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X3S3.3/91-340: Marked-up IDRP GDMO

Subject: Marked-up IDRP GDMO
Source: C. A. Kunzinger (Project Editor)
Reference: X3S3.3/91-307 by S. Hares

This is an editorial revision of the material that Sue Hares presented in 91-307. The change bars and strike-throughs were applied relative to the existing text in CD 10747 so that you can readily identify the things that have changed.

I believe that all the changes I made are strictly editorial (capitalization, consecutive parameter numbering, removal of duplicate sections of text, etc.). I also added some change bars to denote a few differences between CD 10747 and 91-307 that were not marked as such in 91-307.

12.0 System Management and GDMO Definitions

The operation of the inter-domain routing functions in a BIS may be monitored and controlled using System Management. This clause contains management specification for IDRP, expressed in the GDMO notation defined in ISO 10165-4.

12.1 Name Bindings

iSOxxxx-NB NAME BINDING

SUBORDINATE OBJECT CLASS idrp_config
NAMED BY
SUPERIOR OBJECT CLASS "ISO/IEC xxxx":
networkEntity;
WITH ATTRIBUTE "ISO/IEC xxxx":
idrp_config_MO_Name
CREATE with-automatic-instance-naming
iSO-xxxxx-NB-pl;
DELETE on-if-no-contained-objects;
REGISTERED AS {ISO xxxxx-IDRP.nboi
iSOxxxx-NB (1)};

adjacentBIS NAME BINDING

SUBORDINATE OBJECT CLASS adjacentBIS
NAMED BY
SUPERIOR OBJECT CLASS idrp_config
WITH ATTRIBUTE BIS-NET;
DEFINED AS This name binding attribute identifies a BIS to BIS connection information block. One of these blocks of data should exist per remote BIS that this local BIS exchanges BISPDU with.;
REGISTERED AS {ISO xxxx-IDRP.nboi adjacentBIS (2)};

12.2 Local BIS Managed Objects for IDRP

idrp_config MANAGED OBJECT CLASS

DERIVED FROM "ISO/IEC xxxxxx": top
CHARACTERIZED BY localbispackage **PACKAGE BEHAVIOUR**

iDRPBasicImportedAlarmNotifications-B
BEHAVIOUR DEFINED AS Imports the communicationsAlarm notification from ISO/IEC 10165-2. It is used to report the following protocol events:

errorBISPDUsent: generated when a BISPDU is received with an error in its format. In addition to the parameters specified by ISO/IEC 10733, the following information will be reported in the AdditionalInformation field for the BIS Connection on which the error BISPDU was received:

- RemoteBIS-NET for BIS-BIS connection—using the **notificationRemoteBIS-NET** parameter
- BISPDU error code (see 7.4 and 8.19)—this reports the error code that will be sent in the ERROR PDU using the parameter **notificationBISpduerrorcode**.
- BIS error subcode (see 7.4 and 8.19)—this reports the subcode that will be sent using the parameter **notificationBISerrorsubcode**.
- BISPDU error information (see 7.4 and 8.19)—this reports the data from the received BISPDU that will be used to diagnose the problem for the Notification. The parameter **notificationBISpduerrorinfo** will be used to report this information.

openBISpduRDCError: generated when an OPEN BISPDU is received from another BIS in the same routing domain, and the remote BIS is not a member of identically the same confederations as the local BIS. In addition to the parameters specified by ISO/IEC 10733, the following information will be reported by the AdditionalInformation field for the BIS Connection on which this OPEN PDU was received:

- Remote BIS NET for this BIS-BIS connection—using the **notificationRemoteBIS-NET** parameter.
- Remote BIS Routing Domain Confederation (RDC) information using the **notificationRemoteRDCconfig** parameter.
- Local BIS Routing Domain Confederation (RDC) information using the **notificationLocalRDCconfig** parameter.

errorBISPDUconnectionclose: generated when an ERROR PDU has been received from a remote BIS. In addition to the parameters specified by ISO/IEC 10733, the following information will be reported by the AdditionalInformation field for the BIS Connection on which this OPEN PDU was received:

- RemoteBIS-NET for BIS-BIS connection—using the **notificationRemoteBIS-NET** parameter
- BISPDU error code (see 7.4 and 8.19)—this reports the error code that will be sent in the ERROR PDU using the parameter **notificationBISpduerrorcode**.

- ! c) BIS error subcode (see 7.4 and 8.19)—this reports the subcode that will be sent using the parameter **notificationBISerrorsubcode**.
- ! d) BISPDU error information (see 7.4 and 8.19)—this reports the data from the received BISPDU that will be used to diagnose the problem for the Notification. The parameter **notificationBISpduerrorinfo** will be used to report this information.

! **CorruptAdjRIBIn**: generated when the local method of checking the Adj-RIB-In has found an error. All Adj-RIBs-In are being purged. In addition to the parameters specified by ISO/IEC 10733, the following information will be reported by the AdditionalInformation field for the BIS with the parameter **MaxAdjRIBIntegritycheck**.

! **packetBomb**: generated when the local BIS has been presented with a BISPDU whose source is not one of the BISs adjacent to the local BIS. Such BISPDU are rejected by the local BIS. In addition to the parameters specified by ISO/IEC 10733, the following information will be reported by the AdditionalInformation field with the parameter Source BIS NET in the parameter **notificationSourceBis**.

! **BEHAVIOUR**

! iDRPBasicImportedInfoNotifications-B

! **BEHAVIOUR DEFINED AS** Imports the communicationsInformation notification from ISO/IES 10165-2. It is used to report the following protocol events:

! **enterFSMState**: generated when a BIS starts the IDRP FSM state machine to establish a connection with a remote BIS. The RemoteBis-NET is reported in the AdditionalInformation field using the **notificationRemoteBis-NET** parameter. The significant subparameter of each item of AdditionalInformation shall be set to "false" (that is, not significant) so that a managing system receiving the event report will be less likely to reject it.

! **FSMStateChange**: generated when the IDRP FSM used to communicate with another BIS transitions from one state to another. The RemoteBis-NET is reported in the AdditionalInformation field using the **notificationRemoteBis-NET** param-

! eter. The significant sub-parameter of each item of AdditionalInformation shall be set to "false" (that is, not significant) so that a managing system receiving the event report will be less likely to reject it.

