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SERIES Q: SWITCHING AND SIGNALLING

Broadband ISDN – Common aspects of B-ISDN
application protocols for access signalling and network
signalling and interworking

AAL type 2 signalling protocol – Capability Set 3

ITU-T Recommendation Q.2630.3

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ITU-T Recommendation Q.2630.3

AAL type 2 signalling protocol – Capability Set 3

Summary

This Recommendation specifies the inter-node protocol and nodal functions that control AAL type 2 point-to-point connections.

The AAL type 2 signalling protocol specified in this Recommendation is usable in switched and non-switched environments and can operate in public or private networks over a range of signalling transport protocol stacks.

It also provides maintenance capabilities, carriage of user-plane protocol stack information and carriage of an identifier to link the connection control protocol with other higher layer control protocols.

Source

ITU-T Recommendation Q.2630.3 was approved on 14 October 2003 by ITU-T Study Group 11 (2001-2004) under the ITU-T Recommendation A.8 procedure.

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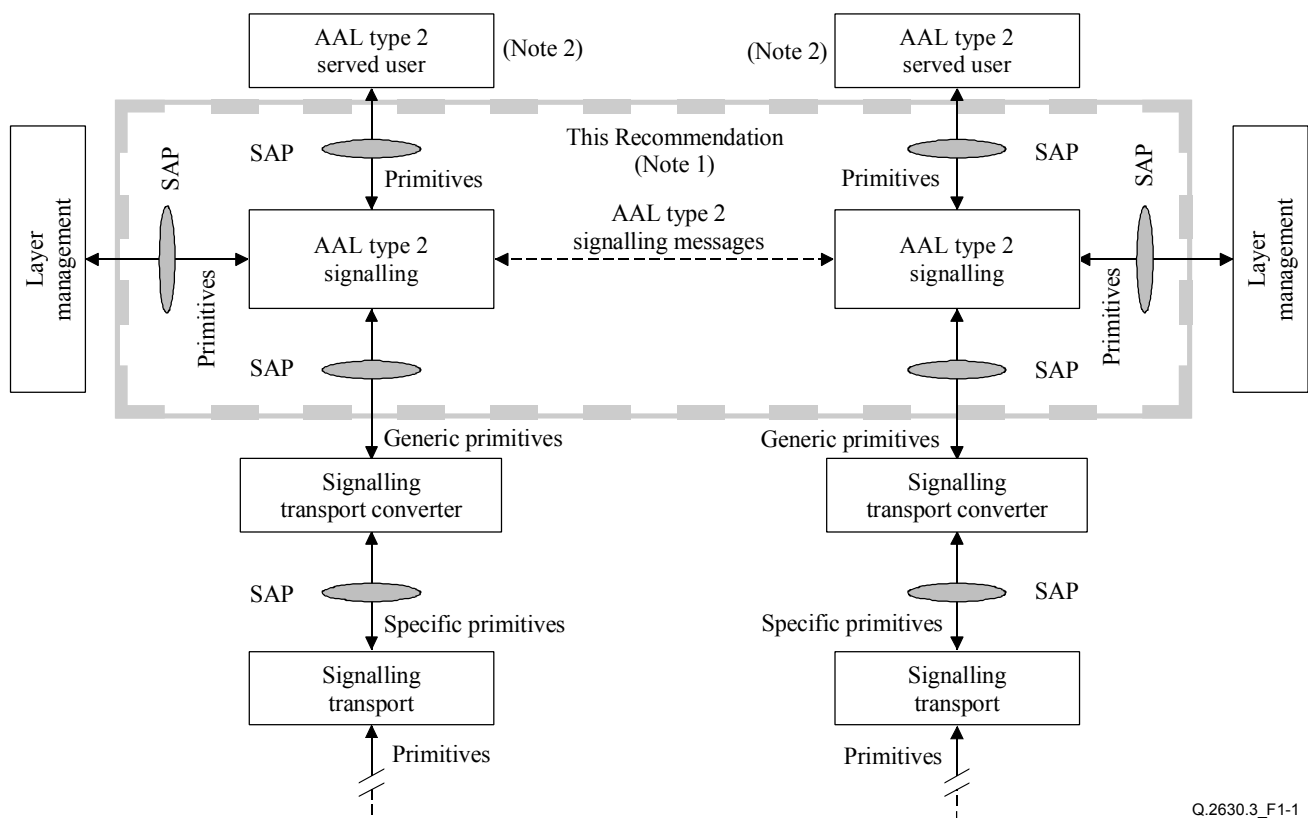
1 Scope

This Recommendation describes the AAL type 2 signalling protocol that supports the dynamic establishment and release of individual AAL type 2 point-to-point connections. It also describes the maintenance procedures, the framework of the protocol, and the interactions between an AAL type 2 signalling protocol entity and:

- the signalling protocol user;
- a signalling transport converter; and
- layer management.

This Recommendation also describes the connection states, messages, parameters, timers, local, and peer-to-peer procedures used for the control of those connections. The scope of this Recommendation is illustrated in Figure 1-1. The AAL type 2 signalling protocol can be deployed over a range of signalling transport protocol stacks.

This Recommendation is based on the requirements defined in ITU-T Q-series Recommendations – Supplement 42 [21] "Signalling Requirements for AAL type 2 Link Control Capability Set 3".



Q.2630.3_F1-1

NOTE 1 – The entities and Service Access Points (SAP) bounded by the gray broken line indicate the extent of the definitions specified in this Recommendation.

NOTE 2 – There are cases where the AAL type 2 served user is not present.

