-domain rerouting capabilities fields. The IE instruction field of the Rerouting services information element shall be coded as specified in section 10.1.

If the connect indication does not contain a Rerouting services information element and the call control entity wishes to activate one or more rerouting services for the call, it shall add a Rerouting services information element to the connect request. The call control entity shall clear all the fields of the Rerouting services information element. The IE instruction field of the Rerouting services information element shall be coded as specified in section 10.1.

The call control entity shall pass on any inter-domain rerouting services indicated in the Rerouting services information element of the connect indication. In addition, the call control entity shall indicate in the Inter-domain rerouting services field that this inter-domain rerouting service is to be activated in all networks in which this service is available if :

- the inter-domain rerouting service was requested in the setup indication and the destination node indicated the availability of this inter-domain rerouting service in the Inter-domain rerouting capabilities field of the Rerouting services information element in the setup request, or
- the node on behalf of the end-system activates the inter-domain rerouting service and the destination node indicated the availability of this inter-domain rerouting service in the Inter-domain rerouting capabilities field of the Rerouting services information element in the setup request, or
- if an inter-domain rerouting capability is advertised by some network (i.e. indicated in the Inter-domain rerouting capability field of the Rerouting services information element included in the received setup indication) and the node on behalf of the end system activates this inter-domain rerouting service, or
- the node is the destination of the call (e.g. soft PVC), activates the inter-domain rerouting service for the call, and the destination node indicated the availability of this inter-domain rerouting service in the Inter-domain rerouting capabilities field of the Rerouting services information element in the setup request, or
- if an inter-domain rerouting capability is advertised by some network (i.e. indicated in the Inter-domain rerouting capability field of the Rerouting services information element included in the received setup indication) and the node is the destination of the call (e.g. soft PVC) and activates this inter-domain rerouting service for the call.

The call control entity shall activate a rerouting service for this call in this rerouting domain and indicate this activation in the Intra-domain rerouting services field if the rerouting service is available at both the source node and the destination node and:

- the intra-domain rerouting service was requested in the setup indication, or
- the node wants to activate the intra-domain rerouting service, or
- the Inter-domain rerouting services field indicates that this inter-domain rerouting service is to be activated in all networks in which this service is available and the destination node indicated the availability of this inter-domain rerouting service in the Inter-domain rerouting capabilities field of the Rerouting services information element in the setup request.

If the symmetric soft rerouting service was requested and the service is not available at the destination node, and the asymmetric soft rerouting service is available at both the source and the destination nodes, the destination node shall activate the asymmetric soft rerouting service in this rerouting domain.

The call control entity may remove the Rerouting services information element from the connect request if the information element is empty (i.e. it does not indicate at least one inter-domain rerouting service, or one intra-domain rerouting service).

If one or more rerouting services are activated for the call in this rerouting domain, the call control entity shall do the following:

1. The call control entity shall add a Rerouting information element to the connect request. The IE instruction field of the information element shall be coded as specified in section 10.1.

2. The Rerouting information element shall contain the Edge node octet group as described in section 5.2. The edge node AESA shall be set to an AESA that identifies the entity within the edge node responsible for rerouting services for this call.

3. The call control entity shall generate an endpoint key that uniquely identifies the call within the scope of the edge node AESA. Endpoint key values should be allocated such that they are not re-used for another call at least within the hard reroute timer interval (HardReroutingTime). The Endpoint key octet group in the Rerouting information element shall contain the generated endpoint key value.

4. The call control entity shall insert into the Rerouting information element the cumulative QoS values recorded during the call setup phase, as discussed in Annex A.

5. If the call control entity supports administrative weight accumulation, and

   if the Optional traffic attributes information element with Cumulative Administrative Weights was present in the initial setup indication, the call control entity shall add an Optional traffic attributes information element with Cumulative Administrative Weights to the connect request. The Cumulative Forward and Cumulative Backward Administrative Weight fields shall be set to the values stored in section 6.3.1

6. The rerouting state of the call shall change from Null to Rerouting idle.

If no rerouting service is activated for this call, all the rerouting information that has been stored during the call setup phase can be discarded.

6.3.3 Rerouting states at the destination node

The following rerouting states are defined at the destination node:

* Null
  - Rerouting services not activated for this call.
* Rerouting Idle
  - No rerouting operation is in progress, and
  - At least one rerouting service is activated for the call, and

- The call/connection state of the connection at both the ingress and the egress of the destination node is Active

* Hard Reroute Indicated
  - The call/connection state of the incumbent connection at the ingress of the destination node is Release request, Release indication or Null, and
  - The destination node is awaiting a reroute setup indication.
* Hard Reroute Initiated
  - The call/connection state of the incumbent connection at the ingress of the destination node is Release request, Release indication or Null, and
  - The call/connection state of the rerouting connection at the ingress of the destination node is Call Initiated or Call Proceeding Sent.
* Soft Reroute Initiated
  - The call/connection state of the incumbent connection at the ingress of the destination node is Active, and
  - The call/connection state of the rerouting connection at the ingress of the source node is Call Initiated or Call Proceeding Sent.
* Awaiting Switchover
  - The call/connection state of the incumbent connection at the ingress of the destination node is Active, and
  - The call/connection state of the rerouting connection at the egress of the source node is Active, and.
  - The destination node is awaiting the release indication for the incumbent connection to switchover from the incumbent connection to the rerouting connection.

Support for symmetric soft rerouting requires the following additional states **[SYM SOFT]**:

* Soft Reroute Triggered
  - The call/connection state of the incumbent connection at the ingress of the destination node is Active, and
  - The call/connection state of the rerouting connection at the ingress of the destination node is Null, and the destination node is in the process of constructing an outgoing setup request for the rerouting connection.
* Soft Reroute Proceeding
  - The call/connection state of the incumbent connection at the ingress of the destination node is Active, and
  - The call/connection state of the rerouting connection at the ingress of the destination node is Call Present or Call Proceeding Received.

6.3.4 Receipt of release indication

A release indication can be received for various reasons, including a RELEASE or RELEASE COMPLETE message, the expiry of timer T310, the final expiry of timer T303, SAAL failure, RESTART message, STATUS message with incompatible state, or other protocol errors. Except for the receipt of a RELEASE or RELEASE COMPLETE message, the release indication does not contain a Rerouting cause information element.

6.3.4.1 Receipt of release indication in the Null state

The call control entity shall apply the normal call clearing procedures.

6.3.4.2 Receipt of release indication in the Rerouting Idle state

To specify the procedures in this section, the following cases apply:

Case 1

- The call control entity receives a release indication from the direction of the called party, and
- At least one of the following is true:
  1. The hard rerouting service is NOT activated for the call in this rerouting domain, or
  2. The release indication does contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the calling party for the incumbent connection. If present, the Rerouting cause IE shall be forwarded without modification in the release request. The rerouting state of the call shall change to Null.

Case 2

- The call control entity receives a release indication from the direction of the called party, and
- The hard rerouting service is activated for the call in this rerouting domain, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the calling party for the incumbent connection. The call control entity shall insert the Rerouting cause information element with the Rerouting release cause set to #1 "*release received from outside any rerouting domain*" in the release request. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The rerouting state of the call shall change to Null.

Case 3

- The call control entity receives a release indication from the direction of the calling party for the incumbent connection, and
- At least one of the following is true
  1. The hard rerouting service is NOT activated for the call in this rerouting domain, or
  2. The release indication contains the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the called party. If the Rerouting cause IE is present and contains the Rerouting release cause #1 "*release received from outside any rerouting domain*", it shall be forwarded without modification in the release request. If the Rerouting cause IE is present and contains any other cause than #1 "*release received from outside any rerouting domain*", the Rerouting cause IE shall be forwarded with the Rerouting release cause set to #2 "*failed to recover the connection using domain-based rerouting*" in the release request. The rerouting state of the call shall change to Null.

Case 4

- The call control entity receives a release indication from the direction of the calling party for the incumbent connection, and
- The hard rerouting service is activated for the call in this rerouting domain, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The call control entity shall start the hard rerouting timer with initial value HardReroutingTime. The content of the Cause information element contained in the release indication shall be saved for further processing if the hard reroute operation fails. The rerouting state of the call shall change to Hard Reroute Indicated.

6.3.4.3 Receipt of release indication in the Hard Reroute Indicated state

To specify the procedures in this section, the following cases apply:

Case 1

- The call control entity receives a release indication from the direction of the called party.

then:

The hard rerouting timer shall be cleared. The rerouting state of the call shall change to Null

6.3.4.4 Receipt of release indication in the Hard Reroute Initiated state

To specify the procedures in this section, the following cases apply:

Case 1

- The call control entity receives a release indication from the direction of the called party, and
- The release indication does contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the calling party for the rerouting connection. The Rerouting cause IE shall be forwarded without modification in the release request. The hard rerouting timer shall be cleared. The rerouting state of the call shall change to Null.

Case 2

- The call control entity receives a release indication from the direction of the called party, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the calling party for the rerouting connection. The call control entity shall insert the Rerouting cause information element with the Rerouting release cause set to #1 ”*release received from outside any rerouting domain*” in the release request. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The hard rerouting timer shall be cleared. The rerouting state of the call shall change to Null.

Case 3

- The call control entity receives a release indication from the direction of the calling party for the rerouting connection, and
- The release indication contains the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the called party. If the Rerouting cause IE contains the Rerouting release cause #1 ”*release received from outside any rerouting domain*”, it shall be forwarded without modification in the release request. If the Rerouting cause IE contains any other cause than #1 ”*release received from outside any rerouting domain*”, the Rerouting cause IE shall be forwarded with the Rerouting release cause set to #2 “*failed to recover the connection using domain-based rerouting*” in the release request. The hard rerouting timer shall be cleared. The rerouting state of the call shall change to Null.

Case 4

- The call control entity receives a release indication from the direction of the calling party for the rerouting connection, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The hard rerouting timer shall continue to run. The content of the Cause information element contained in the release indication shall be saved for further processing if the hard reroute operation fails. The rerouting state of the call shall change to Hard Reroute Indicated.

6.3.4.5 Receipt of release indication in the Soft Reroute Initiated state

To specify the procedures in this section, the following cases apply:

Case 1

- The call control entity receives a release indication from the direction of the called party, and
- At least one of the following is true:
  1. The hard rerouting service is NOT activated for the call in this rerouting domain, or
  2. The release indication does contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the calling party for both the incumbent and the rerouting connections. If present, the Rerouting cause IE shall be forwarded without modification in both release requests. The rerouting state of the call shall change to Null.

Case 2

- The call control entity receives a release indication from the direction of the called party, and
- The hard rerouting service is activated for the call in this rerouting domain, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the calling party for both the incumbent and the rerouting connections. The call control entity shall insert the Rerouting cause information element with the Rerouting release cause set to #1 "*release received from outside any rerouting domain*" in both release requests. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The rerouting state of the call shall change to Null.

Case 3

- The call control entity receives a release indication from the direction of the calling party for the incumbent connection, and
- At least one of the following is true:
  1. The hard rerouting service is NOT activated for the call in this rerouting domain, or
  2. The release indication contains the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the called party. If the Rerouting cause IE is present and contains the Rerouting release cause #1 "*release received from outside any rerouting domain*", it shall be forwarded without modification in the release request. If the Rerouting cause IE is present and contains any other cause than #1 "*release received from outside any rerouting domain*", the Rerouting cause IE shall be forwarded with the Rerouting release cause set to #2 "*failed to recover the connection using domain-based rerouting*" in the release request. It shall also apply the normal call clearing procedures to the rerouting connection in the direction to the calling party. The rerouting state of the call shall change to Null.

Case 4

- The call control entity receives a release indication from the direction of the calling party for the incumbent connection, and
- The hard rerouting service is activated for the call in this rerouting domain, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The call control entity shall start the hard rerouting timer with initial value HardReroutingTime and the rerouting state of the call shall change to Hard Reroute Initiated. The call control entity shall continue to process the reroute setup indication that was received earlier. (See section 6.3.5)

Case 5

- The call control entity receives a release indication from the direction of the calling party for the rerouting connection.

then:

The call control entity shall abort the soft rerouting operation. The rerouting state of the call shall change to Rerouting Idle. The call/connection state of the incumbent connection remains unchanged.

6.3.4.6 Receipt of release indication in the Awaiting Switchover state

To specify the procedures in this section, the following cases apply:

Case 1

Section 6.3.4.5 –Case 1 applies.

Case 2

Section 6.3.4.5 – Case 2 applies.

Case 3

- The call control entity receives a release indication from the direction of the calling party for the incumbent connection, and
- The release indication contains the Rerouting cause information element with its Rerouting release cause NOT set to #4 "*rerouting operation complete*".

then:

Actions of section 6.3.4.5 - Case 3 apply.

Case 4

- The call control entity receives a release indication from the direction of the calling party for the incumbent connection, and
- At least one of the following is true:
  1. The release indication does NOT contain the Rerouting cause information element, or
  2. The release indication contains the Rerouting cause information element with its Rerouting release cause set to #4 "*rerouting operation complete*".

then:

The call control entity shall switch the connection point, which is connecting to the inter-domain interface, from the incumbent connection to the rerouting connection. If the call control entity supports administrative weight accumulation, the call control entity shall use the rerouting connection's cumulative forward and backward administrative weights recorded in section 6.3.5 for the administrative weights of the connection within this rerouting domain. The rerouting state of the call shall return to Rerouting Idle.

Case 5

- The call control entity receives a release indication from the direction of the calling party for the rerouting connection, and
- The release indication contains the Rerouting cause information element.

then:

The call control entity shall apply the normal call clearing procedures in the direction of the called party. If the Rerouting cause IE contains the Rerouting release cause #1 "*release received from outside any rerouting domain*", it shall be forwarded without modification in the release request. If the Rerouting cause IE contains any other cause than #1 "*release received from outside any rerouting domain*", the Rerouting cause IE shall be forwarded with the

Rerouting release cause set to #2 *"failed to recover the connection using domain-based rerouting*" in the release request. It shall also apply the normal call clearing procedures for the incumbent connection in the direction of the calling party. The rerouting state of the call shall change to Null.

Case 6

- The call control entity receives a release indication from the direction of the calling party for the rerouting connection, and
- the release indication does NOT contain the Rerouting cause information element.

then:

Actions of section 6.3.4.5 – Case 5 apply.

6.3.4.7 Receipt of release indication in the Soft Reroute Triggered state [SYM SOFT]

Section 6.3.4.1 applies.

6.3.4.8 Receipt of release indication in the Soft Reroute Proceeding state [SYM SOFT]

To specify the procedures in this section, the following cases apply:

Case 1

Section 6.3.4.5 –Case 1 applies.

Case 2

Section 6.3.4.5 – Case 2 applies.

Case 3

Section 6.3.4.5 – Case 3 applies.

Case 4

- The call control entity receives a release indication from the direction of the calling party for the incumbent connection, and
- The hard rerouting service is activated for the call in this rerouting domain, and
- The release indication does NOT contain the Rerouting cause information element.

then:

The hard rerouting timer shall be started with initial value HardReroutingTime. The call control entity shall clear the rerouting connection with cause #21 *"call rejected"* in the direction of the calling party. The content of the Cause information element contained in the release indication shall be saved for further processing if the hard reroute operation fails. The rerouting state of the call shall change to Hard Reroute Indicated.

Case 5

- The call control entity receives a release indication from the direction of the calling party for the rerouting connection, and
- The release indication contains a Crankback information element and an alternate path is found.

then:

The normal crankback procedures shall be applied (see Annex 8/PNNI 1.0). If the call control entity supports administrative weight accumulation, the call control entity shall perform the procedures for the Optional traffic attributes information element with Cumulative Administrative Weights as described in section 6.2.9.1.

Case 6

- The call control entity receives a release indication from the direction of the calling party for the rerouting connection
- At least one of the following is true:
  1. The release indication contains a Crankback information element but no alternate path is found, or
  2. The release indication does not contain a Crankback information element.

then:

Actions of section 6.3.4.5 - Case 5 applies.

6.3.5 Receipt of a reroute setup indication

See section 6.1 – Case 3.

If the Rerouting control octet group in the Rerouting information element contains an unrecognized switchover behavior indicator, and the rerouting state of the call is in any other state but Hard Reroute Indicated or Hard Reroute Initiated, the setup indication shall be rejected with a Rerouting cause information element set to the Rerouting release cause #8 "*unsupported switchover behavior*". The cause code of the Cause information element shall be coded as specified in section 6.6. The remaining procedures of this section do not apply.

The incarnation number in the Rerouting information element shall be verified. If this incarnation number is NOT greater than the current incarnation number RemoteIncarnationNumber, the setup indication shall be rejected with a Rerouting cause information element set to the Rerouting release cause #5 "*old incarnation number*". The cause code of the Cause information element shall be coded as specified in section 6.6. The remaining procedures of this section do not apply.

Otherwise, the incarnation number RemoteIncarnationNumber is updated with the value given by the Rerouting information element.

If the call control entity supports administrative weight accumulation, and the Optional traffic attributes information element with Cumulative Administrative Weights is present in the setup indication, then the call control entity shall add the administrative weight of the link over which the SETUP message was received and the node's administrative weight from the egress port to the ingress port to the Cumulative Backward Administrative Weight. The call control entity shall add the node's administrative weight from the ingress port to the egress port to the Cumulative Forward Administrative Weight. The administrative weights used shall be the values associated with the service category of the call. The call control entity shall record the cumulative forward administrative weight as contained in the Cumulative Forward Administrative Weight field and shall record the cumulative backward administrative weight as contained in the Cumulative Backward Administrative Weight field.

The procedures for received traffic parameters specified in Annex A shall apply.

If the Rerouting information element contains the switchover behavior indicator set to "*switchover immediately*", the setup indication is a hard reroute setup indication. If the switchover behavior indicator is set to "*switchover when receiving the call clearing message for the incumbent connection*", the setup indication is a soft reroute setup indication. If the switchover behavior indicator contains an unrecognized value, and the rerouting state of the call is in Hard Reroute Indicated or Hard Reroute Initiated, the setup indication shall be processed as a hard reroute setup indication.

One of the following procedures shall apply:

6.3.5.1 Receipt of a reroute setup indication in the Rerouting Idle state

Case 1

- A hard reroute setup is received.

then:

The rerouting state of the call shall change to Hard Reroute Initiated. The hard rerouting timer shall be started with initial value HardReroutingTime. The call control entity shall release the incumbent connection in the direction of the calling party. The procedures in section 6.3.5.8 shall then apply.

Case 2

- A soft reroute setup is received.

then:

The rerouting state of the call shall change to Soft Reroute Initiated. The procedures in section 6.3.5.9 shall then apply.

6.3.5.2 Receipt of a reroute setup indication in the Hard Reroute Indicated state

Case 1

- A hard reroute setup is received, or
- A soft reroute setup is received.

then:

The rerouting state of the call shall change to Hard Reroute Initiated. The procedures in section 6.3.5.8 shall then apply.

6.3.5.3 Receipt of a reroute setup indication in the Hard Reroute Initiated state

Case 1

- A hard reroute setup is received, or
- A soft reroute setup is received.

then:

The old reroute setup indication, which is indicated by an older incarnation number, shall be released with cause #21 *"call rejected"* in the direction of the calling party and the new reroute setup indication shall be accepted. There shall be no change to the rerouting state. The procedures in section 6.3.5.8 shall then apply.

6.3.5.4 Receipt of a reroute setup indication in the Soft Reroute Initiated state

Case 1

- A hard reroute setup is received.

then:

This indicates that there is a collision between the soft reroute and the hard reroute. Both the soft and hard reroute setup indications were received by the destination node before the release indication for the incumbent connection. The hard rerouting operation takes precedence.

The hard rerouting timer shall be started with initial value HardReroutingTime. The call control entity shall release with cause #21 *"call rejected"* both the incumbent connection and the older reroute setup indication in the direction of the calling party. The rerouting state of the call shall change to Hard Reroute Initiated. The procedures in section 6.3.5.8 shall then apply.

Case 2

- A soft reroute setup is received.

then:

The call control entity shall release with cause #21 *"call rejected"* the older reroute setup indication in the direction of the calling party. The rerouting state of the call shall change to Soft Reroute Initiated. The procedures in section 6.3.5.9 shall then apply.

6.3.5.5 Receipt of a reroute setup indication in the Awaiting Switchover state

Section 6.3.5.4 applies.

6.3.5.6 Receipt of a reroute setup indication in the Soft Reroute Triggered state [SYM SOFT]

The procedures in section 6.3.5.1 apply.

6.3.5.7 Receipt of a reroute setup indication in the Soft Reroute Proceeding state [SYM SOFT]

Case 1

- A hard reroute setup is received.

then:

The hard rerouting timer shall be started with initial value HardReroutingTime. The call control entity shall release with cause #21 *"call rejected"* both the incumbent and the locally initiated rerouting connections in the direction of the calling party. The rerouting state of the call shall change to Hard Reroute Initiated. The procedures in section 6.3.5.8 shall then apply.

Case 2

- A soft reroute setup is received.

then:

It indicates that there is a collision between a soft rerouting operation initiated locally and a soft rerouting operation initiated at the source node. The soft rerouting operation initiated at the source node shall take the precedence.

The locally initiated rerouting connection shall be released with cause #21 *"call rejected"* in the direction of the calling party and the new reroute setup indication shall be accepted. The rerouting state of the call shall change to Soft Reroute Initiated. The procedures in section 6.3.5.9 shall then apply.

6.3.5.8 Sending a reroute connect request in the Hard Reroute Initiated state

A connect request shall be sent in the direction of the calling party for the rerouting connection. The call control entity shall then switch the connection point, which is connecting to the inter-domain to the rerouting connection.

If the call control entity supports administrative weight accumulation, and the Optional traffic attributes information element with Cumulative Administrative Weights was present in the reroute setup indication, the call control entity shall add an Optional traffic attributes information element with Cumulative Administrative Weights information element to the connect request. The Cumulative Forward and Cumulative Backward Administrative Weight fields shall be set to the values stored in section 6.3.5. The call control entity shall use these new cumulative forward and backward administrative weights for the administrative weights of the connection within this rerouting domain.

The rerouting state of the call shall return to Rerouting Idle. The hard rerouting timer shall be cleared.

6.3.5.9 Sending a reroute connect request in the Soft Reroute Initiated state

A connect request shall be sent in the direction of the calling party for the rerouting connection.

If the call control entity supports administrative weight accumulation, and the Optional traffic attributes information element with Cumulative Administrative Weights was present in the reroute setup indication, the call control entity shall add an Optional traffic attributes information element with Cumulative Administrative Weights information element to the connect request. The Cumulative Forward and Cumulative Backward Administrative Weight fields shall be set to the values stored in section 6.3.5.

The rerouting state of the call shall change to Awaiting Switchover and the call/connection state of the incumbent connection remains unchanged.

6.3.5.10 Hard rerouting timer expiry

Upon expiry of the hard rerouting timer before receiving a setup indication and sending a connect request for the rerouting connection, the following procedures shall apply.

1. If the rerouting state is Hard Reroute Indicated, the call control entity shall initiate normal call clearing procedures in the direction of the called party. The call control entity shall insert the Rerouting cause information element with the Rerouting release cause set to #2 *failed to recover the connection using domain-based rerouting*". The content of the Cause information element shall contain the content assigned at the point of failure on the incumbent connection. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The rerouting state of the call shall change to Null.

2. If the rerouting state is Hard Reroute Initiated, the call control entity shall initiate normal call clearing procedures in the direction of the called party. It shall also initiate call clearing procedures in the direction of the calling party for the rerouting connection. The call control entity shall insert the Rerouting cause information element with the Rerouting release cause set to #2 "*failed to recover the connection using domain-based rerouting*" in both release requests. The content of the Cause information element shall contain the content assigned at the point of failure on the incumbent connection. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1. The rerouting state of the call shall change to Null.

6.3.6 Initiating a reroute setup request [SYM SOFT]

6.3.6.1 Procedures for the soft reroute setup request.

Case 1

- The rerouting state of the call is in Rerouting Idle, and
- A soft reroute operation is triggered.

then:

The call control entity shall attempt to establish an alternate path for the call towards the source node as identified by the edge node AESA which was received in the Rerouting information element of the SETUP message during the initial call establishment. When applicable, the call control entity shall also use the previously recorded cumulative QoS parameters information of the source node and itself to select an alternate path towards the source node (see Annex A).

The rerouting connection may be routed on the same path as the incumbent connection in some switches between the destination node and the source node.

If no alternate path can be found, the reroute trigger shall be disregarded. The rerouting state of the call shall remain in Rerouting Idle. The remaining procedures of this section do not apply.

If an alternate path is found, the call control entity shall increment by one the incarnation number LocalIncarnationNumber and build a soft reroute SETUP message that contains the following information elements:

- The Called party number information element set to the source node AESA.
- QoS and traffic related information elements as defined in Annex A.
- Other mandatory information elements (e.g Broadband bearer capability information element)
- The Rerouting information element shall be added with a Rerouting control octet group which contains
  - the incarnation number LocalIncarnationNumber
  - the switchover behavior indicator set to "*switchover when receiving the call clearing message for the incumbent connection*"
- The Rerouting information element shall also include a Endpoint key octet group which contains
  - the source node endpoint key.

- If the call control entity supports administrative weight accumulation, the call control entity may include an Optional traffic attributes information element with Cumulative Administrative Weights as described in section 6.2.9.1.
- Inclusion of other information elements is not precluded (see Appendix A).

The IE instruction field of the Rerouting information element shall be coded as specified in section 10.1.

The reroute setup request shall be progressed in the direction of the source node. The rerouting state of the call shall change to Soft Reroute Proceeding.

Case 2

- ❖ The rerouting state of the call is in any other state but Rerouting Idle, and
- ❖ A soft reroute operation is triggered.

then:

The reroute trigger shall be disregarded.

6.3.7 Receipt of a reroute connect indication at the destination node [SYM SOFT]

6.3.7.1 Receipt of a reroute connect indication in the Soft Reroute Proceeding state

Upon receiving the connect indication, the call control entity either releases the incumbent connection, or rejects the rerouting connection. The procedures for both are defined below.

If the call control entity rejects the rerouting connection based on the local policy, the call control entity shall release the rerouting connection in the direction of the called party. The release request shall NOT contain the Rerouting cause information element. The cause code of the Cause information element shall be coded to cause code #21 *"call rejected"*. The rerouting state of the call shall return to Rerouting Idle. The rest of the procedures in this section shall not apply.

The call control entity shall switch the connection point, which is connecting to the inter-domain interface, from the incumbent connection to the rerouting connection. The call control entity shall release the incumbent connection in the direction of the calling party. The release request shall contain the Rerouting cause information element with the Rerouting release cause set to #4 "*rerouting operation complete*". The cause code of the Cause information element shall be coded as specified in section 6.6. The IE instruction field of the Rerouting cause information element shall be coded as specified in section 10.1.

If the call control entity supports administrative weight accumulation, and the Optional traffic attributes information element with Cumulative Administrative Weights is present in the connect, the call control entity shall record the cumulative forward administrative weight as contained in the Cumulative Backward Administrative Weight field and shall record the cumulative backward administrative weight as contained in the Cumulative Forward Administrative Weight field. The call control entity shall use the rerouting connection's cumulative forward and backward administrative weights as recorded above for the administrative weights of the connection within this rerouting domain.

The rerouting state of the call shall return to Rerouting Idle.

6.3.8 Content validation of information elements

Procedures of section 6.2.8 apply.

6.4 Procedures at a node between two intra-domain interfaces

See section 6.1 – Case 7.

6.4.1 Rerouting services information element

When a call control entity receives a setup, or a connect indication with a Rerouting services information element from an intra-domain interface and the setup, or the connect request is to be progressed to an intra-domain interface the received Rerouting services information element shall be forwarded without modification.

If both the IE instruction field flag (bit 5) and the pass along request bit (bit 4) of the received Rerouting services information element are set to 1, no content validation shall be performed on the Rerouting services information element, other than verifying the maximum information element length. This allows support for other rerouting services in the future.

6.4.2 Rerouting information element

When a call control entity receives a setup, or a connect indication with a Rerouting information element from an intra-domain interface and the setup, or the connect request is to be progressed to an intra-domain interface the received Rerouting information element shall be forwarded without modification.

If both the IE instruction field flag (bit 5) and the pass along request bit (bit 4) of the received Rerouting information element are set to 1, no content validation shall be performed on the Rerouting information element, other than verifying the maximum information element length. This allows support for other rerouting services in the future.

6.4.3 Rerouting cause information element

When a call control entity receives a release indication with a Rerouting cause information element from an intra-domain interface and the release request is to be progressed to an intra-domain interface the received Rerouting cause information element shall be forwarded without modification.

No content validation shall be performed on the Rerouting cause information element, other than verifying the maximum information element length.

6.4.4 Optional traffic attributes information element

If a call control entity supports administrative weights accumulation the following procedures shall apply.

When a call control entity receives a setup indication with an Optional traffic attributes information element with Cumulative Administrative Weights from an intra-domain interface and the setup request is to be progressed to an intra-domain interface:

1. The call control entity shall record the received values in the Cumulative Backward Administrative Weight and the Cumulative Forward Administrative Weight for crankback processing.

2. The call control entity shall add to the Cumulative Backward Administrative Weight of the Optional traffic attributes information element the administrative weight of the link over which the SETUP message was received and the administrative weight of the node from the egress port to the ingress port. The call control entity shall then add to the Cumulative Backward Administrative Weight of the Optional traffic attributes information element the administrative weight of the node from the egress port to the ingress port. The administrative weights used shall be the values associated with the service category of the call.

3. The call control entity shall add to the Cumulative Forward Administrative Weight of the Optional traffic attributes information element the administrative weight of the node from the ingress port to the egress port. The call control entity shall then add to the Cumulative Forward Administrative Weight of the Optional traffic attributes information element the administrative weight of the link over which the SETUP message will be sent and the administrative weight of the node from the ingress port to the egress port. The administrative weights used shall be the values associated with the service category of the call.

When a call control entity receives a connect indication with an Optional traffic attributes information element with Cumulative Administrative Weights from an intra-domain interface and the connect request is to be progressed to an intra-domain interface the received Optional traffic attributes information element shall be forwarded without modification.

When a call control entity receives a release indication with a Crankback information element, and the initial setup indication contained an Optional traffic attributes information element with Cumulative Administrative Weights, and the normal crankback procedures specified in Annex 8/PNNI 1.0 result in the call control entity sending an alternate routing setup request, the call control entity shall add an Optional traffic attributes information element with Cumulative Administrative Weight to the alternate routing setup request. The Cumulative Backward Administrative Weight shall be set to the sum of the cumulative backward administrative weight recorded in step 1 above, the administrative weight of the node from the egress port to the ingress port, and the administrative weight of the link over which the SETUP message was received. The Cumulative Forward Administrative Weight value shall be set to the sum of the cumulative forward administrative weight recorded in step 1 above, the administrative weight of the node from the ingress port to the egress port, and the administrative weight of the link over which the SETUP message will be sent. The administrative weights used shall be the values associated with the service category of the call.

6.5 Procedures at a node between two inter-domain interfaces

See section 6.1 – Case 8.

6.5.1 Rerouting services information element

When the call control entity receives a connect indication with a Rerouting services information element from an inter-domain interface and the connect request is to be progressed to an inter-domain interface, the call control entity shall forward the received Rerouting services information element without modification.

When the call control entity receives a setup indication from an inter-domain interface and the setup request is to be progressed to an inter-domain interface:

- If the setup indication contains a Rerouting services information element, the call control entity shall pass on the Inter-domain rerouting services and the Inter-domain rerouting capabilities fields indicated in the Rerouting services information element.

- If the setup indication does not contain a Rerouting services information element and if the call control entity wishes to request one or more inter-domain rerouting services, or one or more intra-domain rerouting services, it shall add a Rerouting services information element to the forwarded setup request. The Inter-domain rerouting capabilities and the Intra-domain rerouting capabilities fields shall be set to zero.

  Based on subscription, the call control entity can request inter-domain rerouting services on behalf of the calling end system. The request for inter-domain rerouting services shall be coded in the Inter-domain rerouting services field of the Rerouting services information element as described in section 5.1.

- The call control entity can request any of the intra-domain rerouting services. It may take the received intra-domain rerouting services into account in determining whether to request any intra-domain rerouting services. The request for intra-domain rerouting services shall be coded in the Intra-domain rerouting services field of the Rerouting services information element as described in section 5.1. If an intra-domain rerouting service is not requested, the corresponding bits of the Intra-domain rerouting services field shall be set to zero.

- Prior to progressing the setup request, the call control entity shall clear the Intra-domain rerouting capabilities field in the Rerouting services information element. The call control entity may clear or forward the Intra-domain rerouting services field in the Rerouting services information element.

6.5.2 Rerouting information element

When the call control entity receives a setup indication with a Rerouting information element from an inter-domain interface and the setup request is to be progressed to an inter-domain interface:

- If the Rerouting information element contains a Rerouting control octet group, then Case 2 of section 6.1 apply.
- If the Rerouting information element does not contain a Rerouting control octet group, the call control entity shall discard the Rerouting information element.

When the call control entity receives a connect indication with a Rerouting information element from an inter-domain interface and the connect request is to be progressed to an inter-domain interface the call control entity shall discard the Rerouting information element.

6.5.3 Rerouting cause information element

When the call control entity receives a release indication with a Rerouting cause information element from an inter-domain interface and the release request is to be progressed to an inter-domain interface the received Rerouting cause information element shall be forwarded without modification.

No content validation shall be performed on the Rerouting cause information element, other than verifying the maximum information element length.

6.5.4 Crankback

If as the result of a crankback, the call is subsequently routed over an intra-domain interface, procedures of section 6.2.1 shall apply.

6.6 Release cause codes

When a Rerouting cause information element is inserted in a release request the cause code of the Cause information element shall be set as follows.

Cause code #21 *"call rejected"* shall be returned in the Cause information element when the Rerouting cause information element contains:

- cause #3 "unrecognized endpoint key for rerouting", or
- cause #5 "old incarnation number", or
- cause #6 "rerouting operation already in progress"
- cause #8 "unsupported switchover behavior"

Cause code #31 *"normal, unspecified"* shall be returned in the Cause information element when the Rerouting cause information element contains:

- cause #4 "rerouting operation complete"

6.7 Architectural Variables

These are the architectural variables used in the Domain-based rerouting specification:

HardReroutingTime: default value is 15 seconds

> The initial value in seconds for the hard rerouting timer. An edge node clears the call if the hard rerouting operation has not been completed within this amount of time.

7 Domain-based rerouting feature for PNNI

This section describes the additions to PNNI signalling messages and the call control procedures to convey information about rerouting services across a PNNI interface. A PNNI interface shall support the procedures of an intra-domain interface. A PNNI interface can optionally support the procedures of an inter-domain interface. The following procedures only apply to point-to-point calls.

The procedures for basic call control as described in [PNNI 1.0] shall apply. Additional procedures for domain-based rerouting are specified in section 6.

7.1 Additions to PNNI signalling messages

To provide the domain-based rerouting feature, the following information elements are added to Table 6-5 in 6.4.5.1/PNNI 1.0:

Table 7-1: Additional information elements used in PNNI

Bits 8 7 6 5 4 3 2 1	Information Element	Max Length	Max no. of Occurrences
1 1 1 1 0 0 1 0	Rerouting services	8	1
1 1 1 1 0 0 1 1	Rerouting	80 (note)	1
1 1 1 1 0 1 0 0	Rerouting cause	5	1

Note: This value provides for future extensions.

To provide the domain-based rerouting feature, Table in 4.1/BCS 1.0 is modified as follows:

Table 7-2: Modified information element from [BCS 1.0] used in PNNI

Bits 8 7 6 5 4 3 2 1	Information Element	Max Length	Max no. of Occurrences
[BCS 1.0]	Optional traffic attributes	6-14	5

7.1.1 CONNECT

The following information elements are added to Figure 6-5 in 6.3.1.3/PNNI 1.0:

Information Element	Reference	Type	Length
Rerouting services	5.1	O	8
Rerouting	5.2	O(1, 3)	11-80
Optional traffic attributes	5.4	O(2)	6-14

Note 1: May be included if present in the SETUP message.

Note 2: May be included if present in the SETUP message with Cumulative Administrative Weights.

Note 3: Included only at an intra-domain interface

Figure 7-1: Additional CONNECT message content

7.1.2 RELEASE

The following information element is added to Figure 6-6 in 6.3.1.4/PNNI 1.0:

Information Element	Reference	Type	Length
Rerouting cause	5.3	O	5

Figure 7-2: Additional RELEASE message content

7.1.3 RELEASE COMPLETE

The following information element is added to Figure 6-7 in 6.3.1.5/PNNI 1.0:

Information Element	Reference	Type	Length
Rerouting cause	5.3	O	5

Figure 7-3: Additional RELEASE COMPLETE message content

7.1.4 SETUP

The following information elements are added to Figure 6-8 in 6.3.1.6/PNNI 1.0:

Information Element	Reference	Type	Length
Rerouting services	5.1	O(1)	8
Rerouting	5.2	O(2)	11-80

Note 1: Included during the initial call establishment.

Note 2: Included only at an intra-domain interface.

Figure 7-4: Additional SETUP message content

To provide the domain-based rerouting feature, Table in 4.1.1/BCS 1.0 is modified as follows:

Information Element	Reference	Type	Length
Optional traffic attributes	5.4	O(3)	6-14

Note 3: This information element may occur up to 5 times. At most one instance may contain Cumulative Administrative Weight.

Figure 7-5: Modified SETUP message content

8 Domain-based rerouting feature for AINI

[Normative]

This section is written as a delta to the [AINI] document. An AINI interface shall support the procedures of an inter-domain interface. This specification does not define procedures for AINI as an intra-domain interface. Additional procedures for domain-based rerouting are specified in section 6. The following procedures only apply to point-to-point calls.