! **ATTRIBUTES**

- ! InternalBIS **GET**,
- ! IntraIS **GET**,
- ! ExternalBISNeighbor **GET**,
- ! InternalSystems **GET**,
- ! LocalRDI **GET**,
- ! RDC-Config **GET**,
- ! LocalSNPA **GET**,
- ! MultiExit **GET**,
- ! routeserver **GET**,
- ! maximumPDUsize **GET**,
- ! holdTime **GET**,
- ! outstandingPDUs **GET**,
- ! authenticationCode **GET**,
- ! RetransmissionTimer **GET**,
- ! CloseWaitDelayPeriod **GET**,
- ! RDTransitDelay **GET**,
- ! RDLRE **GET**,
- ! LocExpense **GET**,
- ! RIBAttsSet **GET**,
- ! Capacity **GET**,
- ! Priority **GET**;
- ! version **GET**
- ! maxRIBIntegrityCheck **GET**
- ! maxIntegrityTimer **GET**

! **ACTIONS**

- ! startevent,
- ! stopevent;

! **NOTIFICATIONS**

- ! ~~enterFSMState,~~
- ! ~~FSMStateChange,~~
- ! ~~errorBISPDUsent,~~
- ! ~~openBISpduRDCerror,~~
- ! ~~errorBISPDUconnectionclose,~~
- ! ~~CorruptAdjRIBIn~~
- ! ~~packetbomb~~

! "REC X.721 | ISO/IEC 10165-2:1992":

! communicationsAlarm

- ! notificationRemotebis-NET
- ! notificationBISpduerrorcode
- ! notificationBISerrorssubcode
- ! notificationBISpduerrorinfo
- ! notificationRemoteRDCconfig
- ! notificationLocalRDCconfig
- ! maxAdjRibIntegritycheck
- ! notificationSourceBis

! "REC X.723 | ISO/IEC 10165-5: 1992":

! communicationsInformation

- ! notificationRemotebis-NET

! **REGISTERED AS** {ISOxxx-IDRP.moi idrp_config (1) ;;;

12.3 Adjacent BIS Peer Managed objects

adjacentBIS MANAGED OBJECT CLASS

DERIVED FROM "ISO/IEC xxxxx": top
CHARACTERIZED BY adjacentBIS PACKAGE
ATTRIBUTES

BIS_NET **GET**,
 BIS_RDI **GET**,
 BIS_RDC **GET**,
 BISnegotiatedversion **GET**,
 BISpeerSNPAs **GET**,
 Authentication_type **GET**,
 State **GET**,
 Lastseqnosent **GET**,
 Lastseqnorecv **GET**,
 Lastacksent **GET**,
 Lastackrecv **GET**,
 updatesIn **GET**,
 updatesOut **GET**,
 totalBISPDUsIn **GET**,
 totalBISPDUsOut **GET**,
 KeepalivesSinceLastUpdate **GET**,
 closeWaitDelayTimer **GET**,
 keepAliveTimer **GET**,
 minRouteSelectionTimer **GET**,
 maxCPUOverloadTimer **GET**,
 minRDOriginationTimer **GET**,

ATTRIBUTE GROUPS

"REC X.723 | ISO/IEC 10165-5": counters
 updateIN
 updateOUT
 totalBISPDUsIN
 totalBISPDUsOUT
 KeepalivesSinceLastUpdate;
 "REC X.723 | ISO/IEC 10165-5": state
 state
 lastseqnosent
 lastseqnorecv
 lastacksent
 lastackrecv;
 "REC X.723 | ISO/IEC 10165-5": timer
 closeWaitDelayTimer **GET**;
 keepALiveTimer **get**;
 MinRouteSelectionTimer **GET**;
 maxCPUOverloadTimer **GET**;
 minRDUOriginationTimer **GET**;

REGISTERED AS [ISO xxxxx-IDRP.moi
 adjacentBIS(2);

12.4 Attribute Definitions

InternalBIS ATTRIBUTE

WITH ATTRIBUTE SYNTAX
 ISOXXXX-IDRP.BIS_group;
MATCHES FOR Equality;
BEHAVIOUR InternalBIS-B
BEHAVIOUR DEFINED AS The set of NETs
 which identify the BISs in this routing
 domain;

REGISTERED AS {ISOXXXX-IDRP.aoi
 InternalBIS(1);

IntraIS ATTRIBUTE

WITH ATTRIBUTE SYNTAX
 ISOXXXX-IDRP.BIS_group;
MATCHES FOR Equality;
BEHAVIOUR IntraIS-B
BEHAVIOUR DEFINED AS The set of NETs of
 the ISs to which the local BIS may deliver an
 inbound NPDUs whose destination lies within
 the BIS's routing domain. These ISs must
 be located on the same common subnetwork
 as this local BIS, and must be capable of
 delivering NPDUs to destinations that are
 located within the local BIS's routing
 domain.
REGISTERED AS {ISOXXXX-IDRP.aoi IntraBIS(2);

ExternalBISNeighbor ATTRIBUTE

WITH ATTRIBUTE SYNTAX
 ISOXXXX-IDRP.BIS_group;
MATCHES FOR Equality;
BEHAVIOUR ExternalBISNeighborB
BEHAVIOUR DEFINED AS The set of NETs
 which identify the BISs in adjacent routing
 domain that are reachable via a single sub-
 network hop.
REGISTERED AS {ISOXXXX-IDRP.aoi
 ExternalBISNeighbor (3);

InternalSystems ATTRIBUTE

WITH ATTRIBUTE SYNTAX
 ISOXXXX-IDRP.system_id_group
MATCHES FOR Equality;
BEHAVIOUR InternalSystems-B
BEHAVIOUR DEFINED AS The set of NETs
 and NSAPS which identify the systems in this
 routing domain which the BIS uses to con-
 struct network layer reachability information;
REGISTERED AS ISOXXXX-IDRP.aoi
 InternalSystems (4);