Figure 1-1/Q.2630.3 – Functional architecture of the AAL type 2 signalling

2 References

2.1 Normative references

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [1] ITU-T Recommendation I.363.2 (2000), *B-ISDN ATM adaptation layer specification: Type 2 AAL*.
- [2] ITU-T Recommendation I.361 (1999), *B-ISDN ATM layer specification*.
- [3] ITU-T Recommendation X.200 (1994) ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The basic model*.
- [4] ITU-T Recommendation X.210 (1993) | ISO/IEC 10731:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: Conventions for the definition of OSI services*.
- [5] ITU-T Recommendation X.213 (2001) | ISO/IEC 8348:2002, *Information technology – Open Systems Interconnection – Network service definition*.
- [6] ITU-T Recommendation Q.850 (1998), *Usage of cause and location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN User Part*.
- [7] ITU-T Recommendation Q.2610 (1999), *Usage of cause and location in B-ISDN user part and DSS2*.
- [8] ITU-T Recommendation I.366.2 (1999), *AAL type 2 service specific convergence sublayer for trunking*.
- [9] ITU-T Recommendation I.366.1 (1998), *Segmentation and Reassembly Service Specific Convergence Sublayer for the AAL type 2*.
- [10] ITU-T Recommendation E.164 (1997), *The international public telecommunication numbering plan*.
- [11] IEEE Standard 802-2001, *IEEE Standards for Local and Metropolitan Area Networks: Overview and Architecture*.
- [12] ITU-T Recommendation Q.2150.0 (2001), *Generic signalling transport service*.
- [13] ITU-T Recommendation I.356 (2000), *B-ISDN ATM layer cell transfer performance*.
- [14] ITU-T Recommendation I.366.2 (2000), *AAL type 2 service specific convergence sublayer for narrow-band services*.
- [15] ITU-T Recommendation Q.2630.1 (1999), *AAL type 2 signalling protocol – Capability Set 1*.
- [16] ITU-T Recommendation Q.2630.2 (2000), *AAL type 2 signalling protocol – Capability Set 2*.
- [17] ITU-T Recommendation E.412 (2003), *Network management controls*.

- [18] ITU-T Recommendation Q.542 (1993), *Digital exchange design objectives – Operations and maintenance*.
- [19] ITU-T Recommendation I.378 (2002), *Traffic control and congestion control at the ATM Adaptation Layer Type 2*.

2.2 Informative references

The documents listed in this clause provide informative background information for the reader and are not normative within this Recommendation.

- [21] ITU-T Q-series Recommendations – Supplement 42 (2003), *Technical Report TRQ.2402: Transport control signalling requirements – Signalling requirements for AAL type 2 link control Capability Set 3*.
- [22] ITU-T Recommendation Q.2150.1 (2001), *Signalling transport converter on MTP3 and MTP3b*.
- [23] ITU-T Recommendation Q.2150.2 (2001), *Signalling transport converter on SSCOP and SSCOPMCE*.
- [24] ITU-T Recommendation Q.2210 (1996), *Message transfer part level 3 functions and messages using the services of ITU-T Recommendation Q.2140*.
- [25] ITU-T Recommendation Q.2110 (1994), *B-ISDN ATM adaptation layer – Service Specific Connection Oriented Protocol (SSCOP)*.
- [26] ITU-T Recommendation Q.2130 (1994), *B-ISDN signalling ATM adaptation layer – Service specific coordination function for support of signalling at the user-network interface (SSCF at UNI)*.
- [27] ITU-T Recommendation Q.2941.2 (1999), *Digital Subscriber Signalling System No. 2 – Generic identifier transport extensions*.
- [28] ITU-T Recommendation Q.2150.3 (2002), *Signalling transport converter on SCTP*.
- [29] ITU-T Recommendation Q.2140 (1995), *B-ISDN ATM adaptation layer – Service specific coordination function for signalling at the network node interface (SSCF at NNI)*.
- [30] ETSI TS 126 103 V 5.1.0 (2002), *Universal Mobile Telecommunications System (UMTS); Speech codec list for GSM and UMTS (3GPP TS 26.103 version 5.1.0 Release 5)*.

3 Definitions

This Recommendation is based upon the concepts developed in ITU-T Recs X.200 [3] and X.210 [4].

In addition, for the purposes of this Recommendation, the following definitions apply:

3.1 AAL type 2 channel: A concept used in ITU-T Rec. I.363.2 [1] to describe transport of CPS-packets [1] associated in a common unique identifier value called CID on an ATM VCC.

3.2 AAL type 2 connection: The logical concatenation of one or more AAL type 2 links between two AAL type 2 service endpoints.

3.3 AAL type 2 connection resource: Describe the attributes of the AAL type 2 links making up the connection, and the Service Specific Convergence Sublayer resources used at the AAL type 2 service endpoints.

3.4 AAL type 2 link: The logical user plane communication facility between two adjacent AAL type 2 switching points or service endpoints. An AAL type 2 link is designated by a single CID value.

3.5 AAL type 2 link characteristics: Information that describes the attributes of the AAL type 2 link.

NOTE – In this Recommendation, AAL type 2 link characteristics are only used for backward compatibility, i.e., for interworking with AAL type 2 nodes that conform only to ITU-T Recs Q.2630.1 [15] or Q.2630.2 [16] (see Annex C).

3.6 AAL type 2 node: An AAL type 2 service endpoint or an AAL type 2 switch.

3.7 AAL type 2 path: An ATM VCC between two adjacent AAL type 2 nodes. This ATM VCC can either be an SVC, SPVC or PVC.

3.8 AAL type 2 path identifier: The identifier of the AAL type 2 path.

3.9 AAL type 2 requested path type: Information that describes the AAL type 2 path type. These path types may be "stringent class", "tolerant class", or "stringent bi-level class" (see ITU-T Rec. I.356 [13]).

3.10 AAL type 2 service endpoint: A termination point of an AAL type 2 connection.

3.11 AAL type 2 served user: The user of an AAL type 2 signalling protocol.

3.12 AAL type 2 signalling protocol: Control plane functions for establishing and releasing AAL type 2 connections and the maintenance functions associated with the AAL type 2 signalling.

3.13 AAL type 2 signalling transport: A facility for carrying AAL type 2 signalling messages.

3.14 AAL type 2 signalling endpoint: The termination point of an AAL type 2 signalling transport.

3.15 AAL type 2 switch: A system capable of switching AAL type 2 connections.

3.16 AAL type 2 transfer capability: Information that describes the attributes of the AAL type 2 link according to ITU-T Rec. I.378 [19].

NOTE – The attributes of the AAL type 2 link as described by AAL type 2 transfer capability parameters are intended to replace the attributes of the AAL type 2 link as described by AAL type 2 link characteristics parameters. The AAL type 2 transfer capability may describe the attributes of the AAL type 2 link in greater detail than the AAL type 2 link characteristics.

3.17 ATM layer signalling: Control plane functions for establishing, clearing and maintaining ATM VCCs.

3.18 ATM VCC: The logical concatenation of one or more ATM virtual channel links between two ATM service endpoints.

3.19 Connection resource: (see AAL type 2 connection resource.)

3.20 CS-1 node: An AAL type 2 node conforming to capability set 1 (see ITU-T Rec. Q.2630.1 [15]).

3.21 CS-1 service endpoint: An AAL type 2 service endpoint conforming to capability set 1 (see ITU-T Rec. Q.2630.1 [15]).