8.1 Additions to AINI signalling messages

To provide the domain-based rerouting feature, the following information elements are added to Table 6-5 in 6.4.5.1/PNNI 1.0:

Table 8-1: Additional information elements used in PNNI

Bits 8 7 6 5 4 3 2 1	Information Element	Max Length	Max no. of Occurrences
1 1 1 1 0 0 1 0	Rerouting services	8	1

8.1.1 CONNECT

The following information elements are added to Figure 6-5 in 6.3.1.3/PNNI 1.0:

Information Element	Reference	Type	Length
Rerouting services	5.1	O(1)	8

Note 1: May be included if present in the SETUP message.

Figure 8-1: Additional CONNECT message content

8.1.2 RELEASE

The following information element is added to Figure 6-6 in 6.3.1.4/PNNI 1.0:

Information Element	Reference	Type	Length
Rerouting cause	5.3	O	5

Figure 8-2: Additional RELEASE message content

8.1.3 RELEASE COMPLETE

The following information element is added to Figure 6-7 in 6.3.1.5/PNNI 1.0:

Information Element	Reference	Type	Length
Rerouting cause	5.3	O	5

Figure 8-3: Additional RELEASE COMPLETE message content

8.1.4 SETUP

The following information elements are added to Figure 6-8 in 6.3.1.6/PNNI 1.0:

Information Element	Reference	Type	Length
Rerouting services	5.1	O(1)	8

Note 1: Included during the initial call establishment.

Figure 8-4: Additional SETUP message content

8.2 Protocol Interworking at the AINI

8.2.1 Interworking between AINI and PNNI

Mapping of the Rerouting services information element, the Rerouting information element, the Rerouting cause information element, and the Optional traffic attributes information element with Cumulative administrative weights shall follow the procedures of section 6.

8.2.2 Interworking from AINI to B-ISUP

The following row is added to the table of AINI/4.1.1.2.1.1:

AINI to B-ISUP	
SETUP	**IAM**
Rerouting Services	Not carried (Note 1)

Table 8-2: Additional CONNECT to ANM mapping

Note 1: The information element shall be discarded and no status need be returned.

The following row is added to the table of AINI/4.1.1.2.4.1:

AINI to B-ISUP	
CONNECT	**ANM**
Rerouting Services	Not carried (Note 1)

Table 8-3: Additional SETUP to IAM mapping

Note 1: The information element shall be discarded and no status need be returned.

The following row is added to the table of AINI/4.1.3.2.2.1:

AINI to B-ISUP	
RELEASE	**REL**
Rerouting Cause	Not carried (Note 1)

Table 8-4: Additional RELEASE to REL mapping

Note 1: The information element shall be discarded and no status need be returned.

8.2.3 Interworking from B-ISUP to AINI

Insertion of the Rerouting services information element shall follow the procedures of section 6.

9 Domain-based rerouting feature for UNI

[Normative]

This section is written as a delta to the [UNI 4.0] document. An UNI interface shall support the procedures of an inter-domain interface. This specification does not define procedures for UNI as an intra-domain interface.

9.1 Additions to UNI signalling messages

To provide the domain-based rerouting feature, the following information elements are added to Table 2-1/UNI 4.0:

Table 9-1: Additional information elements used in UNI 4.0

Bits 8 7 6 5 4 3 2 1	Information Element	Max Length	Max no. of Occurrences
1 1 1 1 0 0 1 0	Rerouting services	8	1
1 1 1 1 0 1 0 0	Rerouting cause	5	1

9.1.1 CONNECT

The following information element is added to Table 3-4/Q.2931:

Information Element	Reference	Direction	Type	Length
Rerouting services	5.1	Both	O(1)	8

Note 1: Included in the user-to-network direction when the called user wants to activate a rerouting service which was advertised by the network. Included in the network-to-user direction to inform the calling user of the rerouting service activated for the call.

Figure 9-1: Additional CONNECT message content

9.1.2 RELEASE

The following information element is added to Table 3-6/Q.2931:

Information Element	Reference	Direction	Type	Length
Rerouting cause	5.3	Both	O	5

Figure 9-2: Additional RELEASE message content

9.1.3 RELEASE COMPLETE

The following information element is added to Table 3-7/Q.2931:

Information Element	Reference	Direction	Type	Length
Rerouting cause	5.3	Both	O	5

Figure 9-3: Additional RELEASE COMPLETE message content

9.1.4 SETUP

The following information elements are added to Table 3-8/Q.2931:

Information Element	Reference	Direction	Type	Length
Rerouting services	5.1	Both	O(1)	8

Note 1: Included in the user-to-network direction when the calling user requests a rerouting service. Included in the network-to-user direction to inform the called user of the rerouting services available through the rerouting domains traversed by the call.

Figure 9-4: Additional SETUP message content

9.2 Signalling procedures for UNI

The procedures for basic call control as described in section 2 of [UNI 4.0] shall apply. Call control procedures in section 6 shall apply, additional procedures for domain-based rerouting are specified in this section.

9.2.1 Call establishment at the originating interface

If the user side receives a setup request containing a Rerouting services information element, it shall include this information element in the SETUP message sent to the network. The Inter-domain rerouting services field and the Inter-domain rerouting capabilities field shall be forwarded unchanged. The Intra-domain rerouting services field and the Intra-domain rerouting capabilities field shall be set to zero.

If the user side receives a setup request which does not contain a Rerouting services information element, and if it wishes to request one or more inter-domain rerouting services, it shall include a Rerouting services information element in the SETUP message that is transferred to the network[6]. The request for inter-domain rerouting services shall be coded in the Inter-domain rerouting services field of the Rerouting services information element as described in section 5.1. The Inter-domain rerouting capabilities, the Intra-domain rerouting services, and the Intra-domain rerouting capabilities fields of the Rerouting services information element shall be set to zero.

If the network receives a SETUP message containing a Rerouting services information element requesting a rerouting service for which the user is not registered, the network shall ignore the Rerouting services information element and may send a STATUS message to the user with Cause No. #50 "*requested facility not subscribed*" with a diagnostic field containing the information element identifier of the Rerouting services information element.

9.2.2 Call establishment at the destination interface

If the user side receives a connect request containing a Rerouting services information element, it shall include this information element in the CONNECT message sent to network.

If the user side receives a connect request which does not contain a Rerouting services information element, then:

- If an inter-domain rerouting capability is advertised by the network (i.e. indicated in the Inter-domain rerouting capability field of the Rerouting services information element included in the received SETUP message), the user may activate a supported rerouting service by including a Rerouting services information element in the CONNECT message it sends to the network. The inter-domain rerouting service to be activated along the path of the call shall be indicated in the Inter network rerouting services field of the Rerouting services information element as described in section 5.1.

[6] These procedures allow a border node of a private network to request a rerouting service from an ASP network for a given connection, provided that the calling end system has not already requested this service. The criteria used to decide whether or not the border node should request a rerouting service for a given connection are outside the scope of this specification.

- If an inter-domain rerouting service was requested in the SETUP message received by the user, and the capability to support that service has been advertised by the network, the user shall include a Rerouting services information element in the CONNECT message and shall activate that rerouting service in the Inter-domain rerouting services field of the Rerouting services information element.

The user shall not activate a rerouting service which is not advertised by the network.

If the user side sends a CONNECT message that includes a Rerouting services information element, it shall clear the Inter-domain capabilities, the Intra-domain rerouting services and the Intra-domain rerouting capabilities fields in the Rerouting services information element.

If the network side receives a CONNECT message requesting an inter-domain rerouting service which it did not advertise, the network may ignore the Rerouting services information element and may send a STATUS message to the user with Cause No. #69 "*requested facility not implemented*" with a diagnostic field containing the information element identifier of the Rerouting services information element.

10 Compatibility with nodes not supporting this feature

10.1 Rerouting related information elements

[Normative]

10.1.1 PNNI

To handle the rerouting operations consistently according to the procedures described in section 7, when coding the rerouting related information elements, the flag (bit 5) in the information element instruction field shall be set to "follow explicit instructions", the pass along request (bit 4) in the instruction field shall be set to "pass along request". The action indicator shall be set to "discard information element and proceed".

When coding an Optional traffic attributes information element with Cumulative Administrative Weights, the flag (bit 5) in the information element instruction field shall be set to "follow explicit instructions", the pass along request (bit 4) in the instruction field shall be set to "no pass along request", and the action indicator shall be set to "discard information element and proceed". This encoding ensures that if the Optional traffic attributes information element with Cumulative Administrative Weights is received at the source or destination nodes the administrative weights contained in the information element contain the actual path cost for the connection within the rerouting domain.

10.1.2 AINI

To handle the rerouting operations consistently according to the procedures described in section 8, when coding the rerouting related information elements, the flag (bit 5) in the information element instruction field shall be set to "follow explicit instructions", the pass along request (bit 4) in the instruction field shall be set to "pass along request". The action indicator shall be set to "discard information element and proceed".

10.1.3 UNI

To handle the rerouting operations consistently according to the procedures described in section 9, when coding the rerouting related information elements, the flag (bit 5) in the information element instruction field shall be set to "follow explicit instructions". The action indicator shall be set to "discard information element and proceed".

10.2 Association between a source node and a destination node

[Informative]

Figure 10-1 illustrates a network configuration that can lead to the incorrect association between two edge nodes belonging to two different rerouting domains and to the activation of a rerouting service across an inter-domain interface. An incorrect association can occur if a Rerouting information element is transported across an inter-domain interface from a rerouting domain A to a rerouting domain B because of the “Pass Along Request” handling directive. The conditions needed to encounter this problem are:

- The ingress switch of rerouting domain A and the egress switch of rerouting domain B support the rerouting feature
- The egress switch of rerouting domain A and the ingress switch of rerouting domain B do not support the rerouting feature and share an AINI.
- The egress switch of rerouting domain A “passes along” unrecognized information elements from the PNNI to the AINI and the ingress switch of rerouting domain B “passes along” unrecognized information elements from the AINI to the PNNI.

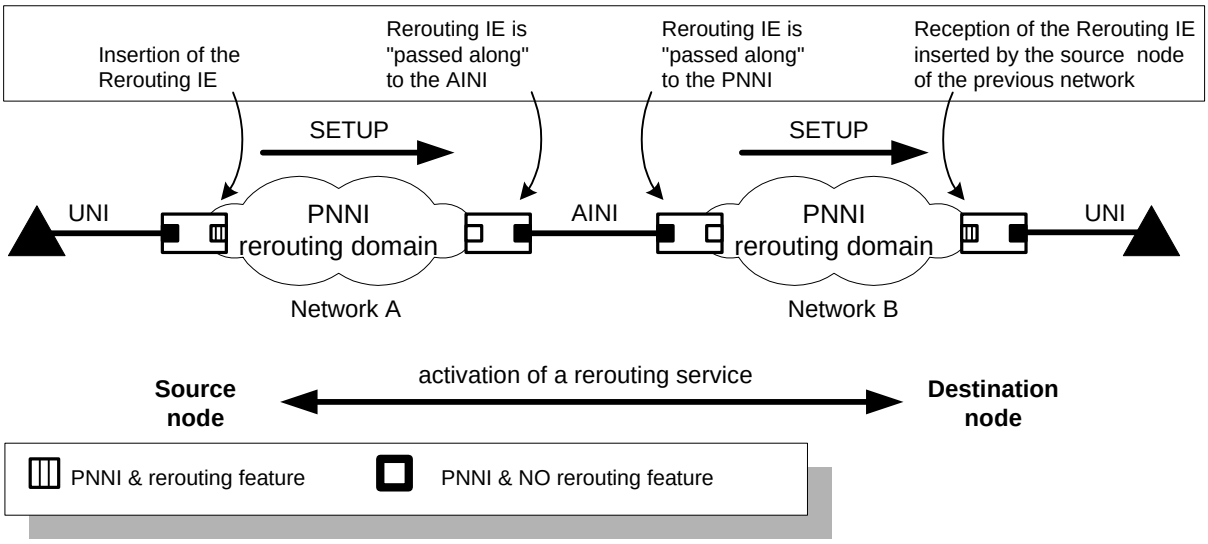


Figure 10-1: Incorrect association between the source node and the destination node when a call spans over multiple rerouting domains

A correct association between source nodes and the destination nodes is guaranteed if

- all the edge nodes of the rerouting domain with AINI or inter-domain PNNI interfaces support the domain-based rerouting feature, or
- the AINI or inter-domain PNNI interface between two rerouting domains does not “pass along” unrecognized information elements when the preceding side and the succeeding side of the AINI or inter-domain PNNI do not support the rerouting feature.

10.3 Cumulative administrative weight collection

[Informative]

The encoding of the Optional traffic attributes information element with Cumulative Administrative Weights as specified in section 5.4 ensures that if the SETUP message transits a node that does not support this feature, then the Optional traffic attributes information element with Cumulative Administrative Weights will be discarded from the SETUP message. As a result, if the Optional traffic attributes information element with Cumulative Administrative Weights is received at the

source or destination nodes the administrative weights present in the information element contain the actual path cost for the connection within the rerouting domain and can be used for local rerouting policy decisions.

11 Feature interactions

11.1 Soft PVCC and soft PVPC

When the originating or terminating node of a soft PVCC (soft PVPC) wishes to tear down this soft PVCC (soft PVPC) and it is also the rerouting source or destination node of this soft PVCC (soft PVPC) and the hard rerouting service is activated on this call, the call control entity shall release the call with a Rerouting cause information element with the Rerouting release cause set to #1 "*release received from outside any rerouting domain*". This prevents the trigger of a hard rerouting operation at the remote node.

At the destination of a soft PVCC or a soft PVPC, the cumulative QoS parameter values should be padded to the maximum acceptable values provided in the SETUP message to maximize the chances of success of future rerouting operations.

When hard rerouting is active on a soft PVCC (soft PVPC) and a release indication is received at the soft PVCC (soft PVPC) source node, then domain-based hard rerouting procedures shall apply before any soft PVCC (soft PVPC) rerouting procedures.

11.2 Modification of traffic descriptor [MODIFY 2.0]

If a Modification request occurs while the rerouting state of the call is in any state but the Rerouting Idle state, the modification request shall be rejected with a MODIFY REJECT message with cause #41, *"temporary failure"*.

While connection modification is in progress the traffic parameters of the connection are not stable (i.e. it is not known whether the modification will be accepted/rejected/negotiated). Thus it is not known what ATM traffic parameters to place in the SETUP message for reroute. Reroute shall not be invoked while connection modification is in progress. If reroute cannot be deferred (e.g. in the case of hard reroute) the call shall be cleared with cause #41, *"temporary failure"*.

If a reroute setup indication is received while connection modification is in progress, the reroute setup indication shall be rejected with cause #41, *"temporary failure"*.

If symmetric soft rerouting is activated for a call, and the current connection has been originated by the destination node, subsequent Modification requests shall be rejected by the source node with a MODIFY REJECT message with cause #41, *"temporary failure"*. The rejection is required due to the fact that nodes along the path of the rerouted connection segment would consider the forward direction to be that from the destination node to the source node.

11.3 Connection trace [TRACE 1.0]

If a TRACE CONNECTION message or TRACE CONNECTION ACKNOWLEDGE message is received while the rerouting state of the call is in any state but the Rerouting Idle state, the received message may be discarded.

11.4 Network Call Correlation Identifier [NCCI 1.0]

When the call control initiates the rerouting of a connection, the call control may add a Network Call Correlation Identifier information element to the reroute setup request. If provided, the NCCI value shall be the same as the original NCCI value.

11.5 Security [SEC 1.1]

If a rerouting domain boundary falls in between the association of two security agents, special care must be taken to maintain the correct association between the security agents when the connection is rerouted.

Annex A QoS preservation during rerouting

[Normative]

When a call is rerouted, special care must be taken to guarantee that the QoS provided by the rerouting connection is at least as good as the QoS that was committed for the initial connection.

Meeting this constraint requires special handling of some information elements at the source and destination nodes :

- During the initial connection establishment, values of the traffic and QoS parameters received by the source and the destination nodes must be recorded.
- The rerouting node uses these values to compute the contents of the reroute SETUP message sent to establish a rerouting connection.

The following sections define the procedures that a source node and destination node must implement to maintain QoS on the rerouting connection. Each of the following sections covers the procedures which apply for the ATM Service Categories defined in [TM 4.1].

A.1 CBR, rt-VBR or nrt-VBR call

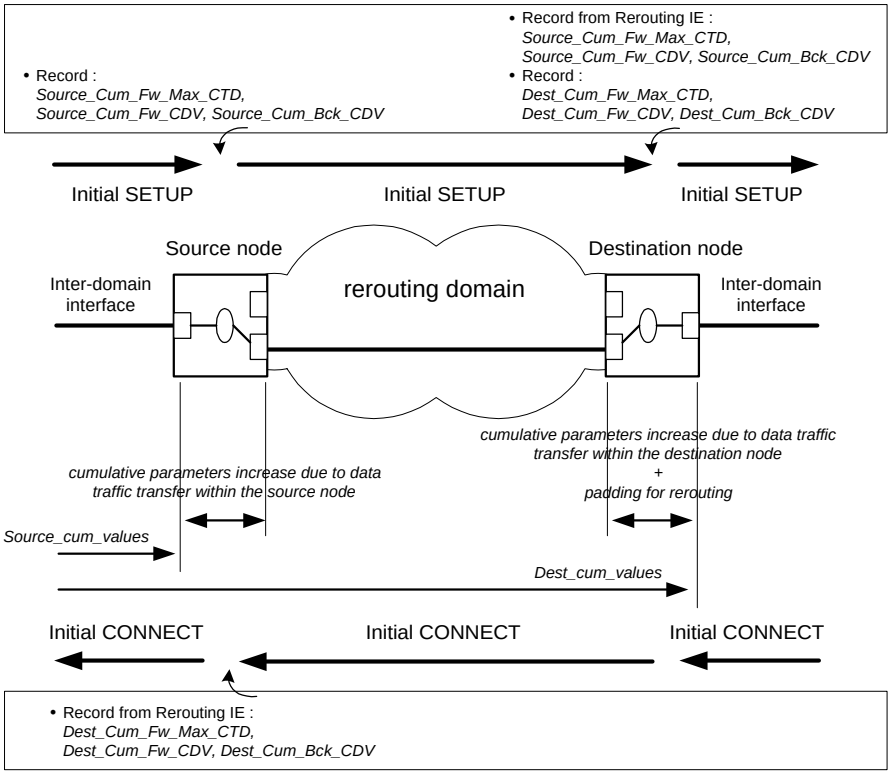


Figure Annex A-1: Exchange of the cumulative parameters between the source node and the destination node during the initial call establishment

A.1.1 Procedures for the initial call establishment at the source node

During the establishment of the initial connection, the source node shall record the contents of the Broadband bearer capability, ATM traffic descriptor and QoS parameter information elements contained in the received SETUP message (ini_SETUP). If negotiation of traffic parameters occurred, the negotiated values as returned in the initial CONNECT

message shall be recorded. If subsequent modification of traffic parameters occurs, the modified values as returned in the MODIFY ACKNOWLEDGE message shall be recorded.

ini_SETUP may or may not contain an Extended QoS parameters information element. Procedures of section 6.5.2.3.5/PNNI 1.0 specify that if ini_SETUP does not contain an Extended QoS parameters information element, the source node will generate one, using a local mapping from the service category and the forward and backward QoS class fields in the QoS parameter information element. In addition, an End-to-end transit delay information element may be generated as part of the above mapping, if it was not contained in ini_SETUP.

When applicable, the source node shall record:

- the Cumulative Forward Maximum Cell Transfer Delay as : *Source_Cum_Fw_Max_CTD.*
- the Cumulative Forward and Backward Cell Delay Variation as : *Source_Cum_Fw_CDV* and *Source_Cum_Bck_CDV*, respectively.
- the Acceptable Forward and Backward Cell Loss Ratio as : *Source_Fw_CLR* and *Source_Bck_CLR*, respectively.

The cumulative values of the Extended QoS parameters information element and the End-to-end transit delay information element shall be recorded after accounting for all, part, or none of the following:

- The expected increases due to user data transfer over the incoming link
- The expected increases due to user data transfer within the switching system that do NOT vary depending on the outgoing interface.

The cumulative values of the Extended QoS parameters information element and the End-to-end transit delay information element shall be recorded before taking into account the following:

- The expected increases due to user data transfer within this switching system that vary depending on the outgoing interface.
- The expected increases due to user data transfer in the forward direction over the outgoing link chosen to reach the Called party, between this switching system and the switching system on the succeeding side

If at least one rerouting service is indicated as available in the Rerouting services information element the call control entity shall include a Rerouting information element containing the recorded cumulative values into the SETUP message it sends towards the destination node. These values shall be coded in the Rerouting information element as specified in section 5.2. The IE instruction field of the Rerouting information element shall be coded as specified in section 10.1.

Upon receipt of the initial CONNECT message, the source node shall record *Dest_Cum_Fw_Max_CTD, Dest_Cum_Fw_CDV* and *Dest_Cum_Bck_CDV* if they are present in the Rerouting information element.

A.1.2 Procedures for the initial call establishment at the destination node

Upon receipt of ini_SETUP, the destination node applies the procedures of section 6.5.2.3.5/PNNI 1.0.

Following these procedures, when applicable, the call control entity shall record :

- the Cumulative Forward Maximum Cell Transfer Delay as : *Dest_Cum_Fw_Max_CTD.*
- the Cumulative Forward and Backward Cell Delay Variation as *Dest_Cum_Fw_CDV* and *Dest_Cum_Bck_CDV*, respectively.

The cumulative values of the Extended QoS parameters information element and the End-to-end transit delay information element shall be recorded after accounting for all of:

- the expected increases due to user data transfer over the incoming link from this switching system to the switching system on the preceding side (see section 6.5.2.3.5/PNNI 1.0),

- the expected increases due to user data transfer within this switching system that vary depending on the incoming interface, and

- "padding"[7] of the cumulative values by a network specific amount. The cumulative values contained in the SETUP message forwarded by the destination node in the direction of the Called party shall also reflect this padding.

and after accounting for all, part or none of:

- the expected increases due to user data transfer within this switching system that do NOT vary depending on the incoming interface, and

- The expected increases due to user data transfer over the outgoing link chosen to reach the Called party.

Upon receipt of the initial CONNECT message (ini_CONNECT) at the destination node, *Dest_Cum_Fw_Max_CTD, Dest_Cum_Fw_CDV* and *Dest_Cum_Bck_CDV*, when recorded for this call, shall be included in a Rerouting information element into the CONNECT message forwarded towards the source node. These values shall be coded in the Rerouting information element as specified in section 5.2. The IE instruction field of the Rerouting information element shall be coded as specified in section 10.1.

[SYM SOFT]

If symmetric soft rerouting is available for the call (i.e. symmetric soft rerouting is available at both the source and the destination node), the destination node shall record *Source_Cum_Fw_Max_CTD, Source_Cum_Fw_CDV* and *Source_Cum_Bck_CDV* from ini_SETUP. The destination node shall also record the contents of the Broadband bearer capability, ATM traffic descriptor, Extended QoS parameters and QoS parameter information elements contained in the received SETUP message. If negotiation of traffic parameters occurred, the negotiated values as returned in the initial CONNECT message shall be recorded. If subsequent modification of traffic parameters occurs, the modified values as returned in the MODIFY ACKNOWLEDGE message shall be recorded.

A.1.3 Procedures for rerouting a connection from the source node

The following procedures apply for hard rerouting, asymmetric soft rerouting and symmetric soft rerouting when the source node is the Rerouting node.

The reroute SETUP (rer_SETUP) computed by the source node for the establishment of the rerouting connection shall be coded with the following information :

- The contents of the Broadband bearer capability, ATM traffic descriptor and QoS parameter information elements shall be set to what was recorded during the establishment of the initial connection.
- Negotiation of traffic parameters shall not be allowed. Specifically, neither a Minimum acceptable ATM traffic descriptor information element nor an Alternative ATM traffic descriptor information element shall be included.
- If *Source_Cum_Fw_Max_CTD* was recorded, an End to end transit delay information element shall be included in rer_SETUP with :

  PNNI Cumulative Forward Maximum CTD (rer_SETUP) := 0

[7] The path of the initial connection is usually the nominal (i.e. shortest) network path. When rerouting occurs, since the path of the rerouting connection will often be longer than the path of the initial connection, it may be difficult to meet stringent requirements on Max CTD or CDV. For this reason, the values recorded by the destination node may be padded by a network specific amount, providing a reserve to the source node when it must select the path of the rerouting connection.

PNNI Acceptable Forward Maximum CTD (rer_SETUP) := Dest_Cum_Fw_Max_CTD - Source_Cum_Fw_Max_CTD

- If *Source_Cum_Fw_CDV, Source_Cum_Bck_CDV, Source_Fw_CLR* or *Source_Bck_CLR* were recorded, an Extended QoS parameters information element shall be included in rer_SETUP, with , when applicable :

Cumulative Forward CDV (rer_SETUP) := 0

Acceptable Forward CDV (rer_SETUP) := Dest_Cum_Fw_CDV - Source_Cum_Fw_CDV

Cumulative Backward CDV (rer_SETUP) := 0

Acceptable Backward CDV (rer_SETUP) := Dest_Cum_Bck_CDV - Source_Cum_Bck_CDV

Acceptable Forward CLR (rer_SETUP) := Source_Fw_CLR

Acceptable Backward CLR (rer_SETUP) := Source_Bck_CLR

Following these settings, the cumulative values shall be increased to account for:

- Any part of the expected increases due to user data transfer over the incoming link and within this switching system that were NOT included in the recorded cumulative values from the initial SETUP message.
- The expected increases due to user data transfer over the outgoing link chosen to reach the Called party.

A.1.4 Procedures for rerouting a connection from the destination node [SYM SOFT]

The following procedures apply for symmetric soft rerouting when the destination node is the Rerouting node.

The reroute SETUP (rer_SETUP) computed by the source node for the establishment of the rerouting connection shall be coded with the following information :

- The contents of the Broadband bearer capability, ATM traffic descriptor and QoS parameter information elements shall be set using what was recorded during the establishment of the initial connection. The recorded Broadband bearer capability information element shall be included in the reroute SETUP as is. The forward and backward fields of the ATM traffic descriptor and the QoS parameter information elements shall be swapped as described in Annex B
- Negotiation of traffic parameters shall not be allowed. Specifically, neither a Minimum acceptable ATM traffic descriptor information element nor an Alternative ATM traffic descriptor information element shall be included.
- If *Source_Cum_Fw_CDV, Source_Cum_Bck_CDV, Source_Fw_CLR* or *Source_Bck_CLR* were recorded, an Extended QoS parameters information element shall be included in rer_SETUP, with , when applicable :

Cumulative Forward CDV (rer_SETUP) := 0

Acceptable Forward CDV (rer_SETUP) := Dest_Cum_Bck_CDV - Source_Cum_Bck_CDV

Cumulative Backward CDV (rer_SETUP) := 0

Acceptable Backward CDV (rer_SETUP) := Dest_Cum_Fw_CDV - Source_Cum_Fw_CDV

Acceptable Forward CLR (rer_SETUP) := Source_Bck_CLR

Acceptable Backward CLR (rer_SETUP) := Source_Fw_CLR

- If *Source_Cum_Fw_Max_CTD* was recorded, an End to end transit delay information element shall be included in rer_SETUP with :

PNNI Cumulative Forward Maximum CTD (rer_SETUP) := 0

PNNI Acceptable Forward Maximum CTD (rer_SETUP) := (Dest_Cum_Fw_Max_CTD - Dest_Cum_Fw_CDV + Dest_Cum_Bck_CDV) – (Source_Cum_Fw_Max_CTD - Source_Cum_Fw_CDV + Source_Cum_Bck_CDV)

The node shall apply a subset of the procedures of section 6.5.2.3.5/PNNI 1.0 as if the call/connection was received on the inter-domain interface. Specifically, the cumulative values shall only be increased to account for:

- Any part of the expected increases due to user data transfer over the inter-domain interface and within this switching system that were included in the recorded cumulative values from the initial SETUP message.
- The expected increases due to user data transfer over the intra-domain interface.

A.1.5 Procedures for accepting a rerouting connection at the destination node

The node shall apply a subset of the procedures of section 6.5.2.3.5/PNNI 1.0 as if the call/connection was to be progressed out the inter-domain interface. Specifically, the cumulative values shall only be increased to account for:

- The expected increases due to user data transfer over the incoming link chosen to reach the Called party.
- Any part of the expected increases due to user data transfer over the outgoing link and within this switching system that were included in the recorded cumulative values from the initial SETUP message.

A.1.6 Procedures for accepting a rerouting connection at the source node [SYM SOFT]

The node shall apply a subset of the procedures of section 6.5.2.3.5/PNNI 1.0 as if the call/connection was to be progressed out the inter-domain interface. Specifically, the cumulative values shall only be increased to account for:

- Any part of the expected increases due to user data transfer over the inter-domain interface and within this switching system that were NOT included in the recorded cumulative values from the initial SETUP message.
- The expected increases due to user data transfer over the intra-domain interface chosen to reach the Calling party.

A.2 ABR call

A.2.1 Issues associated to rerouting ABR calls

During establishment of an ABR call, all parameters are eligible for negotiation by nodes on the path of the connection. There are no signalling procedures to disable or disallow negotiation during an ABR call establishment. As a result, rerouting of an ABR call will often result in allocation of new ABR parameters to the connection segment between the source and destination nodes.

For example, the Transient Buffer Exposure and RM Fixed Round Trip Time allocated to the rerouting connection may be completely different from those allocated to the initial call. Since the Initial Cell Rate that applies to an ABR connection is defined as ICR = max {MCR, min(ICR, TBE/FRTT)}, there is a possibility that the ICR of the rerouting connection (rer_ICR) is less than the ICR of the initial connection (ini_ICR). Since end systems are not aware that rerouting occurred on their ABR connection, every time they come out of the idle state, during the time it takes for the RM control loop to be re-established, they will transmit at ini_ICR. The intermediate nodes on the rerouting connection have only allocated resources for rer_ICR, so the commitment on low cell loss ratio may not be met. Worse, this may also have a negative impact on QoS provided to other ABR connections on these intermediate nodes.

The use of a Virtual Source/Virtual Destination at the source and destination nodes allows the division of the connection into a number of separately controlled ABR segments. In such configurations, the connection segment between the source and destination nodes is managed separately from the rest of the connection. As such, the QoS impact of a rerouting operation can be managed as part of the more general, implementation specific, problem of coupling two adjacent ABR control segments. This is the only way to alleviate the possible QoS degradation of rerouting an ABR connection.

[SYM SOFT]

Preservation of QoS for an ABR call when the destination node is the rerouting node is not addressed in this specification.

A.2.2 Procedures for the initial call establishment at the source node

During the establishment of the initial connection, the source node shall record the contents of the Broadband bearer capability, ABR setup parameters, QoS parameter, and when applicable, ABR additional parameters information elements contained in the received SETUP (ini_SETUP). The source node shall record the Forward and Backward Minimum Cell Rate provided to the call (if negotiation occurred, these are returned in the initial CONNECT message).

A.2.3 Procedures for rerouting a connection from the source node

The reroute SETUP (rer_SETUP) initiated by the source node for the establishment of the rerouting connection shall be coded with the following information :

- The contents of the Broadband bearer capability, ABR setup parameters, QoS parameter, and when applicable, ABR additional parameters information elements shall be identical to their contents as received in ini_SETUP.
- The ATM traffic descriptor information element shall contain the forward and backward Minimum cell rate, as recorded during the initial call establishment. Negotiation of the Minimum cell rate shall not be allowed, i.e. a Minimum acceptable ATM traffic descriptor information element shall NOT be included in rer_SETUP.

A.2.4 Procedures for rerouting a connection from the destination node [SYM SOFT]

Procedures for rerouting an ABR connection when the destination node is the rerouting node are not addressed in this specification.

A.3 UBR, UBR with MDCR or UBR with BCS call

A.3.1 Procedures for the initial call establishment at the source node

During the establishment of the initial connection, the source node shall record the contents of the Broadband bearer capability, ATM traffic descriptor and QoS parameter information elements contained in the received SETUP (ini_SETUP).

When applicable, upon receipt of ini_SETUP, the source node shall also record :

- the contents of the Minimum desired cell rate information element included in the initial setup request .
- the contents of the Optional traffic attributes information elements containing BCS values included in the initial setup request.

If negotiation of traffic parameters occurred, the negotiated values as returned in the initial CONNECT message shall be recorded. If subsequent modification of traffic parameters occurs, the modified values as returned in the MODIFY ACKNOWLEDGE message shall be recorded.

A.3.2 Procedures for the initial call establishment at the destination node [SYM SOFT]

If symmetric soft rerouting is available for the call, the destination node shall record the contents of the Broadband bearer capability, ATM traffic descriptor and QoS parameter information elements contained in the received SETUP.

When applicable, upon receipt of ini_SETUP, the destination node shall also record :

- the contents of the Minimum desired cell rate information element if the call is a UBR with MDCR call included in the initial setup indication.
- the contents of the Optional traffic attributes information elements containing BCS values included in the initial setup indication.

If negotiation of traffic parameters occurred, the negotiated values as returned in the initial CONNECT message shall be recorded. If subsequent modification of traffic parameters occurs, the modified values as returned in the MODIFY ACKNOWLEDGE message shall be recorded.

A.3.3 Procedures for rerouting a connection from the source node

The reroute SETUP initiated by the source node for the establishment of the rerouting connection shall be coded with the following information :

- The contents of the Broadband bearer capability, ATM traffic descriptor and QoS parameter information elements shall be identical to their contents as received in ini_SETUP.
- If a Minimum desired cell rate information element was recorded, a Minimum desired cell rate information element with the same content shall be included in the rer_SETUP.
- If an Optional traffic attributes information element with BCS values was recorded, an Optional traffic attributes information element with the same BCS content shall be included in rer_SETUP.

A.3.4 Procedures for rerouting a connection from the destination node [SYM SOFT]

The reroute SETUP initiated by the destination node for the establishment of the rerouting connection shall be coded with the following information:

- The contents of the Broadband bearer capability, ATM traffic descriptor and QoS parameter information elements shall be set using what was recorded during the establishment of the initial connection. The recorded Broadband bearer capability information element shall be included in the reroute SETUP as is. The forward and backward fields of the ATM traffic descriptor and the QoS parameter information elements shall be swapped as described in Annex B.

- If a Minimum desired cell rate information element was recorded, the forward and backwards fields shall be swapped as described in Annex B and the resulting Minimum desired cell rate information element shall be included in rer_SETUP.
- If an Optional traffic attributes information element with BCS values was recorded, the forward and backward fields shall be swapped as described in Annex B, and the resulting Optional traffic attributes information element with BCS values shall be included in rer_SETUP.

A.4 GFR call

A.4.1 Procedures for the initial call establishment at the source node

During the establishment of the initial connection, the source node shall record the contents of the Broadband bearer capability and QoS parameter information elements contained in the received SETUP message (ini_SETUP).

If neither Minimum acceptable ATM traffic descriptor information element nor Alternative ATM traffic descriptor information element are included in ini_SETUP and no parameter defaulting occurs, the source node shall also record the contents of the ATM traffic descriptor information element as *Source_Ini_ATD*.

If a Minimum acceptable ATM traffic descriptor information element or an Alternative ATM traffic descriptor information element is contained in ini_SETUP or if parameter defaulting occurs, then negotiation of the traffic parameters will take place during the establishment of the initial connection. The values of the traffic parameters provided by the network will be indicated in the initial CONNECT message. As a result the source node shall record the contents of the ATM traffic descriptor information element received in the ini_CONNECT as *Source_Ini_ATD*.

If subsequent modification of traffic parameters occurs, the modified values as returned in the MODIFY ACKNOWLEDGE message shall be recorded.

A.4.2 Procedures for the initial call establishment at the destination node [SYM SOFT]

If symmetric soft rerouting is available for the call, the destination node shall record the contents of the Broadband bearer capability and QoS parameter information elements contained in the received SETUP (ini_SETUP).

If neither Minimum acceptable ATM traffic descriptor information element nor Alternative ATM traffic descriptor information element are included in ini_SETUP, the destination node shall also record the contents of the ATM traffic descriptor information element as *Dest_Ini_ATD.*

If a Minimum acceptable ATM traffic descriptor information element or an Alternative ATM traffic descriptor information element is contained in the ini_SETUP, then negotiation of the traffic parameters will take place during the establishment of the initial connection. The values of the traffic parameters provided by the network will be indicated in the initial CONNECT message. As a result the destination node shall record the contents of the ATM traffic descriptor information element received in the ini_CONNECT as *Dest_Ini_ATD*.

If subsequent modification of traffic parameters occurs, the modified values as returned in the MODIFY ACKNOWLEDGE message shall be recorded.

A.4.3 Procedures for rerouting a connection from the source node

The reroute SETUP initiated by the source node for the establishment of the rerouting connection shall be coded with the following information:

- The contents of the Broadband bearer capability and QoS parameter information elements shall be identical to their contents as received in ini_SETUP.
- The contents of the ATM traffic descriptor information element shall be identical to that of *Source_Ini_ATD*.

- Negotiation of the traffic parameters shall not be allowed, neither a Minimum acceptable ATM traffic descriptor information element nor an Alternative ATM traffic descriptor information element shall be included.

A.4.4 Procedures for rerouting a connection from the destination node [SYM SOFT]

The reroute SETUP initiated by the source node for the establishment of the rerouting connection shall be coded with the following information:

- The contents of the Broadband bearer capability, ATM traffic descriptor and QoS parameter information elements shall be set using what was recorded during the establishment of the initial connection. The recorded Broadband bearer capability information element shall be included unaltered in the reroute SETUP. The forward and backward fields of the ATM traffic descriptor and the QoS parameter information elements shall be swapped as described in Annex B.
- The contents of the ATM traffic descriptor information element shall be identical to that of *Source_Ini_ATD*.
- Negotiation of the traffic parameters shall not be allowed, neither a Minimum acceptable ATM traffic descriptor information element nor an Alternative ATM traffic descriptor information element shall be included.

Annex B Additional procedures when establishing a rerouting connection from the destination node [SYM SOFT].