LocalIRDI ATTRIBUTE

WITH ATTRIBUTE SYNTAX ISOXXXX-IDRP.rdi
MATCHES FOR Equality;
BEHAVIOUR LocalIRDI-B
BEHAVIOUR DEFINED AS The Routing
 Domain Identifier for the routing domain
 where this BIS is located;
REGISTERED AS ISOXXXX-IDRP.aoi LocalIRDI (5);

RDC-Config ATTRIBUTE

WITH ATTRIBUTE SYNTAX
 ISOXXXX-IDRP.rdc_group
MATCHES FOR Equality;
BEHAVIOUR RDC-Config-B
BEHAVIOUR DEFINED AS All of the Routing
 Confederations to which the RD of this BIS

belongs and the nesting relationships that are in force between them. The nesting relationships are described as a sequence of sets of RDC Identifiers;

REGISTERED AS ISOXXXX-IDRP.aoi RDC-Config (6);

LocalSNPA ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOXXXX-IDRP.localSNPA

MATCHES FOR Equality;

BEHAVIOUR localSNPA-B

BEHAVIOUR DEFINED AS The list of SNPA's of this BIS;

REGISTERED AS ISOXXXX-IDRP.aoi LocalSNPA(7);

Multixit ATTRIBUTE

WITH ATTRIBUTE SYNTAX Boolean

MATCHES FOR Equality

BEHAVIOUR Multixit-B

BEHAVIOUR DEFINED AS The indication whether this BIS will use the MULTI_EXIT_DISC attribute to decide between otherwise identical routes. The Multixit parameter is used as the default value for the "multi_exit_disc" function in policy decisions;;

REGISTERED AS ISOXXXX-IDRP.aoi MultiExit(8);

maximumPDUsize ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.MaximumPDUSize;

MATCHES FOR Equality, Ordering;

BEHAVIOUR maximumPDUsize-B

BEHAVIOUR DEFINED AS The maximum number of octets that this BIS is able to handle in an incoming BISPDU;

REGISTERED AS ISOXXXX-IDRP.aoi maximumPDUsize(9);

holdtime ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.Holdtime;

MATCHES FOR Equality, Ordering;

BEHAVIOUR holdtime-B

BEHAVIOUR DEFINED AS The maximum number of seconds that may elapse between the receipt of two successive BISPDU's of any of the following types: KEEPALIVE, UPDATE, RIB CHECKSUM PDU's or RIB REFRESH PDU's;

REGISTERED AS ISOXXXX-IDRP.aoi holdtime(10);

outstandingPduS ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.OutstandingPduS;

MATCHES FOR Equality, Ordering;

BEHAVIOUR outstandingPduS-B

BEHAVIOUR DEFINED AS The maximum number of BISPDU's that may be sent to this BIS without receiving an acknowledgement;

REGISTERED AS ISOXXXX-IDRP.aoi outstandingPduS(11);

authenticationCode ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.AuthenticationCode;

MATCHES FOR Equality, Ordering;

BEHAVIOUR authenticationCode-B

BEHAVIOUR DEFINED AS Indication of which authentication mechanism will be used;

REGISTERED AS ISOXXXX-IDRP.aoi authenticationCode (12);

RetransmissionTimer ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.retransmissiontimer

MATCHES FOR Equality, Ordering;

BEHAVIOUR RetransmissionTimer-B

BEHAVIOUR DEFINED AS The Number of seconds of between KEEPALIVE messages if no other traffic is sent;

REGISTERED AS ISOXXXX-IDRP.aoi RetransmissionTimer (13);

CloseWaitDelayPeriod ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.closewaitdelayperiod

MATCHES FOR Equality, Ordering;

BEHAVIOUR CloseWaitDelayPeriod-B

BEHAVIOUR DEFINED AS The number of seconds the local system shall stay in the CLOSE-WAIT state prior to changing to the CLOSED state.;

REGISTERED AS ISOXXXX-IDRP.aoi CloseWaitDelayPeriod (14);

RDTransitDelay ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.RDtransitdelay

MATCHES FOR Equality, Ordering;

BEHAVIOUR RDTransitDelay-B

BEHAVIOUR DEFINED AS The estimated average delay across a Routing Domain in units of 500ms.

REGISTERED AS ISOXXXX-IDRP.aoi RDTransitDelay (15);

RDLE ATTRIBUTE

WITH ATTRIBUTE SYNTAX ISOxxxx-IDRP.rdle

MATCHES FOR Equality, Ordering;

BEHAVIOUR RDLE-B

BEHAVIOUR DEFINED AS The average error rate of a Routing Domain in units of an integer which if divided by $2^{*32}-1$ will provide the actual probability of the error.

REGISTERED AS ISOXXXX-IDRP.aoi RDLE(16);

LocExpense ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.locexpense

MATCHES FOR Equality, Ordering;**BEHAVIOUR** LocExpense-B

BEHAVIOUR DEFINED AS The monetary expense of transiting this Routeing Domain. The attribute contains an indication of cost and the units in which it is calculated;

REGISTERED AS ISOXXXX-IDRP.aoi

LocExpense(17);

RIBAttsSet ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.ribattsSet

MATCHES FOR Equality;**BEHAVIOUR** RIBAttsSet-B

BEHAVIOUR DEFINED AS The set of Rib Attributes supported by this BIS.;

REGISTERED AS ISOXXXX-IDRP.aoi

RIBAttsSet(18);

Capacity ATTRIBUTE

WITH ATTRIBUTE SYNTAX ISOxxxx-IDRP.capacity**MATCHES FOR** Equality, Ordering;**BEHAVIOUR** Capacity-B

BEHAVIOUR DEFINED AS The traffic carrying capacity of this Routeing Domain.