3.22 CS-1 switch: An AAL type 2 switch conforming to capability set 1 (see ITU-T Rec. Q.2630.1 [15]).

3.23 CS-2 node: An AAL type 2 node conforming to capability set 2 (see ITU-T Rec. Q.2630.2 [16]).

3.24 CS-2 service endpoint: An AAL type 2 service endpoint conforming to capability set 2 (see ITU-T Rec. Q.2630.2 [16]).

3.25 CS-2 switch: An AAL type 2 switch conforming to capability set 2 (see ITU-T Rec. Q.2630.2 [16]).

- 3.26 CS-3 node:** An AAL type 2 node, switch, or service endpoint conforming to capability set 3 (defined in this Recommendation).
- 3.27 CS-3 service endpoint:** An AAL type 2 service endpoint conforming to capability set 3 (defined in this Recommendation).
- 3.28 CS-3 switch:** An AAL type 2 switch conforming to capability set 3 (defined in this Recommendation).
- 3.29 field:** Information carried in a parameter in a message. A field can have fixed or variable length data.
- 3.30 generic signalling transport:** The function that enables an AAL type 2 signalling entity to communicate with a peer AAL type 2 signalling entity independently of the underlying signalling transport.
- 3.31 link associated signalling relationship:** A logical signalling relationship that is established during AAL type 2 connection establishment between two protocol entities in adjacent AAL type 2 nodes associated with the AAL type 2 link as part of the connection. A link associated signalling relationship is uniquely identified by a pair of Signalling Association Identifiers (Originating and Destination) within a signalling transport association and for the time the link exists.
- 3.32 link characteristics:** (See AAL type 2 link characteristics.)
- 3.33 network default stringent QoS class:** A stringent QoS class as defined in ITU-T Rec. I.356 [13] and as deployed in a network operating with signalling defined in ITU-T Rec. Q.2630.1 [15].
- 3.34 nodal function:** The functions that provide the bridge between incoming and outgoing protocol entities, perform the routing, and keep track of the AAL type 2 path resources.
- 3.35 parameter:** Information carried in a message. A parameter has a fixed, defined set of fields.
- 3.36 path identifier:** See AAL type 2 path identifier.
- 3.37 protocol entity:** The functions performed within an AAL type 2 signalling entity that relate to the exchange of AAL type 2 signalling information.
- 3.38 requested path type:** (See AAL type 2 requested path type.)
- 3.39 signalling transport association:** A signalling capability that exists between two adjacent AAL type 2 nodes to control the AAL type 2 connections that may exist in one or more AAL type 2 paths. There may be one or more signalling transport associations between two adjacent AAL type 2 nodes.
- 3.40 signalling transport:** A signalling link or network that connects two AAL type 2 nodes.
- 3.41 signalling transport converter:** A function that converts the services provided by a particular signalling transport to the services required by the generic signalling transport.
- 3.42 subfield:** The smallest unit of information in a field that has its own functional meaning.
- 3.43 transfer capability:** (See AAL type 2 transfer capability.)

4 Abbreviations

This Recommendation uses the following abbreviations:

A2P	AAL type 2 Path Identifier
A2SU	AAL type 2 Served User
AAL	ATM Adaptation Layer

ACC	Automatic Congestion Control
AESA	ATM End System Address
AMR	Adaptive Multi-rate Codec
ANI	Adjacent AAL type 2 Node Identifier
ATM	Asynchronous Transfer Mode
ATM VCC	ATM Virtual Channel Connection
BCD	Binary Coded Decimal
BLC	Block Confirm Message
BLO	Block Request Message
CAS	Channel Associated Signalling
CAU	Cause Parameter
CEID	AAL type 2 Connection Element Identifier
CFN	Confusion Message
CID	Channel Identifier
CMD	Circuit Mode Data
CP	Connection Priority
CPHL	CPS Packet Header Overhead Length
CPS	(AAL type 2) Common Part Sublayer
CS	Capability Set
CS-1	Capability Set 1 (ITU-T Rec. Q.2630.1 [15])
CS-2	Capability Set 2 (ITU-T Rec. Q.2630.2 [16])
CS-3	Capability Set 3 (this Recommendation)
DA2EA	Destination AAL type 2 Service Endpoint Address (Note 1)
DESEA	Destination E.164 Service Endpoint Address Parameter (Note 1)
DNSEA	Destination NSAP Service Endpoint Address Parameter (Note 1)
DSAID	Destination Signalling Association Identifier
DTMF	Dual Tone Multi-Frequency
ECF	Establish Confirm Message
ERQ	Establish Request Message
FAX	Demodulated Facsimile Data
FBW	Fixed Bandwidth Transfer Capability
FRM	Frame Mode Data
GST	Generic Signalling Transport
HBx	Header Bit Rate associated with x
HC	Hop Counter
ID	Identifier

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IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
ISO	International for Standardization Organization
LB	Loopback
LC	Link Characteristics (Note 2)
LM	Layer Management
LSB	Least Significant Bit
M	Mandatory
MF-R1	Multi-Frequency R1
MF-R2	Multi-Frequency R2
MOA	Modification Acknowledge message
MOD	Modification Request message
MOR	Modification Reject message
MSB	Most Significant Bit
MSLC	Modify Support for Link Characteristics
MSSSI	Modify Support for SSCS Information
MTP3b	Message Transfer Part level 3 using ITU-T Rec. Q.2140 [29]
NF	Nodal Function
NNI	Network-Network Interface
NSAP	Network Service Access Point
O	Optional
OA2EA	Origination AAL type 2 Service Endpoint Address
OESEA	Origination E.164 Service Endpoint Address Parameter
ONSEA	Origination NSAP Service Endpoint Address Parameter
OSAID	Originating Signalling Association Identifier (Parameter)
OUI	Organizational Unique Identifier
PFBW	Preferred FBW
PLC	Preferred Link Characteristics
PSSCS	Preferred SSCS Information
PSSIAE	Preferred Service Specific Information (Audio Extended)
PSSIME	Preferred Service Specific Information (Multirate Extended)
PT	Path Type
PTC	Preferred Transfer Capability
PVBWS	Preferred VBWS
PVBWT	Preferred VBWT