[Normative]

B.1 ATM Traffic descriptor IE

The ATM Traffic descriptor information element of the reroute SETUP message shall contain the same values as the agreed ATM Traffic descriptor of the initial connection. To achieve this, since the rerouting connection is established from the destination node to the source node, the fields of the ATM Traffic descriptor information element shall be set by the destination node to the following values:

- If the “Forward peak cell rate (CLP=0)” octet group (octet 5.1-5.3) was recorded during the establishment of the initial connection, it shall be coded as the “Backward peak cell rate (CLP=0)” octet group (octet 6.1-6.3) in the reroute SETUP message.

- If the “Backward peak cell rate (CLP=0)” octet group (octet 6.1-6.3) was recorded during the establishment of the initial connection, it shall be coded as the “Forward peak cell rate (CLP=0)” octet group (octet 5.1-5.3) in the reroute SETUP message.

- The “Forward peak cell rate (CLP=0+1)” octet group (octet 7.1-7.3) was recorded during the establishment of the initial connection, it shall be coded as the “Backward peak cell rate (CLP=0+1)” octet group (octet 8.1-8.3) in the reroute SETUP message.

- The “Backward peak cell rate (CLP=0+1)” octet group (octet 8.1-8.3) was recorded during the establishment of the initial connection, it shall be coded as the “Forward peak cell rate (CLP=0+1)” octet group (octet 7.1-7.3) in the reroute SETUP message.

- If the “Forward sustainable cell rate (CLP=0)” octet group (octet 9.1-9.3) was recorded during the establishment of the initial connection, it shall be coded as the “Backward sustainable cell rate (CLP=0)” octet group (octet 10.1-10.3) in the reroute SETUP message.

- If the “Backward sustainable cell rate (CLP=0)” octet group (octet 10.1-10.3) was recorded during the establishment of the initial connection, it shall be coded as the “Forward sustainable cell rate (CLP=0)” octet group (octet 9.1-9.3) in the reroute SETUP message.

- If the “Forward sustainable cell rate (CLP=0+1)” octet group (octet 11.1-11.3) was recorded during the establishment of the initial connection, it shall be coded as the “Backward sustainable cell rate (CLP=0+1)” octet group (octet 12.1-12.3) in the reroute SETUP message.

- If the “Backward sustainable cell rate (CLP=0+1)” octet group (octet 12.1-12.3) was recorded during the establishment of the initial connection, it shall be coded as the “Forward sustainable cell rate (CLP=0+1)” octet group (octet 11.1-11.3) in the reroute SETUP message.

- If the “Forward maximum burst size (CLP=0)” octet group (octet 13.1-13.3) was recorded during the establishment of the initial connection, it shall be coded as the “Backward maximum burst size (CLP=0)” octet group (octet 14.1-14.3) in the reroute SETUP message.

- If the “Backward maximum burst size (CLP=0)” octet group (octet 14.1-14.3) was recorded during the establishment of the initial connection, it shall be coded as the “Forward maximum burst size (CLP=0)” octet group (octet 13.1-13.3) in the reroute SETUP message.

- If the “Forward maximum burst size (CLP=0+1)” octet group (octet 15.1-15.3) was recorded during the establishment of the initial connection, it shall be coded as “Backward maximum burst size (CLP=0+1)” octet group (octet 16.1-16.3) in the reroute SETUP message.

- If the “Backward maximum burst size (CLP=0+1)” octet group (octet 16.1-16.3) was recorded during the establishment of the initial connection, it shall be coded as the “Forward maximum burst size (CLP=0+1)” octet group (octet 15.1-15.3) in the reroute SETUP message.

- If the “Traffic management option” octet (octet 17.1) was recorded during the establishment of the initial connection, it shall be modified as follows before being included in the reroute SETUP message:

  - Bits 1 and 2 shall be swapped (Tagging Forward/Backward)

  - Bits 7 and 8 shall be swapped (Forward/Backward frame discard)

- If the “Forward minimum cell rate (CLP=0+1)” octet group (octet 19.1-19.3) was recorded during the establishment of the initial connection, it shall be coded as the “Backward minimum cell rate (CLP=0+1)” octet group (octet 20.1-20.3) in the reroute SETUP message.

- If the “Backward minimum cell rate (CLP=0+1)” octet group (octet 20.1-20.3) was recorded during the establishment of the initial connection, it shall be coded as the “Forward minimum cell rate (CLP=0+1)” octet group (octet 19.1-19.3) in the reroute SETUP message.

- If the “Forward maximum frame size” octet group (octet 21.1-21.2) was recorded during the establishment of the initial connection, it shall be coded as the “Backward maximum frame size” octet group (octet 22.1-22.2) in the reroute SETUP message.

- If the “Backward maximum frame size” octet group (octet 22.1-22.2) was recorded during the establishment of the initial connection, it shall be coded as the “Forward maximum frame size” octet group (octet 21.1-21.2) in the reroute SETUP message.

- If the “Forward burst cell tolerance” octet group (octet 23.1-23.3) was recorded during the establishment of the initial connection, it shall be coded as the “Backward burst cell tolerance” octet group (octet 24.1-24.3) in the reroute SETUP message.

- If the “Backward burst cell tolerance” octet group (octet 24.1-24.3) was recorded during the establishment of the initial connection, it shall be coded as the “Forward burst cell tolerance” octet group (octet 23.1-23.3) in the reroute SETUP message.

B.2 QoS parameter IE

The QOS parameter information element of the reroute SETUP message shall contain the same values as the agreed QOS parameters of the initial connection. To achieve it, the fields of the QOS parameter information element shall be set by the destination node to the following values:

- Octet 5 and 6 as received in the initial SETUP message shall be swapped (QOS class Forward/Backward).

B.3 Minimum desired cell rate IE

The Minimum desired cell rate (MDCR) information element of the reroute SETUP message shall contain the same values as the MDCR of the initial connection. To achieve it, the fields of the MDCR parameter information element shall be set by the destination node to the following values:

- If the “Forward Minimum Desired Cell Rate” octet group (octet 6.1-6.3) was recorded during the establishment of the initial connection, it shall be coded as the “Backward Minimum Desired Cell Rate” octet group (octet 7.1-7.3) in the reroute SETUP message.

- If the “Backward Minimum Desired Cell Rate” octet group (octet 7.1-7.3) was recorded during the establishment of the initial connection, it shall be coded as the “Forward Minimum Desired Cell Rate” octet group (octet 6.1-6.3) in the reroute SETUP message.

B.4 Optional Traffic Attributes IE

The Optional traffic attributes information element of the reroute SETUP message shall contain the same values as the Optional traffic attributes of the initial connection. To achieve it, the fields of the Optional traffic attributes information element shall be set by the destination node to the following values:

- If a “Forward/Backward Behavior Class Selector” octet group was recorded during the establishment of the initial connection, the values of the “Forward Behavior Class Selector (BCS) value” field (octet 6.1-6.2) and the “Backward Behavior Class Selector (BCS) value” field (octet 7.1-7.2) shall be swapped in the reroute SETUP message.

Annex C SNMP MIB for domain-based rerouting

[Normative]

```
ATM-REROUTING-MIB DEFINITIONS ::= BEGIN
    IMPORTS
            MODULE-IDENTITY, OBJECT-TYPE, enterprises,
            Integer32, Unsigned32, Counter32
                    FROM SNMPv2-SMI
            MODULE-COMPLIANCE, OBJECT-GROUP
                    FROM SNMPv2-CONF
            TEXTUAL-CONVENTION, RowStatus
                    FROM SNMPv2-TC
            InterfaceIndex, ifIndex
                    FROM IF-MIB
            AtmAddr
                    FROM ATM-TC-MIB
            atmVplVpi, atmVclVpi, atmVclVci
                    FROM ATM-MIB;

atmfreroutingMIB MODULE-IDENTITY
    LAST-UPDATED    "200104260000Z"
    ORGANIZATION    "The ATM Forum"
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    DESCRIPTION
        "The MIB module for managing the ATM Forum
         Domain-based rerouting for active point-to-point calls v1.0"
    REVISION "200104260000Z"
    DESCRIPTION
      "Initial version of the MIB module for managing the ATM Forum
       Domain-based rerouting for active point-to-point calls v1.0"
   ::= { atmfRerouting 1 }

-- The object identifier subtree for the ATM Forum domain-based
-- rerouting MIB

atmForum                   OBJECT IDENTIFIER ::= { enterprises 353 }
atmForumNetworkManagement  OBJECT IDENTIFIER ::= { atmForum 5 }
atmfSignalling             OBJECT IDENTIFIER ::= { atmForumNetworkManagement 9 }
atmfRerouting              OBJECT IDENTIFIER ::= { atmfSignalling 3 }


--
-- The ATM Forum REROUTING MIB contains the following groups:
--
-- (1) Rerouting services configuration base group
-- (2) Rerouting services configuration table (filters)
-- (3) Rerouting attributes per VPL
-- (4) Rerouting attributes per VCL
--
-- The rerouting MIB can be used to configure and monitor rerouting
-- services on a switching system, on an end system or on an
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-- inter-networking device.
--
-- Rerouting services are only supported for point-to-point calls.
--
-- The reroutingFilterTable is used to configure
-- the availability and request of rerouting services for a call on a
-- per filter basis. A filter can be specified to match the interface,
-- the class of service, the type of connection (svc, spvc, svp, spvp)
-- and the calling or called party address.
--
-- The reroutingVpTable and reroutingVcTable are used to monitor
-- what rerouting services have been activated for a call, the
-- current rerouting state of a call, and provide counters for
-- successful and unsuccessful rerouting operations.
--
-- When using this MIB to configure end systems,
-- some objects are not available. The objects relevant
-- for end systems can be found in the conformance statements.
--
-- The rerouting objects defined in this MIB are available on
-- inter-domain interfaces.


reroutingMIBObjects OBJECT IDENTIFIER ::= { atmfreroutingMIB 1 }

-- ======================================
-- Domain-based rerouting types definitions
-- ======================================

NetworkReroutingCapabilities ::= TEXTUAL-CONVENTION
    STATUS        current
    DESCRIPTION
        "Indicates the network rerouting services available
         on a switching system."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    SYNTAX        BITS {
                       dbrHardRerouting (0),
                       dbrAsymmetricSoftRerouting (1),
                       dbrSymmetricSoftRerouting (2)
                      }

HardReroutingServicesClass ::= TEXTUAL-CONVENTION
    STATUS        current
    DESCRIPTION
        "Indicates the service of the hard rerouting services class
         which is requested/activated for a call."
    REFERENCE
        "Domain-based rerouting 1.0"
    SYNTAX        INTEGER {
                         none (1),
                         dbrInterDomainHardRerouting (2),
                         dbrIntraDomainHardRerouting (3)
                        }

SoftReroutingServicesClass ::= TEXTUAL-CONVENTION
    STATUS        current
    DESCRIPTION
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        "Indicates the service of the soft rerouting
         services class which is requested/activated for
         a call."
    REFERENCE
        "Domain-based rerouting 1.0"
    SYNTAX        INTEGER {
                           none (1),
                           dbrIntraDomainAsymmetricSoftRerouting (2),
                           dbrIntraDomainSymmetricSoftRerouting (3)
                          }

ReroutingNodeRole ::= TEXTUAL-CONVENTION
    STATUS        current
    DESCRIPTION
        "Describes whether the node is the source node or
         the destination node for a call."
    REFERENCE
        "Domain-based rerouting 1.0"
    SYNTAX        INTEGER {
                           other (1),
                           sourceNode (2),
                           destinationNode (3)
                          }

ReroutingState ::= TEXTUAL-CONVENTION
    STATUS        current
    DESCRIPTION
        "Indicates the type of the rerouting operation in
         progress.

         The following mapping is done between the rerouting
         states of the FSM and the values of this object:

         FSM state                  ReroutingState
         ---------                  --------------
         null                    -> idle
         reroutingIdle           -> idle
         hardRerouteTriggered    -> hardReroute
         hardRerouteProceeding   -> hardReroute
         hardRerouteIndicated    -> hardReroute
         hardRerouteInitiated    -> hardReroute
         softRerouteTriggered    -> softReroute
         softRerouteProceeding   -> softReroute
         softRerouteInitiated    -> softReroute
         awaitingSwitchover      -> softReroute
        "
    REFERENCE
        "Domain-based rerouting 1.0"
    SYNTAX        INTEGER {
                           idle (1),
                           hardReroute (2),
                           softReroute (3)
                          }

ExtendedReroutingState ::= TEXTUAL-CONVENTION
    STATUS        current
    DESCRIPTION
        "Describes the different states of the rerouting
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          finite state machine. The states varies depending
          on the rerouting services activated for a call and
          on the role of the edge switch for the call
          (source vs destination node)"
    REFERENCE
        "Domain-based rerouting 1.0"
    SYNTAX        INTEGER {
                           null (1),
                           reroutingIdle (2),
                           hardRerouteTriggered (3),
                           hardRerouteProceeding (4),
                           hardRerouteIndicated (5),
                           hardRerouteInitiated (6),
                           softRerouteTriggered(7),
                           softRerouteProceeding(8),
                           softRerouteInitiated(9),
                           awaitingSwitchover(10)
                          }

-- ========================================
-- Domain-based rerouting capabilities
-- ========================================

reroutingBaseGroup OBJECT IDENTIFIER ::= { reroutingMIBObjects 1 }

reroutingVersion OBJECT-TYPE
    SYNTAX        INTEGER {unsupported (1), version1point0 (2)}
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "The version of the ATM Forum rerouting specification
         that the software in this switching system is capable of
         executing."
    REFERENCE
        "Domain-based rerouting 1.0"
    ::= { reroutingBaseGroup 1 }

reroutingCapabilitiesSupported OBJECT-TYPE
    SYNTAX        BITS {
                        dbrHardRerouting (0),
                        dbrAsymmetricSoftRerouting (1),
                        dbrSymmetricSoftRerouting (2)
                       }
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates the rerouting mechanisms supported on
         this switching system"
    REFERENCE
        "Domain-based rerouting 1.0"
    ::= { reroutingBaseGroup 2 }

reroutingHardReroutingTime OBJECT-TYPE
    SYNTAX        Unsigned32
    MAX-ACCESS    read-write
    STATUS        current
    DESCRIPTION
        "The timeout value in milliseconds for a hard rerouting
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          operation to be completed. The hard rerouting timer is set
          to this value when a hard rerouting operation is triggered.

          A value of zero indicates that there is no timeout"
     REFERENCE
         "Domain-based rerouting 1.0"
     ::= { reroutingBaseGroup 3 }

reroutingFilterTable OBJECT-TYPE
     SYNTAX        SEQUENCE OF ReroutingFilterEntry
     MAX-ACCESS    not-accessible
     STATUS        current
     DESCRIPTION
         "The table is used to configure the rerouting services of a
          call during the initial call establishment. The configuration
          includes:
            - the availability of rerouting services,
            - the request for inter and intra-domain rerouting services.
            - the applicability of the configuration to svc, spvc, svp,
              spvp.

          The configuration of rerouting services is based on a filter.
          Incoming setups and outgoing setups on inter-domain interfaces
          (e.g. UNI, AINI, inter-domain PNNI) are matched against the
          filters contained in this table. The configuration of the
          rerouting services contained in a row of this table apply if
          the setup message matches the filtering criteria contained
          in the row.

          If the setup message matches several filters of this table,
          the resulting configuration of the rerouting services is
          implementation dependent.

          An entry in this table configures the rerouting services for
          SVCs, SVPs, soft PVCs, and soft PVPs. The configuration
          Applies to point-to-point calls only."
      REFERENCE
         "Domain-based rerouting v1.0"
     ::= { reroutingMIBObjects 2 }

reroutingFilterEntry OBJECT-TYPE
     SYNTAX        ReroutingFilterEntry
     MAX-ACCESS    not-accessible
     STATUS        current
     DESCRIPTION
         "Each entry in this table defines a filter to match against
          incoming/outgoing setups on inter-domain interfaces. Each
          entry also contains the configuration of the rerouting
          services for a call matching the filter.

          Matching is performed on incoming setup indications and
          Outgoing setup requests of svcs and svps when the switching
          system is the edge switch for the call. The matching is done
          on the inter-domain interface.

          A setup message is matching a filter entry, if all the
          attributes contained in the filter match the setup message.
          The matching criteria is contained in the description of each
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        object.

        The entry is also used to configure the rerouting services for
        soft pvcs or soft pvps whose terminating legs are located on
        an interface of this switch.

        A new entry can be created by specifying an atmTraceFilterIndex
        value that is currently not being used and also using an
        appropriate value (createAndGo or createAndWait) for the
        reroutingFilterRowStatus object.

        The reroutingFilterIndex is used as the instance ID to
        Uniquely identify a filter configured on this switching
        system."
    INDEX { reroutingFilterIndex}
    ::= { reroutingFilterTable 1 }

ReroutingFilterEntry ::=
    SEQUENCE {
      reroutingFilterIndex                          INTEGER,
      reroutingFilterIfDirection                    INTEGER,
      reroutingFilterInterface                      InterfaceIndex,
      reroutingFilterConnKind                       BITS,
      reroutingFilterServiceCategory                BITS,
      reroutingFilterCallingPartyPrefix             AtmAddr,
      reroutingFilterCallingPartyLength             Integer32,
      reroutingFilterCalledPartyPrefix              AtmAddr,
      reroutingFilterCalledPartyLength              Integer32,
      reroutingFilterNetworkServicesAvailable       NetworkReroutingCapabilities,
      reroutingFilterHardReroutingServiceRequest    HardReroutingServicesClass,
      reroutingFilterSoftReroutingServiceRequest    SoftReroutingServicesClass,
      reroutingFilterRowStatus                      RowStatus
            }

reroutingFilterIndex OBJECT-TYPE
    SYNTAX        INTEGER (1..65535)
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        "An arbitrary integer uniquely identifying a filter
         in this table."
    REFERENCE
        "Domain-based rerouting 1.0"
    ::= { reroutingFilterEntry 1}

reroutingFilterIfDirection  OBJECT-TYPE
    SYNTAX     INTEGER {
                        none (0),
                        in (1),
                        out (2),
                        both (3)
                       }
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        "The combination of this object and the corresponding instance
         of reroutingFilterInterface is one selection criteria for
         this filter entry.  If the value of this object is different
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          from 'none', the object restricts the scope of the filter to
          calls which enter, exit or both enter and exit the ATM device
          through the port represented by reroutingFilterInterface.
          Calls initiated or terminated at this port (e.g. Soft PVCs)
          are also scoped.

          When this object has the value 'none', it indicates that the
          scope of the filter is not restricted by the port."
    REFERENCE
        "Domain-based rerouting v1.0"
    DEFVAL     { none }
    ::= { reroutingFilterEntry 2 }

reroutingFilterInterface  OBJECT-TYPE
    SYNTAX     InterfaceIndex
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        "The combination of this object and the corresponding instance
         of reroutingIfDirection is one selection criteria
         for this filter entry. This object restricts the scope of the
         filter to calls which enter, exit or both enter and exit the
         ATM device through the port represented by this object. Calls
         initiated or terminated at this port (e.g. Soft PVCs) are also
         scoped.

         When reroutingFilterCallDirection has the value 'none', the
         value contained in this object is ignored and the scope
         of the filter is not restricted by the port."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingFilterEntry 3 }

reroutingFilterConnKind  OBJECT-TYPE
    SYNTAX     BITS {
                    other(0),
                    svcAndSpvcNotInitiator(1),
                    spvcInitiator(2),
                    svpAndSpvpNotInitiator(3),
                    spvpInitiator(4)
                    }
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
       "Indicates if the configuration defined in this entry applies
        to:
         - 'svcAndSpvcNotInitiator' to switched virtual channels only.
         - 'spvcInitiator' to soft permanent virtual channels,
            when initiated or terminated on this switching system.
         - 'svpAndSpvpNotInitiator' to switched virtual paths only.
         - 'spvpInitiator' to soft permanent virtual paths,
            when initiated or terminated on this switching system."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingFilterEntry 4 }

reroutingFilterServiceCategory OBJECT-TYPE
    SYNTAX     BITS {
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                        cbr(0),
                        rtVbr(1),
                        nrtVbr(2),
                        abr(3),
                        ubr(4),
                        gfr(5),
                        other(6)
                        }
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        "This object restricts the scope of the filter to calls
         belonging to service categories represented by this object."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingFilterEntry 5 }

reroutingFilterCallingPartyPrefix     OBJECT-TYPE
    SYNTAX     AtmAddr
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        "The combination of this object and the corresponding instance
         of reroutingFilterCallingPartyLength is one selection criteria
         for this record.  To match this selection criteria, a
         call setup must have a Calling Party Address which has
         an initial part (of length reroutingFilterCalledPartyLength
         bits) equal in value to reroutingFilterCallingParty.  When
         the default value for the object is retained then the call
         will match this filtering criteria for any calling address in
         the call, or if the calling party number is not present in the
         call.  The value must be padded with zeros from
         reroutingFilterCallingPartyLength to the full length of the
         address (8 octets for E.164 numbers and 20 octets for AESAs)."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    DEFVAL     { "" }
    ::= { reroutingFilterEntry 6 }

reroutingFilterCallingPartyLength OBJECT-TYPE
    SYNTAX     Integer32 (1..160)
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        "This object specifies the number of bits in
         reroutingFilterCallingParty that shall be used when matching
         against the calling party of a new call setup."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    DEFVAL     { 152 }
    ::= { reroutingFilterEntry 7 }

reroutingFilterCalledPartyPrefix      OBJECT-TYPE
    SYNTAX     AtmAddr
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        "The combination of this object and the corresponding instance
```

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          of reroutingFilterCalledPartyLength is one selection criteria
          for this record.  To match this selection criteria, a
          connection segment setup must have a called party address
          which has an initial part (of length
          reroutingFilterCalledPartyLength bits) equal in value to
          reroutingFilterCalledParty. When the default value for the
          object is retained then the call will match this  filtering
          criteria for any called address in the all. The value must be
          padded with zeros from reroutingFilterCalledPartyLength to
          the full length of the address (8 octets for E.164 numbers and
          20 octets for AESAs)."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    DEFVAL     {""}
    ::= { reroutingFilterEntry 8 }

reroutingFilterCalledPartyLength  OBJECT-TYPE
    SYNTAX     Integer32 (1..160)
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
        "This object specifies the number of bits in
         reroutingFilterCalledParty that shall be used when matching
         against the called party of a new call setup."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    DEFVAL     { 152 }
    ::= { reroutingFilterEntry 9 }

reroutingFilterNetworkServicesAvailable OBJECT-TYPE
    SYNTAX        NetworkReroutingCapabilities
    MAX-ACCESS    read-create
    STATUS        current
    DESCRIPTION
        "Indicates what network rerouting services are
         locally available for a call when it matches this filter.
         If a rerouting service is not available, the negotiation
         protocol of rerouting services ensures that the service
         cannot be activated for the call within this rerouting domain.

         This object can be used to filter and disable the services
         requested by a user.

         The determination of the values indicated in the
         Rerouting Service IE is described in sections 6.2.1 and
         6.3.2."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingFilterEntry 10}


reroutingFilterHardReroutingServiceRequest OBJECT-TYPE
    SYNTAX       HardReroutingServicesClass
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "Indicates which hard rerouting service is requested by the
         network on behalf of the user when a setup matches this
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```
          address filter.

          'none' means that no hard rerouting service is requested
          for the call.

          'dbrInterDomainHardRerouting' means that the Domain-based
          hard rerouting service is requested end to end for
          the call. In addition the intra-domain hard rerouting service
          is requested for the call. Conditions for the request the
          inter-domain hard rerouting service are described in sections
          6.2.1 and 6.3.2.

          'dbrIntraDomainHardRerouting' means that the Domain-based
          hard rerouting service is requested for the call
          within this rerouting domain only. This value can be set if
          the switch is connected directly to the ATM end system, or if
          it is connected to another switch with an inter-domain
          interface (e.g. AINI, UNI, inter-domain PNNI)

          The service specified in this object is only requested for the
          call if the service is available for this interface.
          (see object reroutingFilterNetworkServicesAvailable).

          The determination of the activation of the service depends on
          the service availability at the other edge nodes. The
          procedures are described in sections 6.2.1 and  6.3.2."
      REFERENCE
          "ATM Forum Domain-based rerouting 1.0"
      DEFVAL { none }
      ::= { reroutingFilterEntry 11}

reroutingFilterSoftReroutingServiceRequest OBJECT-TYPE
      SYNTAX       SoftReroutingServicesClass
      MAX-ACCESS   read-create
      STATUS       current
      DESCRIPTION
          "Indicates which soft rerouting service is requested by the
           network on behalf of the user when a setup matches this
           address filter.

           'none' means that no soft rerouting service is requested
           for the call.

           'dbrIntraDomainAsymmetricSoftRerouting' means that the
           Domain-based asymmetric soft rerouting service is requested
           for the call within this rerouting domain only. This value
           can be set if the switch is connected directly to the ATM end
           system, or if it is connected to another switch with an
           inter-domain interface (e.g. AINI, UNI, inter-domain PNNI)

           'dbrIntraDomainSymmetricSoftRerouting' means that the
           Domain-based symmetric soft rerouting service is requested
           for the call within this rerouting domain only. This value
           can be set if the switch is connected directly to the
           ATM end system, or if it is connected to another switch with
           an inter-domain interface (e.g. AINI, UNI, inter-domain PNNI)

           The service specified in this object is only requested for the
```

```
          call if the service is available for this interface.
          (see object reroutingFilterInterNetworkServicesAvailable)

          The determination of the activation of the service depends on
          the service availability at the other edge nodes. The
          procedures are described in sections 6.2.1 and 6.3.2."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    DEFVAL { none }
    ::= { reroutingFilterEntry 12}

reroutingFilterRowStatus OBJECT-TYPE
    SYNTAX        RowStatus
    MAX-ACCESS    read-create
    STATUS        current
    DESCRIPTION
        "To create, delete, activate and de-activate a
         filter for the configuration of the rerouting
         services."
    ::= { reroutingFilterEntry 13}


-- ======================================
-- Vpl table for rerouting
-- ======================================

reroutingVpTable OBJECT-TYPE
    SYNTAX        SEQUENCE OF ReroutingVpEntry
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        "The table used to describe the rerouting
         attributes of a Pt-to-Pt svp or spvp.

         The entire reroutingVpTable is read-only reflecting
         the fact that reroutable connections are created
         through the ATM signalling protocol rather than configured."
     REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingMIBObjects 3 }

reroutingVpEntry OBJECT-TYPE
    SYNTAX        ReroutingVpEntry
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        "Each entry in this table contains the rerouting
         attributes of a SVP or Soft PVP connection.

         The content of this table reflects only the rerouting values
         associated with VPCs. This table is similar to the atmVclTable
         specified in ATM-MIB (RFC 2515).

         Entries are included for Vpls for which this is the source
         interface or the destination interface in the rerouting
         domain. Entries may be included for Vpls at the endpoints
         of the connection (see the
         reroutingVpHardReroutingServiceActivated object).
```

```
         This entry serves to identify the VPL on the interface."
    INDEX { ifIndex, atmVplVpi }
    ::= { reroutingVpTable 1 }

ReroutingVpEntry ::=
    SEQUENCE {
      reroutingVpNodeRole                          ReroutingNodeRole,
      reroutingVpRemoteNodeAddress                 AtmAddr,
      reroutingVpHardReroutingServiceActivated     HardReroutingServicesClass,
      reroutingVpSoftReroutingServiceActivated     SoftReroutingServicesClass,
      reroutingVpReroutingState                    ReroutingState,
      reroutingVpReroutingOperationSuccessCounter  Counter32,
      reroutingVpReroutingOperationFailuresCounter Counter32,
      reroutingVpLocalIncarnationNumber            INTEGER,
      reroutingVpRemoteIncarnationNumber           INTEGER,
      reroutingVpExtendedReroutingState            ExtendedReroutingState
            }

reroutingVpNodeRole OBJECT-TYPE
    SYNTAX        ReroutingNodeRole
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates if the switch is the source node or the
         destination node for the call."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVpEntry 1 }

reroutingVpRemoteNodeAddress OBJECT-TYPE
    SYNTAX        AtmAddr
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Contains the ATM address of the remote edge node"
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVpEntry 2 }

reroutingVpHardReroutingServiceActivated OBJECT-TYPE
    SYNTAX       HardReroutingServicesClass
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Indicates which hard rerouting service is activated for
         this call.
         'none' means that no hard rerouting service is activated
         for the call.

         On a switch, 'dbrInterDomainHardRerouting' means that the
         Domain-based hard rerouting service has been requested end to
         end for the call, and that it is activated within this
         rerouting domain.

         On an end system, 'dbrInterDomainHardRerouting' means
         the hard rerouting service has been requested end to end
         for the call, and that at least one rerouting domain along
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         the path has activated it.

         'dbrIntraDomainHardRerouting' means that the Domain-based
         hard rerouting service is activated for the call
         within this rerouting domain only."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVpEntry 3 }

reroutingVpSoftReroutingServiceActivated OBJECT-TYPE
    SYNTAX       SoftReroutingServicesClass
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Indicates which soft rerouting service is activated for this
         call.
         'none' means that no soft rerouting service is activated
         for the call.

         'dbrIntraDomainAsymmetricSoftRerouting' means that the
         Domain-based asymmetric soft rerouting service is activated
         for the call within this rerouting domain only.

         'dbrIntraDomainSymmetricSoftRerouting' means that the
         Domain-based symmetric soft rerouting service is activated
         for the call within this rerouting domain only."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVpEntry 4 }

reroutingVpReroutingState OBJECT-TYPE
    SYNTAX        ReroutingState
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates if a rerouting operation is in progress
         and what type of rerouting operation is in progress.

         'idle' indicates that no rerouting operation is
         in progress.

         'hardRerouting' indicates that a hard rerouting operation
         is in progress.

         'softRerouting' indicates that a soft rerouting operation
         is in progress."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVpEntry 5 }

reroutingVpReroutingOperationSuccessCounter OBJECT-TYPE
    SYNTAX        Counter32
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates the number of rerouting operations
         initiated by this node that succeeded on this call.
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         The establishment of the initial call is not counted"
    ::= { reroutingVpEntry 6 }

reroutingVpReroutingOperationFailuresCounter OBJECT-TYPE
    SYNTAX        Counter32
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates the number of rerouting operations
         initiated by this node that failed on this call."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVpEntry 7 }

reroutingVpLocalIncarnationNumber OBJECT-TYPE
    SYNTAX        INTEGER (0..65535)
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates the current local incarnation number associated
         with the call. The value contained in this object is the
         incarnation number of the last reroute setup that was
         sent by this node for this call.

         The value zero indicates that no reroute setup has been
         sent for this call.

         This object is not instantiated if this node is
         the destination node of the call and symmetric soft
         rerouting is not activated for the call"
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVpEntry 8 }

reroutingVpRemoteIncarnationNumber OBJECT-TYPE
    SYNTAX        INTEGER (0..65535)
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates the current remote incarnation number associated
         with the call. The value contained in this object is the
         incarnation number of the last reroute setup that was
         received by this node for this call.

         The value zero indicates that no reroute setup has been
         received for this call.

         This object is not instantiated if this node is
         the source node of the call and symmetric soft
         rerouting is not activated for the call"
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVpEntry 9 }

reroutingVpExtendedReroutingState OBJECT-TYPE
    SYNTAX        ExtendedReroutingState
    MAX-ACCESS    read-only
    STATUS        current
```

```
    DESCRIPTION
        "Indicates the current rerouting state of the call,
         as defined in the rerouting Finite State Machine."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0 sections 6.2.3, 6.3.3"
    ::= { reroutingVpEntry 10 }

-- ======================================
-- Vcl table for rerouting
-- ======================================

reroutingVcTable OBJECT-TYPE
    SYNTAX        SEQUENCE OF ReroutingVcEntry
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        "The table used to describe the rerouting related
         attributes of a Pt-to-Pt svc or spvc.

         The entire reroutingVcTable is read-only reflecting
         the fact that reroutable connections are created
         through the ATM signalling protocol rather than configured."
     REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingMIBObjects 4 }

reroutingVcEntry OBJECT-TYPE
    SYNTAX        ReroutingVcEntry
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        "Each entry in this table contains the rerouting
         attributes of a SVC or Soft PVC connection.

         The content of this table reflects only the rerouting values
         associated with VCCs. This table is similar to the atmVclTable
         specified in ATM-MIB (RFC 2515).

         Entries are included for Vcls for which this is the source
         interface or the destination interface in the rerouting
         domain. Entries may be included for Vcls at the endpoints
         of the connection (see the
         reroutingVcHardReroutingServiceActivated object).

         This entry serves to identify the VCL on the interface."
    INDEX{ ifIndex, atmVclVpi, atmVclVci }
    ::= { reroutingVcTable 1 }

ReroutingVcEntry ::=
    SEQUENCE {
      reroutingVcNodeRole                          ReroutingNodeRole,
      reroutingVcRemoteNodeAddress                 AtmAddr,
      reroutingVcHardReroutingServiceActivated     HardReroutingServicesClass,
      reroutingVcSoftReroutingServiceActivated     SoftReroutingServicesClass,
      reroutingVcReroutingState                    ReroutingState,
      reroutingVcReroutingOperationSuccessCounter  Counter32,
      reroutingVcReroutingOperationFailuresCounter Counter32,
      reroutingVcLocalIncarnationNumber            INTEGER,
```

```
      reroutingVcRemoteIncarnationNumber          INTEGER,
      reroutingVcExtendedReroutingState           ExtendedReroutingState
            }

reroutingVcNodeRole OBJECT-TYPE
    SYNTAX        ReroutingNodeRole
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates if the switch is the source node or the
         destination node for the call."
    ::= { reroutingVcEntry 1 }

reroutingVcRemoteNodeAddress OBJECT-TYPE
    SYNTAX        AtmAddr
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Contains the ATM address of the remote edge node"
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVcEntry 2 }

reroutingVcHardReroutingServiceActivated OBJECT-TYPE
    SYNTAX       HardReroutingServicesClass
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Indicates which hard rerouting service is activated for
         this call.

         'none' means that no hard rerouting service is activated
         for the call.

         On a switch, 'dbrInterDomainHardRerouting' means that the
         Domain-based hard rerouting service has been requested end to
         end for the call, and that it is activated within this
         rerouting domain.

         On an end system, 'dbrInterDomainHardRerouting' means
         the hard rerouting service has been requested end to end
         for the call, and that at least one rerouting domain along
         the path has activated it.

         'dbrIntraDomainHardRerouting' means that the Domain-based
         hard rerouting service is activated for the call
         within this rerouting domain only."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVcEntry 3 }

reroutingVcSoftReroutingServiceActivated OBJECT-TYPE
    SYNTAX       SoftReroutingServicesClass
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Indicates which soft rerouting service is activated for this
         call.
```

```
          'none' means that no soft rerouting service is activated
          for the call.

          'dbrIntraDomainAsymmetricSoftRerouting' means that the
          Domain-based asymmetric soft rerouting service is activated
          for the call within this rerouting domain only.

          'dbrIntraDomainSymmetricSoftRerouting' means that the
          Domain-based symmetric soft rerouting service is activated
          for the call within this rerouting domain only."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVcEntry 4 }

reroutingVcReroutingState OBJECT-TYPE
    SYNTAX        ReroutingState
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates if a rerouting operation is in progress
         and what type of rerouting operation is in progress.

         'idle' indicates that no rerouting operation is
         in progress.

         'hardRerouting' indicates that a hard rerouting operation
         is in progress.

         'softRerouting' indicates that a soft rerouting operation
         is in progress."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVcEntry 5 }

reroutingVcReroutingOperationSuccessCounter OBJECT-TYPE
    SYNTAX        Counter32
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates the number of rerouting operations
         initiated by this node that succeeded on this call.

         The establishment of the initial call is not counted"
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVcEntry 6 }

reroutingVcReroutingOperationFailuresCounter OBJECT-TYPE
    SYNTAX        Counter32
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates the number of rerouting operations
         initiated by this node that failed on this call."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVcEntry 7 }
```

```
reroutingVcLocalIncarnationNumber OBJECT-TYPE
    SYNTAX        INTEGER (0..65535)
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates the current local incarnation number associated
         with the call. The value contained in this object is the
         incarnation number of the last reroute setup that was
         sent by this node for this call.

         The value zero indicates that no reroute setup has been
         sent for this call.

         This object is not instantiated if this node is
         the destination node of the call and symmetric soft
         rerouting is not activated for the call"
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVcEntry 8 }

reroutingVcRemoteIncarnationNumber OBJECT-TYPE
    SYNTAX        INTEGER (0..65535)
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates the current remote incarnation number associated
         with the call. The value contained in this object is the
         incarnation number of the last reroute setup that was
         received by this node for this call.

         The value zero indicates that no reroute setup has been
         received for this call.

         This object is not instantiated if this node is
         the source node of the call and symmetric soft
         rerouting is not activated for the call"
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0"
    ::= { reroutingVcEntry 9 }

reroutingVcExtendedReroutingState OBJECT-TYPE
    SYNTAX        ExtendedReroutingState
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates the current rerouting state of the call,
         as defined in the rerouting Finite State Machine."
    REFERENCE
        "ATM Forum Domain-based rerouting 1.0 sections 6.2.3, 6.3.3"
    ::= { reroutingVcEntry 10 }

-- conformance information

reroutingMIBConformance
               OBJECT IDENTIFIER ::= { atmfreroutingMIB 2 }
reroutingMIBCompliances
               OBJECT IDENTIFIER ::= { reroutingMIBConformance 1 }
```

```
reroutingMIBGroups
               OBJECT IDENTIFIER ::= { reroutingMIBConformance 2 }


-- compliance statements

reroutingMIBCompliance MODULE-COMPLIANCE
    STATUS        current
    DESCRIPTION
        "The compliance statement for entities which implement
         the ATM rerouting MIB.

         Groups of required rerouting objects for configuring and
         monitoring the domain-based rerouting feature in a switching
         system are identified by the suffix SwMinGroup.

         Groups of optional rerouting objects for switching systems
         are identified by the suffix SwOptGroup.