REGISTERED AS ISOXXXX-IDRP.aoi Capacity(19);

Priority ATTRIBUTE

WITH ATTRIBUTE SYNTAX ISOxxxx-IDRP.priority**MATCHES FOR** Equality, Ordering;**BEHAVIOUR** Priority-B

BEHAVIOUR DEFINED AS The lowest value of ISO 8473 priority parameter that this RD will provide forwarding services for;

REGISTERED AS ISOXXXX-IDRP.aoi Priority(20);

BIS_NET ATTRIBUTE

WITH ATTRIBUTE SYNTAX ISO xxxx-IDRP.bis_net;**MATCHES FOR** Equality;**BEHAVIOUR** BIS_NET-B

BEHAVIOUR DEFINED AS The NET of the remote BIS of this BIS to BIS connection.;

REGISTERED AS {ISO-IDRP.aoi BIS_NET (21)};

BIS_RDI ATTRIBUTE

WITH ATTRIBUTE SYNTAX ISO xxxx-IDRP.rdi;**MATCHES FOR** Equality;**BEHAVIOUR** BIS_RDI-B

BEHAVIOUR DEFINED AS The RDI of the remote BIS of this BIS to BIS connection.;

REGISTERED AS {ISO-IDRP.aoi BIS_RDI (22)};

BIS_RDC ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.rdc_group

MATCHES FOR Equality;**BEHAVIOUR** BIS_RDC-B

BEHAVIOUR DEFINED AS The RDC the remote BIS belongs to in this BIS to BIS connection.;

REGISTERED AS {ISO-IDRP.aoi BIS_RDC (23)};

BISnegotiatedversion ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.bisnegotiatedvesion;

MATCHES FOR Equality, Ordering;**BEHAVIOUR** BISnegotiatedversion-B

BEHAVIOUR DEFINED AS The negotiated version of IDRП protocol this BIS to BIS connection is using.;

REGISTERED AS {ISOxxxx-IDRP.aoi

BISnegotiatedversion (24)};

BISpeerSNPAs ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.bispeersSNPAs

MATCHES FOR Equality;**BEHAVIOUR** BISpeerSNPAs-B

BEHAVIOUR DEFINED AS The SNPAs announced by the remote BIS of this BIS to BIS connection.

REGISTERED AS {ISOxxxx-IDRP.aoi

BISpeerSNPAs (25)};

Authentication_type ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.auth_type

MATCHES FOR Equality, Ordering;**BEHAVIOUR** authentication_type-B

BEHAVIOUR DEFINED AS The authentication type the remote BIS sent in the OPEN BISPDU in this BIS to BIS connection.

REGISTERED AS {ISOxxxx-IDRP.aoi

Authentication_type (26)};

State ATTRIBUTE

WITH ATTRIBUTE SYNTAX ISOxxxx-IDRP.state**MATCHES FOR** Equality, Ordering;**BEHAVIOUR** state-B

BEHAVIOUR DEFINED AS The current state of BIS to BIS communication in the local BIS.

REGISTERED AS {ISOxxxx-IDRP.aoi state (27)};

Lastseqnosent ATTRIBUTE

WITH ATTRIBUTE SYNTAX

ISOxxxx-IDRP.lastseqnosent

DERIVED FROM nonWrappingCounter;**MATCHES FOR** Equality, Ordering;**BEHAVIOUR** Lastseqnosent-B

BEHAVIOUR DEFINED AS The last sequence number sent to the remote BIS from this local BIS on this BIS to BIS connection.

REGISTERED AS {ISOxxxx-IDRP.aoi Lastseqnosent (28)};

Lastseqnorecv **ATTRIBUTE**

WITH ATTRIBUTE SYNTAX
ISOxxxx-IDRP.lastseqnorecv

DERIVED FROM nonWrappingCounter;

MATCHES FOR Equality, Ordering;

BEHAVIOUR Lastseqnorecv-B

BEHAVIOUR DEFINED AS The last sequence number received from the remote BIS by this local BIS on this BIS to BIS connection.

REGISTERED AS {ISO xxxx-IDRP.aoi Lastseqnorecv (29)};

Lastacksent **ATTRIBUTE**

WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.lastacksent

DERIVED FROM nonWrappingCounter;

MATCHES FOR Equality, Ordering;

BEHAVIOUR Lastacksent-B

BEHAVIOUR DEFINED AS The number of the last ack sent to the remote BIS from this local BIS on this BIS to BIS connection.

REGISTERED AS {ISO xxxxx-IDRP.aoi Lastacksent (30)};

Lastackrecv **ATTRIBUTE**

WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.lastackrecv

DERIVED FROM nonWrappingCounter;

MATCHES FOR Equality, Ordering;

BEHAVIOUR Lastacksent-B

BEHAVIOUR DEFINED AS The number of the last ack received from the remote BIS by this local BIS on this BIS to BIS connection.

REGISTERED AS {ISO xxxxx-IDRP.aoi Lastackrecv (31)};

updatesIn **ATTRIBUTE**

WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.updatesin

DERIVED FROM nonWrappingCounter;

MATCHES FOR Equality, Ordering;

BEHAVIOUR updatesIn-B

BEHAVIOUR DEFINED AS The number of UPDATE BISPDU received by this BIS on this BIS to BIS connection.

REGISTERED AS {ISO xxxx-IDRP.aoi updatesIn (32)};

updatesOut **ATTRIBUTE**

WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.updatesout

DERIVED FROM nonWrappingCounter;

MATCHES FOR Equality, Ordering;

BEHAVIOUR updatesOut-B

BEHAVIOUR DEFINED AS The number of UPDATE BISPDU sent by this BIS on this BIS to BIS connection.

REGISTERED AS {ISO xxxx-IDRP.aoi updatesOut (33)};

totalBISPDUIn **ATTRIBUTE**

WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.totalbispdusin

DERIVED FROM nonWrappingCounter;

MATCHES FOR Equality, Ordering;

BEHAVIOUR totalBISPDUIn-B

BEHAVIOUR DEFINED AS The number of BISPDU received by this BIS from the remote BIS on this BIS to BIS connection.

REGISTERED AS {ISO xxxx-IDRP.aoi totalBISPDUIn (34)};

totalBISPDUOut **ATTRIBUTE**

WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.totalbispdusout

DERIVED FROM nonWrappingCounter;

MATCHES FOR Equality, Ordering;

BEHAVIOUR totalBISPDUOut-B

BEHAVIOUR DEFINED AS The number of BISPDU received by this BIS from the remote BIS on this BIS to BIS connection.

REGISTERED AS {ISO xxxx-IDRP.aoi totalBISPDUOut (35)};

KeepalivesSinceLastUpdate **ATTRIBUTE**

WITH ATTRIBUTE SYNTAX ISO
xxxxx-IDRP.keepaliveSincelastupdate

DERIVED FROM nonWrappingCounter;

MATCHES FOR Equality, Ordering;

BEHAVIOUR KeepalivesSinceLastUpdate-B

BEHAVIOUR DEFINED AS The number of KEEPALIVE BISPDU received by this BIS from the remote BIS since this last UPDATE BISPDU.