PVC	Permanent Virtual Channel
RC	Rate Control
REL	Release Request Message
RES	Reset Request Message
RLC	Release Confirm Message
RSC	Reset Confirm Message
SAAL	ATM Adaptation Layer for Signalling
SAID	Signalling Association Identifier
SAP	Service Access Point
SAR	Segmentation and Reassembly (Sublayer)
SDL	Specification and Description Language
SDU	Service Data Unit
SPVC	Soft PVC
SSCOP	Service Specific Connection Oriented Protocol
SSCS	Service Specific Convergence Sublayer
SSCS	SSCS Information
SSIA	Service Specific Information (Audio) Parameter
SSIAE	Service Specific Information (Audio Extended)
SSIM	Service Specific Information (Multirate) Parameter
SSIME	Service Specific Information (Multirate Extended)
SSISA	Service Specific Information (SAR-assured) Parameter
SSISU	Service Specific Information (SAR-unassured) Parameter
SSSAR	Segmentation and Reassembly Service Specific Convergence Sublayer
STC	Signalling Transport Converter
SUCI	Served User Correlation ID
SUGR	Served User Generated Reference
SUT	Served User Transport
SVC	Switched Virtual Channel
SYN	Synchronization of change in SSCS operation
TAR	Temporary Alternative Routing
TC	Transfer Capability
TCC	TAR Controlled Connection
TCI	Test Connection Indication
TCS	Transfer Capability Support
TED	Transmission Error Detection
UBC	Unblock Confirm Message
UBL	Unblock Request Message

UNI	User-Network Interface
UU	User-user
VBWS	Variable Bandwidth Stringent Transfer Capability
VBWT	Variable Bandwidth Tolerant Transfer Capability
VCC	Virtual Channel Connection
VPC	Virtual Path Connection

NOTE 1 – In ITU-T Recs Q.2630.1 [15] and Q.2630.2 [16], the abbreviation A2EA was used instead of DA2EA, ESEA instead of DESEA, and NSEA instead of DNSEA.

NOTE 2 – In ITU-T Rec. Q.2630.1 [15], the abbreviation ALC was used instead of LC.

5 General framework of the AAL type 2 signalling protocol

The AAL type 2 signalling protocol provides the signalling capability to establish, release and maintain AAL type 2 point-to-point connections across a series of ATM VCCs that carry AAL type 2 links. These services are accessible via the AAL type 2 served user service access point (A2SU-SAP).

The AAL type 2 signalling protocol also provides maintenance functions associated with the AAL type 2 signalling.

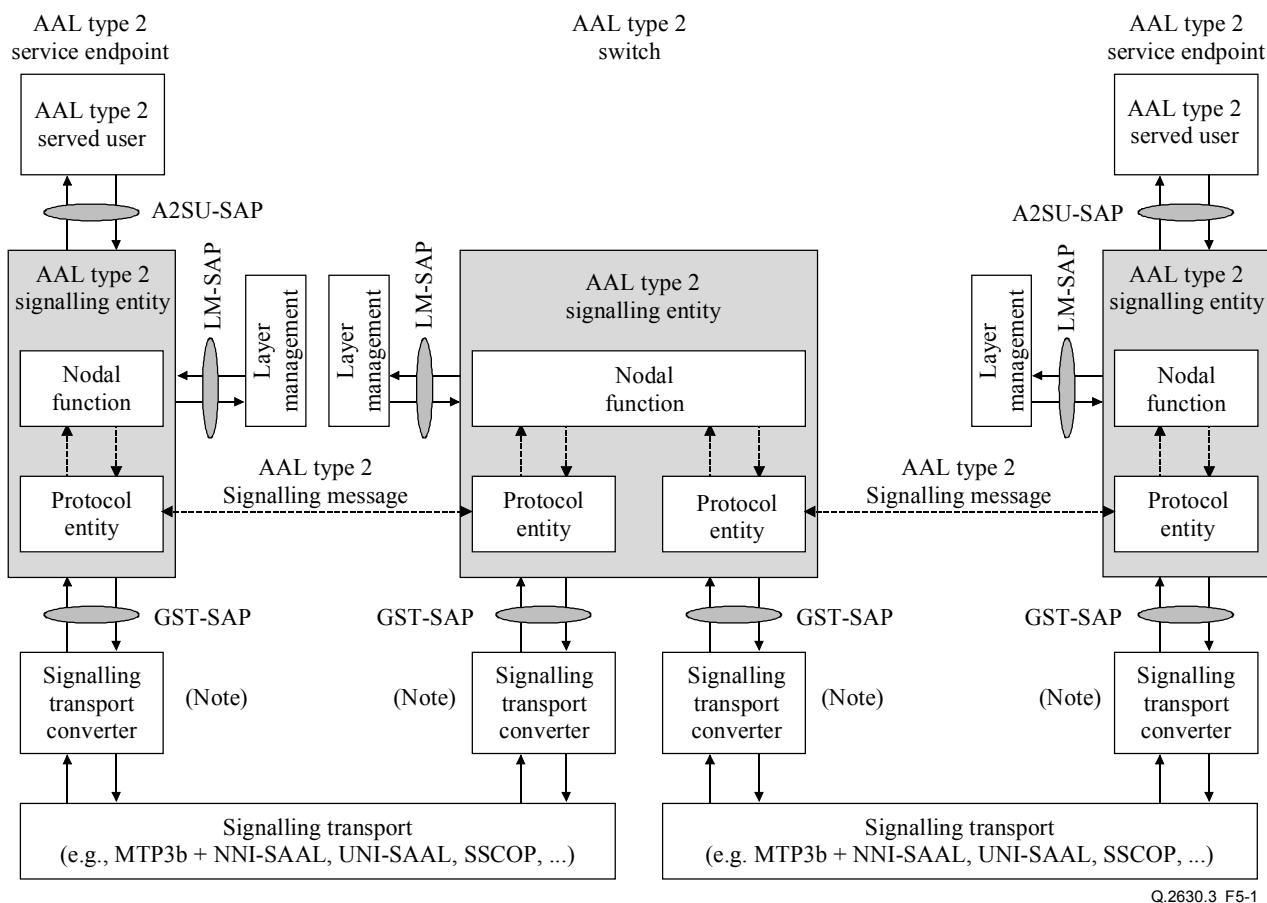
An AAL type 2 signalling endpoint shall be able to control AAL type 2 links on more than one AAL type 2 path. These AAL type 2 paths may be contained on different ATM VPCs, which in turn may be carried on different ATM physical interfaces.