         Groups of required rerouting objects for configuring and
         monitoring the domain-based rerouting feature at an end system
         are identified by the suffix EsMinGroup.

         Groups of optional rerouting objects for end systems
         are identified by the suffix EsOptGroup."

    MODULE  -- this module

        GROUP reroutingBaseSwMinGroup
        DESCRIPTION
        "The reroutingBaseSwMinGroup is mandatory for switching
         systems"

        GROUP reroutingFilterSwMinGroup
        DESCRIPTION
        "The reroutingFilterSwMinGroup is mandatory for switching
         systems"

        GROUP reroutingVcSwMinGroup
        DESCRIPTION
        "The reroutingVcSwMinGroup is mandatory for switching
         systems"

        GROUP reroutingBaseEsMinGroup
        DESCRIPTION
        "The reroutingBaseEsMinGroup is mandatory for end systems"

        GROUP reroutingFilterEsMinGroup
        DESCRIPTION
        "The reroutingFilterEsMinGroup is mandatory for end systems"

        GROUP reroutingVcEsMinGroup
        DESCRIPTION
        "The reroutingVcEsMinGroup is mandatory for end systems"

    ::= { reroutingMIBCompliances 1 }

-- units of conformance for switching devices
```

```
reroutingBaseSwMinGroup OBJECT-GROUP
    OBJECTS {
               reroutingVersion,
               reroutingCapabilitiesSupported
             }
    STATUS current
    DESCRIPTION
        "A collection of mandatory rerouting objects which describe
         the rerouting services supported in a switching
         system."
    ::= { reroutingMIBGroups 1 }

reroutingFilterSwMinGroup OBJECT-GROUP
    OBJECTS {
              reroutingFilterIfDirection,
              reroutingFilterInterface,
              reroutingFilterNetworkServicesAvailable,
              reroutingFilterHardReroutingServiceRequest,
              reroutingFilterSoftReroutingServiceRequest,
              reroutingFilterRowStatus
             }
    STATUS current
    DESCRIPTION
        "A collection of mandatory objects used for the configuration
         of rerouting services in a switching system when using
         filters."
    ::= { reroutingMIBGroups 2 }

reroutingVcSwMinGroup OBJECT-GROUP
    OBJECTS {
              reroutingVcNodeRole,
              reroutingVcRemoteNodeAddress,
              reroutingVcHardReroutingServiceActivated,
              reroutingVcSoftReroutingServiceActivated,
              reroutingVcReroutingState,
              reroutingVcReroutingOperationSuccessCounter,
              reroutingVcReroutingOperationFailuresCounter
             }
    STATUS current
    DESCRIPTION
        "A collection of mandatory per Vc rerouting objects describing
         the state of the rerouting services associated to a
         call in a switching system."
    ::= { reroutingMIBGroups 3 }

reroutingBaseSwOptionalGroup OBJECT-GROUP
    OBJECTS {
               reroutingHardReroutingTime
}
    STATUS current
    DESCRIPTION
        "A collection of optional rerouting object which describe
         the timer configuration when hard rerouting service
         is supported in a switching system."
    ::= { reroutingMIBGroups 4 }

reroutingFilterSwOptionalGroup OBJECT-GROUP
```

```
    OBJECTS {
              reroutingFilterConnKind,
              reroutingFilterServiceCategory,
              reroutingFilterCallingPartyPrefix,
              reroutingFilterCallingPartyLength,
              reroutingFilterCalledPartyPrefix,
              reroutingFilterCalledPartyLength
            }
    STATUS current
    DESCRIPTION
        "A collection of optional objects used for the configuration
         of rerouting services in a switching system when using
         filters."
    ::= { reroutingMIBGroups 5 }

reroutingVpSwOptionalGroup OBJECT-GROUP
    OBJECTS {
              reroutingVpNodeRole,
              reroutingVpRemoteNodeAddress,
              reroutingVpHardReroutingServiceActivated,
              reroutingVpSoftReroutingServiceActivated,
              reroutingVpReroutingState,
              reroutingVpReroutingOperationSuccessCounter,
              reroutingVpReroutingOperationFailuresCounter,
              reroutingVpLocalIncarnationNumber,
              reroutingVpRemoteIncarnationNumber,
              reroutingVpExtendedReroutingState
             }
    STATUS current
    DESCRIPTION
        "A collection of optional per Vp rerouting objects describing
         the state of the rerouting services associated to a
         call in a switching system."
    ::= { reroutingMIBGroups 6 }

reroutingVcSwOptionalGroup OBJECT-GROUP
    OBJECTS {
              reroutingVcLocalIncarnationNumber,
              reroutingVcRemoteIncarnationNumber,
              reroutingVcExtendedReroutingState
            }
    STATUS current
    DESCRIPTION
        "A collection of optional per Vc rerouting objects describing
         the state of the rerouting services associated to a
         call in a switching system."
    ::= { reroutingMIBGroups 7 }

-- units of conformance for end system devices

reroutingBaseEsMinGroup OBJECT-GROUP
    OBJECTS {
               reroutingVersion
            }
    STATUS current
    DESCRIPTION
        "A collection of mandatory rerouting objects which describe
         the rerouting services supported in an end system."
```

```
    ::= { reroutingMIBGroups 8 }

reroutingFilterEsMinGroup OBJECT-GROUP
    OBJECTS {
              reroutingFilterIfDirection,
              reroutingFilterInterface,
              reroutingFilterHardReroutingServiceRequest,
              reroutingFilterRowStatus
            }
    STATUS current
    DESCRIPTION
        "A collection of mandatory objects used for the request
         of rerouting services in this end system device when using
         filters."
    ::= { reroutingMIBGroups 9 }

reroutingVcEsMinGroup OBJECT-GROUP
    OBJECTS {
              reroutingVcHardReroutingServiceActivated

            }
    STATUS current
    DESCRIPTION
        "A collection of mandatory rerouting objects describing
         the rerouting services associated to a call in an
         end system device."
    ::= { reroutingMIBGroups 10 }

reroutingFilterEsOptionalGroup OBJECT-GROUP
    OBJECTS {
              reroutingFilterConnKind,
              reroutingFilterServiceCategory,
              reroutingFilterCallingPartyPrefix,
              reroutingFilterCallingPartyLength,
              reroutingFilterCalledPartyPrefix,
              reroutingFilterCalledPartyLength
            }
    STATUS current
    DESCRIPTION
        "A collection of optional objects used for the configuration
         of rerouting services in this end system device when using
         filters."
    ::= { reroutingMIBGroups 11 }

reroutingVpEsOptionalGroup OBJECT-GROUP
    OBJECTS {
              reroutingVpHardReroutingServiceActivated,
              reroutingVpSoftReroutingServiceActivated,
              reroutingVcSoftReroutingServiceActivated
             }
    STATUS current
    DESCRIPTION
        "A collection of optional rerouting objects describing
         the rerouting services associated to a call in an
         end system device."
    ::= { reroutingMIBGroups 12 }