REGISTERED AS {ISO xxxx-IDRP.aoi KeepAlivesSinceLastUpdate (36)};

version **ATTRIBUTE**

WITH ATTRIBUTE SYNTAX ISO xxxx-IDRP.version

MATCHES FOR Equality, Ordering;

BEHAVIOUR version-B

BEHAVIOUR DEFINED AS The version of IDRP protocol this machine defaults to using.;

REGISTERED AS {ISO xxxx-IDRP.aoi version (37)};

maxRIBIntegrityCheck**ATTRIBUTE**

WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.maxribintegritycheck

MATCHES FOR Equality, Ordering;

BEHAVIOUR maxRIBIntegrityCheck-B

BEHAVIOUR DEFINED AS The maximum time in seconds between checking of the Adj-RIBs-In by a local mechanism. If corrupt

Adj-RIB-In is detected, the BIS shall purge the offending Adj-RIB-In;
REGISTERED AS {ISO xxxx-IDRP.aoi
! MaxRIBIntegrityCheck(38)};

maxRIBIntegrityTimer**ATTRIBUTE**
WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.ribintegritytimer
DERIVED FROM timer
MATCHES FOR Equality, Ordering;
BEHAVIOUR RIBIntegritytimer-B
BEHAVIOUR DEFINED AS The timer that measures in seconds the time remaining until the Adj-RIBs-In must be checked by a local mechanism. If a corrupt Adj-RIB-In is detected, the BIS shall purge the offending Adj-RIB-In;
REGISTERED AS {ISO xxxx-IDRP.aoi
! MaxRIBIntegrityTimer(39)};

closeWaitDelayTimer**ATTRIBUTE**
WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.waitdelaytimer
DERIVED FROM timer
MATCHES FOR Equality, Ordering;
BEHAVIOUR CloseWaitDelaytimer-B
BEHAVIOUR DEFINED AS The timer that measures in seconds the time that has elapsed since the BIS FSM entered the CLOSE-WAIT state. Upon timer expiration, the BIS FSM will enter the CLOSED state;
REGISTERED AS {ISO xxxx-IDRP.aoi
! CloseWaitDelayTimer(40)};

keepAliveTimer**ATTRIBUTE**
WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.keepalivetimer
DERIVED FROM timer
MATCHES FOR Equality, Ordering;
BEHAVIOUR Keepalivetimer-B
BEHAVIOUR DEFINED AS The timer that measures in seconds the time that has elapsed since the previous KEEPALIVE PDU was received by the local BIS. Upon its expiration, the BIS will send a BISPDU to its peer BIS;
REGISTERED AS {ISO xxxx-IDRP.aoi
! KeepAliveTimer(41)};

minRouteSelectionTimer**ATTRIBUTE**
WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.routeselectiontimer
DERIVED FROM timer
MATCHES FOR Equality, Ordering;
BEHAVIOUR Routeselectiontimer-B
BEHAVIOUR DEFINED AS The timer that measures in seconds the time that has elapsed since the advertisement by the local BIS of a better route that was received from a BIS located in another routing domain. See clause -- Heading 'MINSEL' unknown --;
REGISTERED AS {ISO xxxx-IDRP.aoi
! MinRouteSelectiontimer(42)};

minRDOriginationTimer**ATTRIBUTE**
WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.rdorinationtimer
DERIVED FROM timer
MATCHES FOR Equality, Ordering;
BEHAVIOUR RDOriginationtimer-B
BEHAVIOUR DEFINED AS The timer that measures in seconds the time that has elapsed since the advertisement by the local BIS of an UPDATE PDU that reported changes within the local BIS's routing domain. See clause -- Heading 'MINORG' unknown --;
REGISTERED AS {ISO xxxx-IDRP.aoi
! MinRDOriginationtimer(43)};

maxCPUOverloadTimer**ATTRIBUTE**
WITH ATTRIBUTE SYNTAX ISO
xxxx-IDRP.maxcpuoverloadtimer
DERIVED FROM timer
MATCHES FOR Equality, Ordering;
BEHAVIOUR MaxCPUOverloadTimer-B
BEHAVIOUR DEFINED AS The timer that measures in seconds the time that has elapsed since the local BIS has detected that its CPU has become overloaded. See Annex -- Heading 'CPUOLD' unknown --;
REGISTERED AS {ISO xxxx-IDRP.aoi
! MaxCPUOverloadtimer(44)};

routesserver **ATTRIBUTE**
WITH ATTRIBUTE SYNTAX Boolean;
MATCHES FOR Equality
BEHAVIOUR routesserver-B
BEHAVIOUR DEFINED AS The indication whether this BIS may set the "IDRP_Server_Allowed" field in the NEXT_HOP attribute to X"FF" for BIS to BIS UPDATE BISPDU. If this variable is true then in accordance with local policy, the IDRP_Server_Allowed field may be set on some UPDATE BISPDU that this BIS sends. If this attribute is set to false, then no UPDATE BISPDU will be sent by this BIS with NEXT_HOP attributes containing an "IDRP_Server flag" equal to X"FF".;
REGISTERED AS ISOXXXX-IDRP.aoi
! routesserver(45);

12.5 Action Definitions

minRDOrignationTimer **ATTRIBUTE**

WITH ATTRIBUTE SYNTAX ISO

xxxx-IDRP.rdorignationtimer

MATCHES FOR Equality, Ordering;

BEHAVIOUR RDOrignationtimer-B

BEHAVIOUR DEFINED AS The timer that measures in seconds the time that has elapsed since the advertisement by the local BIS of an UPDATE PDU that reported changes within the local BIS's routing domain. See clause -- Heading 'MINORC' unknown --;

REGISTERED AS (ISO xxxx-IDRP.aci MinRDOrignationtimer(40));

startevent **Action**

BEHAVIOUR

startevent **BEHAVIOUR**

MODE CONFIRMED;

CONTEXT ACTION-INFO;

WITH INFORMATION SYNTAX ISO

xxxx-idrp.Actioninfo;