Two peer AAL type 2 signalling entities rely on the generic signalling transport service to provide assured data transfer between them and service availability indications. These services are accessible via the Generic Signalling Transport Service Access Point (GST-SAP).

NOTE – Primitives over the A2SU-SAP, GST-SAP, and LM-SAP are used for descriptive purpose only. They do not imply a specific implementation.

Both peer AAL type 2 signalling entities provide the same set of services.

The AAL type 2 signalling entity is subdivided into protocol entities and nodal functions as shown in Figure 5-1. At each AAL type 2 service endpoint, the AAL type 2 signalling entity communicates with the AAL type 2 served user. At an AAL type 2 switch, the AAL type 2 signalling entity does not communicate with an AAL type 2 served user.



NOTE – In every AAL type 2 node, a signalling transport converter instance is associated with each AAL type 2 signalling transport.

Figure 5-1/Q.2630.3 – AAL type 2 signalling protocol reference architecture

Protocol Entities define the interactions between two adjacent AAL type 2 nodes. AAL type 2 messages are exchanged between peer protocol entities using the generic signalling transport service.

The AAL type 2 signalling is independent of the signalling transport, although an assured data transport is required and a message size limit applies. The Generic Signalling Transport Service used is defined in ITU-T Rec. Q.2150.0 [12]. To adapt the Generic Signalling Transport Services to a specific signalling transport service, a signalling transport converter may be needed. The specification of signalling transport converters is beyond the scope of this Recommendation (see ITU-T Recs Q.2150.1 [22], Q.2150.2 [23] and Q.2150.3 [28]).

The protocol entity is divided into several procedures as shown in Figure 5-2.

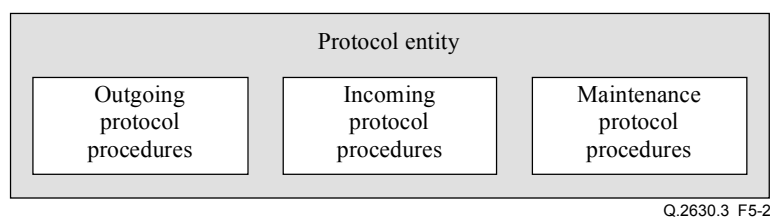


Figure 5-2/Q.2630.3 – Internal structure of the AAL type 2 signalling protocol entity

The outgoing protocol procedures provide the mechanism to initiate an AAL type 2 connection request. The incoming protocol procedures are applied when a request for an AAL type 2 connection is received from a peer entity. Both of these procedures provide for the orderly release of an AAL type 2 connection. The maintenance protocol procedures provide the mechanisms to align the status of the AAL type 2 resources at the two adjacent AAL type 2 nodes and the procedures to block and unblock an AAL type 2 path.

The unrecognized information procedures in the nodal function as well as in the protocol entities provide the forward compatibility mechanism which enables extension of the protocol in the future.

The nodal function provides the bridge between incoming and outgoing protocol entities, performs the routing functionality, and keeps track of the AAL type 2 path resources.

5.1 Interface between the AAL type 2 signalling entity and the AAL type 2 served user

5.1.1 Service provided by the AAL type 2 signalling entity

The AAL type 2 signalling entity provides the following services to the AAL type 2 served user across the A2SU-SAP:

- establishment of AAL type 2 connections;
- release of AAL type 2 connections; and
- modification of AAL type 2 connection resources.

The AAL type 2 signalling protocol entity is independent of the AAL type 2 served user.

5.1.2 Primitives between AAL type 2 signalling entities and the AAL type 2 served user

The A2SU-SAP primitives are used:

- 1) by the originating served user to initiate AAL type 2 connection establishment and by the originating and destination served users to initiate the release of a connection;
- 2) by the AAL type 2 signalling entities to indicate an incoming connection to the destination served user and notifying either the originating or destination served user of the release of a connection;
- 3) by the modification sending served user to originate, and the modification receiving served user to respond to, an AAL type 2 connection resource modification request; and
- 4) by the AAL type 2 signalling entities to indicate a modification of the AAL type 2 connection resource to the modification receiving served user and notify the modification originating served user of the successful or unsuccessful modification.

NOTE – When sending a primitive between the signalling protocol and its user, the primitive needs to be associated with a particular AAL type 2 connection instance. The mechanism used for this binding is considered to be an implementation detail and therefore is outside the scope of this Recommendation.

The services are provided through the transfer of primitives which are summarized in Table 5-1, and are defined after the table.

The AAL type 2 served user passes information in parameters in the primitives. Some of those parameters are mandatory and some are optional; the appropriate usage of the parameters is described in clause 8.

Table 5-1/Q.2630.3 – Primitives and parameters exchanged between the AAL type 2 signalling entities and the AAL type 2 served user

Primitive generic name	Type			
	Request	Indication	Response	Confirm
ESTABLISH	DA2EA, OA2EA, SUGR, SUT, TC, PTC, TCS, LC, PLC, MSLC, SSCS, PSSCS, MSSSI, PT, CP, TCI	OA2EA, SUGR, SUT, TC, PTC, TCS, LC, PLC, MSLC, SSCS, PSSCS, MSSSI, PT, CP, TCI	Not defined	TCS, MSLC, MSSSI
RELEASE	Cause	Cause	Not defined	Cause
MODIFY	TC, LC, SSCS, SUCI	TC, LC, SSCS, SUCI	SUCI	SUCI
MODIFY-REJECT	Not defined	Not defined	Not defined	Cause

- a) **ESTABLISH.request:**
This primitive is used by the AAL type 2 served user to initiate the establishment of a new AAL type 2 connection, and optionally request the capability for subsequent modification to be performed on the requested connection.
- b) **ESTABLISH.indication:**
This primitive is used by the AAL type 2 signalling entities to indicate that an incoming connection has been successfully established, and optionally indicate that the incoming connection is capable of subsequent modification.
- c) **ESTABLISH.confirm:**
This primitive is used by the AAL type 2 signalling entities to indicate that the connection (which was previously requested by the served user) has successfully been established and optionally indicate that the established connection is capable of subsequent modification.
- d) **RELEASE.request:**
This primitive is used by the AAL type 2 served user to initiate clearing of an AAL type 2 connection.
- e) **RELEASE.indication:**
This primitive is used by the AAL type 2 signalling entities to indicate that an AAL type 2 connection has been released.
- f) **RELEASE.confirm:**
This primitive is used as a negative acknowledgement for an ESTABLISH.request.
- g) **MODIFY.request:**
This primitive is used by the AAL type 2 served user to originate the modification of the AAL type 2 connection resource.
- h) **MODIFY.indication:**
This primitive is used by the AAL type 2 signalling entities to indicate that the modification of the AAL type 2 connection resource has been successfully performed.
- i) **MODIFY.response:**
This primitive is used by the AAL type 2 served user to respond to the modification of the AAL type 2 connection resource.