END
```

Annex D Domain-based rerouting PICS Proforma for PNNI 1.0

D.1 Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a telecommunication specification. Such a statement is called a Protocol Implementation Conformance Statement (PICS).

D.1.1 Scope

The present document provides the Protocol Implementation Conformance Statement (PICS) proforma for the ATM Forum "Domain-based rerouting for active point-to-point calls version 1.0" for PNNI v1.0, defined in "af-cs-0173.000", in compliance with the relevant requirements, and in accordance with the relevant guidelines, given in ISO/IEC 9646-7 [A.3].

D.1.2 References

[A.1] af-cs-0173.000: 2001, ATM Forum, Domain-based rerouting for active point-to-point calls version 1.0.

[A.2] ISO/IEC 9646-1: 1994, Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 1: General concepts (see also ITU-T Recommendation X.290 (1995)).

[A.3] ISO/IEC 9646-7: 1995, Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements (see also ITU-T Recommendation X.296 (1995)).

[A.4] ISO/IEC 9646-3: 1998, Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN) (see also ITU-T Recommendation X.292 (1998)).

D.1.3 Definitions

This Specification uses the following terms defined in ISO/IEC 9646-1 [A.2]:

Implementation Conformance Statement (ICS): A statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented.

ICS proforma: A document, in the form of a questionnaire, which when completed for an implementation or system becomes an ICS.

D.1.4 Abreviations

ASN.1	Abstract Syntax Notation One
ATS	Abstract Test Suite
ICS	Implementation Conformance Statement
PICS	Protocol Implementation Conformance Statement
IE	Information Element
IUT	Implementation under Test
SUT	System Under Test

D.1.5 Conformance

This PICS does not modify any of the requirements detailed in the ATM Forum “Domain-based rerouting for active point-to-point calls version 1.0”. In case of apparent conflict between the statements in the base specification and the annotations of "M" (mandatory) and "O" (optional) in this PICS, the text of the base specification takes precedence.

For each protocol implementation for which conformance is claimed to the ATM Forum “Domain-based rerouting for active point-to-point calls version 1.0”, the supplier is required to complete a copy of the PICS proforma provided in this document and is required to provide the information necessary to identify both the supplier and the implementation.

D.2 Identification of the Implementation

D.2.1 Date of the Statement

_____

D.2.2 Implementation Under Test (IUT) Identification

IUT Name: _____

IUT Version: _____

_____

D.2.3 System Under Test (SUT) Identification

SUT Name: _____

Hardware Configuration: _____

_____

_____

Operating System: _____

D.2.4 Product supplier

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

E-mail Address: _____

Additional Information: _____

D.2.5 Client (if different from product supplier)

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

E-mail Address: _____

Additional Information: _____

D.2.6 ICS Contact Person

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

E-mail Address: _____

Additional Information: _____

_____

_____

_____

D.2.7 Identification of the Implementation

This ICS proforma applies to the following specification:

af-cs-0173.000 (2001), Domain-based rerouting for active point-to-point calls version 1.0 for PNNI 1.0

D.3 The PICS proforma

D.3.1 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No) _____

NOTE: Answering "No" to this question indicates non-conformance to the ATM Forum “Domain-based rerouting for active point-to-point calls version 1.0” specification for PNNI v1.0. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is non-conforming, on pages attached to the ICS proforma.

D.3.2 Instructions for Completing the PICS Proforma

The supplier of the implementation shall complete the PICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support column entries provided, using the specified notation.

The supplier of the implementation shall fill in the support column. The following common notations, defined in ISO-IEC 9646-7 [A.3], are used for the support column:

Y or y	supported by the implementation.
N or n	not supported by the implementation.
N/A, n/a or -	no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).

The following notations, defined in ISO/IEC 9646-7 [A.3] are used for the status column:

M	mandatory - the capability is required to be supported.
O	optional - the capability may be supported or not.
N/A	not applicable - in the given context, it is impossible to use the capability.
X	prohibited (excluded) - there is a requirement not to use this capability in the given context.
O.i	qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer, which identifies a unique group of related optional items and the logic of their selection, which is defined immediately following the table.

Table D.1 Roles

Item	Roles Does the implementation support …	Reference	Sta-tus	Condition for status	Support
D1-1	The negotiation of rerouting services?	1.1	M		Yes___ No___
D1-2	The asymmetric soft rerouting service?	1.1	M		Yes___ No___
D1-3	The symmetric soft rerouting service?	1.1	O		Yes___ No___
D1-4	The hard rerouting service?	1.1	M		Yes___ No___
D1-5	The procedures associated with intra-domain PNNI?	1.1	M		Yes___ No___
D1-6	The procedures at a source node of a rerouting domain?	6.2	M		Yes___ No___
D1-7	The procedures at a destination node of a rerouting domain?	6.3	M		Yes___ No___
D1-8	The procedures at a node between two intra-domain interfaces?	6.4	M		Yes___ No___
D1-9	Accumulation of administrative weights?	1.1	O		Yes___ No___
D1-10	PNNI between two rerouting domains?	1.1	O		Yes___ No___

D1-11	The procedures at a node between two inter-domain interfaces?	6.5	M	D1-10	Yes___ No___
Comment:					

Table D.2 Major capabilities

Item	Major capabilities Does the implementation support the …	Reference	Sta-tus	Condition for status	Support
D2-1	Negotiation of the rerouting services for a point-to-point SVCC?	1.1	M		Yes___ No___
D2-2	Negotiation of the rerouting services for a point-to-point soft PVCC?	1.1	M	OPT_7/PNNI Errata & PICS	Yes___ No___
D2-3	Negotiation of the rerouting services for a point-to-point SVPC?	1.1	M	OPT_6/PNNI Errata & PICS	Yes___ No___
D2-4	Negotiation of the rerouting services for a point-to-point soft PVPC?	1.1	M	OPT_7/PNNI Errata & PICS	Yes___ No___
D2-5	Rerouting of a point-to-point SVCC?	1.1	M		Yes___ No___
D2-6	Rerouting of a point-to-point soft PVCC?	1.1	M	OPT_7/PNNI Errata & PICS	Yes___ No___
D2-7	Rerouting of a point-to-point SVPC?	1.1	M	OPT_6/PNNI Errata & PICS	Yes___ No___
D2-8	Rerouting of a point-to-point soft PVPC?	1.1	M	OPT_7/PNNI Errata & PICS	Yes___ No___
Comments:					

Table D.3 Major capabilities of the rerouting services negotiation

Item	Major capabilities of the rerouting services negotiation Does the implementation …	Reference	Sta-tus	Condition for status	Support
D3-1	Support the negotiation of the hard rerouting service?	1.1	M		Yes___ No___
D3-2	Support the negotiation of the asymmetric soft rerouting service?	1.1	M		Yes___ No___
D3-3	Support the negotiation of the symmetric soft rerouting service?	1.1	M		Yes___ No___
D3-4	Support the request of inter-domain rerouting services on behalf of the calling end-system at the source node?	6.2.1	M		Yes___ No___
D3-5	Support the request of inter-domain rerouting services for originating SVCC at the source node?	6.2.1	M		Yes___ No___
D3-6	Support the request of inter-domain rerouting services for originating soft PVCC at the source node?	6.2.1	M	D2-2	Yes___ No___
D3-7	Support the request of inter-domain rerouting services for originating SVPC at the source node?	6.2.1	M	D2-3	Yes___ No___
D3-8	Support the request of inter-domain rerouting services for originating soft PVPC at the source node?	6.2.1	M	D2-4	Yes___ No___
D3-9	Support the request of intra-domain rerouting services at the source node?	6.2.1	M		Yes___ No___
D3-10	Support the indication of rerouting services available at the source node?	6.2.1	M		Yes___ No___

D3-11	Support the indication of rerouting services available without requesting the services, at the source node?	6.2.1	M		Yes___ No___
D3-12	Support the activation of inter-domain rerouting services on behalf of the called end-system at the destination node?	6.3.1	M		Yes___ No___
D3-13	Support the activation of inter-domain rerouting services for terminating SVCC at the source node?	6.3.1	M		Yes___ No___
D3-14	Support the activation of inter-domain rerouting services for terminating soft PVCC at the destination node?	6.3.1	M	D2-2	Yes___ No___
D3-15	Support the activation of inter-domain rerouting services for terminating SVPC at the destination node?	6.3.1	M	D2-3	Yes___ No___
D3-16	Support the activation of inter-domain rerouting services for terminating soft PVPC at the destination node?	6.3.1	M	D2-4	Yes___ No___
D3-17	Support the activation of intra-domain rerouting services at the destination node?	6.3.1	M		Yes___ No___
D3-18	Support the activation of inter-domain rerouting services at the destination node?	6.3.1	M		Yes___ No___
Comments:					

Table D.4 Coding of the Rerouting services IE

Item	Format and coding Does the implementation …	Reference	Sta-tus	Condition for status	Support
D4-1	Support the coding of the Rerouting services information element as specified in section 5.1?	5.1	M		Yes___ No___
D4-2	Set the action indicator to "discard information element and proceed" in the Rerouting services IE when adding this IE to a PNNI signalling message?	10.1, 6	M		Yes___ No___
D4-3	Set to 1 bit 4 (i.e. pass along request) and bit 5 (i.e. flag) of the IE instruction field in the Rerouting services IE when adding this IE to a PNNI signalling message?	10.1, 6	M		Yes___ No___
Comments:					

Table D.5 Coding of the Rerouting IE

Item	Format and coding Does the implementation support …	Reference	Sta-tus	Condition for status	Support
D5-1	Support the coding of the Rerouting information element as specified in section 5.2?	5.2	M		Yes___ No___
D5-2	Set the action indicator to "discard information element and proceed" in the Rerouting IE when adding this IE to a PNNI signalling message?	10.1, 6	M		Yes___ No___
D5-3	Set to 1 bit 4 (i.e. pass along request) and bit 5 (i.e. flag) of the IE instruction field when adding this IE to a PNNI signalling message?	10.1, 6	M		Yes___ No___
Comments:					

Table D.6 Coding of the Rerouting cause IE

Item	Format and coding Does the implementation …	Reference	Sta-tus	Condition for status	Support
D6-1	Support the coding of the Rerouting cause information element as specified in section 5.3?	5.3	M		Yes___ No___
D6-2	Set the action indicator to "discard information element and proceed" in the Rerouting cause IE when adding this	10.1, 6	M		Yes___ No___

	IE to a PNNI signalling message?				
D6-3	Set to 1 bit 4 (i.e. pass along request) and bit 5 (i.e. flag) of the IE instruction field in the Rerouting cause IE when adding this IE to a PNNI signalling message?	10.1, 6	M		Yes___ No___
Comments:					

Table D.7 Coding of Optional traffic attributes IE with Cumulative Administrative Weights

Item	**Format and coding** Does the implementation …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D7-1	Support the coding of the Optional Traffic Attributes information element with Cumulative Administrative Weights as specified in section 5.4?	5.4	M	D1-9	Yes___ No___
D7-2	Set the action indicator to "discard information element and proceed" the Optional traffic attributes IE with Cumulative Administrative Weights when adding this IE to a PNNI signalling message?	10.1, 6	M		Yes___ No___
D7-3	Set to 0 bit 4 (i.e. pass along request) and set to 1 bit 5 (i.e. flag) of the IE instruction field in the Optional traffic attributes IE with Cumulative Administrative Weights when adding this IE to a PNNI signalling message?	10.1, 6	M	D1-9	Yes___ No___
Comments:					

Table D.8 Supported messages

Item	**Messages and IE support** Does the implementation support …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D8-1	Rerouting services IE in a SETUP message?	7.1.4	M		Yes___ No___
D8-2	Rerouting services IE in a CONNECT message?	7.1.1	M		Yes___ No___
D8-3	Rerouting IE in a SETUP message?	7.1.4	M		Yes___ No___
D8-4	Rerouting IE in a CONNECT message?	7.1.1	M		Yes___ No___
D8-5	Rerouting cause IE in a RELEASE message?	7.1.2	M		Yes___ No___
D8-6	Rerouting cause IE in a RELEASE COMPLETE message?	7.1.3	M		Yes___ No___
D8-7	Optional Traffic attributes IE with Cumulative Administrative Weights in a SETUP message?	7.1.4	M	D1-9	Yes___ No___
D8-8	Optional Traffic attributes IE with Cumulative Administrative Weights in a CONNECT message?	7.1.1	M	D1-9	Yes___ No___
Comments:					

Table D.9 Processing of a setup indication

Item	**Messages and IE support** Does the implementation, when it receives a setup indication, …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D9-1	Reject the setup indication with a Rerouting cause IE set to cause #7 and a Crankback IE set to cause #63 when the setup indication is received from an intra-domain interface, and the call is to progressed to an inter-domain interface, and the setup indication contains a Rerouting IE with a Rerouting control octet group?	6.1	M		Yes___ No___
D9-2	Reject the setup indication with a Rerouting cause IE set to cause #7 and a Crankback IE set to cause #63 when the setup indication is received from an inter-domain interface and the setup indication contains a Rerouting IE with a	6.1	M		Yes___ No___

	Rerouting control octet group?				
D9-3	Treat the setup indication as a reroute setup indication when: • the setup indication is received from an intra-domain interface, and • the called party address of the setup indication is one of the edge node AESA assigned to this node, and • the setup indication contains a Rerouting IE, and • the Rerouting IE contains a Rerouting control octet group?	6.1	M		Yes___ No___
D9-4	Treat the setup indication as an initial setup indication at the source node when: • the setup indication is received from an inter-domain interface, and • the call is to be progressed to an intra-domain interface?	6.1	M		Yes___ No___
D9-5	Treat the setup indication as an initial setup indication at the destination node when: • the setup indication is received from an intra-domain interface, and • the call is to be progressed to an inter-domain interface?	6.1	M		Yes___ No___
Comments:					

Table D.10 Processing the setup indication at the source node during the initial call establishment

Item	**Processing the setup indication during the initial call establishment** Does the implementation of the source node when it receives an initial setup indication (see D9-4) from an inter-domain interface to be progressed to an intra-domain interface…	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D10-1	Discard the Rerouting IE if the setup indication contains a Rerouting IE?	6.2.1	M		Yes___ No___
D10-2	Discard the Optional traffic attributes IE with Cumulative Administrative Weights if present in the setup indication?	6.2.1	M	D1-9	Yes___ No___
D10-3	Apply the procedures of section 6.2.9.1 for the administrative weight accumulation?	6.2.1	M	D1-9	Yes___ No___
D10-4	Clear the Intra-domain rerouting capabilities field of Rerouting services IE if the setup indication contains a Rerouting services IE?	6.2.1	M		Yes___ No___
D10-5	Pass on without modification the Inter-domain rerouting services and the Inter-domain rerouting capabilities fields of the Rerouting services IE if the setup indication contains a Rerouting services IE?	6.2.1	M		Yes___ No___
D10-6	Add a Rerouting services IE and clear all its fields when the source node wishes to request one or more rerouting services or advertise the availability of rerouting services and the setup indication does not contain a Rerouting services IE?	6.2.1	M		Yes___ No___
D10-7	Code the request for inter-domain services in the Inter-domain rerouting service field of the Rerouting services IE with the coding described in section 5.1?	6.2.1	M		Yes___ No___
D10-8	Code the request for intra-domain services in the Intra-domain rerouting service field of the Rerouting services IE with the coding described in section 5.1?	6.2.1	M		Yes___ No___
D10-9	Code the availability of intra-domain services in the Intra-	6.2.1	M		Yes___ No___

	domain rerouting capabilities field of the Rerouting services IE with the coding described in section 5.1?				
D10-10	Set the local incarnation number associated with the call to zero?	6.2.1	M		Yes___ No___
D10-11	Apply procedures of Annex A.1.1 for QoS preservation during rerouting and insert the recorded cumulative QoS values in the Rerouting IE when at least one rerouting service is indicated as available in the IE and the call is a CBR, rt-VBR or nrt-VBR call?	6.2.1, Anx A.1.1	M		Yes___ No___
D10-12	Record the cumulative values of the Extended QoS parameters IE and the End-to-End Transit Delay IE before taking into account • the expected increase due to user data transfer with this switching system that vary depending on the outgoing interface, and • the expected increase due to user data transfer in the forward direction over the outgoing link chosen to reach the called party when at least one rerouting service is indicated as available in the IE and the call is a CBR, rt-VBR or nrt-VBR call?	Anx A.1.1	M		Yes___ No___
D10-13	Apply procedures of Annex A.2.2 for QoS preservation during rerouting when at least one rerouting service is indicated as available in the IE and the call is an ABR call?	6.2.1, Anx A.2.2	M		Yes___ No___
D10-14	Apply procedures of Annex A.3.1 for QoS preservation during rerouting when at least one rerouting service is indicated as available in the IE and the call is a UBR, UBR with MDCR, or UBR with BCS call?	6.2.1, Anx A.3.1	M		Yes___ No___
D10-15	Apply procedures of Annex A.4.1 for QoS preservation during rerouting when at least one rerouting service is indicated as available in the IE and the call is a GFR call?	6.2.1, Anx A.4.1	M		Yes___ No___
D10-16	Add a Rerouting IE to the setup request with the IE containing the Edge node octet set to the AESA of the source node if symmetric soft rerouting is indicated as available in the Rerouting services IE?	6.2.1	M	D1-3	Yes___ No___
D10-17	Generate an endpoint key that uniquely identifies the call within the scope of the edge node AESA and code it in the Endpoint key octet group in the Rerouting IE if symmetric soft rerouting is indicated as available in the Rerouting services IE?	6.2.1	M	D1-3	Yes___ No___
D10-18	Set the remote incarnation number associated with the call to zero?	6.2.1	M	D1-3	Yes___ No___
D10-19	Insert a Rerouting control octet group in the Rerouting IE?	6.2.1	X		Yes___ No___
D10-20	Remove the Rerouting services IE from the setup request if this Rerouting services IE is empty (the IE does not indicate at least one inter-domain rerouting service, or one inter-domain rerouting capability, or one intra-domain rerouting service, or one intra-domain rerouting capability)?	6.2.1	O		Yes___ No___
D10-21	Code the IE instruction field of the Rerouting services IE with “pass along request” prior to sending the SETUP message containing this IE?	6.2.1	M		Yes___ No___
D10-22	Code the IE instruction field of the Rerouting IE with “pass along request” prior to sending the SETUP message containing this IE?	6.2.1	M		Yes___ No___
Comments:					

Table D.11 Processing the connect indication at the source node during the initial call establishment

Item	Processing the connect indication during initial call establishment Does the implementation of the source node when it receives an initial connect indication from an intra-domain interface to be progressed to an inter-domain interface …	Reference	Sta-tus	Condition for status	Support
D11-1	Reject the call with a Cause IE set to cause #96 "mandatory information element is missing" and the diagnostic field set to the identifier of the Rerouting services IE, if the connect indication has a Rerouting IE and no Rerouting services IE?	6.2.2	M		Yes___ No___
D11-2	Record the destination node AESA, contained in the Edge node octet group of the Rerouting IE, if the Rerouting service IE has one or more rerouting services indicated in the Intra-domain rerouting services field?	6.2.2	M		Yes___ No___
D11-3	Record the destination node endpoint key, contained in the Endpoint key octet group of the Rerouting IE, if the Rerouting service IE has one or more rerouting services indicated in the Intra-domain rerouting services field?	6.2.2	M		Yes___ No___
D11-4	Record the QoS cumulative values contained in the Rerouting IE when the Rerouting service IE has one or more rerouting services indicated in the Intra-domain rerouting services field?	6.2.2	M		Yes___ No___
D11-5	Remove the Rerouting IE prior to progressing the connect request?	6.2.2	M		Yes___ No___
D11-6	Remove the Optional traffic attributes IE with Cumulative Administrative Weights prior to progressing the connect request if the IE is present in the connect indication?	6.2.2	M	D1-9	Yes___ No___
D11-7	Clear the Intra-domain rerouting services field in the Rerouting services IE prior to progressing the connect request?	6.2.2	M		Yes___ No___
D11-8	Pass on the inter-domain rerouting services indicated in the Rerouting services IE prior to progressing the connect request?	6.2.2	M		Yes___ No___
D11-9	Change the rerouting state to Rerouting Idle when the CONNECT message has been sent?	6.2.2	M		Yes___ No___
Comments:					

Table D.12 Rerouting states at the source node

Item	States Does the implementation of the source node support …	Reference	Sta-tus	Condition for status	Support
D12-1	The Null state?	6.2.3	M		Yes___ No___
D12-2	The Rerouting Idle state?	6.2.3	M		Yes___ No___
D12-3	The Hard Reroute Triggered state?	6.2.3	M		Yes___ No___
D12-4	The Hard Reroute Proceeding state?	6.2.3	M		Yes___ No___
D12-5	The Soft Reroute Triggered state?	6.2.3	M		Yes___ No___
D12-6	The Soft Reroute Proceeding state?	6.2.3	M		Yes___ No___
D12-7	The Soft Reroute Initiated state?	6.2.3	M	D1-3	Yes___ No___
D12-8	The Awaiting Switchover state?	6.2.3	M	D1-3	Yes___ No___
Comments:					

Table D.13 Receipt of release indication in the Null state

Item	Release indication in Null state Does the implementation of the source node, while in Null state, …	Reference	Sta-tus	Condition for status	Support
D13-1	Clear the incumbent connection with Rerouting release cause set to #1 "*release received from outside any rerouting domain*" in the direction of the called party, when a release indication which does not contain a Rerouting cause IE is received from the direction of the calling party, and the hard rerouting service was indicated as available for the call in this rerouting domain?	6.2.4.1	M		Yes___ No___
Comments:					

Table D.14 Receipt of release indication in the Rerouting Idle state

Item	Release indication in rerouting idle state Does the implementation of the source node, while in Rerouting Idle state, …	Reference	Sta-tus	Condition for status	Support
D14-1	Release the incumbent connection in the direction of the called party with the Rerouting cause IE unmodified and change the rerouting state to Null when it receives a release indication from the direction of the calling party and the release indication contains a Rerouting cause IE?	6.2.4.2	M		Yes___ No___
D14-2	Release the incumbent connection in the direction of the called party and change the rerouting state to Null when it receives a release indication from the direction of the calling party and the hard rerouting service is not activated, and the release indication does not contain the Rerouting cause IE?	6.2.4.2	M		Yes___ No___
D14-3	Release the incumbent connection in the direction of the called party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when the node receives a release indication from the direction of the calling party, and the hard rerouting service is activated for the call, and the release indication does not contain the Rerouting cause IE?	6.2.4.2	M		Yes___ No___
D14-4	Release the connection in the direction of the calling party and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the hard rerouting service is NOT activated for the call?	6.2.4.2	M		Yes___ No___
D14-5	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to cause #1?	6.2.4.2	M		Yes___ No___
D14-6	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #2 and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to any other cause than #1?	6.2.4.2	M		Yes___ No___
D14-7	Start the hard rerouting timer, change the rerouting state to Hard Reroute Triggered and attempt to establish a rerouting connection towards the destination node when it receives a release indication from the direction of the	6.2.4.2	M		Yes___ No___

	called party, and the release indication is for the incumbent connection, and the release indication does not contain the Rerouting cause IE, and the hard rerouting service is activated for the call?				
Comments:					

Table D.15 Receipt of release indication in the Hard Reroute Triggered state

Item	Release indication in hard reroute triggered state Does the implementation of the source node, while in Hard Reroute Triggered state, …	Reference	Sta-tus	Condition for status	Support
D15-1	Clear the hard rerouting timer and change the rerouting state to Null when a release indication from the direction of the calling party is received?	6.2.4.3	M		Yes___ No___
Comments:					

Table D.16 Receipt of release indication in the Hard Reroute Proceeding state

Item	Release in hard reroute proceeding state Does the implementation of the source node, while in hard reroute proceeding state, …	Reference	Sta-tus	Condition for status	Support
D16-1	Clear the hard rerouting timer, release the rerouting connection in the direction of the called party with the Rerouting cause IE unmodified, and change the rerouting state to Null when it receives a release indication from the direction of the calling party that contains the Rerouting cause IE?	6.2.4.4	M		Yes___ No___
D16-2	Clear the hard rerouting timer, release the rerouting connection in the direction of the called party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when the node receives a release indication from the direction of the calling party, and the release indication does not contain the Rerouting cause IE?	6.2.4.4	M		Yes___ No___
D16-3	Clear the hard rerouting timer, release the connection in the direction of the calling party with a Rerouting cause IE set to cause #1, and change the rerouting state to Null when the node receives a release indication from the direction of the called party, and the release indication is for the rerouting connection, and the release indication contains a Rerouting cause IE set to cause #1?	6.2.4.4	M		Yes___ No___
D16-4	Clear the hard rerouting timer, release the connection in the direction of the calling party with a Rerouting cause IE set to cause #2, and change the rerouting state to Null when the node receives a release indication from the direction of the called party, and the release indication is for the rerouting connection, and the release indication contains a Rerouting cause IE set to any other cause than #1?	6.2.4.4	M		Yes___ No___
D16-5	Apply the normal Crankback procedures, keep the hard rerouting timer running, and stay in the Hard Reroute Proceeding state when the node receives a release indication from the direction of the called party, and the release indication is for the rerouting connection, and the release indication does not contain the Rerouting cause IE, and the release indication contains the Crankback IE, and an alternate path is found?	6.2.4.4	M		Yes___ No___
D16-6	Apply the procedures of section 6.2.9.1 for the	6.2.4.4	M	D1-9	Yes___ No___

	administrative weight accumulation when the node receives a release indication from the direction of the called party, and the release indication is for the rerouting connection, and the release indication does not contain the Rerouting cause IE, and the release indication contains the Crankback IE, and an alternate path is found?				
D16-7	Clear the hard rerouting timer, release the rerouting connection in the direction of the calling party with a Rerouting cause IE set to cause #2 and change the rerouting state to Null when the node receives a release indication from the direction of the called party, and the release indication is for the Rerouting connection, and the release indication does not contain the Rerouting cause IE, and the release indication contains the Crankback IE, and no alternate path was found?	6.2.4.4	M	D16-5	Yes___ No___
D16-8	Initiate another attempt to establish a rerouting connection towards the destination node, keep the hard rerouting timer running, and change the rerouting state to Hard Reroute Triggered when the node receives a release indication from the direction of the called party, and the release indication is for the rerouting connection, and the release indication does not contain the Rerouting cause IE, and the release indication does not contain the Crankback IE?	6.2.4.4	O		Yes___ No___
Comments:					

Table D.17 Receipt of release indication in Soft Reroute Proceeding state

Item	**Release in soft reroute proceeding state** Does the implementation of the source node, while in Soft Reroute Proceeding state, …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D17-1	Release the incumbent and the rerouting connections in the direction of the called party with the Rerouting cause IE unmodified and change the rerouting state to Null when it receives a release indication from the direction of the calling party and the release indication contains a Rerouting cause IE?	6.2.4.6	M		Yes___ No___
D17-2	Release the incumbent and the rerouting connections in the direction of the called party and change the rerouting state to Null when it receives a release indication from the direction of the calling party and the hard rerouting service is not activated, and the release indication does not contain the Rerouting cause IE?	6.2.4.6	M		Yes___ No___
D17-3	Release the incumbent and the rerouting connections in the direction of the called party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when the node receives a release indication from the direction of the calling party, and the hard rerouting service is activated for the call, and the release indication does not contain the Rerouting cause IE?	6.2.4.6	M		Yes___ No___
D17-4	Release the connection in the direction of the calling party, release the rerouting connection in the direction of the called party, and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection, and the hard rerouting service is NOT activated for the call?	6.2.4.6	M		Yes___ No___
D17-5	Release the connection in the direction of the calling party and the rerouting connection in the direction of the called party with a Rerouting cause IE set to cause #1, and	6.2.4.6	M		Yes___ No___

	change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to cause #1?				
D17-6	Release the connection in the direction of the calling party and the rerouting connection in the direction of the called party with a Rerouting cause IE set to cause #2, and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to any other cause than #1?	6.2.4.6	M		Yes___ No___
D17-7	Start the hard rerouting timer, change the rerouting state to the Hard Reroute Proceeding when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection, and the release indication does NOT contain the Rerouting cause IE, and the hard rerouting service is activated for the call?	6.2.4.6	M		Yes___ No___
D17-8	Apply the normal Crankback procedure and stay in the Soft Reroute Proceeding state when the node receives a release indication from the direction of the called party, and the release indication is for the rerouting connection, and the release indication contains the Crankback IE, and an alternate path is found?	6.2.4.6	M		Yes___ No___
D17-9	Apply the procedures of section 6.2.9.1 for the administrative weight accumulation when the node receives a release indication from the direction of the called party, and the release indication is for the rerouting connection, and the release indication contains the Crankback IE, and an alternate path is found?	6.2.4.6	M	D1-9	Yes___ No___
D17-10	Abort the soft rerouting operation and change the rerouting state to Rerouting Idle, when the node receives a release indication from the direction of the called party, and the release indication is for the rerouting connection, and the release indication contains the Crankback IE, and no alternate path is found?	6.2.4.6	M		Yes___ No___
D17-11	Abort the soft rerouting operation and change the rerouting state to Rerouting Idle, when the node receives a release indication from the direction of the called party, and the release indication is for the rerouting connection, and the release indication does NOT contain the Crankback IE?	6.2.4.6	M		Yes___ No___
Comments:					

Table D.18 Receipt of release indication in Soft Reroute Initiated state [symmetric soft rerouting]

Item	**Release in soft reroute initiated state** Does the implementation of the source node, while in Soft Reroute Initiated state, …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D18-1	Release the incumbent and the rerouting connections in the direction of the called party with the Rerouting cause IE unmodified and change the rerouting state to Null when it receives a release indication from the direction of the calling party and the release indication contains a Rerouting cause IE?	6.2.4.7	M	D1-3	Yes___ No___
D18-2	Release the incumbent and the rerouting connections in the direction of the called party and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the hard rerouting	6.2.4.7	M	D1-3	Yes___ No___

	service is not activated, and the release indication does not contain the Rerouting cause IE?				
D18-3	Release the incumbent and the rerouting connections in the direction of the called party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when the node receives a release indication from the direction of the calling party, and the hard rerouting service is activated for the call, and the release indication does not contain the Rerouting cause IE?	6.2.4.7	M	D1-3	Yes___ No___
D18-4	Release the connection in the direction of the calling party, release the rerouting connection in the direction of the called party, and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection, and the hard rerouting service is NOT activated for the call?	6.2.4.7	M	D1-3	Yes___ No___
D18-5	Release the connection in the direction of the calling party and the rerouting connection in the direction of the called party with a Rerouting cause IE set to cause #1, and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to cause #1?	6.2.4.7	M	D1-3	Yes___ No___
D18-6	Release the connection in the direction of the calling party and the rerouting connection in the direction of the called party with a Rerouting cause IE set to cause #2, and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to any other cause than #1?	6.2.4.7	M	D1-3	Yes___ No___
D18-7	Start the hard rerouting timer, release the rerouting connection with cause #21 in the direction of the called party, change the rerouting state to the Hard Reroute Triggered, and attempt to establish a rerouting connection towards the destination node when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection, and the release indication does NOT contain the Rerouting cause IE, and the hard rerouting service is activated for the call?	6.2.4.7	M	D1-3	Yes___ No___
D18-8	Abort the soft rerouting operation and change the rerouting state to Rerouting Idle, when the node receives a release indication from the direction of the called party, and the release indication is for the rerouting connection?	6.2.4.7	M	D1-3	Yes___ No___
Comments:					

Table D.19 Receipt of release indication in Awaiting Switchover state [symmetric soft rerouting]

Item	**Release in awaiting switchover state** Does the implementation of the source node, while in Awaiting Switchover state, …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D19-1	Release the incumbent and the rerouting connections in the direction of the called party with the Rerouting cause IE unmodified and change the rerouting state to Null when it receives a release indication from the direction of the calling party and the release indication contains a Rerouting cause IE?	6.2.4.8	M	D1-3	Yes___ No___
D19-2	Release the incumbent and the rerouting connections in the direction of the called party and change the rerouting	6.2.4.8	M	D1-3	Yes___ No___

	state to Null when it receives a release indication from the direction of the calling party and the hard rerouting service is not activated, and the release indication does not contain the Rerouting cause IE?				
D19-3	Release the incumbent and the rerouting connections in the direction of the called party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when the node receives a release indication from the direction of the calling party, and the hard rerouting service is activated for the call, and the release indication does not contain the Rerouting cause IE?	6.2.4.8	M	D1-3	Yes___ No___
D19-4	Release the connection in the direction of the calling party and the rerouting connection in the direction of the called party with a Rerouting cause IE set to cause #1, and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to cause #1?	6.2.4.8	M	D1-3	Yes___ No___
D19-5	Release the connection in the direction of the calling party and the rerouting connection in the direction of the called party with a Rerouting cause IE set to cause #2, and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to any other cause than #1 and #4?	6.2.4.8	M	D1-3	Yes___ No___
D19-6	Switch the connection point, which is connecting to the inter-domain interface (i.e. in the direction of the calling party), from the incumbent connection to the rerouting connection, and change the rerouting state to Rerouting Idle when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the release indication does NOT contain the Rerouting cause IE?	6.2.4.8	M	D1-3	Yes___ No___
D19-7	Switch the connection point, which is connecting to the inter-domain interface (i.e. in the direction of the calling party), from the incumbent connection to the rerouting connection, and change the rerouting state to Rerouting Idle when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to cause #4?	6.2.4.8	M	D1-3	Yes___ No___
D19-8	Apply the procedures of section 6.2.7.1 for the administrative weight accumulation when it receives a release indication from the direction of the called party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to cause #4?	6.2.4.8	M	D1-3, D1-9	Yes___ No___
D19-9	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #1, release the incumbent connection in the direction of the called party, and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the release indication is for the rerouting connection and the release indication contains the Rerouting cause IE set to cause #1?	6.2.4.8	M	D1-3	Yes___ No___
D19-10	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #2, release the incumbent connection in the direction of the called party, and change the rerouting state to Null when it receives a release indication from the direction of the called party,	6.2.4.8	M	D1-3	Yes___ No___