WITH REPLY SYNTAX ISO

xxxx-idrp.Startevenreply;

DEFINED AS The request to start communication with a remote BIS peer;

PARAMETERS Remotebis-NET;

MODE CONFIRMED;

REGISTERED AS ISO xxxxx-IDRP.aci startevent (1);

Stopevent **Action**

BEHAVIOUR

stopevent **BEHAVIOUR**

MODE CONFIRMED;

CONTEXT ACTION-INFO;

WITH INFORMATION SYNTAX ISO

xxxx-idrp.Actioninfo;

WITH REPLY SYNTAX ISO

xxxx-idrp.Stopevenreply;

PARAMETERS Remotebis-NET;

MODE CONFIRMED;

DEFINED AS The request to stop communication with a remote BIS peer;

REGISTERED AS ISO xxxxx-IDRP.aci stopevent (2);

12.6 Notification Definitions

enterFSMstatemachine **NOTIFICATON**

BEHAVIOUR enterFSMstatemachine-B

BEHAVIOUR DEFINED AS The indication of starting the FSM state machine to establish a connection with a remote BIS.;

MODE NON-CONFIRMED

PARAMETERS Remotebis-NET;

WITH INFORMATION SYNTAX

ISOxxxx-IDRP.NotificationInfo

REGISTERED AS ISOxxxx-IDRP.noi

enterFSMstatemachine (1);

FSMstatechange **NOTIFICATION**

BEHAVIOUR FSMstatechange-B

BEHAVIOUR DEFINED AS The indication of transiting from one state to another in the IDRP connection state machine in communication with another BIS.;

MODE NON-CONFIRMED

PARAMETERS remoteBIS-NET, state;

WITH INFORMATION SYNTAX

ISOxxxx-IDRP.NotificationInfo

REGISTERED AS ISOxxxx-IDRP.noi

FSMstatechange(2);

errorBISPDUsent **NOTIFICATION**

BEHAVIOUR errorBISPDUsent-B

BEHAVIOUR DEFINED AS The indication of an error in the format of BISPDU.;

MODE NON-CONFIRMED

PARAMETERS Remotebis-NET, BISpduerrorcode, BISerrorsubcode, BISpduerrorinfo;

WITH INFORMATION SYNTAX

ISOxxxx-IDRP.NotificationInfo **REGISTERED AS**

ISOxxxx-IDRP.noi errorBISPDUsent (3);;

openBISpduRDCerror **NOTIFICATION**

BEHAVIOUR openBISpduRDCerror-B

BEHAVIOUR DEFINED AS The indication that an OPEN PDU has been received with the RDC Config for remote BIS and this BIS do not indicate that the two BIS trying to establish a connection are a part of the same confederations;

MODE NON-CONFIRMED

PARAMETERS Remotebis-NET, RemoteRDCconfig, LocalRDCconfig;

WITH INFORMATION SYNTAX

ISOxxxx-IDRP.NotificationInfo

REGISTERED AS ISOxxxx-IDRP.noi

errorpduRDCerror(4);

errorBISPDUconnectionclose **NOTIFICATION**

BEHAVIOUR errorBISPDUconnectionclose-B

BEHAVIOUR DEFINED AS The indication that an ERROR BISPDU has been received from a remote BIS;

MODE NON-CONFIRMED

PARAMETERS Remotebis-NET, bispduerrorcode, bispduerrorsubcode, bispduinfo;

WITH INFORMATION SYNTAX

ISOxxxx-IDRP.NotificationInfo

REGISTERED AS ISOxxxx-IDRP.noi

errorBISPDUconnectionclose(5);;

CorruptAdjRIBIn **NOTIFICATION**

BEHAVIOUR corruptAdjRIBIn-B

BEHAVIOUR DEFINED AS The indication that the local method of checking the Adj-RIB-In has found an error. All Adj-RIBs-In are being purged.

MODE NON-CONFIRMED

PARAMETERS maxAdjRibIntegritycheck;

WITH INFORMATION SYNTAX

ISOxxxx-IDRP.NotificationInfo

REGISTERED AS ISOxxxx-IDRP.noi corruptAdjRIBIn(6);;

packetBomb **NOTIFICATION**

BEHAVIOUR packetBomb-B

BEHAVIOUR DEFINED AS The indication that the local BIS has been presented with a BISPDU whose source is not one of the BISs adjacent to the local BIS. Such BISPDU are rejected by the local BIS.

MODE NON-CONFIRMED

WITH INFORMATION SYNTAX

ISOxxxx-IDRP.NotificationInfo

REGISTERED AS ISOxxxx-IDRP.noi packetBomb(7);;

12.7 Parameter Definitions

! notificationRemoteBIS-NET **PARAMETER**

CONTEXT ACTION-REPLY;

WITH SYNTAX ISOxxxx-IDRP.remoteBIS-NET;

BEHAVIOUR RemoteBIS-NET-B

PARAMETER DEFINED AS The NET of the Remote BIS that this local BIS is starting IDRP protocol communication with.;

REGISTERED AS ISOxxx-IDRP.proj RemoteBIS-NET(1);

! ~~Remotebis-NET~~ **PARAMETER**

~~**CONTEXT** EVENT-INFO;~~

~~**WITH SYNTAX** ISOxxxx-IDRP.remoteBIS-NET;~~

~~**BEHAVIOUR** Remotebis-NET-B~~

~~**PARAMETER DEFINED AS** The NET of the Remote BIS that this local BIS is starting IDRP protocol communication with.;~~

~~**REGISTERED AS** ISOxxxx-IDRP.proj Remotebis-NET(1);~~

! notificationSTATE **PARAMETER**

CONTEXT EVENT-INFO;

WITH SYNTAX ISOxxxx-IDRP.state

BEHAVIOUR ISOxxx-IDRP.STATE-B

PARAMETER DEFINED AS The state of the local BIS Finite State machine.;

REGISTERED AS ISOxxxx-IDRP.prio STATE(1);

! notificationBISpduerrorcode **PARAMETER**

CONTEXT EVENT-INFO;

WITH SYNTAX ISOxxxx-IDRP.bispduerrorcode

BEHAVIOUR ISOxxxx-IDRP.BISpduerrorcode-B

BEHAVIOUR DEFINED AS The error code indicating what type of error occurred in the BIS PDU.;