- j) **MODIFY.confirm:**
This primitive is used by the AAL type 2 signalling entities to indicate that the AAL type 2 connection resource modification (which was previously requested by the served user) has successfully been performed.
- k) **MODIFY-REJECT.confirm:**
This primitive is used by the AAL type 2 signalling entities to indicate that the AAL type 2 connection resource modification (which was previously requested by the served user) has been rejected.

5.1.3 Parameters between AAL type 2 signalling entities and the AAL type 2 served user

- a) **Destination AAL type 2 Service Endpoint Address (DA2EA)**
This parameter carries the service endpoint address of the destination. It can have the form of an E.164 address or an NSAP address.
- b) **Origination AAL type 2 Service Endpoint Address (OA2EA)**
This parameter carries the service endpoint address of the origination. It can have the form of an E.164 address or an NSAP address.
- c) **Served User Generated Reference (SUGR)**
This parameter carries a reference provided by the originating AAL type 2 served user and this reference is transported unmodified to the destination served user.
- d) **Served User Transport (SUT)**
This parameter carries the served user data that is transported unmodified to the destination served user.
- e) **Transfer Capability (TC)**
This parameter gives an indication of the AAL type 2 transfer capability required for the AAL type 2 connection. This parameter can have the form of either:
- Fixed Bandwidth Transfer Capability; or
 - Variable Bandwidth Stringent Transfer Capability; or
 - Variable Bandwidth Tolerant Transfer Capability.
- f) **Preferred Transfer Capability (PTC)**
This parameter gives an indication that the AAL type 2 Transfer Capability shall be set as indicated in this parameter if the modification of the AAL type 2 Transfer Capability is permitted. This parameter can have the form of either:
- Preferred Fixed Bandwidth Transfer Capability; or
 - Preferred Variable Bandwidth Stringent Transfer Capability; or
 - Preferred Variable Bandwidth Tolerant Transfer Capability.
- g) **Transfer Capability Support (TCS)**
This parameter gives an indication whether Transfer Capabilities are supported by all AAL type 2 nodes of the AAL type 2 connection.
- h) **Link Characteristics (LC)**
This parameter gives an indication of the resources required for the AAL type 2 connection and is used only for AAL type 2 path selection and connection admission control.
- i) **Preferred Link Characteristics (PLC)**
This parameter gives an indication that the Link Characteristics shall be set as indicated in this parameter if the modification of the Link Characteristics is permitted.

- j) **Modify Support for Link Characteristics (MSLC)**
This parameter gives an indication that the AAL type 2 Link Characteristics of the AAL type 2 connection may need to be modified during the lifetime of the AAL type 2 connection (ESTABLISH.request) or is permitted to be modified (ESTABLISH.indication and ESTABLISH.confirm).
- k) **SSCS Information (SSCS)**
This parameter identifies the type and the capabilities of an AAL type 2 SSCS protocol. This parameter can have the form of either:
- Service Specific Information (Multirate) (see ITU-T Rec. I.366.2 [14]),
 - Service Specific Information (Audio) (see ITU-T Rec. I.366.2 [14]),
 - Service Specific Information (Multirate Extended) (see Note);
 - Service Specific Information (Audio Extended) (see Note); or
 - Service Specific Information (SAR) (see ITU-T Rec. I.366.1 [9]) with or without the additional parameters necessary for the assured data transfer.
- NOTE – Multirate Extended and Audio Extended are used in this Recommendation to support the services of the U-Plane definitions of the 2000 version of ITU-T Rec. I.366.2 [14]. The (non-extended) Multirate and Audio are retained for backward compatibility with ITU-T Rec. Q.2630.1 [15]. For example, the Audio Extended form of the SSCS Information parameter in this Recommendation (see 7.4.19) adds support for LB, RC, and SYN that were added as U-Plane functions in the 2000 version of ITU-T Rec. I.366.2 [14].
- l) **Preferred SSCS Information (PSSCS)**
This parameter gives an indication that the SSCS Information shall be set as indicated in this parameter if the modification of the SSCS Information is permitted. This parameter can have the form of either:
- Preferred Service Specific Information (Multirate Extended) (see Note); or
 - Preferred Service Specific Information (Audio Extended) (see Note).
- Modification of Frame Mode Data as specified in ITU-T Rec. I.366.2 [14], or modification of SAR as specified in ITU-T Rec. I.366.1 [9] is outside the scope of this Recommendation.
- m) **Modify Support for SSCS Information (MSSSI)**
This parameter gives an indication that the SSCS Information of the AAL type 2 connection may need to be modified during the lifetime of the AAL type 2 connection (ESTABLISH.request) or are permitted to be modified (ESTABLISH.indication and ESTABLISH.confirm).
- n) **Path Type (PT)**
This parameter indicates a request for an AAL type 2 path with a specified Quality of Service.
- o) **Connection Priority (CP)**
This parameter carries information sent in the forward direction to indicate the priority level of the connection request.
- p) **Test Connection Indication (TCI)**
By its presence, this parameter indicates that the AAL type 2 connection to be established is a test connection.
- q) **Cause**
This parameter describes the reason for the release of the AAL type 2 connection. It also may indicate the reason why an AAL type 2 connection could not be established or a modification was rejected.

- r) **Served User Correlation ID (SUCI)**
This parameter carries the SSCS correlation ID (as specified in ITU-T Rec. I.366.2 [14]) during the modification of SSCS information and is transported unmodified to the destination or origination served user.

5.2 Interface between the AAL type 2 signalling entity and the generic signalling transport

5.2.1 Service provided by the generic signalling transport service

The Generic Signalling Transport Service is specified in ITU-T Rec. Q.2150.0 [12]. For convenience, a summary of the primitives for accessing the service is reproduced in Table 5-2. In the event of any difference between this table and the definitions in ITU-T Rec. Q.2150.0, the definitions in ITU-T Rec. Q. 2150.0 take precedence.