	and the release indication is for the rerouting connection and the release indication contains the Rerouting cause IE set to any other cause than #1?				
D19-11	Abort the soft rerouting operation and change the rerouting state to Rerouting Idle, when the node receives a release indication from the direction of the called party, and the release indication is for the rerouting connection, and the release indication does NOT contain the Rerouting cause IE?	6.2.4.8	M	D1-3	Yes___ No___
Comments:					

Table D.20 Timers expiry

Item	Timers expiry Does the implementation of the source node …	Reference	Sta-tus	Condition for status	Support
D20-1	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #2 and change the rerouting state to Null when the current rerouting state is Hard Reroute Triggered and the hard rerouting timer expires?	6.2.5.2	M		Yes___ No___
D20-2	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #2, release the rerouting connection in the direction of the called party with a Rerouting cause IE set to cause #2, and change the rerouting state to Null when the current rerouting state is Hard Reroute Proceeding and the hard rerouting timer expires?	6.2.5.2	M		Yes___ No___
D20-3	Set the content of the Cause IE to the content assigned at the point of failure when connections are released as the result of the expiry of the hard rerouting timer?	6.2.5.2	M		Yes___ No___
Comments:					

Table D.21 Procedures for the hard reroute setup request

Item	Hard reroute setup request Does the implementation of the source node …	Reference	Sta-tus	Condition for status	Support
D21-1	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #2, clear the hard rerouting timer and change the rerouting state to Null when the rerouting state enters Hard Reroute Triggered and no path is found to hard reroute the connection?	6.2.5.1	M		Yes___ No___
D21-2	Build a hard reroute SETUP message that contains: • The Called party number information set to the destination node AESA. • QoS and traffic related information elements as defined in Annex A. • The Rerouting information element with a Rerouting control octet group that contains - the local incarnation number incremented by one from the previous value - the switchover behavior indicator set to "*switchover immediately*" • The Rerouting information element with an Endpoint key octet group that contains the destination node endpoint key • Unrecognized information elements with the "pass	6.2.5.1	M		Yes___ No___

	along request bit" set that were present in the original setup when the rerouting state enters Hard Reroute Triggered and a path is found to hard reroute the connection?				
D21-3	Progress the hard reroute SETUP message in the direction of the destination node and change the rerouting state to Hard Reroute Proceeding?	6.2.5.1	M		Yes___ No___
D21-4	Apply the procedures of section 6.2.9.1 for the administrative weight accumulation?	6.2.5.1	M	D1-9	Yes___ No___
Comments:					

Table D.22 Procedures for the soft reroute setup request

Item	Soft reroute setup request Does the implementation of the source node …	Reference	Sta-tus	Condition for status	Support
D22-1	Disregard the soft reroute trigger when the rerouting state is in any state but Rerouting Idle, and a soft reroute operation is triggered?	6.2.5.3	M		Yes___ No___
D22-2	Disregard the soft reroute trigger when the rerouting state is Rerouting Idle, and a soft reroute operation is triggered, and no path to soft reroute the connection is found?	6.2.5.3	M		Yes___ No___
D22-3	Build a soft reroute SETUP message that contains: • The Called party number information set to the destination node AESA. • QoS and traffic related information elements as defined in Annex A. • The Rerouting information element with a Rerouting control octet group that contains - the local incarnation number incremented by one from the previous value - the switchover behavior indicator set to "*switchover when receiving the call clearing message for the incumbent connection* " • The Rerouting information element with an Endpoint key octet group that contains the destination node endpoint key • Unrecognized information elements with the "pass along request bit" set that were present in the original setup when the rerouting state is Rerouting Idle, and a soft reroute operation has been triggered, and a path to soft reroute the connection is found?	6.2.5.3	M		Yes___ No___
D22-4	Progress the soft reroute SETUP message in the direction of the destination node and change the rerouting state to Soft Reroute Proceeding?	6.2.5.3	M		Yes___ No___
D22-5	Apply the procedures of section 6.2.9.1 for the administrative weight accumulation?	6.2.5.1	M	D1-9	Yes___ No___
Comments:					

Table D.23 QoS procedures for rerouting a connection from the source node

Item	QoS procedures for rerouting a connection from the source node Does the implementation of the source node when building a reroute setup request …	Reference	Sta-tus	Condition for status	Support

D23-1	Include the Broadband bearer capability IE, ATM traffic descriptor IE, and QoS parameter IE recorded during the initial call establishment when the call is a CBR, rt-VBR or nrt-VBR call?	Anx A.1.3	M		Yes___ No___
D23-2	Include the End-to-end transit delay IE with: • The PNNI Cumulative Forward Maximum Cell Transfer Delay set to zero • The PNNI Acceptable Forward Maximum Cell Transfer Delay set to difference between the PNNI Cumulative Forward Maximum Cell Transfer Delay contained in the Rerouting IE received in the initial connect indication and the PNNI Cumulative Forward Maximum Cell Transfer Delay recorded during the initial setup indication when the End-to-end transit delay IE was recorded during the initial call establishment and the call is a CBR, rt-VBR or nrt-VBR call?	Anx A.1.3	M		Yes___ No___
D23-3	Include the Extended QoS parameters IE with: • The Cumulative Forward Cell Delay Variation set to zero • The Cumulative Forward Cell Delay Variation set to difference between the Cumulative Forward Cell Delay Variation contained in the Rerouting IE received in the initial connect indication and the Cumulative Forward Cell Delay Variation recorded during the initial setup indication • The Cumulative Backward Cell Delay Variation set to zero • The Cumulative Backward Cell Delay Variation set to difference between the Cumulative Backward Cell Delay Variation contained in the Rerouting IE received in the initial connect indication and the Cumulative Backward Cell Delay Variation recorded during the initial setup indication • The Acceptable Forward Cell Loss Ratio set to the Acceptable Forward Cell Loss Ratio recorded during the initial setup indication • The Acceptable Backward Cell Loss Ratio set to the Acceptable Backward Cell Loss Ratio recorded during the initial setup indication when the Extended QoS parameters IE was recorded during the initial call establishment and the call is a CBR, rt-VBR or nrt-VBR call?	Anx A.1.3	M		Yes___ No___
D23-4	Increase the cumulative values to account for: • The expected increases due to user data transfer over the incoming link and within this switching system that were NOT included in the recorded cumulative values from the initial setup indication, and • The expected increases due to user data transfer over the outgoing link when the call is a CBR, rt-VBR or nrt-VBR call?	Anx A.1.3	M		Yes___ No___
D23-5	Include the Broadband bearer capability IE, ABR setup parameters IE, and QoS parameter IE recorded during the initial call establishment when the call is an ABR call?	Anx A.2.3	M		Yes___ No___
D23-6	Include, if recorded, the ABR additional parameters IE recorded during the initial call establishment when the call is an ABR call?	Anx A.2.3	M		Yes___ No___
D23-7	Include an ATM traffic descriptor IE with the forward and	Anx A.2.3	M		Yes___ No___

	backward Minimum cell rate recorded during the initial call establishment when the call is an ABR call?				
D23-8	Include the Broadband bearer capability IE, ATM traffic descriptor IE, and QoS parameter IE recorded during the initial call establishment when the call is an UBR, UBR with MDCR, or UBR with BCS call?	Anx A.3.3	M		Yes___ No___
D23-9	Include, if recorded, the Minimum desired cell rate IE recorded during the initial call establishment when the call is an UBR with MDCR call?	Anx A.3.3	M		Yes___ No___
D23-10	Include, if recorded, the Optional traffic attributes IE with BCS values recorded during the initial call establishment when the call is an UBR with BCS call?	Anx A.3.3	M		Yes___ No___
D23-11	Include the Broadband bearer capability IE, and QoS parameter IE recorded during the initial call establishment when the call is a GFR call?	Anx A.4.3	M		Yes___ No___
D23-12	Include an ATM traffic descriptor IE with the content recorded during the initial call establishment when the call is a GFR call?	Anx A.4.3	M		Yes___ No___
D23-13	Include a Minimum acceptable ATM traffic descriptor IE?	Anx A.1.3 Anx A.2.3 Anx A.4.3	X		Yes___ No___
D23-14	Include an Alternative ATM traffic descriptor IE?	Anx A.1.3 Anx A.2.3 Anx A.4.3	X		Yes___ No___
Comments:					

Table D.24 Receipt of a reroute connect indication

Item	**Receipt of reroute connect indication** Does the implementation of the source node …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D24-1	Switch the connection point connecting to the inter-domain interface to the rerouting connection, clear the hard rerouting timer, and change the rerouting state to Rerouting Idle when it receives a reroute connect indication while in Hard Reroute Proceeding state?	6.2.6.1	M		Yes___ No___
D24-2	Have the capability to switch the connection point connecting to the inter-domain interface from the incumbent connection to the rerouting connection, release the incumbent connection in the direction of the called party with a Rerouting cause IE set to cause #4, and change the rerouting state to Rerouting Idle when it receives a reroute connect indication while in Soft Reroute Proceeding state?	6.2.6.2	M		Yes___ No___
Comments:					

Table D.25 Receipt of a reroute setup indication at the source node [symmetric soft rerouting]

Item	**Receipt of a reroute setup indication** Does the implementation of the source node, when it receives a reroute setup indication (see D9-3), …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D25-1	Reject the reroute setup indication with a Rerouting cause IE set to cause #3 if the Rerouting IE does not contain an Endpoint key octet group?	6.1	M	D1-3	Yes___ No___
D25-2	Reject the reroute setup indication with a Rerouting cause IE set to cause #3 if the Rerouting IE contains an Endpoint key octet group but the endpoint key cannot be matched to	6.1	M	D1-3	Yes___ No___

	any existing connection?				
D25-3	Reject the reroute setup indication with a Rerouting cause IE set to cause #8 if the Rerouting control octet group in the Rerouting information element contains an unrecognized switchover behavior indicator?	6.2.7	M	D1-3	Yes___ No___
D25-4	Reject the reroute setup indication with a Rerouting cause IE set to cause #8 if the Rerouting control octet group in the Rerouting information element contains a switchover behavior indicator set to "*switchover immediately*"?	6.2.7	M	D1-3	Yes___ No___
D25-5	Reject the reroute setup indication with a Rerouting cause IE set to cause #5 if the incarnation number in the Rerouting IE is NOT greater than the remote incarnation number associated with the call?	6.2.7	M	D1-3	Yes___ No___
D25-6	Update the remote incarnation number associated with the call with the value contained in the Rerouting IE if both the endpoint key matches an existing connection and the incarnation number contained in the Rerouting IE is greater than the remote incarnation number associated with the call?	6.2.7	M	D1-3	Yes___ No___
D25-7	Apply the procedures for received traffic parameters specified in Annex A?	6.2.7	M	D1-3	Yes___ No___
D25-8	Treat the reroute setup indication as a soft reroute setup indication if the reroute setup indication has not been rejected by any of the above questions, and the switchover behavior indicator in the Rerouting IE is set to "*switchover when receiving the call clearing message fro the incumbent connection*"?	6.2.7	M	D1-3	Yes___ No___
D25-9	Change the rerouting state to Soft Reroute Initiated, when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Rerouting Idle?	6.2.7.1	M	D1-3	Yes___ No___
D25-10	Reject the reroute setup indication with a Rerouting cause IE set to cause #6 when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Hard Reroute Triggered?	6.2.7.2	M	D1-3	Yes___ No___
D25-11	Reject the reroute setup indication with a Rerouting cause IE set to cause #6 when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Hard Reroute Proceeding?	6.2.7.3	M	D1-3	Yes___ No___
D25-12	Reject the reroute setup indication with a Rerouting cause IE set to cause #6 when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Soft Reroute Triggered?	6.2.7.4	M	D1-3	Yes___ No___
D25-13	Reject the reroute setup indication with a Rerouting cause IE set to cause #6 when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Soft Reroute Proceeding?	6.2.7.5	M	D1-3	Yes___ No___
D25-14	Change the rerouting state to Soft Reroute Initiated and release the old rerouting connection in the direction of the calling party, when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Soft Reroute Initiated?	6.2.7.6	M	D1-3	Yes___ No___
D25-15	Change the rerouting state to Soft Reroute Initiated and release the old rerouting connection in the direction of the calling party, when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Awaiting Switchover?	6.2.7.7	M	D1-3	Yes___ No___
D25-16	Send a CONNECT message, change the rerouting state to Awaiting Switchover, when the current rerouting state enters Soft Reroute Initiated?	6.2.7.8	M	D1-3	Yes___ No___

D25-17	Add an Optional traffic attributes IE with Cumulative Administrative Weights with the administrative weight values set as described in section 6.2.7.8 to the CONNECT message if the IE was present in the reroute setup indication?	6.2.7.8	M	D1-9, D1-3	Yes___ No___
Comments:					

Table D.26 Processing the setup indication at the destination node during the initial call establishment

Item	Processing the setup indication at the destination node during the initial call establishment Does the implementation of the destination node when it receives an initial setup indication (see D9-5) from an intra-domain interface to be progressed to an inter-domain interface …	Reference	Sta-tus	Condition for status	Support
D26-1	Reject the call with a Cause IE set to cause #96 "mandatory information element is missing" and diagnostic field set to the identifier of the Rerouting services IE, if the setup indication contains a Rerouting IE and no Rerouting services IE?	6.3.1	M		Yes___ No___
D26-2	Pursue the normal processing of the setup indication if the setup indication does not contain a Rerouting services IE?	6.3.1	M		Yes___ No___
D26-3	Record the content of the Rerouting services IE for further processing in the connect indication if the setup indication contains a Rerouting services IE?	6.3.1	M		Yes___ No___
D26-4	Apply procedures of Annex A.1.2 for QoS preservation during rerouting and store the cumulative QoS values contained in the Rerouting IE when one or more rerouting service are available at both the source node and the destination node and the call is a CBR, rt-VBR or nrt-VBR call?	6.3.1, Anx A.1.2	M		Yes___ No___
D26-5	Record the cumulative values of the Extended QoS parameters IE and the End-to-End Transit Delay IE after taking into account • the expected increases due to user data transfer over the incoming link, and • the expected increase due to user data transfer with this switching system that vary depending on the incoming interface, and • the padding by a network specific amount when one or more rerouting service are available at both the source node and the destination node and the call is a CBR, rt-VBR or nrt-VBR call?	Anx A.1.2	M		Yes___ No___
D26-6	Apply procedures of Annex A.3.2 for QoS preservation during rerouting if the symmetric soft rerouting service is available at both the source node and the destination node and the call is a UBR, UBR with MDCR, or UBR with BCS call?	6.3.1, Anx A.3.2	M	D1-3	Yes___ No___
D26-7	Apply procedures of Annex A.4.2 for QoS preservation during rerouting if the symmetric soft rerouting service is available at both the source node and the destination node and the call is a GFR call?	6.3.1, Anx A.4.2	M	D1-3	Yes___ No___
D26-8	Have the capability to indicate the availability of the rerouting service in the Inter-domain rerouting capabilities field of the Rerouting services IE if an inter-domain rerouting service is available at both the destination node and the source node?	6.3.1	M		Yes___ No___
D26-9	Set the remote incarnation number associated with the call to zero if one or more rerouting services are available at both the destination node and the source node?	6.3.1	M		Yes___ No___

D26-10	Record the source node AESA, contained in the Edge node octet group of the Rerouting IE if the symmetric soft rerouting service is available at both the source node and the destination node?	6.3.1	M	D1-3	Yes___ No___
D26-11	Record the endpoint key contained in the endpoint key octet group in the Rerouting IE if the symmetric soft rerouting service is available at both the source node and the destination node?	6.3.1	M	D1-3	Yes___ No___
D26-12	Set the local incarnation number associated with the call to zero if the symmetric soft rerouting service is available at both the source node and the destination node?	6.3.1	M	D1-3	Yes___ No___
D26-13	Remove the Rerouting IE and clear the Intra-domain rerouting capabilities field in the Rerouting services IE prior to progressing the setup request?	6.3.1	M		Yes___ No___
D26-14	Pass on the inter-domain rerouting services and the inter-domain rerouting capabilities indicated in the Rerouting services IE prior to progressing the setup request?	6.3.1	M		Yes___ No___
D26-15	Remove the Rerouting services IE from the setup request if this Rerouting services IE is empty (the IE does not indicate at least one inter-domain rerouting service, or one inter-domain rerouting capability, or one intra-domain rerouting service or one intra-domain rerouting capability)?	6.3.1	M		Yes___ No___
D26-16	Have the capability to clear the Intra-domain rerouting services field in the Rerouting services IE from the setup request prior to progressing it?	6.3.1	M		Yes___ No___
D26-17	Have the capability to forward the Intra-domain rerouting services field in the Rerouting services IE from the setup request prior to progressing it?	6.3.1	O		Yes___ No___
D26-18	Accumulate and record administrative weights as described in section 6.3.1, if the Optional traffic attributes IE with Cumulative Administrative Weights is present in the setup indication?	6.3.1	M	D1-9	Yes___ No___
D26-19	Discard the Optional traffic attributes IE with Cumulative Administrative Weights prior to progressing the setup request, if the IE is present in the setup indication?	6.3.1	M	D1-9	Yes___ No___
Comments:					

Table D.27 Processing the connect indication at the destination node during the initial call establishment

Item	Processing the connect indication during the initial call establishment Does the implementation of the destination node when it receives an initial connect indication from an inter-domain interface to be progressed to an intra-domain interface …	Reference	Sta-tus	Condition for status	Support
D27-1	Discard the Rerouting IE if contained in the connect indication?	6.3.2	M		Yes___ No___
D27-2	Clear the Intra-domain rerouting services and the Intra rerouting capabilities fields if the connect indication contains a Rerouting services IE?	6.3.2	M		Yes___ No___
D27-3	Pass on any inter-domain rerouting services indicated in the Inter-domain rerouting services field of the Rerouting services IE if the connect indication contains a Rerouting services IE?	6.3.2	M		Yes___ No___
D27-4	Add a Rerouting services IE to the connect request if it wishes to activate one or more rerouting services for the call when the connect indication does not contain a Rerouting services IE?	6.3.2	M		Yes___ No___

D27-5	Indicate in the Inter-domain rerouting services field of the Rerouting services IE the activation of an inter-domain rerouting service if the destination node indicated the availability of this inter-domain rerouting service in the setup request and the inter-domain rerouting service was requested in the setup indication?	6.3.2	M		Yes___ No___
D27-6	Indicate in the Inter-domain rerouting services field of the Rerouting services IE the activation of an inter-domain rerouting service if the destination node indicated the availability of this inter-domain rerouting service in the setup request and the destination node on behalf of the end-system activates the inter-domain rerouting service?	6.3.2	M		Yes___ No___
D27-7	Indicate in the Inter-domain rerouting services field of the Rerouting services IE the activation of an inter-domain rerouting service if the rerouting capability has been advertised by some network (i.e. indicated in the Inter-domain rerouting capability field of the Rerouting services IE received in the setup indication) and the destination node on behalf of the end-system activates the inter-domain rerouting service?	6.3.2	M		Yes___ No___
D27-8	Indicate in the Inter-domain rerouting services field of the Rerouting services IE the activation of an inter-domain rerouting service if the destination node indicated the availability of this inter-domain rerouting service in the setup request and the destination node is the destination of the call (e.g. soft PVC) and activates the inter-domain rerouting service for the call?	6.3.2	M		Yes___ No___
D27-9	Indicate in the Inter-domain rerouting services field of the Rerouting services IE the activation of an inter-domain rerouting service if the rerouting capability has been advertised by some network (i.e. indicated in the Inter-domain rerouting capability field of the Rerouting services IE received in the setup indication) and the destination node is the destination of the call (e.g. soft PVC) and activates the inter-domain rerouting service for the call?	6.3.2	M		Yes___ No___
D27-10	Code the activation of rerouting services in the Inter-domain rerouting service field of the Rerouting services IE as described in section 5.1?	6.3.2	M		Yes___ No___
D27-11	Indicate in the Intra-domain rerouting services field of the Rerouting services IE the activation of an intra-domain rerouting service if the rerouting service is available at both the source node and itself and the intra-domain rerouting service was requested in the setup indication?	6.3.2	M		Yes___ No___
D27-12	Indicate in the Intra-domain rerouting services field of the Rerouting services IE the activation of an intra-domain rerouting service if the rerouting service is available at both the source node and itself and the destination node wants to activate the intra-domain rerouting service?	6.3.2	M		Yes___ No___
D27-13	Indicate in the Intra-domain rerouting services field of the Rerouting services IE the activation of an intra-domain rerouting service if the Inter-domain rerouting services field indicates that this inter-domain rerouting services is to be activated and the destination node indicated the availability of the inter-domain rerouting service in the setup request?	6.3.2	M		Yes___ No___
D27-14	Activate the asymmetric soft rerouting service in this domain if the symmetric soft rerouting service was requested and the service is not available at the destination node, and the asymmetric soft rerouting service is available at both the source and the destination nodes?	6.3.2	M		Yes___ No___
D27-15	Code the activation of rerouting services in the Intra-	6.3.2	M		Yes___ No___

	domain rerouting service field of the Rerouting services IE as described in section 5.1?				
D27-16	Add a Rerouting IE to the connect request with the Edge node octet group set to the AESA of the destination node if one or more rerouting services are activated?	6.3.2	M		Yes___ No___
D27-17	Generate an endpoint key that uniquely identifies the call within the scope of the destination node AESA and code it in the Endpoint key octet group in the Rerouting IE if one or more rerouting services are activated?	6.3.2	M		Yes___ No___
D27-18	Apply procedures of Annex A.1.2 for QoS preservation during rerouting and insert the recorded cumulative QoS values in the Rerouting IE if one or more rerouting services are activated and the call is a CBR, rt-VBR or nrt-VBR call?	6.3.2, Anx A.1.2	M		Yes___ No___
D27-19	Discard the Optional traffic attributes IE with Cumulative Administrative Weights, if the IE is present in the received connect indication?	6.3.2	M	D1-9	Yes___ No___
D27-20	Add an Optional traffic attributes IE with Cumulative Administrative Weights to the connect request with values set as described in section 6.3.2, if the Optional traffic attributes information element with Cumulative Administrative Weights was present in the initial setup indication, and one or more rerouting services are activated?	6.3.2	M	D1-9	Yes___ No___
D27-21	Remove the Rerouting services IE from the connect request if this Rerouting services IE is empty (the IE does not indicate at least one inter-domain rerouting service or one intra-domain rerouting service)?	6.3.2	O		Yes___ No___
D27-22	Code the IE instruction field of the Rerouting services IE with “pass along request” prior to sending a CONNECT message containing this IE?	6.3.2	M		Yes___ No___
D27-23	Code the IE instruction field of the Rerouting IE with “pass along request” prior to sending a CONNECT message containing this IE?	6.3.2	M		Yes___ No___
D27-24	Change the rerouting state to Rerouting Idle when the CONNECT message has been sent?	6.3.2	M		Yes___ No___
Comments:					

Table D.28 Rerouting states at the destination node

Item	States Does the implementation of the destination node support …	Reference	Sta-tus	Condition for status	Support
D28-1	The Null state?	6.3.3	M		Yes___ No___
D28-2	The Rerouting Idle state?	6.3.3	M		Yes___ No___
D28-3	The Hard Reroute Indicated state?	6.3.3	M		Yes___ No___
D28-4	The Hard Reroute Initiated state?	6.3.3	M		Yes___ No___
D28-5	The Soft Reroute Initiated state?	6.3.3	M		Yes___ No___
D28-6	The Awaiting Switchover state?	6.3.3	M		Yes___ No___
D28-7	The Soft Reroute Triggered state?	6.3.3	M	D1-3	Yes___ No___
D28-8	The Soft Reroute proceeding state?	6.3.3	M	D1-3	Yes___ No___
Comments:					

Table D.29 Receipt of release indication in the Rerouting Idle state

Item	Release indication in Rerouting Idle state Does the implementation of the destination node, while in Rerouting Idle state, …	Reference	Sta-tus	Condition for status	Support
D29-1	Release the incumbent connection in the direction of the calling party with the Rerouting cause IE unmodified and change the rerouting state to Null when it receives a release indication from the direction of the called party and the release indication contains a Rerouting cause IE?	6.3.4.2	M		Yes___ No___
D29-2	Release the incumbent connection in the direction of the calling party and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the hard rerouting service is not activated, and the release indication does not contain the Rerouting cause IE?	6.3.4.2	M		Yes___ No___
D29-3	Release the incumbent connection in the direction of the calling party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when the node receives a release indication from the direction of the called party, and the hard rerouting service is activated for the call, and the release indication does not contain the Rerouting cause IE?	6.3.4.2	M		Yes___ No___
D29-4	Release the connection in the direction of the called party and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection and the hard rerouting service is NOT activated for the call?	6.3.4.2	M		Yes___ No___
D29-5	Release the connection in the direction of the called party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to cause #1?	6.3.4.2	M		Yes___ No___
D29-6	Release the connection in the direction of the called party with a Rerouting cause IE set to cause #2 and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to any other cause than #1?	6.3.4.2	M		Yes___ No___
D29-7	Start the hard rerouting timer, change the rerouting state to Hard Reroute Indicated when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection, and the release indication does not contain the Rerouting cause IE, and the hard rerouting service is activated for the call?	6.3.4.2	M		Yes___ No___
Comments:					

Table D.30 Receipt of release indication in the Hard Reroute Indicated state

Item	Release indication in hard reroute indicated state Does the implementation of the destination node, while in the Hard Reroute Indicated state, …	Reference	Sta-tus	Condition for status	Support
D30-1	Clear the hard rerouting timer and change the rerouting state to the Null when a release indication from the direction of the called party is received?	6.3.4.3	M		Yes___ No___

Comments:

Table D.31 Receipt of release indication in the Hard Reroute Initiated state

Item	Release in hard reroute initiated state Does the implementation of the destination node , while in the Hard Reroute Initiated state, …	Reference	Sta-tus	Condition for status	Support
D31-1	Clear the hard rerouting timer, release the rerouting connection in the direction of the calling party with the Rerouting cause IE unmodified, and change the rerouting state to Null when it receives a release indication from the direction of the called party that contains the Rerouting cause IE?	6.3.4.4	M		Yes___ No___
D31-2	Clear the hard rerouting timer, release the rerouting connection in the direction of the calling party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when the node receives a release indication from the direction of the called party, and the release indication does NOT contain the Rerouting cause IE?	6.3.4.4	M		Yes___ No___
D31-3	Clear the hard rerouting timer, release the connection in the direction of the called party with a Rerouting cause IE set to cause #1, and change the rerouting state to Null when the node receives a release indication from the direction of the calling party, and the release indication is for the rerouting connection, and the release indication contains a Rerouting cause IE set to cause #1?	6.3.4.4	M		Yes___ No___
D31-4	Clear the hard rerouting timer, release the connection in the direction of the called party with a Rerouting cause IE set to cause #2, and change the rerouting state to Null when the node receives a release indication from the direction of the calling party, and the release indication is for the rerouting connection, and the release indication contains a Rerouting cause IE set to any other cause than #1?	6.3.4.4	M		Yes___ No___
D31-5	Keep the hard rerouting timer running, and change the rerouting state to Hard Reroute Indicated when the node receives a release indication from the direction of the calling party, and the release indication does NOT contain the Rerouting cause IE, and the hard rerouting timer has not expired?	6.3.4.4	O		Yes___ No___
Comments:					

Table D.32 Receipt of release indication in Soft Reroute Initiated state

Item	Release in Soft Reroute Initiated state Does the implementation of the destination node , while in the Soft Reroute Initiated state, …	Reference	Sta-tus	Condition for status	Support
D32-1	Release both the incumbent and the rerouting connections in the direction of the calling party with the Rerouting cause IE unmodified and change the rerouting state to Null when it receives a release indication from the direction of the called party and the release indication contains the Rerouting cause IE?	6.3.4.5	M		Yes___ No___
D32-2	Release the incumbent and the rerouting connections in the direction of the calling party and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the hard rerouting service	6.3.4.5	M		Yes___ No___

	is not activated, and the release indication does NOT contain a Rerouting cause IE?				
D32-3	Release the incumbent and the rerouting connections in the direction of the calling party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when the node receives a release indication from the direction of the called party, and the hard rerouting service is activated for the call, and the release indication does NOT contain the Rerouting cause IE?	6.3.4.5	M		Yes___ No___
D32-4	Release the connection in the direction of the called party, release the rerouting connection in the direction of the calling party, and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection, and the hard rerouting service is NOT activated for the call?	6.3.4.5	M		Yes___ No___
D32-5	Release the connection in the direction of the called party with the Rerouting cause IE set to cause #1, release the rerouting connection in the direction of the calling party, and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to cause #1?	6.3.4.5	M		Yes___ No___
D32-6	Release the connection in the direction of the called party with the Rerouting cause IE set to cause #2, release the rerouting connection in the direction of the calling party, and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to any other cause than #1?	6.3.4.5	M		Yes___ No___
D32-7	Start the hard rerouting timer, change the rerouting state to Hard Reroute Initiated and continue processing the reroute SETUP message when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection, and the release indication does NOT contain the Rerouting cause IE, and the hard rerouting service is activated for the call?	6.3.4.5	M		Yes___ No___
D32-8	Abort the soft rerouting operation and change the rerouting state to Rerouting Idle, when the node receives a release indication from the direction of the calling party, and the release indication is for the rerouting connection?	6.3.4.5	M		Yes___ No___
Comments:					

Table D.33 Receipt of release indication in the Awaiting Switchover state

Item	**Release in awaiting switchover state** Does the implementation of the destination node, while in the Awaiting Switchover state, …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D33-1	Release both the incumbent and the rerouting connections in the direction of the calling party with the Rerouting cause IE unmodified and change the rerouting state to Null when it receives a release indication from the direction of the called party and the release indication contains a Rerouting cause IE?	6.3.4.6	M		Yes___ No___
D33-2	Release the incumbent and the rerouting connections in the direction of the calling party and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the hard rerouting service	6.3.4.6	M		Yes___ No___

	is not activated, and the release indication does NOT contain the Rerouting cause IE?				
D33-3	Release the incumbent and the rerouting connections in the direction of the calling party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when the node receives a release indication from the direction of the called party, and the hard rerouting service is activated for the call, and the release indication does NOT contain the Rerouting cause IE?	6.3.4.6	M		Yes___ No___
D33-4	Release the connection in the direction of the called party with the Rerouting cause IE set to cause #1, release the rerouting connection in the direction of the calling party, and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to cause #1?	6.3.4.6	M		Yes___ No___
D33-5	Release the connection in the direction of the called party with the Rerouting cause IE set to cause #2, release the rerouting connection in the direction of the calling party, and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to any other cause than #1 and #4?	6.3.4.6	M		Yes___ No___
D33-6	Switch the connection point, which is connecting to the inter-domain interface (i.e. in the direction of the called party), from the incumbent connection to the rerouting connection, release the incumbent connection in the direction of the calling party, and change the rerouting state to Rerouting Idle when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection and the release indication does NOT contain the Rerouting cause IE?	6.3.4.6	M		Yes___ No___
D33-7	Switch the connection point, which is connecting to the inter-domain interface, from the incumbent connection to the rerouting connection, release the incumbent connection in the direction of the calling party, and change the rerouting state to Rerouting Idle when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to cause #4?	6.3.4.6	M		Yes___ No___
D33-8	Release the connection in the direction of the called party with the Rerouting cause IE set to cause #1, release the incumbent connection in the direction of the calling party, and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the rerouting connection and the release indication contains the Rerouting cause IE set to cause #1?	6.3.4.6	M		Yes___ No___
D33-9	Release the connection in the direction of the called party with the Rerouting cause IE set to cause #2, release the incumbent connection in the direction of the calling party, and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the rerouting connection and the release indication contains the Rerouting cause IE set to any other cause than #1?	6.3.4.6	M		Yes___ No___
D33-10	Abort the soft rerouting operation and change the rerouting state to Rerouting Idle, when the node receives a	6.3.4.6	M		Yes___ No___

	release indication from the direction of the calling party, and the release indication is for the rerouting connection, and the release indication does NOT contain the Rerouting cause IE?				
Comments:					

Table D.34 Receipt of release indication in the Soft Reroute Proceeding state [symmetric soft rerouting]

Item	Release in Soft Reroute Proceeding state Does the implementation of the destination node, while in the Soft Reroute Proceeding state, …	Reference	Sta-tus	Condition for status	Support
D34-1	Release both the incumbent and the rerouting connections in the direction of the calling party with the Rerouting cause IE unmodified and change the rerouting state to Null when it receives a release indication from the direction of the called party and the release indication contains a Rerouting cause IE?	6.3.4.8	M	D1-3	Yes___ No___
D34-2	Release the incumbent and the rerouting connections in the direction of the calling party and change the rerouting state to Null when it receives a release indication from the direction of the called party, and the hard rerouting service is not activated, and the release indication does NOT contain the Rerouting cause IE?	6.3.4.8	M	D1-3	Yes___ No___
D34-3	Release the incumbent and the rerouting connections in the direction of the calling party with a Rerouting cause IE set to cause #1 and change the rerouting state to Null when the node receives a release indication from the direction of the called party, and the hard rerouting service is activated for the call, and the release indication does NOT contain the Rerouting cause IE?	6.3.4.8	M	D1-3	Yes___ No___