REGISTERED AS ISOxxxx-IDRP.prio BISpduerrorcode(2)

! notificationBISpduerrorsubcode **PARAMETER**

CONTEXT EVENT-INFO;

WITH SYNTAX ISOxxxx-IDRP.bispduerrorsubcode

BEHAVIOUR ISOxxxx-IDRP.BISpduerrorcode-B

BEHAVIOUR DEFINED AS The error code indicating what type of error within the major error type occurred in the BIS PDU.;

REGISTERED AS ISOxxxx-IDRP.prio BISpduerrorsubcode(3)

! notificationBISpduerrorinfo **PARAMETER**

CONTEXT EVENT-INFO;

WITH SYNTAX ISOxxxx-IDRP.bispduerrorinfo

BEHAVIOUR ISOxxxx-IDRP.BISpduerrorinfo-B

BEHAVIOUR DEFINED AS The additional information from original pdu that indicated an error in the BIS PDU.;

REGISTERED AS ISOxxxx-IDRP.prio BISpduerrorinfo(4);

! notificationRemoteRDCconfig **PARAMETER**

CONTEXT EVENT-INFO;

WITH SYNTAX ISOxxxx-IDRP.remoteRDCconfig;

BEHAVIOUR ISOxxxx-IDRP.RemoteRDCconfig-B

BEHAVIOUR DEFINED AS The Routing Domain Confederation (RDC) information from the remote BIS on this BIS to BIS communication.;

REGISTERED AS ISOxxxx-IDRP.prio RemoteRDCconfig(5);

! notificationLocalRDCconfig **PARAMETER**

CONTEXT EVENT-INFO;

WITH SYNTAX ISOxxxx-IDRP.localRDCconfig;

BEHAVIOUR ISOxxx-IDRP.LocalRDCconfig-B

BEHAVIOUR DEFINED AS The Routing Domain Confederation (RDC) information from this local BIS on this BIS to BIS communication.;

REGISTERED AS ISOxxxx-IDRP.prio LocalRDCconfig(6);

12.8 Attribute Groups

counters **ATTRIBUTE** group

DESCRIPTION The group of all counter per BIS connection

REGISTERED AS {ISO xxxx-IDRP.agoi counters [1]};

stateinfo **ATTRIBUTE** group

DESCRIPTION The group of all state information per BIS connection
REGISTERED AS {ISO xxxx-IDRP.agoi stateinfo[2]};

! bistimer **ATTRIBUTE** group

! **DESCRIPTION** The group of all timers per BIS connection
 !
 ! **REGISTERED AS** {ISO xxxx-IDRP.agoi bistimer[2]};

12.9 ASN.1 MODULES

! ISO 10747-IDRP(tbd1) **DEFINITIONS::=BEGIN**
 -- object identifier definitions
 sc6 **OBJECT IDENTIFIER** ::= {joint-iso-ccitt sc6(?)}
 -- value to be assigned by SC21 secretariat
 ! idrpoi **OBJECT IDENTIFIER** ::= {sc6 iso 10747(?)}
 -- value to be assigned by SC6 secretariat
 ! sseoi **OBJECT IDENTIFIER** ::= {idrpoi standSpecificExtensions(0)}
 ! moi **OBJECT IDENTIFIER** ::= {idrpoi objectClass (3)}
 poi **OBJECT IDENTIFIER** ::= {idrpoi package (4)}
 proi **OBJECT IDENTIFIER** ::= {idrpoi parameter(5)}
 nboi **OBJECT IDENTIFIER** ::= {idrpoi nameBinding (6)}
 aoi **OBJECT IDENTIFIER** ::= {idrpoi attribute (7)}
 agoi **OBJECT IDENTIFIER** ::= {idrpoi attributeGroup (8)}
 aoi **OBJECT IDENTIFIER** ::= {idrpoi action (9)}
 noi **OBJECT IDENTIFIER** ::= {idrpoi action (10)}
 !
 ! --
 ! --object identifiers for notification parameters
 ! --
 !
 ! **OBJECT IDENTIFIER** ::= {sseoi SpecificProblems(3)?}
 !
 ! errorBISPDUsent **OBJECT IDENTIFIER** ::= {se errorBISPDU(0)}
 ! openBISpduRDCerror **OBJECT IDENTIFIER** ::= {se errorBISPDU(1)}
 ! errorBISPDUconnectionclose **OBJECT IDENTIFIER** ::= {se errorBISPDU(2)}
 ! CorruptAdjRIBIn **OBJECT IDENTIFIER** ::= {se errorBISPDU(3)}
 ! packetBomb **OBJECT IDENTIFIER** ::= {se errorBISPDU(4)}
 ! enterFSMstate **OBJECT IDENTIFIER** ::= {se errorBISPDU(5)}
 ! FSMStateChange **OBJECT IDENTIFIER** ::= {se errorBISPDU(6)}
 !
 ! --
 ! --ASN1 Types and Values
 ! --
 !