Table 5-2/Q.2630.3 – Primitives and parameters of the Generic Signalling Transport Sublayer

Primitive generic name	Type			
	Request	Indication	Response	Confirm
START-INFO	Not defined	Max_Length CIC_Control	Not defined	Not defined
IN-SERVICE	Not defined	Level	Not defined	Not defined
OUT-OF-SERVICE	Not defined	(Note 1)	Not defined	Not defined
CONGESTION	Not defined	Level	Not defined	Not defined
TRANSFER	Sequence Control STC User Data Priority (Note 2)	STC User Data Priority (Note 2)	Not defined	Not defined
NOTE 1 – This primitive has no parameters.				
NOTE 2 – This parameter is a national option (and the use of this parameter is not supported by all signalling transports).				

On the establishment of a signalling transport converter entity and the respective signalling transport converter user entity, for example at power up, the initial conditions are the same as if an OUT-OF-SERVICE.indication primitive had been conveyed across this SAP. Also at this time the START-INFO.indication is sent to the signalling entity.

NOTE – The CIC_Control parameter of the START-INFO.indication is ignored by the AAL type 2 signalling entity.

5.2.2 State transition diagram for sequences of primitives of the generic signalling transport service

This clause defines the constraints on the sequences in which the primitives may occur at the layer boundaries of the generic signalling transport service. The sequences are related to the states at one generic signalling transport endpoint between the generic signalling transport service provider and its user. The possible overall sequences of primitives are shown in the state transition diagram, Figure 5-3.

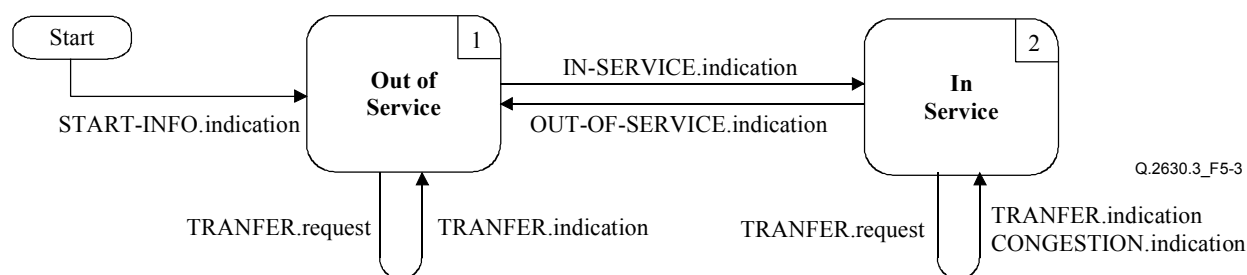


Figure 5-3/Q.2630.3 – State transition diagram for sequences of primitives between the GST and its user

This model assumes that a request primitive is never issued at the same time as an indication primitive. The model also assumes that the primitives are serviced immediately and in zero time.

5.3 Interface between the AAL type 2 signalling entity and layer management

5.3.1 Service provided by layer management

This interface provides the internal interface to the network management system.

5.3.2 Primitives between AAL type 2 signalling entities and layer management

The primitives are summarized in Table 5-3, and are defined after the table.

Table 5-3/Q.2630.3 – Primitives and parameters exchanged between the AAL type 2 signalling entities and layer management

Primitive generic name	Type			
	Request	Indication	Response	Confirm
BLOCK	ANI, A2P	Not defined	Not defined	Cause
UNBLOCK	ANI, A2P	Not defined	Not defined	Cause
RESET	ANI, CEID	ANI, CEID	Not defined	–
STOP-RESET	ANI, CEID	Not defined	Not defined	Not defined
ADD-PATH	Not defined	ANI, A2P, PT Ownership	Not defined	Not defined
REMOVE-PATH	Not defined	ANI, A2P	Not defined	Not defined
ERROR	Not defined	ANI, CEID, Cause	Not defined	Not defined
– This primitive has no parameters.				

NOTE – When sending a primitive between the AAL type 2 signalling entity and layer management, the primitive needs to be associated with a particular management action instance. The mechanism used for this binding is considered to be an implementation detail and, therefore, is outside the scope of this Recommendation.

- BLOCK.request:**
A primitive to request the AAL type 2 signalling entity to locally block a particular, unblocked AAL type 2 path and to indicate this to the peer AAL type 2 signalling entity.
- BLOCK.confirm:**
A primitive with no parameter indicates that the AAL type 2 signalling entity has successfully informed the peer AAL type 2 signalling entity of the blocking of a particular AAL type 2 path. A primitive with a cause parameter indicates that the AAL type 2 signalling entity has detected an error in the blocking procedures.

- c) **UNBLOCK.request:**
A primitive to request the AAL type 2 signalling entity to locally unblock a particular, blocked AAL type 2 path and to indicate this to the peer AAL type 2 signalling entity.
- d) **UNBLOCK.confirm:**
A primitive with no parameter indicates that the AAL type 2 signalling entity has successfully informed the peer signalling entity of the unblocking of a particular AAL type 2 path. A primitive with a cause parameter indicates that the AAL type 2 signalling entity has detected an error in the unblocking procedures.
- e) **RESET.request:**
A primitive to request the AAL type 2 signalling entity to reset a particular channel, all channels on a particular AAL type 2 path, or all channels on all AAL type 2 paths associated with a signalling transport association to the "Idle" state and to indicate this to the peer AAL type 2 signalling entity.
- f) **RESET.indication:**
A primitive indicating that the AAL type 2 signalling entity has reset a particular channel, all channels on a particular AAL type 2 path, or all channels on all AAL type 2 paths associated with a signalling transport association to the "Idle" state on the request of the peer AAL type 2 signalling entity.
- g) **RESET.confirm:**
A primitive indicating that the AAL type 2 signalling entity has successfully informed the peer AAL type 2 signalling entity of the resetting of the channel or all the channels on a specific AAL type 2 path or on all AAL type 2 paths associated with a signalling transport association.
- h) **STOP-RESET.request:**
A primitive to request the AAL type 2 signalling entity to stop a reset procedure.
- i) **ADD-PATH.indication:**
This primitive informs the AAL type 2 signalling entity that a new AAL type 2 path has been established towards one of the adjacent AAL type 2 nodes.
- j) **REMOVE-PATH.indication:**
This primitive informs the AAL type 2 signalling entity that an AAL type 2 path has been removed.
- k) **ERROR.indication:**
A primitive to indicate any operational errors in the AAL type 2 signalling procedures.