D34-4	Release the connection in the direction of the called party, release the rerouting connection in the direction of the calling party, and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection, and the hard rerouting service is NOT activated for the call?	6.3.4.8	M	D1-3	Yes___ No___
D34-5	Release the connection in the direction of the called party with the Rerouting cause IE set to cause #1, release the rerouting connection in the direction of the calling party, and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to cause #1?	6.3.4.8	M	D1-3	Yes___ No___
D34-6	Release the connection in the direction of the called party with the Rerouting cause IE set to cause #2, release the rerouting connection in the direction of the calling party, and change the rerouting state to Null when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection and the release indication contains the Rerouting cause IE set to any other cause than #1?	6.3.4.8	M	D1-3	Yes___ No___
D34-7	Start the hard rerouting timer, release the rerouting connection with cause #21 in the direction of the calling party, and change the rerouting state to Hard Reroute Indicated when it receives a release indication from the direction of the calling party, and the release indication is for the incumbent connection, and the release indication does NOT contain the Rerouting cause IE, and the hard	6.3.4.8	M	D1-3	Yes___ No___

	rerouting service is activated for the call?				
D34-8	Apply the normal Crankback procedure and stay in the Soft Reroute Proceeding state when the node receives a release indication from the direction of the calling party, and the release indication is for the rerouting connection, and the release indication contains the Crankback IE, and an alternate path is found?	6.3.4.8	M	D1-3	Yes___ No___
D34-9	Apply the procedures of section 6.2.9.1 for the administrative weight accumulation when the node receives a release indication from the direction of the calling party, and the release indication is for the rerouting connection, and the release indication contains the Crankback IE, and an alternate path is found?	6.3.4.8	M	D1-3, D1-9	Yes___ No___
D34-10	Abort the soft rerouting operation and change the rerouting state to Rerouting Idle, when the node receives a release indication from the direction of the calling party, and the release indication is for the rerouting connection, and the release indication contains the Crankback IE, and no alternate path is found?	6.3.4.8	M	D1-3	Yes___ No___
D34-11	Abort the soft rerouting operation and change the rerouting state to Rerouting Idle, when the node receives a release indication from the direction of the calling party, and the release indication is for the rerouting connection and the release indication does NOT contain the Crankback IE?	6.3.4.8	M	D1-3	Yes___ No___
Comments:					

Table D.35 Timers expiry

Item	**Timers expiry** Does the implementation of the destination node …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D35-1	Release the connection in the direction of the called party with a Rerouting cause IE set to cause #2 and change the rerouting state to Null when the current rerouting state is Hard Reroute Indicated and the hard rerouting timer expires?	6.3.5.10	M		Yes___ No___
D35-2	Release the connection in the direction of the called party with a Rerouting cause IE set to cause #2, release the rerouting connection in the direction of the calling party with a Rerouting cause IE set to cause #2, and change the rerouting state to Null when the current rerouting state is Hard Reroute Initiated and the hard rerouting timer expires?	6.3.5.10	M		Yes___ No___
D35-3	Set the content of the Cause IE to the content assigned at the point of failure when connections are released as the result of the expiry of the hard rerouting timer?	6.3.5.10	M		Yes___ No___
Comments:					

Table D.36 Receipt of a reroute setup indication at the destination node

Item	**Receipt of a reroute setup indication** Does the implementation of the destination node, when it receives a reroute setup indication (see D9-3), …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
D36-1	Reject the reroute setup indication with a Rerouting cause IE set to cause #3 if the Rerouting IE does not contain an Endpoint key octet group?	6.1	M		Yes___ No___
D36-2	Reject the reroute setup indication with a Rerouting cause IE set to cause #3 if the Rerouting IE contains an Endpoint	6.1	M		Yes___ No___

	key octet group but the endpoint key cannot be matched to any existing connection?				
D36-3	Reject the reroute setup indication with a Rerouting cause IE set to cause #8 if the Rerouting control octet group in the Rerouting information element contains an unrecognized switchover behavior indicator and the current rerouting state is neither Hard Reroute Indicated nor Hard Reroute Initiated?	6.3.5	M		Yes___ No___
D36-4	Reject the reroute setup indication with a Rerouting cause IE set to cause #5 if the incarnation number in the Rerouting IE is NOT greater than the remote incarnation number associated with the call?	6.3.5	M		Yes___ No___
D36-5	Update the remote incarnation number associated with the call with the value contained in the Rerouting IE if both the endpoint key matches an existing connection and the incarnation number contained in the Rerouting IE is greater than the remote incarnation number associated with the call?	6.3.5	M		Yes___ No___
D36-6	Treat the reroute setup indication as a hard reroute setup indication if the reroute setup indication has not been rejected by any of the above questions, and the switchover behavior indicator in the Rerouting IE is set to "*switchover immediately*"?	6.3.5	M		Yes___ No___
D36-7	Treat the reroute setup indication as a hard reroute setup indication if the reroute setup indication has not been rejected by any of the above questions, and the Rerouting control octet group in the Rerouting information element contains an unrecognized switchover behavior indicator and the current rerouting state is either Hard Reroute Indicated or Hard Reroute Initiated?	6.3.5	M		Yes___ No___
D36-8	Treat the reroute setup indication as a soft reroute setup indication if the reroute setup indication has not been rejected by any of the above questions, and the switchover behavior indicator in the Rerouting IE is set to "*switchover when receiving the call clearing message from the incumbent connection*"?	6.3.5	M		Yes___ No___
D36-9	Apply the procedures for received traffic parameters specified in Annex A?	6.3.5	M		Yes___ No___
D36-10	Accumulate and record administrative weights as described in section 6.3.5, if the Optional traffic attributes IE with Cumulative Administrative Weights is present in the setup indication?	6.3.5	M	D1-9	Yes___ No___
D36-11	Change the rerouting state to Hard Reroute Initiated, start the hard rerouting timer, and release the incumbent connection in the direction of the calling party, when the reroute setup indication is a hard reroute setup indication and the current rerouting state is Rerouting Idle?	6.3.5.1	M		Yes___ No___
D36-12	Change the rerouting state to Soft Reroute Initiated, when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Rerouting Idle?	6.3.5.1	M		Yes___ No___
D36-13	Change the rerouting state to Hard Reroute Initiated, when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Hard Reroute Indicated?	6.3.5.2	M		Yes___ No___
D36-14	Change the rerouting state to Hard Reroute Initiated, when the reroute setup indication is a hard reroute setup indication and the current rerouting state is Hard Reroute Indicated?	6.3.5.2	M		Yes___ No___
D36-15	Release the old rerouting connection with cause #21 in the	6.3.5.3	M		Yes___ No___

	direction of the calling party, when the reroute setup indication is a hard reroute setup indication and the current rerouting state is Hard Reroute Initiated?				
D36-16	Release the old rerouting connection with cause #21 in the direction of the calling party, when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Hard Reroute Initiated?	6.3.5.3	M		Yes___ No___
D36-17	Change the rerouting state to Hard Reroute Initiated, start the hard rerouting timer, and release both the incumbent connection and the old rerouting connection with cause #21 in the direction of the calling party, when the reroute setup indication is a hard reroute setup indication and the current rerouting state is Soft Reroute Initiated?	6.3.5.4	M		Yes___ No___
D36-18	Change the rerouting state to Soft Reroute Initiated, release the old rerouting connection with cause #21 in the direction of the calling party, when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Soft Reroute Initiated	6.3.5.4	M		Yes___ No___
D36-19	Change the rerouting state to Hard Reroute Initiated, start the hard rerouting timer, and release both the incumbent connection and the old rerouting connection with cause #21 in the direction of the calling party, when the reroute setup indication is a hard reroute setup indication and the current rerouting state is Awaiting Switchover?	6.3.5.5	M		Yes___ No___
D36-20	Change the rerouting state to Soft Reroute Initiated, release the old rerouting connection with cause #21 in the direction of the calling party, when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Awaiting Switchover	6.3.5.5	M		Yes___ No___
D36-21	Change the rerouting state to Hard Reroute Initiated, start the hard rerouting timer, and release both the incumbent connection and the old rerouting connection with cause #21 in the direction of the calling party, when the reroute setup indication is a hard reroute setup indication and the current rerouting state is Soft Reroute Proceeding?	6.3.5.7	M	D1-3	Yes___ No___
D36-22	Change the rerouting state to Soft Reroute Initiated, release the old rerouting connection (the one initiated locally) with cause #21 in the direction of the calling party, when the reroute setup indication is a soft reroute setup indication and the current rerouting state is Soft Reroute Proceeding?	6.3.5.7	M	D1-3	Yes___ No___
D36-23	Send a CONNECT message, switch the connection point connecting to the inter-domain interface to the rerouting connection, clear the hard rerouting timer, change the rerouting state to Rerouting Idle, when the current rerouting state is Hard Reroute Initiated	6.3.5.8	M		Yes___ No___
D36-24	Add an Optional traffic attributes IE with Cumulative Administrative Weights information element to the connect request with values set as described in section 6.3.5.8, if the IE is present in the reroute setup indication?	6.3.5.8	M	D1-9	Yes___ No___
D36-25	Add an Optional traffic attributes IE with Cumulative Administrative Weights information element to the connect request with values set as described in section 6.3.5.9, if the IE is present in the reroute setup indication?	6.3.5.9	M	D1-9	Yes___ No___
D36-26	Send a CONNECT message, change the rerouting state to Awaiting Switchover, when the current rerouting state is Soft Reroute Initiated	6.3.5.9	M		Yes___ No___
Comments:					

Table D.37 Procedures for soft reroute setup request [symmetric soft rerouting]

Item	Soft reroute setup request Does the implementation of the destination node	Reference	Sta - tus	Condition for status	Support
D37-1	Disregard any soft reroute trigger when the rerouting state is in any state but Rerouting Idle, and a soft reroute operation has been triggered?	6.3.6.1	M	D1-3	Yes___ No___
D37-2	Disregard the soft reroute trigger when the rerouting state is Rerouting Idle, and a soft reroute operation has been triggered, and no path to soft reroute the connection is found?	6.3.6.1	M	D1-3	Yes___ No___
D37-3	Build a soft reroute SETUP message that contains: • The Called party number information set to the source node AESA • QoS and traffic related information elements as defined in Annex A. • The Rerouting information element with a Rerouting control octet group that contains - the local incarnation number incremented by one from the previous value - the switchover behavior indicator set to "*switchover when receiving the call clearing message for the incumbent connection* " • The Rerouting information element with an Endpoint key octet group that contains the source node endpoint key when the rerouting state is Rerouting Idle, and a soft reroute operation has been triggered, and a path to soft reroute the connection is found?	6.3.6.1	M	D1-3	Yes___ No___
D37-4	Apply the procedures of section 6.2.9.1 for the administrative weight accumulation?	6.3.6.1	M	D1-3, D1-9	Yes___ No___
D37-5	Progress the soft reroute SETUP message in the direction of the source node and change the rerouting state to Soft Reroute Proceeding?	6.3.6.1	M	D1-3	Yes___ No___
Comments:					

Table D.38 QoS procedures when rerouting a connection from the destination node [symmetric soft rerouting]

Item	QoS procedures when rerouting a connection from the destination node Does the implementation of the destination node when building a reroute setup request …	Reference	Sta-tus	Condition for status	Support
D38-1	Include the Broadband bearer capability IE, ATM traffic descriptor IE, and QoS parameter IE recorded during the initial call establishment when the call is a CBR, rt-VBR or nrt-VBR call?	Anx A.1.4	M	D1-3	Yes___ No___
D38-2	Include the End-to-end transit delay IE with: • The PNNI Cumulative Forward Maximum Cell Transfer Delay set to zero • The PNNI Acceptable Forward Maximum Cell Transfer Delay as specified in Annex A.1.4 when the End-to-end transit delay IE was recorded during the initial call establishment and the call is a CBR, rt-VBR or nrt-VBR call?	Anx A.1.4	M	D1-3	Yes___ No___
D38-3	Include the Extended QoS parameters IE with: • The Cumulative Forward Cell Delay Variation set to zero	Anx A.1.4	M	D1-3	Yes___ No___

	• The Cumulative Forward Cell Delay Variation set to difference between the Cumulative Backward Cell Delay Variation recorded during the initial setup indication and the Cumulative Backward Cell Delay Variation contained in the Rerouting IE received in the initial connect indication • The Cumulative Backward Cell Delay Variation set to zero • The Cumulative Backward Cell Delay Variation set to difference between the Cumulative Forward Cell Delay Variation recorded during the initial setup indication and the Cumulative Forward Cell Delay Variation contained in the Rerouting IE received in the initial connect indication • The Acceptable Forward Cell Loss Ratio set to the Acceptable Backward Cell Loss Ratio recorded during the initial setup indication • The Acceptable Backward Cell Loss Ratio set to the Acceptable Forward Cell Loss Ratio recorded during the initial setup indication when the Extended QoS parameters IE was recorded during the initial call establishment and the call is a CBR, rt-VBR or nrt-VBR call?				
D38-4	Increase the cumulative values to account for: • The expected increases due to user data transfer over the inter-domain interface and within this switching system that were included in the recorded cumulative values from the initial setup indication, and • The expected increases due to user data transfer over the intra-domain interface when the call is a CBR, rt-VBR or nrt-VBR call?	Anx A.1.4	M	D1-3	Yes___ No___
D38-5	Include the Broadband bearer capability IE, ATM traffic descriptor IE, and QoS parameter IE recorded during the initial call establishment when the call is an UBR, UBR with MDCR, or UBR with BCS call?	Anx A.3.4	M	D1-3	Yes___ No___
D38-6	Include, if recorded, the Minimum desired cell rate IE recorded during the initial call establishment when the call is an UBR with MDCR call?	Anx A.3.4	M	D1-3	Yes___ No___
D38-7	Include, if recorded, the Optional traffic attributes IE with BCS values recorded during the initial call establishment when the call is an UBR with BCS call?	Anx A.3.4	M	D1-3	Yes___ No___
D38-8	Include the Broadband bearer capability IE, and QoS parameter IE recorded during the initial call establishment when the call is a GFR call?	Anx A.4.4	M	D1-3	Yes___ No___
D38-9	Include an ATM traffic descriptor IE with the content recorded during the initial call establishment when the call is a GFR call?	Anx A.4.4	M	D1-3	Yes___ No___
D38-10	Include a Minimum acceptable ATM traffic descriptor IE?	Anx A.1.4 Anx A.3.4 Anx A.4.4	X	D1-3	Yes___ No___
D38-11	Include an Alternative ATM traffic descriptor IE?	Anx A.1.4 Anx A.3.4 Anx A.4.4	X	D1-3	Yes___ No___
D38-12	Swap the forward and backward values of the ATM traffic descriptor IE when inserted in the reroute setup request	Anx B.1	M	D1-3	Yes___ No___
D38-13	Swap the forward and backward values of the QoS parameter IE when inserted in the reroute setup request	Anx B.2	M	D1-3	Yes___ No___

D38-14	Swap the forward and backward values of the Minimum desired call rate IE when inserted in the reroute setup request	Anx B.3	M	D1-3	Yes___ No___
D38-15	Swap the forward and backward values of Behavior class selector values in the Optional traffic attributes IE when inserted in the reroute setup request	Anx B.4	M	D1-3	Yes___ No___
Comments:					

Table D.39 Receipt of reroute connect indication in the soft reroute proceeding state [symmetric soft rerouting]

Item	Receipt of soft reroute connect indication Does the implementation of the destination node…	Reference	Sta-tus	Condition for status	Support
D39-1	Have the capability to switch the connection point connecting to the inter-domain interface from the incumbent connection to the rerouting connection, release the incumbent connection in the direction of the called party with a Rerouting cause IE set to cause #4, and change the rerouting state to Rerouting Idle when it receives a reroute connect indication while in Soft Reroute Proceeding state?	6.3.7.1	M	D1-3	Yes___ No___
Comments:					

Table D.40 Content validation of the Rerouting services IE at the source node and the destination node

Item	Content validation of the Rerouting services IE at the source node and the destination node Does the implementation of the source node and the implementation of the destination node…	Reference	Sta-tus	Condition for status	Support
D40-1	Interpret as the null value and pass on unmodified a rerouting class subfield when it receives a setup indication or a connect indication with an undefined value in a rerouting class subfield (e.g. hard rerouting class, soft rerouting class) of the Inter-domain rerouting services field in the Rerouting services IE?	6.2.8.1, 6.3.8	M		Yes___ No___
D40-2	Interpret as the null value a rerouting class subfield when it receives a setup indication or a connect indication with an undefined value in a rerouting class subfield (e.g. hard rerouting class, soft rerouting class) of the Intra-domain rerouting services field in the Rerouting services IE?	6.2.8.1, 6.3.8	M		Yes___ No___
Comments:					

Table D.41 Content validation of the Rerouting IE at the source node and the destination node

Item	Content validation of the Rerouting IE at the source node and the destination node Does the implementation of the source node and the implementation of the destination node…	Reference	Sta-tus	Condition for status	Support
D41-1	Consider that the unrecognized octet groups in the Rerouting IE are Type Length Value (TLV) encoded when a Rerouting IE is received and the IE contains unrecognized octet groups code points?	6.2.8.2, 6.3.8	M		Yes___ No___
D41-2	Ignore the unrecognized octet groups in the Rerouting IE provided that the IE complies with maximum IE length when a Rerouting IE is received and the IE contains unrecognized octet groups code points?	6.2.8.2, 6.3.8	M		Yes___ No___

D41-3	Take action on the setup indication and the Rerouting IE with those octet groups that are recognized and have valid content when it receives a setup indication with a Rerouting services IE, and the Rerouting services IE contains unrecognized octet groups code points?	6.2.8.2, 6.3.8	M		Yes___ No___
D41-4	Take action on the connect indication and the Rerouting IE with those octet groups that are recognized and have valid content when it receives a connect indication with a Rerouting services IE, and the Rerouting services IE contains unrecognized octet groups code points?	6.2.8.2, 6.3.8	M		Yes___ No___
Comments:					

Table D.42 Release cause codes

Item	Release cause codes Does the implementation …	Reference	Sta-tus	Condition for status	Support
D42-1	Return the cause code #21 *"call rejected"* in the Cause IE when a Rerouting cause IE is inserted in a RELEASE message or a RELEASE COMPLETE message and the Rerouting cause IE is set to the cause #3 "unrecognized endpoint key for rerouting"?	6.6	M		Yes___ No___
D42-2	Return the cause code #21 *"call rejected"* in the Cause IE when a Rerouting cause IE is inserted in a RELEASE message or a RELEASE COMPLETE message and the Rerouting cause IE is set to the cause #5 "old incarnation number"?	6.6	M		Yes___ No___
D42-3	Return the cause code #21 *"call rejected"* in the Cause IE when a Rerouting cause IE is inserted in a RELEASE message or a RELEASE COMPLETE message and the Rerouting cause IE is set to cause #6 "rerouting operation already in progress"?	6.6	M		Yes___ No___
D42-4	Return the cause code #21 *"call rejected"* in the Cause IE when a Rerouting cause IE is inserted in a RELEASE message or a RELEASE COMPLETE message and the Rerouting cause IE is set to cause #8 "unsupported switchover behavior"?	6.6	M		Yes___ No___
D42-5	Return the cause code #31 *"normal unspecified"* in the Cause IE when a Rerouting cause IE is inserted in a RELEASE message or a RELEASE COMPLETE message and the Rerouting cause IE is set to cause #4 "rerouting operation complete"?	6.6	M		Yes___ No___
Comments:					

Table D.43 Procedures at a node between two intra-domain interfaces

Item	Procedures at a node between two intra-domain interfaces Does the implementation…	Reference	Sta-tus	Condition for status	Support
D43-1	Forward the Rerouting services IE without modification when it receives a setup indication with a Rerouting services IE from an intra-domain interface, and the setup request is to be progressed to an intra-domain interface?	6.4.1	M		Yes___ No___
D43-2	Perform no content validation on the Rerouting services IE other than verifying the maximum information element length when it receives a setup indication with a Rerouting services IE from an intra-domain interface, and the setup request is to be progressed to an intra-domain interface, and both the IE instruction field flag and the pass along request bit of the Rerouting services IE are set to 1?	6.4.1	M		Yes___ No___

D43-3	Forward the Rerouting services IE without modification when it receives a connect indication with a Rerouting services IE from an intra-domain interface, and the connect request is to be progressed to an intra-domain interface?	6.4.1	M		Yes___ No___
D43-4	Perform no content validation on the Rerouting services IE other than verifying the maximum information element length when it receives a connect indication with a Rerouting services IE from an intra-domain interface, and the connect request is to be progressed to an intra-domain interface, and both the IE instruction field flag and the pass along request bit of the Rerouting services IE are set to 1?	6.4.1	M		Yes___ No___
D43-5	Forward the Rerouting IE without modification when it receives a setup indication with a Rerouting IE from an intra-domain interface, and the setup request is to be progressed to an intra-domain interface?	6.4.2	M		Yes___ No___
D43-6	Perform no content validation on the Rerouting IE other than verifying the maximum information element length when it receives a setup indication with a Rerouting IE from an intra-domain interface, and the setup request is to be progressed to an intra-domain interface, and both the IE instruction field flag and the pass along request bit of the Rerouting IE are set to 1?	6.4.2	M		Yes___ No___
D43-7	Forward the Rerouting IE without modification when it receives a connect indication with a Rerouting IE from an intra-domain interface, and the connect request is to be progressed to an intra-domain interface?	6.4.2	M		Yes___ No___
D43-8	Perform no content validation on the Rerouting IE other than verifying the maximum information element length when it receives a connect indication with a Rerouting IE from an intra-domain interface, and the connect request is to be progressed to an intra-domain interface, and both the IE instruction field flag and the pass along request bit of the Rerouting IE are set to 1?	6.4.2	M		Yes___ No___
D43-9	Forward the Rerouting cause IE without modification when it receives a release indication with a Rerouting cause IE from an intra-domain interface, and the release request is to be progressed to an intra-domain interface?	6.4.3	M		Yes___ No___
D43-10	Perform no content validation on the Rerouting cause IE other than verifying the maximum information element length when it receives a release indication with a Rerouting cause IE from an intra-domain interface, and the release request is to be progressed to an intra-domain interface?	6.4.3	M		Yes___ No___
D43-11	Accumulate and store administrative weights as described in section 6.4.4, when it receives a setup indication with an Optional traffic attributes IE with Cumulative Administrative Weights from an intra-domain interface, and the release request is to be progressed to an intra-domain interface?	6.4.4	M	D1-9	Yes___ No___
D43-12	Forward without modification the Optional traffic attributes IE with Cumulative Administrative Weights, when it receives a connect indication with an Optional traffic attributes IE with Cumulative Administrative Weights from an intra-domain interface, and the connect request is to be progressed to an intra-domain interface?	6.4.4	M	D1-9	Yes___ No___
D43-13	Add an Optional traffic attributes IE with Cumulative Administrative Weight with values set as described in section 6.4.4 to the alternate routing setup request, when a call control entity receives a release indication with a	6.4.4	M	D1-9	Yes___ No___

	Crankback IE, and the initial setup indication contained an Optional traffic attributes IE with Cumulative Administrative Weights, and the normal crankback procedures specified in Annex 8/PNNI 1.0 result in the node sending an alternate routing setup request?				
Comments:					

Table D.44 Procedures at a node between two inter-domain interfaces

Item	Procedures at a node between two inter-domain interfaces Does the implementation…	Reference	Sta-tus	Condition for status	Support
D44-1	Forward the Rerouting services IE with the Inter-domain rerouting services field passed on unmodified, and the Inter-domain rerouting capabilities field passed on unmodified, and the Intra-domain rerouting capabilities field cleared when it receives a setup indication with a Rerouting services IE from an inter-domain interface, and the setup request is to be progressed to an inter-domain interface?	6.5.1	M	D1-10	Yes___ No___
D44-2	Add a Rerouting services IE, clear all its fields and indicate the request for one or more inter-domain or intra-domain rerouting services when it receives a setup indication without a Rerouting services IE from an inter-domain interface, and the setup request is to be progressed to an inter-domain interface, and it wishes to request one or more rerouting services?	6.5.1	M	D1-10	Yes___ No___
D44-3	Forward the Rerouting services IE without modification when it receives a connect indication with a Rerouting services IE from an inter-domain interface, and the connect request is to be progressed to an inter-domain interface?	6.5.1	M	D1-10	Yes___ No___
D44-4	Reject the setup indication with a Rerouting cause IE set to cause #7 and a Crankback IE set to cause #63 when the setup indication is received from an inter-domain interface and the setup indication contains a Rerouting IE with a Rerouting control octet group, and the setup request is to be progressed to an inter-domain interface?	6.5.2	M	D1-10	Yes___ No___
D44-5	Discard the Rerouting IE when it receives a connect indication with a Rerouting IE from an inter-domain interface, and the connect request is to be progressed to an inter-domain interface?	6.5.2	M	D1-10	Yes___ No___
D44-6	Forward the Rerouting cause IE without modification when it receives a release indication with a Rerouting cause IE from an inter-domain interface, and the release request is to be progressed to an inter-domain interface?	6.5.3	M	D1-10	Yes___ No___
D44-7	Perform no content validation on the Rerouting cause IE other than verifying the maximum information element length when it receives a release indication with a Rerouting cause IE from an inter-domain interface, and the release request is to be progressed to an inter-domain interface?	6.5.3	M	D1-10	Yes___ No___
Comments:					

Annex E Domain-based rerouting PICS Proforma for AINI

E.1 Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a telecommunication specification. Such a statement is called a Protocol Implementation Conformance Statement (PICS).

E.1.1 Scope

The present document provides the Protocol Implementation Conformance Statement (PICS) proforma for the ATM Forum "Domain-based rerouting for active point-to-point calls version 1.0" for AINI, defined in "af-cs-0173.000", in compliance with the relevant requirements, and in accordance with the relevant guidelines, given in ISO/IEC 9646-7 [A.3].

E.1.2 References

[A.1] af-cs-0173.000: 2001, ATM Forum, Domain-based rerouting for active point-to-point calls version 1.0.

[A.2] ISO/IEC 9646-1: 1994, Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 1: General concepts (see also ITU-T Recommendation X.290 (1995)).

[A.3] ISO/IEC 9646-7: 1995, Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements (see also ITU-T Recommendation X.296 (1995)).

[A.4] ISO/IEC 9646-3: 1998, Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN) (see also ITU-T Recommendation X.292 (1998)).

E.1.3 Definitions

This Specification uses the following terms defined in ISO/IEC 9646-1 [A.2]:

Implementation Conformance Statement (ICS): A statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented.

ICS proforma: A document, in the form of a questionnaire, which when completed for an implementation or system becomes an ICS.

E.1.4 Abreviations

ASN.1	Abstract Syntax Notation One
ATS	Abstract Test Suite
ICS	Implementation Conformance Statement
PICS	Protocol Implementation Conformance Statement
IE	Information Element
IUT	Implementation under Test
SUT	System Under Test

E.1.5 Conformance

This PICS does not modify any of the requirements detailed in the ATM Forum “Domain-based rerouting for active point-to-point calls version 1.0”. In case of apparent conflict between the statements in the base specification and the annotations of "M" (mandatory) and "O" (optional) in this PICS, the text of the base specification takes precedence.

For each protocol implementation for which conformance is claimed to the ATM Forum “Domain-based rerouting for active point-to-point calls version 1.0”, the supplier is required to complete a copy of the PICS proforma provided in this document and is required to provide the information necessary to identify both the supplier and the implementation.

E.2 Identification of the Implementation

E.2.1 Date of the Statement

_____

E.2.2 Implementation Under Test (IUT) Identification

IUT Name: _____

IUT Version: _____

_____

E.2.3 System Under Test (SUT) Identification

SUT Name: _____

Hardware Configuration: _____

_____

_____

Operating System: _____

E.2.4 Product supplier

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

E-mail Address: _____

Additional Information: _____

E.2.5 Client (if different from product supplier)

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

E-mail Address: _____

Additional Information: _____

E.2.6 ICS Contact Person

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

E-mail Address: _____

Additional Information: _____

_____

_____

_____

E.2.7 Identification of the Implementation

This ICS proforma applies to the following specification:

af-cs-0173.000 (2001), Domain-based rerouting for active point-to-point calls version 1.0 for AINI

E.3 The PICS proforma

E.3.1 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No) _____

NOTE: Answering "No" to this question indicates non-conformance to the ATM Forum “Domain-based rerouting for active point-to-point calls version 1.0” specification for AINI. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is non-conforming, on pages attached to the ICS proforma.

E.3.2 Instructions for Completing the PICS Proforma

The supplier of the implementation shall complete the PICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support column entries provided, using the specified notation.

The supplier of the implementation shall fill in the support column. The following common notations, defined in ISO-IEC 9646-7 [A.3], are used for the support column:

Y or y	supported by the implementation.
N or n	not supported by the implementation.
N/A, n/a or -	no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).

The following notations, defined in ISO/IEC 9646-7 [A.3] are used for the status column:

M	mandatory - the capability is required to be supported.
O	optional - the capability may be supported or not.
N/A	not applicable - in the given context, it is impossible to use the capability.
X	prohibited (excluded) - there is a requirement not to use this capability in the given context.
O.i	qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer, which identifies a unique group of related optional items and the logic of their selection, which is defined immediately following the table.

Table E.1 Roles

Item	**Roles** Does the implementation support …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
E1-1	The negotiation of rerouting services?	1.1	M		Yes___ No___
E1-2	The procedures at a node between two inter-domain interfaces?	6.5	M		Yes___ No___
Comment:					

Table E.2 Major capabilities of the rerouting services negotiation

Item	**Major capabilities of the rerouting services negotiation** Does the implementation …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
E2-1	Support the negotiation of the rerouting services for a point-to-point SVCC?	1.1	M		Yes___ No___
E2-2	Support the negotiation of the rerouting services for a point-to-point soft PVCC?	1.1	M	OPT_7/PNNI Errata &	Yes___ No___

				PICS	
E2-3	Support the negotiation of the rerouting services for a point-to-point SVPC?	1.1	M	OPT_6/PNNI Errata & PICS	Yes___ No___
E2-4	Support the negotiation of the rerouting services for a point-to-point soft PVPC?	1.1	M	OPT_7/PNNI Errata & PICS	Yes___ No___
E2-5	Support the negotiation of the hard rerouting service?	1.1	M		Yes___ No___
E2-6	Support the negotiation of the asymmetric soft rerouting service?	1.1	M		Yes___ No___
E2-7	Support the negotiation of the symmetric soft rerouting service?	1.1	M		Yes___ No___
E2-8	Support the request of inter-domain rerouting services on behalf of the source end-system?	6.5.1	M		Yes___ No___
E2-9	Support the request of inter-domain rerouting services for originating SVCC?	6.5.1	M		Yes___ No___
E2-10	Support the request of inter-domain rerouting services for originating soft PVCC?	6.5.1	M	E2-2	Yes___ No___
E2-11	Support the request of inter-domain rerouting services for originating SVPC?	6.5.1	M	E2-3	Yes___ No___
E2-12	Support the request of inter-domain rerouting services for originating soft PVPC?	6.5.1	M	E2-4	Yes___ No___
Comments:					

Table E.3 Coding of the Rerouting services IE

Item	**Format and coding** Does the implementation …	**Reference**	**Status**	**Condition for status**	**Support**
E3-1	Support the coding of the Rerouting services information element as specified in section 5.1?	5.1	M		Yes___ No___
E3-2	Set the action indicator to "discard information element and proceed" in the Rerouting services IE when adding this IE to an AINI signalling message?	10.1, 6	M		Yes___ No___
E3-3	Set to 1 bit 4 (i.e. pass along request) and bit 5 (i.e. flag) of the IE instruction field in the Rerouting services IE when adding this IE to an AINI signalling message?	10.1, 6	M		Yes___ No___
Comments:					

Table E.4 Coding of the Rerouting cause IE

Item	**Format and coding** Does the implementation …	**Reference**	**Status**	**Condition for status**	**Support**
E4-1	Support the coding of the Rerouting cause information element as specified in section 5.3?	5.3	M		Yes___ No___
E4-2	Set the action indicator to "discard information element and proceed" in the Rerouting cause IE when adding this IE to an AINI signalling message?	10.1, 6	M		Yes___ No___
E4-3	Set to 1 bit 4 (i.e. pass along request) and bit 5 (i.e. flag) of the IE instruction field in the Rerouting cause IE when adding this IE to an AINI signalling message?	10.1, 6	M		Yes___ No___
Comments:					

Table E.5 Supported Messages

Item	Messages and IE support Does the implementation support …	Reference	Sta-tus	Condition for status	Support
E5-1	Rerouting services IE in the CONNECT message?	8.1.1	M		Yes___ No___
E5-2	Rerouting cause IE in the RELEASE message?	8.1.2	M		Yes___ No___
E5-3	Rerouting cause IE in the RELEASE COMPLETE message?	8.1.3	M		Yes___ No___
E5-4	Rerouting services IE in the SETUP message?	8.1.4	M		Yes___ No___
Comments:					

Table E.6 Procedures at a node between two inter-domain interfaces

Item	Procedures at a node between two inter-domain interfaces Does the implementation…	Reference	Sta-tus	Condition for status	Support
E6-1	Forward the Rerouting services IE with the Inter-domain rerouting services field passed on unmodified, and the Inter-domain rerouting capabilities field passed on unmodified, and the Intra-domain rerouting capabilities field cleared when it receives a setup indication with a Rerouting services IE from an inter-domain interface, and the setup request is to be progressed to an inter-domain interface?	6.5.1	M		Yes___ No___
E6-2	Add a Rerouting services IE, clear all its fields and indicate the request for one or more inter-domain or intra-domain rerouting services when it receives a setup indication without a Rerouting services IE from an inter-domain interface, and the setup request is to be progressed to an inter-domain interface, and it wishes to request one or more rerouting services?	6.5.1	M		Yes___ No___
E6-3	Forward the Rerouting services IE without modification when it receives a connect indication with a Rerouting services IE from an inter-domain interface, and the connect request is to be progressed to an inter-domain interface?	6.5.1	M		Yes___ No___
E6-4	Reject the setup indication with a Rerouting cause IE set to cause #7 and a Crankback IE set to cause #63 when the setup indication is received from an inter-domain interface and the setup indication contains a Rerouting IE with a Rerouting control octet group, and the setup request is to be progressed to an inter-domain interface?	6.5.2	M		Yes___ No___
E6-5	Discard the Rerouting IE when it receives a connect indication with a Rerouting IE from an inter-domain interface, and the connect request is to be progressed to an inter-domain interface?	6.5.2	M		Yes___ No___
E6-6	Forward the Rerouting cause IE without modification when it receives a release indication with a Rerouting cause IE from an inter-domain interface, and the release request is to be progressed to an inter-domain interface?	6.5.3	M		Yes___ No___