ActionInfo ::= **SET OF** Parameter
 ActionReply ::= **SEQUENCE** {
 responseCode **OBJECT IDENTIFIER**
 responseArgs **SET** of Parameter **OPTIONAL**}
 AuthenticationCode ::= **ENUMERATED** {
 integrityOnly(0),
 integrityPlusAuthentication(1)}
 auth_type ::= AuthenticationCode
 BIS_group ::= **SET OF** {NetworkEntityTitle}
 bis_net ::= NetworkEntityTitle
 bisnegotiatedversion ::= version
 bispduerrorcode ::= **ENUMERATED** {
 OPEN_PDU_Error (1),
 UPDATE_PDU_Error (2),
 Hold_timer_Expired (3),
 bispduerrorsubcode ::= **SET OF** {
 openererrorsubcode,
 updateerrorsubcode}
 bispduerrorinfo ::= **OCTETSTRING**(1...50)
 bispeersSNPAs ::= SNPAAddresses
 Boolean ::= **BOOLEAN**
 capacity ::= **INTEGER**(1...255)
 closewaitdelayperiod ::= **INTEGER**(150)
 destinationspecificqos ::= ribattsec
 destinationspecificsecurity ::= ribattsec
 expensevalue ::= localexpense
 Holdtime ::= **INTEGER**(1...65 535)
 keepliveSincelastupdate ::= **INTEGER**(1...65 535)
 keeplivetimer ::= timer
 lastseqnosent ::= **INTEGER**(1...(4 294 967 295))
 lastseqnorecv ::= **INTEGER**(1...(4 294 967 295))
 lastacksent ::= **INTEGER**(1...(4 294 967 295))
 lastackrcv ::= **INTEGER**(1...(4 294 967 295))
 locexpense ::= **INTEGER**(1...65 535)
 localRDCconfig ::= rdc_group
 local_SNPAs ::= SNPAAddresses
 MaximumPDUSize ::= **INTEGER**(1..65 535)
 Metriclength ::= **INTEGER**(1...255)
 Metricvalue ::= **OCTETSTRING**(**SIZE**(1...255))
 NSAPprefixLength ::= **INTEGER**(1...160)
 NSAPprefix ::= **BITSTRING**(**SIZE**(1...160))
 NetworkEntityTitle ::= **OCTETSTRING**(**SIZE**(1...20))
 NotificationInfo ::= **SET OF** Parameter
 openererrorsubcode ::= **ENUMERATED** {
 UnsupportedVersion_number (1),
 Bad_Max_PDU_size (2),
 Bad_Outstanding_PDUs (3),
 Bad_Peer_RD (4),
 Unsupported_Authentication_code (5),
 Authentication_Failure (6),
 Bad_RIB-AttrsSet (7),
 RDC_mismatch (8)}
 OutstandingPdus ::= **INTEGER**(0...255)
 Parameter ::= **SEQUENCE** {
 paramID **OBJECT IDENTIFIER**
 paramInfo **ANY DEFINED BY** ParamID}
 priority ::= **INTEGER**(0...14)
 priorityvalue ::= priority
 QOSlength ::= **INTEGER**(1...255)
 QOSvalue ::= **OCTETSTRING**(**SIZE**(1...255))
 rdi ::= **OCTETSTRING**(**SIZE**(1...20));

```

--assigned from the NSAP address space
rdc_group ::= SEQUENCE { SEQUENCE
  rdc_set_id, SET OF {rdi}}
rdc_set_id ::= INTEGER(1..255)
RDtransitDelay ::= INTEGER(0...65 535)
rdlre ::= INTEGER(0...(4 294 967 295))
! retransmission_timer ::= INTEGER(0...65535)
remoteBIS-NET ::= NetworkEntityTitle
remoteRDCconfig ::= rdc_group
ribattsSet ::= SEQUENCE {
  SEQUENCE {
    ribsetid,
    ribsetcount,
    SET OF {rib_attributes}}
ribsetid ::= INTEGER(1..255)
ribsetcount ::= INTEGER(0..255)
rib_attributes ::= SEQUENCE OF {
  rib_attribute,
  rib_value}
rib_attribute ::= ENUMERATED {
! TRANSIT_DELAY (9),
! RESIDUAL_ERROR (10),
! EXPENSE (11),
! SourceSpecificQOS (12),
! DestinationSpecificQOS (13),
! SourceSpecificSecurity (17),
! DestinationSpecificSecurity(18),
! Capacity (19),
! Priority (20)}
rib_value ::= OCTETSTRING
! -- This octetstring may vary according to the
! -- rib_attribute value: Source Specific QOS,
! -- Destination Specific QOS, Source Specific
! -- Security, Destination Specific Security,
! -- may have varying lengths of rib attribute
! values-
! -- See the appropriate subclause of 8-12
! -- for more details
rib_value ::= SEQUENCE OF {ribattlength,
ribattvalue}
ribattlength ::= INTEGER
ribattvalue ::= CHOICE OF {
! transitdelayvalue,
! residualerrorvalue,
! expensevalue,
! sourcespecificqos,
! destinationspecificqos,
! sourcespecificsecurity,
! destinationspecificsecurity,
! capacityvalue,
! priorityvalue}
ribattqos ::= SEQUENCE OF {
! NSAPprefixlength,
! NSAPprefix,
! QOSlength,
! QOSvalue,
! metriclength,
! metricvalue}
ribattsec ::= SEQUENCE OF {
! NSAPprefixlength,
! NSAPprefix,
! securitylength,
! securitylevel}
securitylength ::= INTEGER(0...255)
securitylevel ::= OCTETSTRING(SIZE(1...255))
routeselectiontimer ::= timer
rdoriginatortimer ::= timer
SNPAAddress ::= SET OF {
  SNPA_Type, SNPAAddress}
SNPAAddress ::= SEMIOCTET STRING
(FROM
('1'H|'2'H|'3'H|'4'H|'5'H|'6'H|'7'H|'8'H|'9'H|
'A'H|'B'H|'C'H|'D'H|'E'H|'F'H))
--integral number of hexadecimal digits
SNPAAddresses ::= SET OF SNPAAddress
state ::= ENUMERATED {
  closed (0),
  open-recv(1),
  established(2),
  open-sent(3),
  close-wait(4)}
system_id_group ::= SEQUENCE OF {
  SET OF {NetworkEntityTitle},
  SET OF {EndSystemNSAPs}}
timer ::= SEQUENCE {
! exponent {1} INTEGER (-62...63)
! mantissa {2} INTEGER (0...65 535)
updateerrorsubcode ::= ENUMERATED {
  Malformed_Attribute_list (1),
  Unrecognized_Well-known_Attribute (2),
  Missing_Well-known_Attribute (3),
  Attribute_Flags_Error (4),
  Attribute_Length_Error (5),
  RD_Routeing_Loop (6),
  Invalid_NEXT_HOP_Attribute (7),
  Optional_Attribute_error (8),
  Invalid_Reachability_Information (9),
  Misconfigured_RDCs (10)}
updatesin ::= INTEGER(1...4 294 967 295)
updatesout ::= INTEGER(1...4 294 967 295)
totalbispdusin ::= INTEGER(1..4 294 967 295)
totalbispdusout ::= INTEGER(1..4 294 967 295)
version ::= INTEGER (1...255)
waitdelattimer ::= timer

```