E6-7	Perform no content validation on the Rerouting cause IE other than verifying the maximum information element length when it receives a release indication with a Rerouting cause IE from an inter-domain interface, and the release request is to be progressed to an inter-domain interface?	6.5.3	M		Yes___ No___
Comments:					

Annex F Domain-based rerouting PICS Proforma for UNI 4.0

F.1 Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a telecommunication specification. Such a statement is called a Protocol Implementation Conformance Statement (PICS).

F.1.1 Scope

The present document provides the Protocol Implementation Conformance Statement (PICS) proforma for the ATM Forum "Domain-based rerouting for point-to-point active calls version 1.0" for UNI 4.0, defined in "af-cs-0173.000", in compliance with the relevant requirements, and in accordance with the relevant guidelines, given in ISO/IEC 9646-7 [A.3].

F.1.2 References

[A.1] af-cs-0173.000: 2001, ATM Forum, Domain-based rerouting for active point-to-point calls version 1.0.

[A.2] ISO/IEC 9646-1: 1994, Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 1: General concepts (see also ITU-T Recommendation X.290 (1995)).

[A.3] ISO/IEC 9646-7: 1995, Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements (see also ITU-T Recommendation X.296 (1995)).

[A.4] ISO/IEC 9646-3: 1998, Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN) (see also ITU-T Recommendation X.292 (1998)).

F.1.3 Definitions

This Specification uses the following terms defined in ISO/IEC 9646-1 [A.2]:

Implementation Conformance Statement (ICS): A statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented.

ICS proforma: A document, in the form of a questionnaire, which when completed for an implementation or system becomes an ICS.

F.1.4 Abreviations

ASN.1	Abstract Syntax Notation One
ATS	Abstract Test Suite
ICS	Implementation Conformance Statement
PICS	Protocol Implementation Conformance Statement
IE	Information Element
IUT	Implementation under Test
SUT	System Under Test

F.1.5 Conformance

This PICS does not modify any of the requirements detailed in the ATM Forum “Domain-based rerouting for active point-to-point calls version 1.0”. In case of apparent conflict between the statements in the base specification and the annotations of "M" (mandatory) and "O" (optional) in this PICS, the text of the base specification takes precedence.

For each protocol implementation for which conformance is claimed to the ATM Forum “Domain-based rerouting for active point-to-point calls version 1.0”, the supplier is required to complete a copy of the PICS proforma provided in this document and is required to provide the information necessary to identify both the supplier and the implementation.

F.2 Identification of the Implementation

F.2.1 Date of the Statement

_____

F.2.2 Implementation Under Test (IUT) Identification

IUT Name: _____

IUT Version: _____

_____

F.2.3 System Under Test (SUT) Identification

SUT Name: _____

Hardware Configuration: _____

_____

_____

Operating System: _____

F.2.4 Product supplier

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

E-mail Address: _____

Additional Information: _____

F.2.5 Client (if different from product supplier)

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

E-mail Address: _____

Additional Information: _____

F.2.6 ICS Contact Person

Name: _____

Address: _____

_____

Telephone Number: _____

Facsimile Number: _____

E-mail Address: _____

Additional Information: _____

_____

_____

_____

F.2.7 Identification of the Implementation

This ICS proforma applies to the following specification:

af-cs-0173.000 (2001), Domain-based rerouting for active point-to-point calls version 1.0 for UNI 4.0

F.3 The PICS proforma

F.3.1 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No) _____

NOTE: Answering "No" to this question indicates non-conformance to the ATM Forum “Domain-based rerouting for active point-to-point calls version 1.0” specification for UNI 4.0. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is non-conforming, on pages attached to the ICS proforma.

F.3.2 Instructions for Completing the PICS Proforma

The supplier of the implementation shall complete the PICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support column entries provided, using the specified notation.

The supplier of the implementation shall fill in the support column. The following common notations, defined in ISO-IEC 9646-7 [A.3], are used for the support column:

Y or y	supported by the implementation.
N or n	not supported by the implementation.
N/A, n/a or -	no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).

The following notations, defined in ISO/IEC 9646-7 [A.3] are used for the status column:

M	mandatory - the capability is required to be supported.
O	optional - the capability may be supported or not.
N/A	not applicable - in the given context, it is impossible to use the capability.
X	prohibited (excluded) - there is a requirement not to use this capability in the given context.
O.i	qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer, which identifies a unique group of related optional items and the logic of their selection, which is defined immediately following the table.

Table F.1 Roles

Item	**Roles** Does the implementation support …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
F1-1	The negotiation of rerouting services?	1.1	M		Yes___ No___
F1-2	Procedures at the user side		O.1		Yes___ No___
F1-3	Procedures at the network side		O.1		Yes___ No___
Comment: O.1: Mandatory to support one of these roles					

Table F.2 Major capabilities of the rerouting services negotiation

Item	**Major capabilities of the rerouting services negotiation** Does the implementation …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
F2-1	Support the negotiation of the rerouting services for a point-to-point SVCC?	1.1	M		Yes___ No___

F2-2	Support the negotiation of the rerouting services for a point-to-point SVPC?	1.1	M		Yes___ No___
F2-3	Support the negotiation of the hard rerouting service?	1.1	M		Yes___ No___
F2-4	Support the request of inter-domain rerouting services at the user side of the originating interface?	9.2.1	M	F1-2	Yes___ No___
F2-5	Support the activation of inter-domain rerouting services at the user side of the destination interface?	9.2.2	M	F1-2	Yes___ No___
F2-6	Support the request of inter-domain rerouting services on behalf of the source end-system at the network side of the originating interface?	6.2.1	M	F1-3	Yes___ No___
F2-7	Support the activation of inter-domain rerouting services on behalf of the destination end-system at the network side of the destination interface?	6.2.1	M	F1-3	Yes___ No___
Comments:					

Table F.3 Coding of the Rerouting services IE

Item	**Format and coding** Does the implementation …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
F3-1	Support the coding of the Rerouting services information element as specified in section 5.1?	5.1	M		Yes___ No___
F3-2	Set the action indicator to "discard information element and proceed" in the Rerouting services IE when adding this IE to a UNI signalling message?	10.1, 6	M		Yes___ No___
Comments:					

Table F.4 Coding of the Rerouting cause IE

Item	**Format and coding** Does the implementation …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
F4-1	Support the coding of the Rerouting cause information element as specified in section 5.3?	5.3	M		Yes___ No___
F4-2	Set the action indicator to "discard information element and proceed" in the Rerouting cause IE when adding this IE to a UNI signalling message?	10.1, 6	M		Yes___ No___
Comments:					

Table F.5 Supported Messages

Item	**Messages and IE support** Does the implementation support …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
F5-1	Rerouting services IE in the CONNECT message?	9.1.1	M		Yes___ No___
F5-2	Rerouting cause IE in the RELEASE message?	9.1.2	M		Yes___ No___
F5-3	Rerouting cause IE in the RELEASE COMPLETE message?	9.1.3	M		Yes___ No___
F5-4	Rerouting services IE in the SETUP message?	9.1.4	M		Yes___ No___
Comments:					

Table F.6 Call establishment at the originating interface - user side

Item	**Call establishment at the originating interface** Does the implementation of the user side …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
F6-1	Include the Rerouting services IE in the SETUP message sent to the network side with the Inter-domain rerouting	9.2.1	M	F1-2	Yes___ No___

	services and the Inter-domain rerouting capabilities fields forwarded unchanged, and with the Intra-domain rerouting services and the Intra-domain rerouting capabilities fields set to zero if the user side receives a setup request containing a Rerouting services IE?				
F6-2	Add a Rerouting services IE in the SETUP message that is transferred to the network side, if the user side receives a setup request which does not contain a Rerouting services IE and wishes to request one or more inter-domain rerouting services?	9.2.1	M	F1-2	Yes___ No___
F6-3	Code the request for inter-domain rerouting services in the Inter-domain rerouting services field of the Rerouting services IE as described in section 5.1?	9.2.1	M	F1-2	Yes___ No___
Comments:					

Table F.7 Call establishment at the destination interface - user side

Item	**Call establishment at the destination interface** Does the implementation of the user side …	**Reference**	**Sta-tus**	**Condition for status**	**Support**
F7-1	Forward the Rerouting services IE to the network side with the Inter-domain rerouting services capabilites, the Intra-domain rerouting services and the Intra-domain rerouting capabilities fields set to zero when the user side receives a connect request containing a Rerouting services IE?	9.2.2	M	F1-2	Yes___ No___
F7-2	Add the Rerouting services IE to the CONNECT message and activate the rerouting service in the Inter-domain rerouting services field of the Rerouting service IE when the user side receives a connect request which does not contain a Rerouting services IE, and inter-domain rerouting service was requested in the SETUP message received by the user, and the capability to support that service has been advertised by the network?	9.2.2	M	F1-2	Yes___ No___
F7-3	Activate a rerouting service in the Rerouting services IE when the capability to support that service has NOT been advertised by the network in the SETUP message received by the user?	9.2.2	X	F1-2	Yes___ No___
F7-4	Code the inter-domain rerouting services to be activated in the Inter-domain rerouting services field of the Rerouting services IE as described in section 5.1?	9.2.2	M	F1-2	Yes___ No___
Comments:					

Table F.8 Call establishment at the originating interface - network side

Item	**Call establishment at the originating interface** Does the implementation of the network side…	**Reference**	**Sta-tus**	**Condition for status**	**Support**
F8-1	Ignore the Rerouting services IE when the network receives a SETUP message containing a Rerouting services IE requesting a rerouting service for which the user is not registered?	9.2.1	M	F1-3	Yes___ No___
F8-2	Send a STATUS message to the user with Cause No. 50 "requested facility not subscribed" with a diagnostic field containing the IE identifier of the Rerouting services IE when the network receives a SETUP message containing a Rerouting services IE requesting a rerouting service for which the user is not registered?	9.2.1	O	F1-3	Yes___ No___
F8-3	Forward the Rerouting services IE without modification to the user side when the network side receives a connect	6.2.2,	M	F1-3	Yes___ No___

	request which contains a Rerouting services IE?	6.5.1			
Comments:					

Table F.9 Call establishment at the destination interface - network side

Item	Call establishment at the destination interface Does the implementation of the network side …	Reference	Sta-tus	Condition for status	Support
F9-1	Forward the Rerouting services IE without modification to the user side when the network side receives a setup request which contains a Rerouting services IE?	6.3.1, 6.5.1	M	F1-3	Yes___ No___
F9-2	Ignore the Rerouting services information element when the network side receives a CONNECT message requesting an inter-domain rerouting service which it did not advertise?	9.2.2	O	F1-3	Yes___ No___
F9-3	Send a STATUS message to the user with Cause No. 69 "requested facility not implemented" with a diagnostic field containing the information element identifier of the Rerouting services IE when the network side receives a CONNECT message requesting an inter-domain rerouting service which it did not advertise?	9.2.2	O	F1-3	Yes___ No___
Comments:					

Table F.10 Call clearing initiated by the network

Item	Call clearing initiated by the network Does the implementation …	Reference	Sta-tus	Condition for status	Support
F10-1	Forward the Rerouting cause IE without modification to the user side when the network side receives a release request which contains a Rerouting cause IE?	6.5.3	M	F1-3	Yes___ No___
F10-2	Perform no content validation on the Rerouting cause IE other than verifying the maximum information element length when the network receives a release request with a Rerouting cause IE?	6.5.3	M	F1-3	Yes___ No___
Comments:					

Appendix A Guidelines on contents of rerouting SETUP messages

[Informative]

The following information elements should be included in a rerouting SETUP message:

- Any information elements that would affect the networks choice of routes or access to resources.

  e.g. If a network has a policy of reserving resources for Soft PVCs then it is essential that a rerouting SETUP message for a Soft PVC contains an indication that the message is for a Soft PVC.

  e.g. If a network provides VPN capabilities then whatever mechanism it uses to identify that a call setup is allowed access to VPN resources should be included in a rerouting SETUP message.
- If a network collects billing related information at a transit node between the edge nodes of a rerouting domain then any information needed for the billing record should be included in the rerouting SETUP message – e.g. NCCI, calling party number of the originating user.

The following information elements need not be included in a rerouting SETUP message:

- Information elements that are transported end-to-end transparently by the network: e.g. B-LLI information element.

Appendix B Interaction between hard rerouting and asymmetric soft rerouting (Rerouting Finite State Machines)

[Informative]

This appendix illustrates with the mean of a finite state machine the most significant events and an overview of the actions when both the hard rerouting and the asymmetric soft rerouting services are activated for a call. The normative procedures for the rerouting FSMs are contained in section 6.

B.1 At the source node

The rerouting finite state machine of the source node contains the following states:

* Null
* Rerouting Idle
* Hard Reroute Triggered
* Hard Reroute Proceeding
* Soft Reroute Triggered
* Soft Reroute Proceeding

The rerouting finite state machine is driven by the following input parameters:

- Signalling event:
  - Signalling message with the content of the information elements and the associated connection (rerouting/incumbent)
  - Timers
- External event

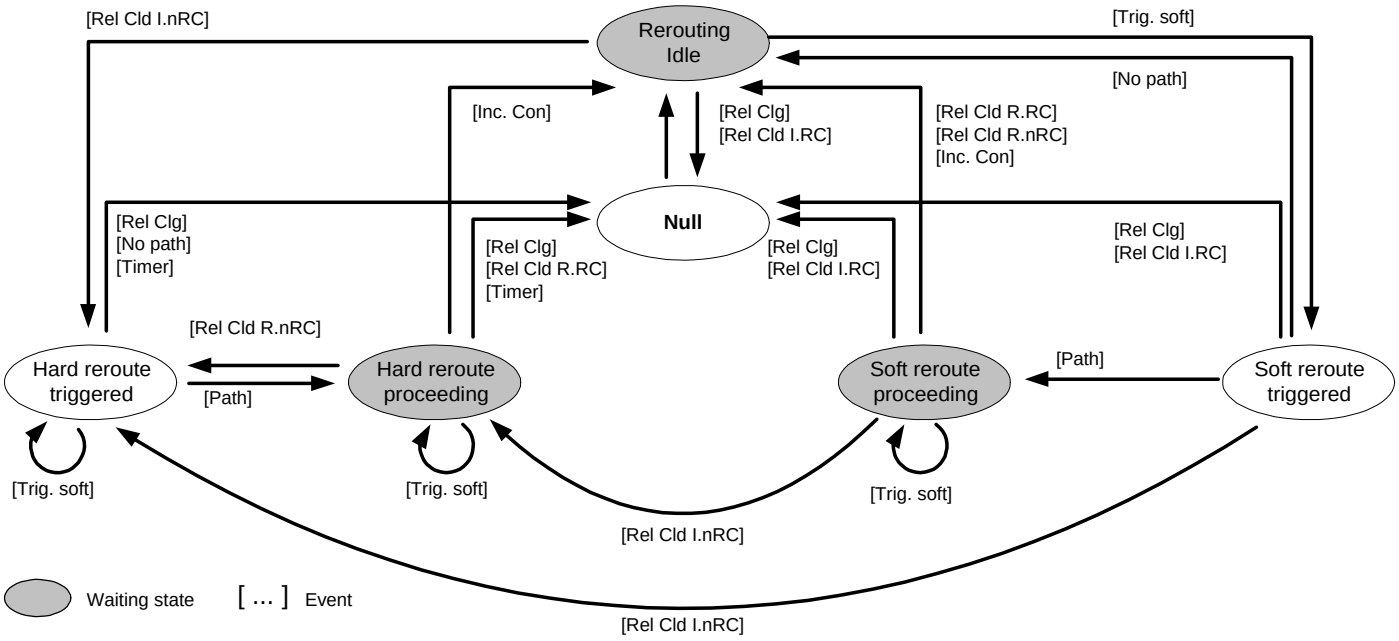

Figure Appendix B-1: Rerouting state transitions at the source node (hard and asymmetric soft rerouting)

Table Appendix B-1: Rerouting Finite State Machine at the source node (hard and asymmetric soft rerouting)

Input Event			Current Rerouting state				
Name	Description	Type of Connection	Rerouting Idle	Hard Reroute Triggered	Hard Reroute Proceeding	Soft Reroute Triggered	Soft Reroute Proceeding
Rel Clg	Release indication from calling side	N/A	Snp[8] 0/ Null	Snp 1/ Null	Snp 2/ Null	Snp 0/ Null	Snp 3/ Null
Rel Cld I.nRC	Release indication from called side without a Rerouting cause IE	incumbent	Snp 8/ Hard Reroute Triggered	FSM-ERR	FSM-ERR	Snp 8/ Hard Reroute Triggered	Snp 9/ Hard Reroute Proceeding
Rel Cld R.nRC		rerouting	FSM-ERR	FSM-ERR	Snp 10/ Hard Reroute Triggered (Note 1)	FSM-ERR	Snp 11/ Rerouting Idle (Note 1)
Rel Cld I.RC	Release indication from called side with Rerouting cause IE	incumbent	Snp 4/ Null	FSM-ERR	FSM-ERR	Snp 4/ Null	Snp 5/ Null
Rel Cld R.RC		rerouting	FSM-ERR	FSM-ERR	Snp 6/ Null	FSM-ERR	Snp 11/ Rerouting Idle
Trig. Soft	Trigger of soft reroute	N/A	Snp 10/ Soft Reroute Triggered	Snp 13/ Hard Reroute Triggered	Snp 13/ Hard Reroute Proceeding	Snp 13/ Soft Reroute Triggered	Snp 13/ Soft Reroute Proceeding
Path	Path found for reroute connection	N/A	FSM-ERR	Snp 14/ Hard Reroute Proceeding	FSM-ERR	Snp 15/ Soft Reroute Proceeding	FSM-ERR
No path	No path found for reroute connection	N/A	FSM-ERR	Snp 16/ Null	FSM-ERR	Snp 11/ Rerouting Idle	FSM-ERR
Inc. Con	Incoming reroute connnect indication	rerouting	FSM-ERR	FSM-ERR	Snp 17/ Rerouting Idle	FSM-ERR	Snp 18/ Rerouting Idle
Timer	Hard rerouting timer expired	N/A	FSM-ERR	Snp 19/ Null	Snp 20/ Null	FSM-ERR	FSM-ERR

Note 1: If the Crankback IE is included in the release indication, apply the normal crankback procedures to the connection. No change in the rerouting state.

[8] Source Node Procedure

Table Appendix B-2: Rerouting State Machine Procedures at the source node (hard and asymmetric soft rerouting)

FSM-ERR		Should not occur, action is implementation specific
Snp 0	**Action**	Release the incumbent connection in the direction of the called party with a Rerouting cause IE set to cause #1 or #2 in the release request.
Snp 1	**Action:**	Clear the hard rerouting timer.
Snp 2	**Action**	Release the rerouting connection in the direction of the called party with a Rerouting cause IE set to cause #1 or #2 in the release request. Clear the hard rerouting timer.
Snp 3	**Action:**	Release both the incumbent and rerouting connections in the direction of the called party with a Rerouting cause IE set to cause #1 or #2 in both release requests.
Snp 4	**Action:**	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #1 or #2 in the release request.
Snp 5	**Action:**	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #1 or #2 in the release request. Release the rerouting connection in the direction of the called party.
Snp 6	**Action:**	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #1 or #2 in the release request. Clear the hard rerouting timer.
Snp 7	**Action:**	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #1 or #2 in the release request. Release the incumbent connection in the direction of the called party.
Snp 8	**Action:**	Start the hard rerouting timer. Compute a new path to reroute the connection.
Snp 9	**Action:**	Start the hard rerouting timer. Do not disturb the existing rerouting operation (i.e. no new reroute setup request).
Snp 10	**Action:**	Compute a new path to reroute the connection.
Snp 11	**Action:**	Abort the rerouting operation. No change to the call/connection state of the incumbent connection.
Snp 13	**Action**	Ignore the soft reroute trigger
Snp 14	**Action:**	Send a hard reroute setup request with an incremented incarnation number.
Snp 15	**Action:**	Send a soft reroute setup request with an incremented incarnation number.
Snp 16	**Action**	Release the connection in the direction of the calling party with a Rerouting Cause IE set to cause #2 in the release request. Clear the hard rerouting timer.
Snp 17	**Action:**	Switch the connection point of the inter-domain interface from the incumbent connection to the rerouting connection. Clear the hard rerouting timer.
Snp 18	**Action:**	Switch the connection point of the inter-domain interface from the incumbent connection to the rerouting connection. Release the incumbent connection in the direction of the called party with a Rerouting cause IE set to cause #4 in the release request.
Snp 19	**Action:**	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #2 in the release request.
Snp 20	**Action**	Release the connection in direction of the calling party and the rerouting connection in the direction of the called party with a Rerouting cause IE set to cause #2 in both release requests.

B.2 At the destination node

The rerouting finite state machine of the destination node contains the following states:

* Null
* Rerouting Idle
* Hard Reroute Indicated
* Hard Reroute Initiated
* Soft Reroute Initiated
* Awaiting Switchover

The rerouting finite state machine is driven by the following input parameters:

- Signalling event:
  - Signalling message with the content of the information elements and the associated connection (rerouting/incumbent)
  - Timers
- External event

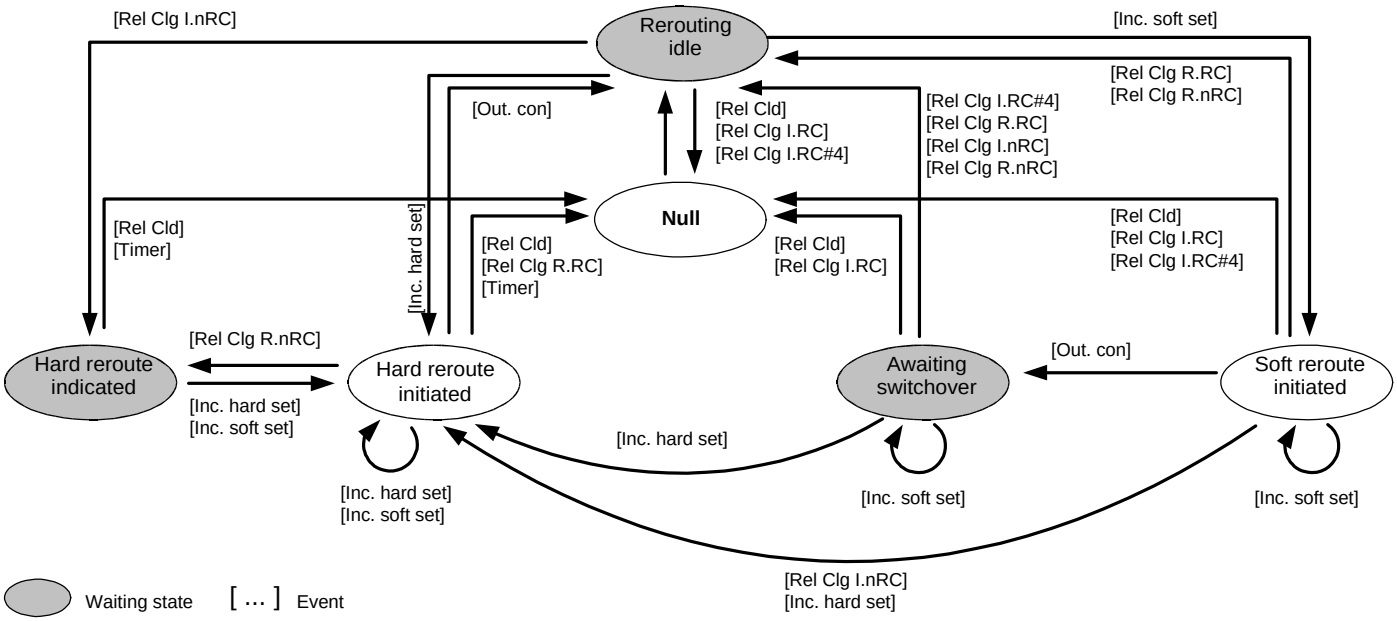

Figure Appendix B-2: Rerouting state transitions at the destination node (hard and asymmetric soft rerouting)

Table Appendix B-3: Rerouting Finite State Machine at the destination node hard and asymmetric soft rerouting)

Input Event			Current Rerouting state				
Name	Description	Type of Connection	Rerouting Idle	Hard Reroute Indicated	Hard Reroute Initiated	Soft Reroute Initiated	Awaiting Switchover
Rel Cld	Release indication from called side	N/A	Dnp[9] 0/ Null	Dnp 1/ Null	Dnp 2/ Null	Dnp 3/ Null	Dnp 3/ Null
Rel Clg I.nRC	Release indication from calling side without a Rerouting cause IE	incumbent	Dnp 8/ Hard Reroute Indicated	FSM-ERR	FSM-ERR	Dnp 9/ Hard Reroute Initiated	Dnp 10/ Rerouting Idle
Rel Clg R.nRC		rerouting	FSM-ERR	FSM-ERR	Dnp 11/ Hard Reroute Indicated	Dnp 12/ Rerouting Idle	Dnp 12/ Rerouting Idle
Rel Clg I.RC#4	Release indication from calling side with Rerouting cause IE, cause = #4 (Note 2)	incumbent	Dnp 4/ Null	FSM-ERR	FSM-ERR	Dnp 5/ Null	Dnp 10/ Rerouting Idle
Rel Clg I.RC	Release indication from calling side with Rerouting cause IE, cause ≠ #4	incumbent	Dnp 4/ Null	FSM-ERR	FSM-ERR	Dnp 5/ Null	Dnp 5/ Null
Rel Clg R.RC		rerouting	FSM-ERR	FSM-ERR	Dnp 6/ Null	Dnp 12/ Rerouting Idle	Dnp 7/ Null
Inc. hard Set.	Incoming hard reroute setup indication (Note 1)	rerouting	Dnp 15/ Hard Reroute Initiated	Dnp 16/ Hard Reroute Initiated	Dnp 17/ Hard Reroute Initiated	Dnp 18/ Hard Reroute Initiated	Dnp 18/ Hard Reroute Initiated
Inc. soft Set.	Incoming soft reroute setup indication (Note 1)	rerouting	Dnp 19/ Soft Reroute Initiated	Dnp 16/ Hard Reroute Initiated	Dnp 17/ Hard Reroute Initiated	Dnp 17/ Soft Reroute Initiated	Dnp 17/ Soft Reroute Initiated
Out. Con.	Outgoing reroute connect request	rerouting	FSM-ERR	FSM-ERR	Dnp 21/ Rerouting Idle	Dnp 22/ Awaiting Switchover	FSM-ERR
Timer	Hard rerouting timer expired	N/A	FSM-ERR	Dnp 23/ Null	Dnp 24/ Null	FSM-ERR	FSM-ERR

Note 1: In order to accept the reroute setup indication, both of the following criteria MUST be satisfied:

- The endpoint key contained in the reroute setup indication matches the endpoint key in the initial setup indication
- The incarnation number contained in the reroute setup indication is greater than the remote incarnation number

If either of these criteria fails, the destination node shall reject the reroute setup indication and not impact the FSM.

Note 2: i.e. the Rerouting cause IE contains a Rerouting release cause set to #4 "*rerouting operation complete*".

Table Appendix B-4: Rerouting State Machine Procedures at the destination node (hard and asymmetric soft rerouting)

FSM-ERR		**Should not occur, action is implementation specific**
Dnp 0	**Action:**	Release the connection in the direction of the calling party with a Rerouting cause IE set to cause #1 or #2 in the release request.
Dnp 1	**Action:**	Clear the hard rerouting timer.
Dnp 2	**Action:**	Release the rerouting connection in the direction of the calling party with a Rerouting cause IE set to cause #1 or #2 in the release request. Clear the hard rerouting timer.

[9] Destination Node Procedure

Dnp 3	**Action:**	Release the both the incumbent and rerouting connections in the direction of the calling party with a Rerouting cause IE set to cause #1 or #2 in both release requests.
Dnp 4	**Action:**	Release the connection in the direction of the called party with a Rerouting cause IE set to cause #1 or #2 in the release request.
Dnp 5	**Action:**	Release the connection in the direction of the called party with a Rerouting cause IE set to cause #1 or #2 in the release request. Release the rerouting connection in the direction of the calling party.
Dnp 6	**Action:**	Release the connection in the direction of the called party with a Rerouting cause IE set to cause #1 or #2 in the release request. Clear the hard rerouting timer.
Dnp 7	**Action:**	Release the connection in the direction of the called party with a Rerouting cause IE set to cause #1 or #2 in the release request. Release the incumbent connection in the direction of the calling party.
Dnp 8	**Action:**	Start the hard rerouting timer.
Dnp 9	**Action:**	Start the hard rerouting timer and continue processing the received reroute setup indication.
Dnp 10	**Action:**	Switch the connection point of the inter-domain interface from the incumbent connection to the rerouting connection.
Dnp 11	**Action:**	The hard rerouting timer continues to run.
Dnp 12	**Action:**	Abort the rerouting operation. No change to the call/connection state of the incumbent connection.
Dnp 15	**Action**	Release the incumbent connection in the direction of the calling party. Start the hard rerouting timer. Process the hard reroute setup indication.
Dnp 16	**Action:**	Process the reroute setup indication.
Dnp 17	**Action:**	Release the older rerouting connection in the direction to the calling party. Process the new setup indication.
Dnp 18	**Action**	Release the incumbent connection in the direction of the calling party. Release the previous rerouting call/connection in the direction of the calling party. Start the hard rerouting timer and process the hard reroute setup indication.
Dnp 19	**Action**	Process the soft reroute setup indication.
Dnp 21	**Action:**	Send a connect request. Switch the connection point of the inter-domain interface from the incumbent connection to the rerouting connection. Clear the hard rerouting timer.
Dnp 22	**Action:**	Send a connect request.
Dnp 23	**Action:**	Release the connection in the direction to the called party with a Rerouting cause IE set to cause #2 in the release request.
Dnp 24	**Action:**	Release the rerouting connection in the direction of the calling party and the rerouting connection in the direction of the called party with a Rerouting cause IE set to cause #2 in both release requests.

Appendix C Interaction between hard rerouting and symmetric soft rerouting (Finite State Machines)

[Informative]

This appendix illustrates with the mean of a finite state machine the most significant events and an overview of the actions when both the hard rerouting and the symmetric soft rerouting services are activated for a call. The normative procedures for the rerouting FSMs are contained in section 6.

Table Appendix C-1 and Table Appendix C-3 are extensions of Table Appendix B-1 and Table Appendix B-3. The extension is indicated by a dotted line in the tables.

C.1 At the source node

The rerouting finite state machine of the source node contains the following states:

* Null
* Rerouting Idle
* Hard Reroute Triggered
* Hard Reroute Proceeding
* Soft Reroute Triggered
* Soft Reroute Proceeding
* Soft Reroute Initiated
* Awaiting Switchover

The rerouting finite state machine is driven by the following input parameters:

- Signalling event:
  - Signalling message with the content of the information elements and the associated connection (rerouting/incumbent)
  - Timers
- External event

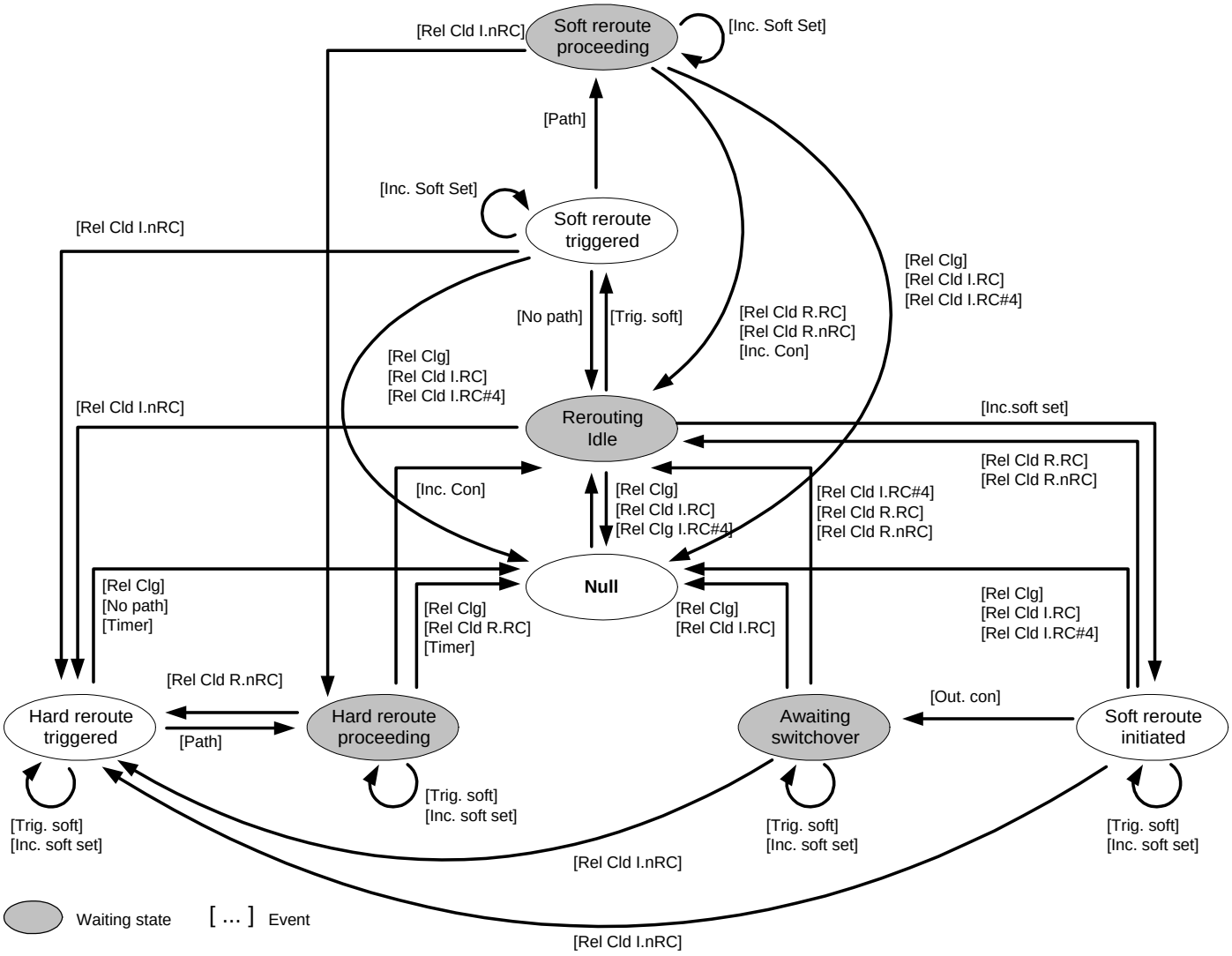

Figure Appendix C-1: Rerouting state transitions at the source node (hard and symmetric soft rerouting)

Table Appendix C-1: Rerouting Finite State Machine at the source node (hard and symmetric soft rerouting)

Input Event			Current Rerouting state						
Name	Description	Type of Connection	Rerouting Idle	Hard Reroute Triggered	Hard Reroute Proceeding	Soft Reroute Triggered	Soft Reroute Proceeding	Soft Reroute Initiated	Awaiting switchover
Rel Clg	Release indication from calling side	N/A	Snp 0/ Null	Snp 1/ Null	Snp 2/ Null	Snp 0/ Null	Snp 3/ Null	Snp 3/ Null	Snp 3/ Null
Rel Cld I.nRC	Release indication from called side without a Rerouting cause IE	incumbent	Snp 8/ Hard Reroute Triggered	FSM-ERR	FSM-ERR	Snp 8/ Hard Reroute Triggered	Snp 9/ Hard Reroute Proceeding	Snp 22/ Hard Reroute Triggered	Snp 21/ Rerouting Idle
Rel Cld R.nRC		rerouting	FSM-ERR	FSM-ERR	Snp 10/ Hard Reroute Triggered (Note 1)	FSM-ERR	Snp 11/ Rerouting Idle (Note 1)	Snp 11/ Rerouting Idle	Snp 11/ Rerouting Idle
Rel Cld I.RC#4	Release indication from called side with Rerouting cause IE, cause = #4 (Note 4)	incumbent	Snp 4/ Null	FSM-ERR	FSM-ERR	Snp 4/ Null	Snp 5/ Null	Snp 5/ Null	Snp 21/ Rerouting Idle
Rel Cld I.RC	Release indication from called side with Rerouting cause IE, cause ≠ #4	incumbent	Snp 4/ Null	FSM-ERR	FSM-ERR	Snp 4/ Null	Snp 5/ Null	Snp 5/ Null	Snp 5/ Null
Rel Cld R.RC		rerouting	FSM-ERR	FSM-ERR	Snp 6/ Null	FSM-ERR	Snp 11/ Rerouting Idle	Snp 11/ Rerouting Idle	Snp 7/ Null
Trig. Soft	Trigger of soft reroute	N/A	Snp 10/ Soft Reroute Triggered	Snp 13/ Hard Reroute Triggered	Snp 13/ Hard Reroute Proceeding	Snp 13/ Soft Reroute Triggered	Snp 13/ Soft Reroute Proceeding	Snp 13/ Soft Reroute Initiated	Snp 13/ Awaiting Switchover
Path	Path found for reroute connection	N/A	FSM-ERR	Snp 14/ Hard Reroute Proceeding	FSM-ERR	Snp 15/ Soft Reroute Proceeding	FSM-ERR	FSM-ERR	FSM-ERR
No path	No path found for reroute connection	N/A	FSM-ERR	Snp 16/ Null	FSM-ERR	Snp 11/ Rerouting Idle	FSM-ERR	FSM-ERR	FSM-ERR
Inc. Con	Incoming reroute connect indication	rerouting	FSM-ERR	FSM-ERR	Snp 17/ Rerouting Idle	FSM-ERR	Snp 18/ Rerouting Idle	FSM-ERR	FSM-ERR
Timer	Hard rerouting timer expired	N/A	FSM-ERR	Snp 19/ Null	Snp 20/ Null	FSM-ERR	FSM-ERR	FSM-ERR	FSM-ERR
Inc. soft Set.	Incoming soft reroute setup indication (Note 3)	rerouting	Snp 24/ Soft Reroute Initiated	Snp 25/ Hard Reroute Triggered	Snp 25/ Hard Reroute Proceeding	Snp 25/ Soft Reroute Triggered	Snp 25/ Soft Reroute Proceeding	Snp 26/ Soft Reroute Initiated	Snp 26/ Soft Reroute Initiated
Out. Con	Outgoing reroute connect request	rerouting	FSM-ERR	FSM-ERR	FSM-ERR	FSM-ERR	FSM-ERR	Snp 27/ Awaiting Switchover	FSM-ERR

Note 1 – Note 2: See Table Appendix B-1

Note 3: In order to accept the reroute setup indication, both of the following criteria MUST be satisfied:

- The endpoint key contained in the reroute setup indication matches the endpoint key in the initial setup indication
- The incarnation number contained in the reroute setup indication is greater than the remote incarnation number

If either of these criteria fails, the source node rejects the reroute setup indication and not impact the FSM.

Note 4: i.e. the Rerouting cause IE contains a Rerouting release cause set to cause #4 "*rerouting operation complete*".

Table Appendix C-2: Rerouting State Machine Procedures at the source node (hard and symmetric soft rerouting)

FSM-ERR		Should not occur, action is implementation specific
Snp 0 – Snp 20	**Action:**	Actions Snp 0 – Snp 20 of Table Appendix B-2 apply.
Snp 21	**Action:**	Switch the connection point of the inter-domain interface from the incumbent connection to the rerouting connection.
Snp 22	**Action:**	Start the hard rerouting timer. Release the rerouting connection in the direction of the called party. Compute a new path to reroute the connection.
Snp 24	**Action:**	Process the soft reroute setup indication.
Snp 25	**Action:**	Reject the setup indication with the Rerouting cause information element set to cause #6 in the release request.
Snp 26	**Action:**	Release the older rerouting connection in the direction of the called party. Process the new soft reroute setup indication.
Snp 27	**Action:**	Send a connect request.

C.2 At the destination node

The rerouting finite state machine of the destination node contains the following states:

* Null
* Rerouting Idle
* Hard Reroute Indicated
* Hard Reroute Initiated
* Soft Reroute Triggered
* Soft Reroute Proceeding
* Soft Reroute Initiated
* Awaiting Switchover

The rerouting finite state machine is driven by the following input parameters:

- Signalling event:
  - Signalling message with the content of the information elements and the associated connection (rerouting/incumbent)

    Timers
- External event

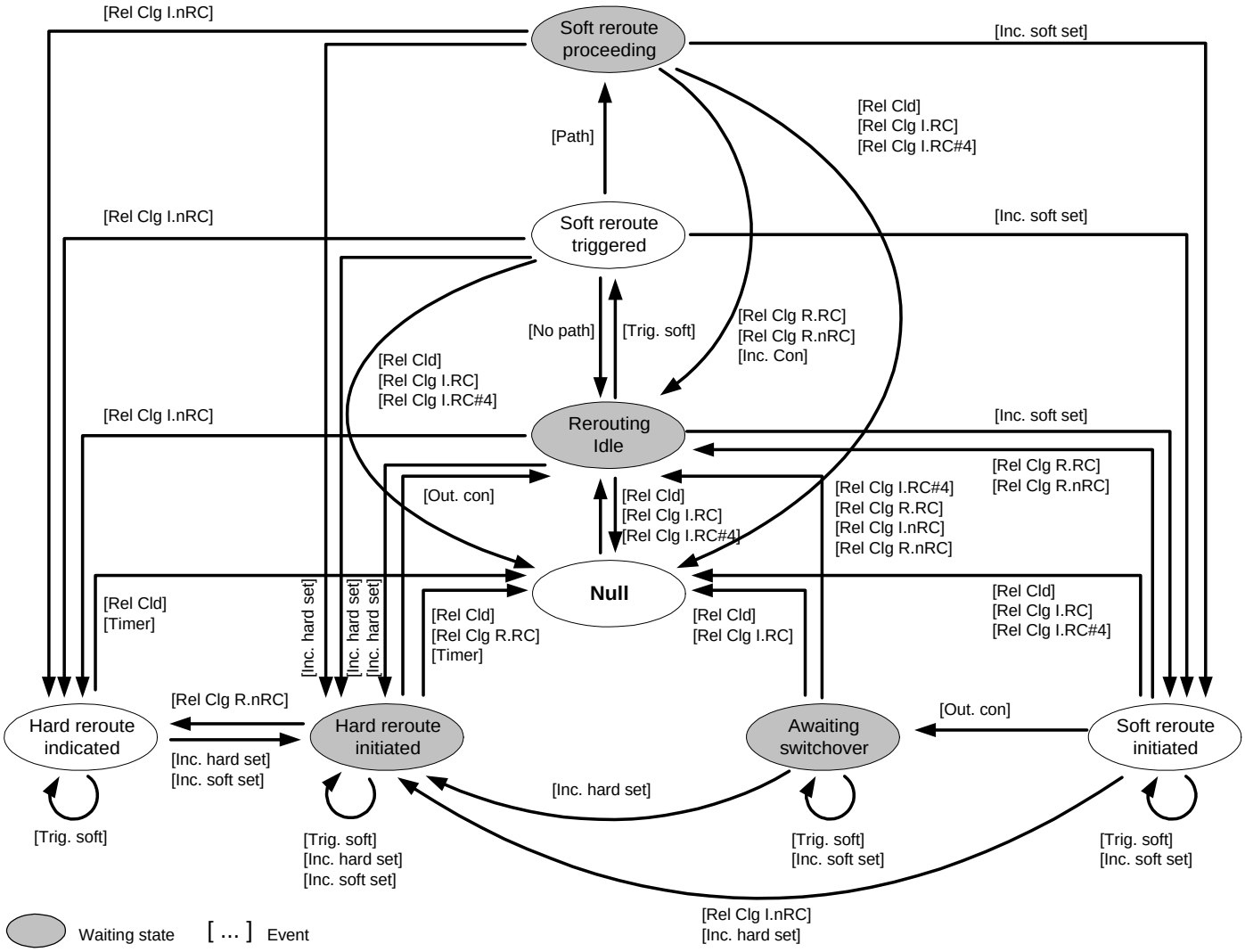

Figure Appendix C-2: Rerouting state transitions at destination node (hard and symmetric soft rerouting)

Table Appendix C-3: Rerouting Finite State Machine at destination node (hard and symmetric soft rerouting)

Input Event			Current Rerouting state						
Name	Description	Type of Connection	Rerouting Idle	Hard Reroute Indicated	Hard Reroute Initiated	Soft Reroute Initiated	Awaiting Switchover	Soft Reroute Triggered	Soft Reroute Proceeding
Rel Cld	Release indication from called side	N/A	Dnp 0/ Null	Dnp 1/ Null	Dnp 2/ Null	Dnp 3/ Null	Dnp 3/ Null	Dnp 0/ Null	Dnp 3/ Null
Rel Clg I.nRC	Release indication from calling side without a Rerouting cause IE	incumbent	Dnp 8/ Hard Reroute Indicated	FSM-ERR	FSM-ERR	Dnp 9/ Hard Reroute Initiated	Dnp 10/ Rerouting Idle	Dnp 8/ Hard Reroute Indicated	Dnp 25/ Hard Reroute Indicated
Rel Clg R.nRC		rerouting	FSM-ERR	FSM-ERR	Dnp 11/ Hard Reroute Indicated	Dnp 12/ Rerouting Idle	Dnp 12/ Rerouting Idle	FSM-ERR	Dnp 12/ Rerouting Idle (Note 3)
Rel Clg I.RC#4	Release indication from calling side with Rerouting cause IE, cause = #4 (Note 2)	incumbent	Dnp 4/ Null	FSM-ERR	FSM-ERR	Dnp 5/ Null	Dnp 10/ Rerouting Idle	Dnp 4/ Null	Dnp 5/ Null
Rel Clg I.RC	Release indication from calling side with Rerouting cause IE, cause ≠ #4	incumbent	Dnp 4/ Null	FSM-ERR	FSM-ERR	Dnp 5/ Null	Dnp 5/ Null	Dnp 4/ Null	Dnp 5/ Null
Rel Clg R.RC		rerouting	FSM-ERR	FSM-ERR	Dnp 6/ Null	Dnp 12/ Rerouting Idle	Dnp 7/ Null	FSM-ERR	Dnp 12/ Rerouting Idle
Inc. hard Set.	Incoming hard reroute setup indication (Note 1)	rerouting	Dnp 15/ Hard Reroute Initiated	Dnp 16/ Hard Reroute Initiated	Dnp 17/ Hard Reroute Initiated	Dnp 18/ Hard Reroute Initiated	Dnp 18/ Hard Reroute Initiated	Dnp 15/ Hard Reroute Initiated	Dnp 18/ Hard Reroute Initiated
Inc. soft Set.	Incoming soft reroute setup indication (Note 1)	rerouting	Dnp 19/ Soft Reroute Initiated	Dnp 16/ Hard Reroute Initiated	Dnp 17/ Hard Reroute Initiated	Dnp 17/ Soft Reroute Initiated	Dnp 17/ Soft Reroute Initiated	Dnp 19/ Soft Reroute Initiated	Dnp 30/ Soft Reroute Initiated
Out. Con.	Outgoing reroute connect request	rerouting	FSM-ERR	FSM-ERR	Dnp 21/ Rerouting Idle	Dnp 22/ Awaiting Switchover	FSM-ERR	FSM-ERR	FSM-ERR
Timer	Hard rerouting timer expired	N/A	FSM-ERR	Dnp 23/ Null	Dnp 24/ Null	FSM-ERR	FSM-ERR	FSM-ERR	FSM-ERR
Trig. Soft	Trigger of soft reroute	N/A	Dnp 26/ Soft Reroute Triggered	Dnp 27/ Hard Reroute Indicated	Dnp 27/ Hard Reroute Initiated	Dnp 27/ Soft Reroute Initiated	Dnp 27/ Awaiting Switchover	Dnp 27/ Soft Reroute Triggered	Dnp 27/ Soft Reroute Proceeding
Path	Path found for reroute connection	N/A	FSM-ERR	FSM-ERR	FSM-ERR	FSM-ERR	FSM-ERR	Dnp 28/ Soft Reroute Proceeding	FSM-ERR
No path	No path found for reroute connection	N/A	FSM-ERR	FSM-ERR	FSM-ERR	FSM-ERR	FSM-ERR	Dnp 12/ Rerouting Idle	FSM-ERR
Inc. Con	Incoming reroute connect indication	rerouting	FSM-ERR	FSM-ERR	FSM-ERR	FSM-ERR	FSM-ERR	FSM-ERR	Dnp 29/ Rerouting Idle

Note 1 – Note 2: See Table Appendix B-3

Note 3: If the Crankback IE is included in the release indication, apply the normal crankback procedures to the connection. No change in the rerouting state.

Table Appendix C-4: Rerouting State Machine Procedures at the destination node (hard and symmetric soft rerouting)

FSM-ERR		Should not occur, action is implementation specific
Dnp 0 – Dnp 24	**Action:**	Actions Dnp 0 – Dnp 24 of Table Appendix B-4 apply.
Dnp 25	**Action:**	Start the hard rerouting timer. Release the rerouting connection in the direction of the calling party.
Dnp 26	**Action:**	Compute a new path to reroute the connection.
Dnp 27	**Action:**	Ignore the soft reroute trigger.
Dnp 28	**Action:**	Send a soft reroute setup request with an incremented incarnation number.
Dnp 29	**Action:**	Switch the connection point of the inter-domain interface from the incumbent connection to the rerouting connection. Release the incumbent connection in the direction of the calling party with a Rerouting cause IE set to cause #4 in the release request.
Dnp 30	**Action**	Release the previous rerouting connection in the direction of the calling party. Process the new soft reroute setup indication.

Appendix D Negotiation of rerouting services

D.1 Negotiation of the rerouting services during the initial call establishment over one rerouting domain

D.1.1 Request for the hard rerouting and asymmetric soft rerouting services from the source

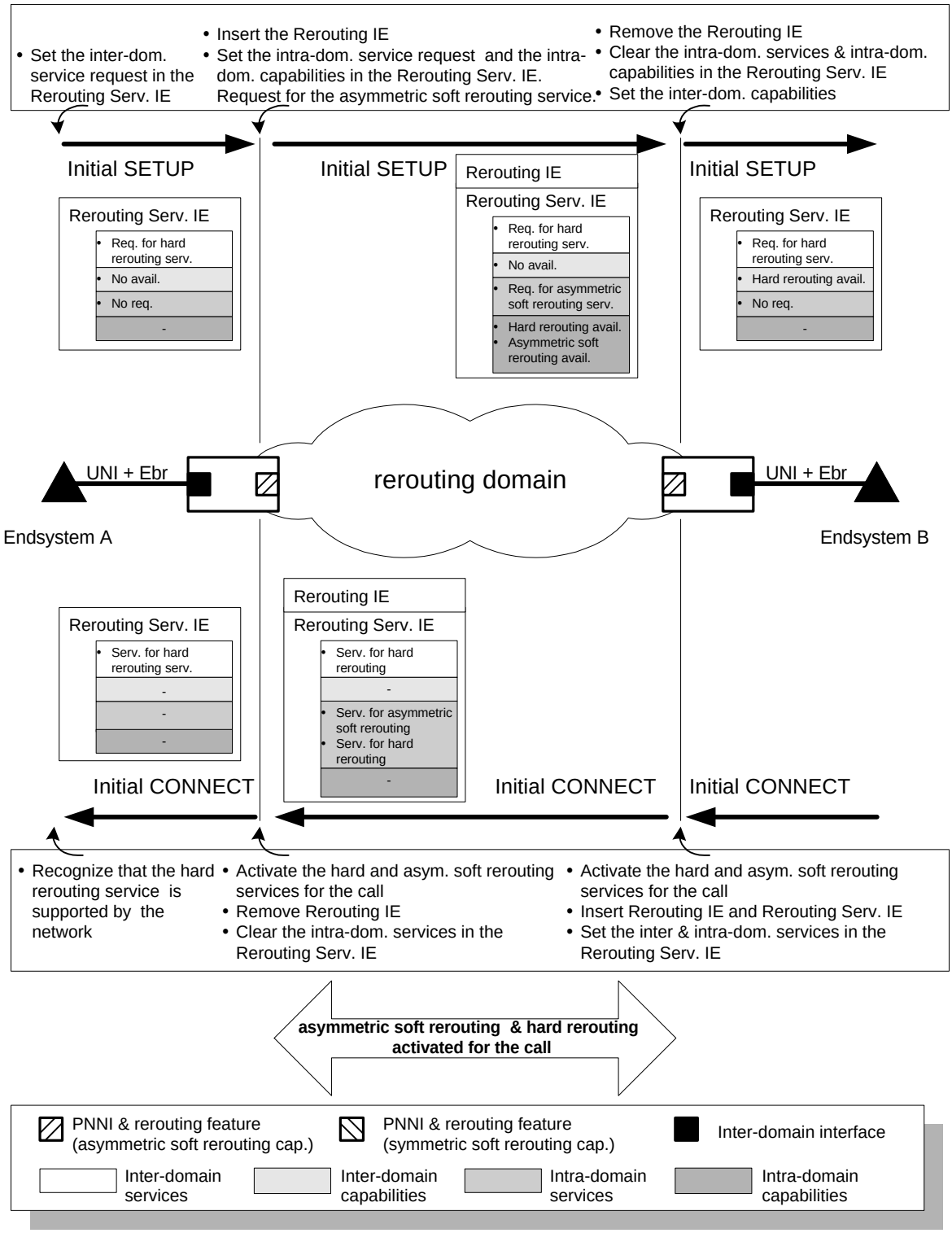

Figure Appendix D-1: Negotiation of the rerouting services over one rerouting domain. Hard rerouting requested by the calling end system. Asymmetric soft rerouting requested by the source node.

D.1.2 Request for the hard rerouting service from the source node

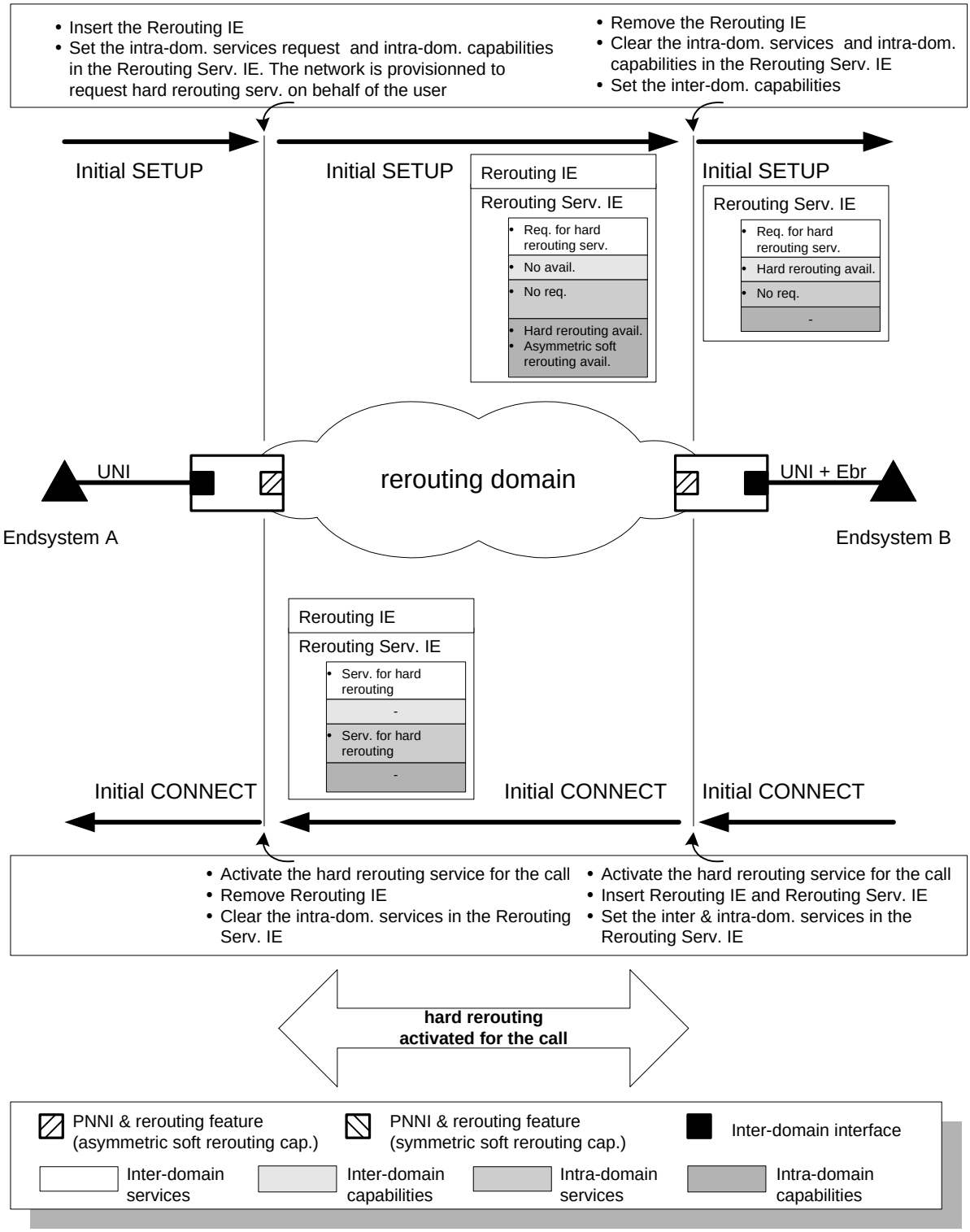

Figure Appendix D-2: Negotiation of the rerouting services over one rerouting domain. Hard rerouting requested by the source node on behalf of the end system.

D.1.3 Request for the hard rerouting service from the destination

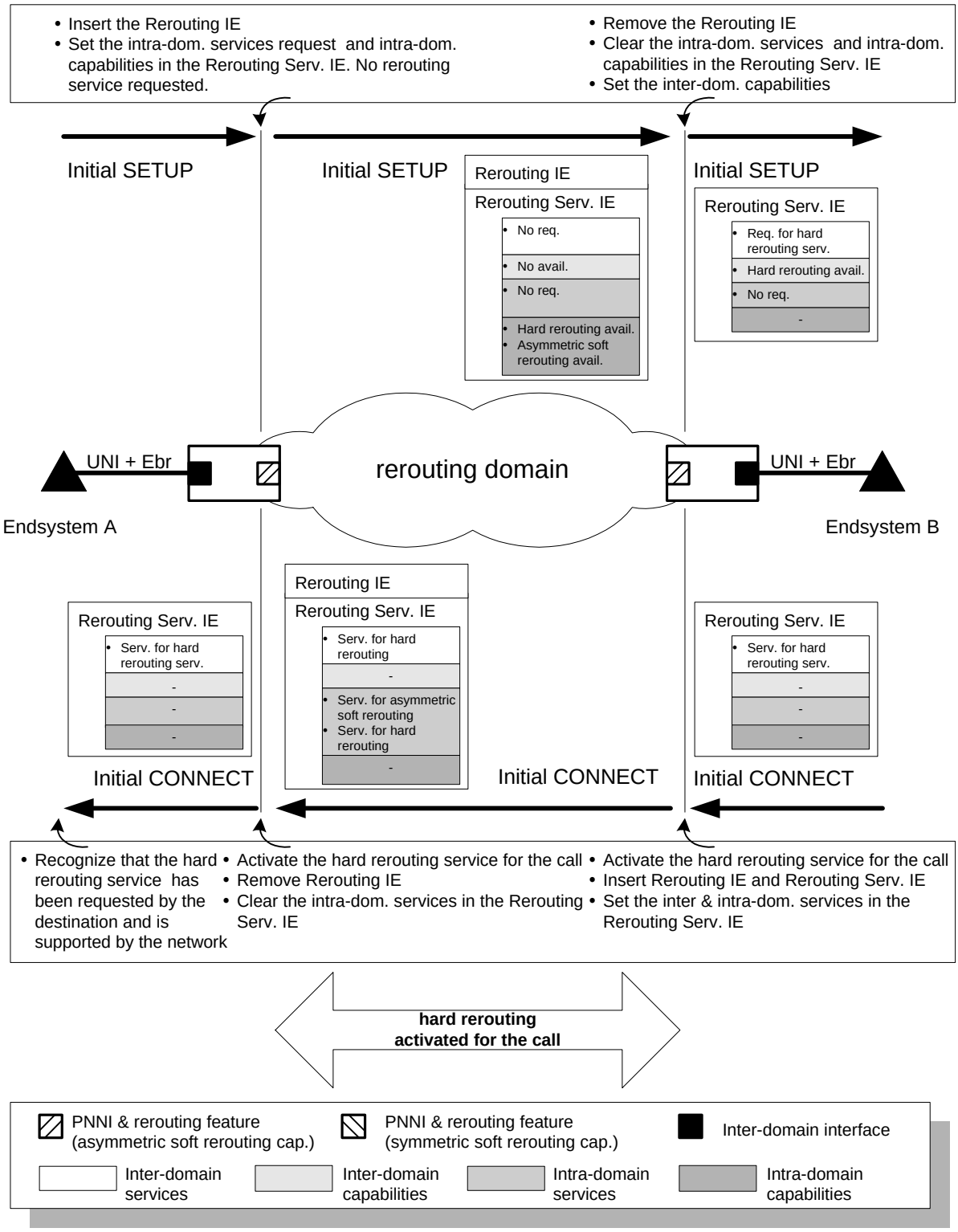

Figure Appendix D-3: Negotiation of the rerouting service over one rerouting domain. Hard rerouting requested by the called end system.

D.1.4 Request for the hard rerouting and symmetric soft rerouting services

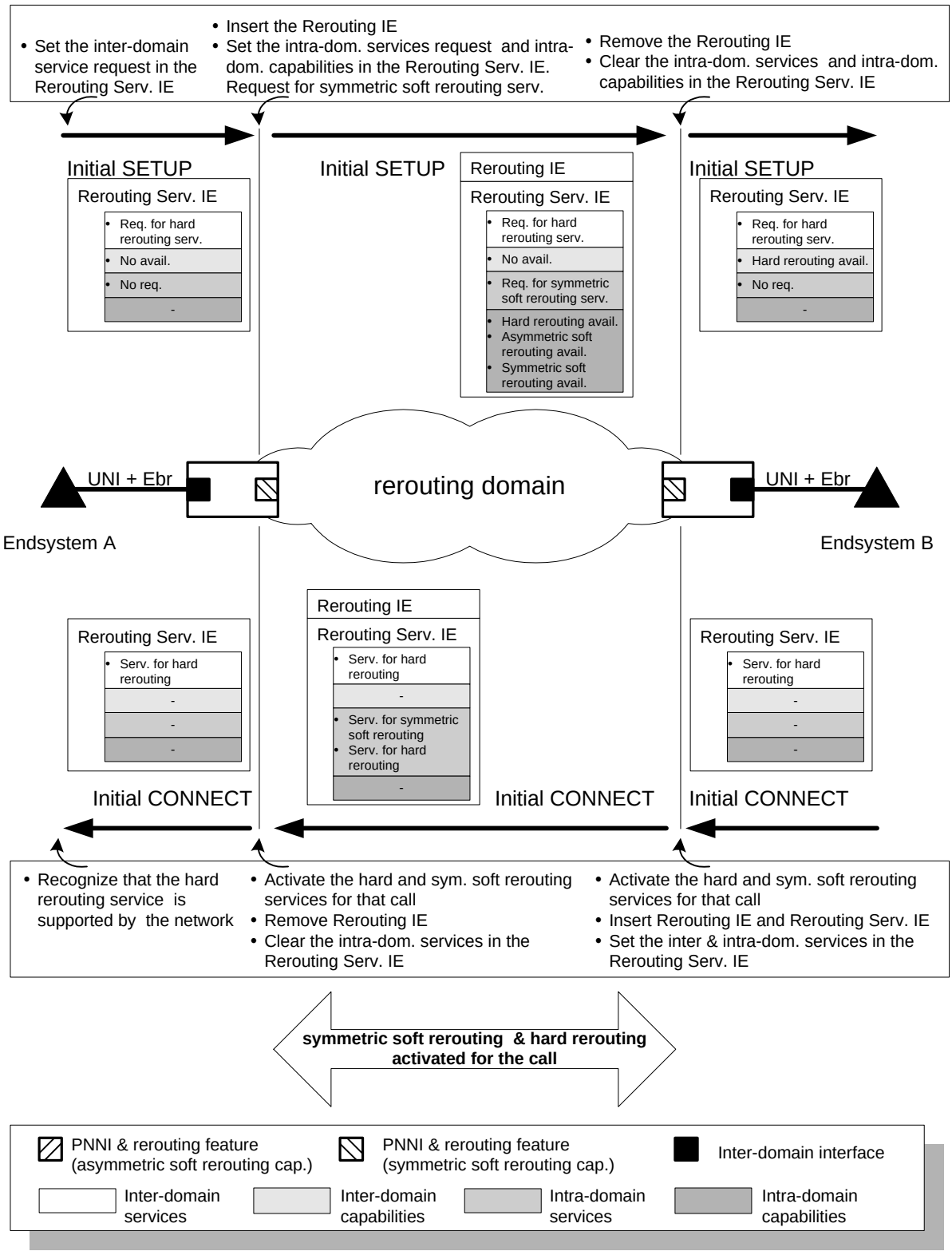

Figure Appendix D-4: Negotiation of the rerouting services over one rerouting domain. Hard rerouting requested by the calling end system. Asymmetric soft rerouting requested by the source node.

D.1.5 Request for the symmetric soft rerouting service from the source when the destination node does not support symmetric soft rerouting

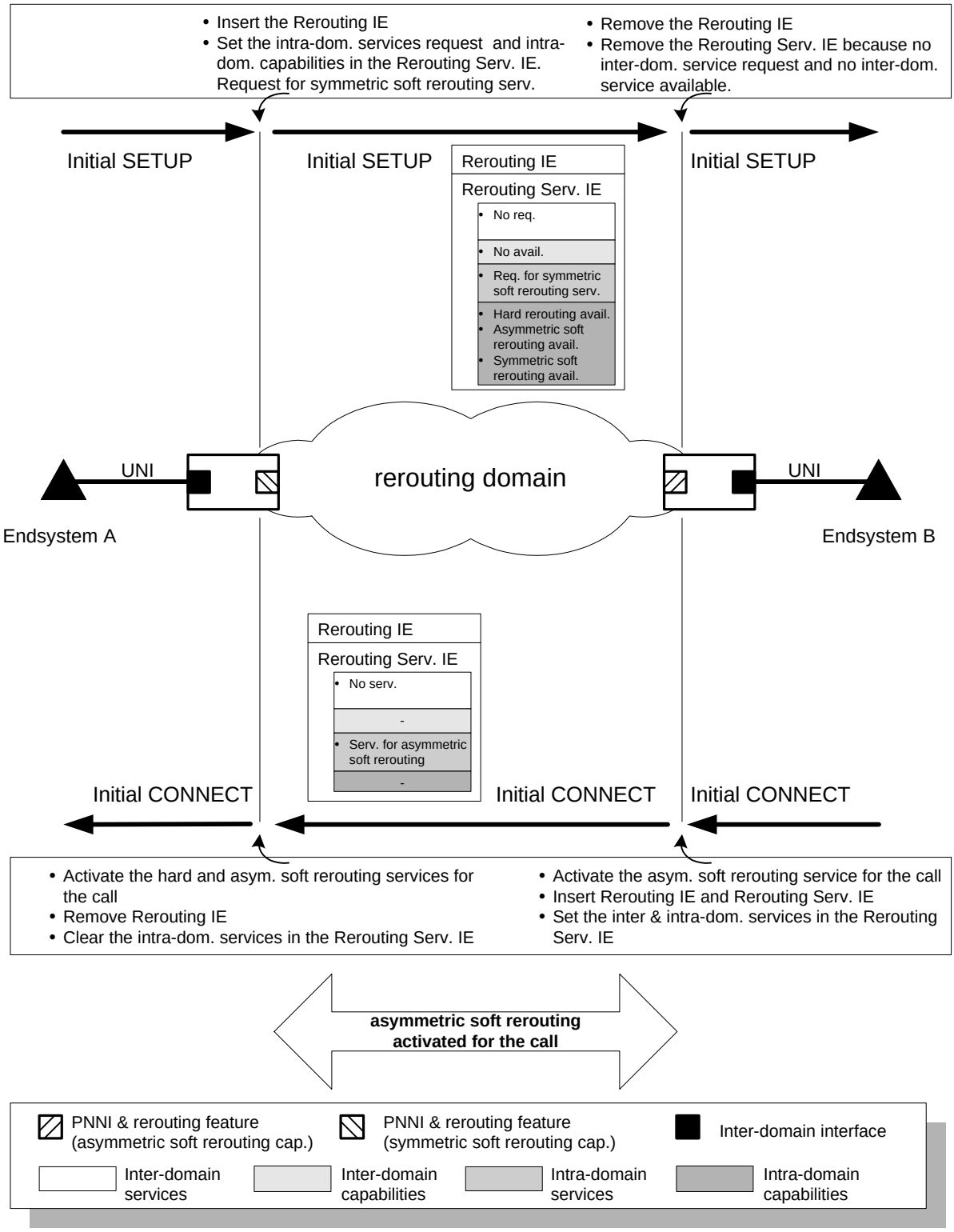

Figure Appendix D-5: Negotiation of the rerouting services over one rerouting domain. The destination node does not support symmetric soft rerouting

D.1.6 Request for rerouting services when the destination node does not support the rerouting feature

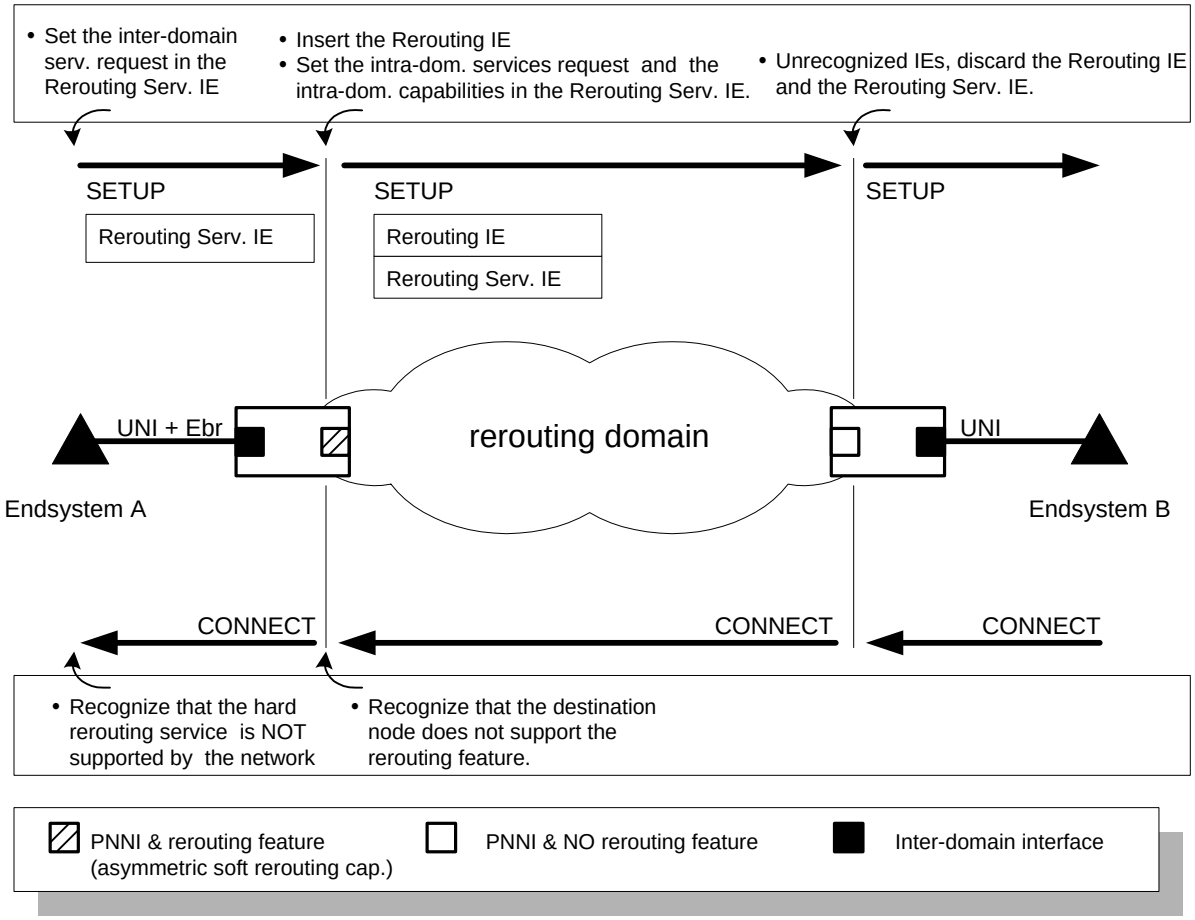

Figure Appendix D-6: Negotiation of the rerouting services over one rerouting domain. The destination node does not support the rerouting feature

D.2 Negotiation of the rerouting services during the initial connection establishment over several rerouting domains

D.2.1 Request for the hard rerouting and asymmetric soft rerouting services from the source

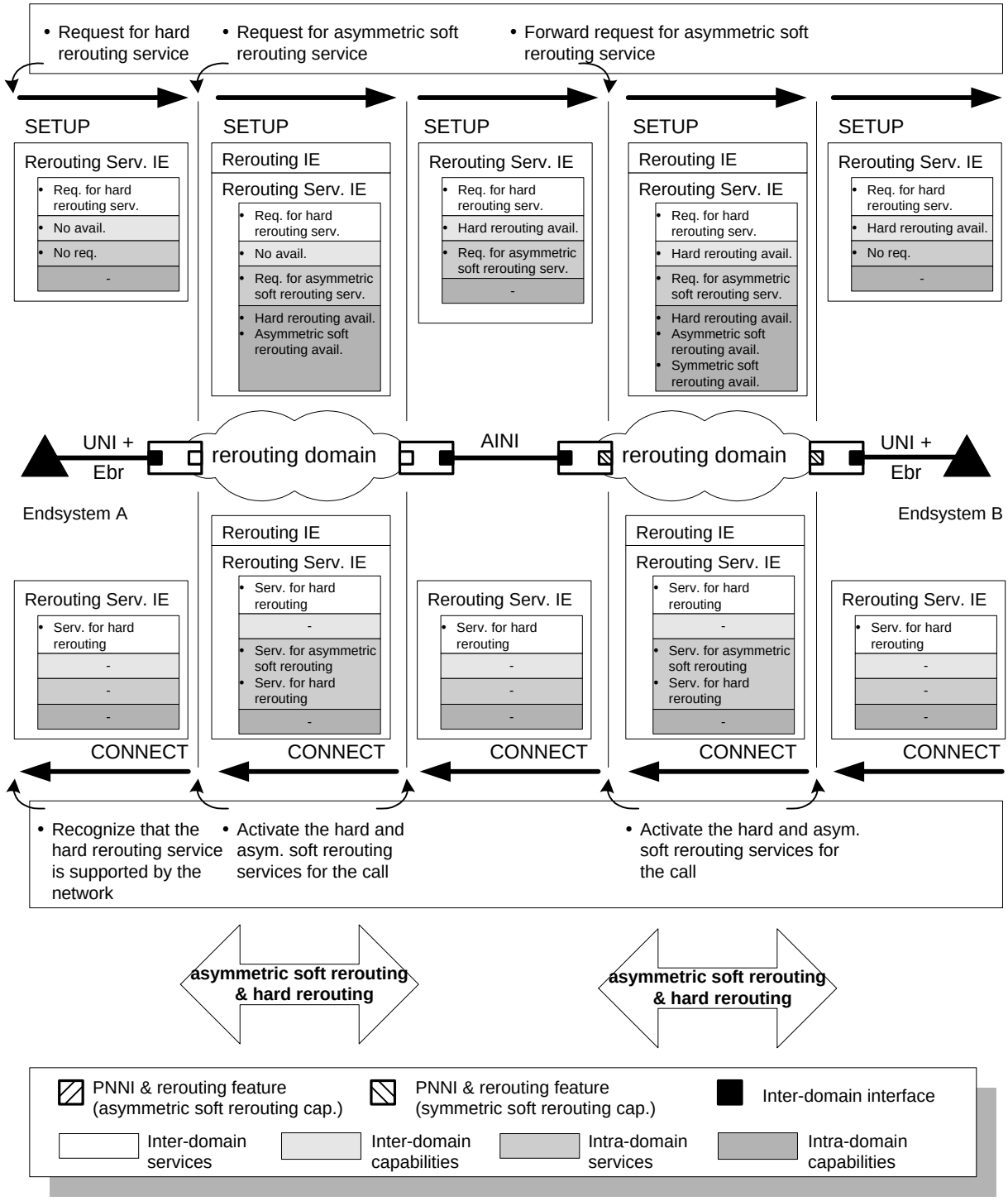

Figure Appendix D-7: Negotiation of the rerouting services over two rerouting domains. Hard rerouting requested by the calling end system. Asymmetric soft rerouting requested by the source node of the first rerouting domain and passed to the second rerouting domain.

D.2.2 Request for the hard rerouting and symmetric soft rerouting services from the destination

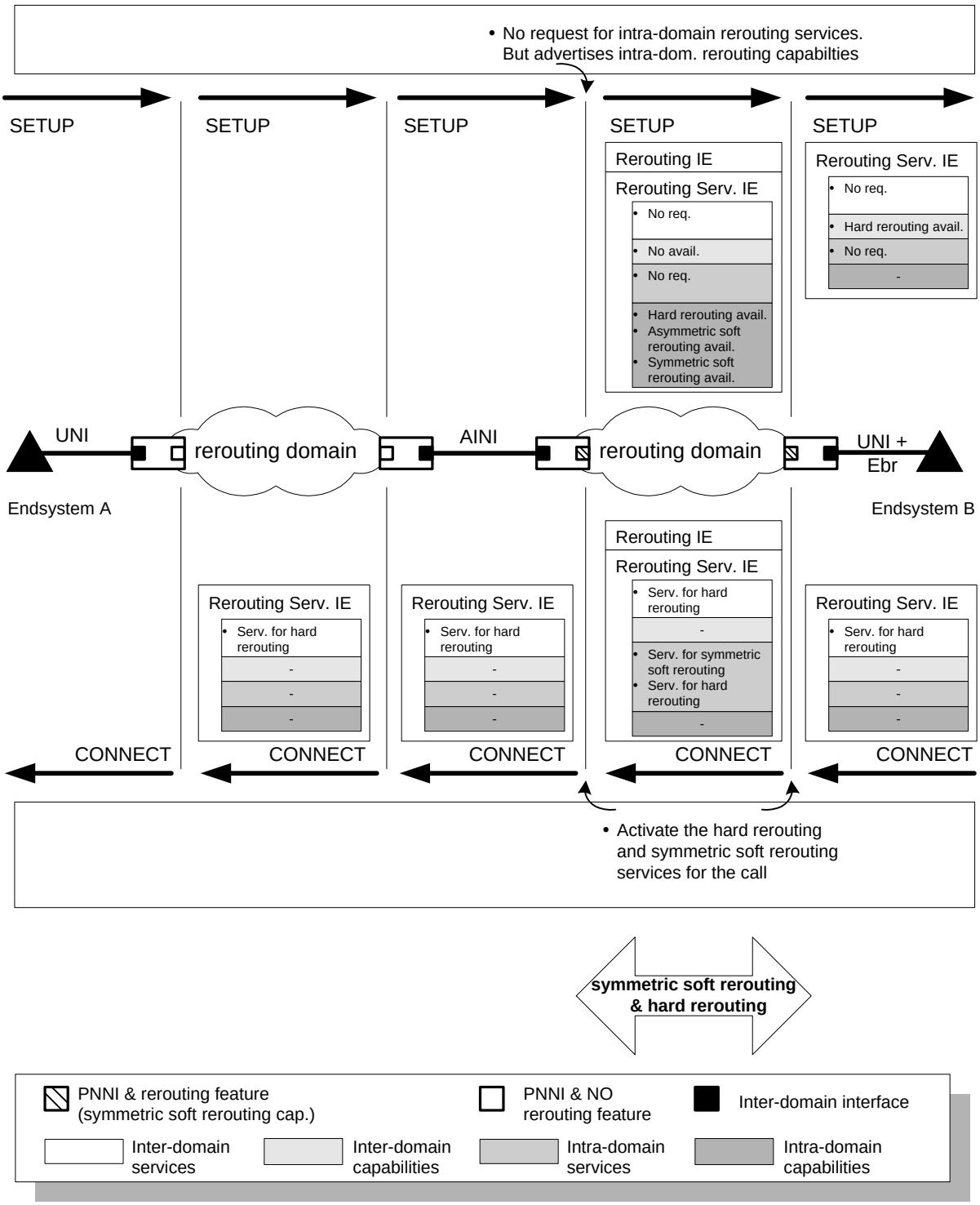

Figure Appendix D-8: Negotiation of the rerouting services over two rerouting domains. Hard rerouting requested by the called end system. Symmetric soft rerouting requested by the destination node of the second rerouting domain.