5.3.3 Parameters between AAL type 2 signalling entities and layer management

- a) **AAL type 2 Path Identifier (A2P)**
This parameter indicates an AAL type 2 path.
- b) **Connection Element Identifier (CEID)**
This parameter allows for the identification of:
 - i) all AAL type 2 paths between two adjacent AAL type 2 nodes associated with a signalling transport association;
 - ii) a particular AAL type 2 path; or
 - iii) a particular channel on a particular AAL type 2 path.
- c) **Cause**
This parameter gives the reason of an operational error.

- d) **Ownership**
This parameter indicates whether a newly established AAL type 2 path is owned by the AAL type 2 signalling entity or by its peer.
- e) **Adjacent AAL type 2 Node Identifier (ANI)**
This parameter is used to unambiguously indicate an adjacent AAL type 2 node.
- f) **Path Type (PT)**
This parameter indicates the Quality of Service class of the newly established AAL type 2 path.

6 Forward and backward compatibility

The compatibility mechanism remains unchanged for all capability sets and/or subsets of the AAL type 2 protocol defined in this Recommendation. It is based on forward compatibility information associated with all signalling information.

The compatibility method eases the network operation, for example:

- For the typical case of an AAL type 2 signalling protocol mismatch during a network upgrading.
- To interconnect two networks on a different functional level.
- For networks using a different subset of the same AAL type 2 protocol, etc.

NOTE – A node may be at a different functional level due to having implemented a different capability set or another subset of the protocol specified in this Recommendation.

The coding of message and parameter compatibility information is shown in Annex B; these codings shall be used to maintain backward compatibility with AAL type 2 nodes conforming only to ITU-T Rec. Q.2630.1 [15] and with AAL type 2 nodes conforming only to ITU-T Rec. Q.2630.2 [16].

The forward compatibility mechanism specified in 6.2 and 8.1 applies to this and future capability sets of this Recommendation.

6.1 Backward compatibility rules

Compatible interworking between AAL type 2 protocol capability sets should be optimized by adhering to the following rules when specifying a new capability set (release):

- 1) Existing protocol elements, i.e., procedures, messages, parameters and subfield values, should not be changed unless a protocol error needs to be corrected or it becomes necessary to change the operation of the service that is being supported by the protocol.
- 2) The semantics of a message, a parameter, or of a field and subfield within a parameter should not be changed.
- 3) Established rules for formatting and encoding messages and parameters should not be modified.

6.2 Forward compatibility mechanism

Compatibility between this and future capability sets will be guaranteed, in the sense that any two capability sets can be interconnected directly with each other, if the following requirements are fulfilled:

- i) *Protocol compatibility*
Connections between any two AAL type 2 protocols do not fail for the reason of not satisfying protocol requirements.

- ii) *Service and functional compatibility*
This feature may be considered as compatibility typically between originating and destination nodes. Services and functions available at these nodes, but possibly not yet taken into account in the intermediate nodes, are supported, provided that information related to these services and functions can be passed transparently through intermediate nodes.
- iii) *Resource control and management compatibility*
For these functions, occurring only link-by-link, at least a backward notification is needed, if correct handling is not possible.

7 Format and coding of AAL type 2 signalling protocol

7.1 Coding conventions for the AAL type 2 signalling protocol

7.1.1 Principles

The following principles shall apply for the coding of the AAL type 2 signalling protocol:

- a) The order of coding of messages shall consist of "destination signalling association identifier", "message identifier", "message compatibility", and any parameters.
- b) Messages shall carry zero or more parameters.
- c) The sequence of parameters is unconstrained.
- d) The order of coding of parameters shall consist of "parameter identifier", "parameter compatibility", "parameter length", and any fields.
- e) Parameters shall carry zero or more fields.
- f) A parameter shall always consist of the same sequence of fields.
- g) If new fields need to be added to a parameter or the length of a fixed size field needs to be changed, the modifications shall be carried in a new parameter (different parameter identifier); the existing parameter shall remain unchanged.
- h) Any sequence of fixed size fields and variable size fields is permissible.
- i) Fixed length fields shall consist of the "field" only; no length is indicated.
- j) Variable length fields shall consist of "field length" and "field".
- k) Fields shall be multiples of one octet.
- l) Fields are composed of one or more subfields.
- m) Reserved subfields shall be coded all zeroes and need not be interpreted by the receiver.
- n) If there is no information to be carried in a variable size field, its length shall be set to zero, i.e., only the field length octet will be present.
- o) If there is no information to be carried in a fixed size field, its content shall be set to zero in all octets.
- p) The presence or the interpretation of a field shall not depend on the value of a field in another parameter.

Consistent with the above coding principles, it is further specified that:

- The message length shall allow for lengths of up to 4 000 octets.
- The parameter length shall allow for lengths of up to 255 octets.

7.1.2 General format of messages

The general format of a message is shown in Table 7-1.

NOTE – No "message length" needs to be carried in the message itself; the length of information passed via a primitive implicitly defines its length and the assured data transfer assures that no octets are lost or gained in transport.

Table 7-1/Q.2630.3 – AAL type 2 message format

	8	7	6	5	4	3	2	1	
Header	Destination signalling association identifier								4 octets
	Message identifier								1 octet
	Message compatibility								1 octet
Payload	Parameters								

The message header consists of the destination signalling association identifier field, the message identifier field, and the message compatibility field. The destination signalling association identifier field is coded the same as the signalling association identifier field (see 7.4.2), the coding of the message identifier field is specified in 7.2.1, and the message compatibility field is coded the same as the compatibility field (see 7.4.1).

The message payload consists of zero, one, or more parameters.

7.1.2.1 Bit coding rules

When a field is contained within a single octet, the lowest bit number of the field represents the lowest order value.

When a field spans more than one octet, the order of bit values within each octet progressively decreases as the octet number increases; the lowest bit number associated with the field represents the lowest order value.

(This coding conforms to the coding conventions specified in 2.1/I.361 [2].)

7.1.3 General format of parameters

The general format of a parameter is shown in Table 7-2.

Table 7-2/Q.2630.3 – AAL type 2 parameter format

	8	7	6	5	4	3	2	1	
Header	Parameter identifier								1 octet
	Parameter compatibility								1 octet
	Parameter length								1 octet
Payload	Fields								

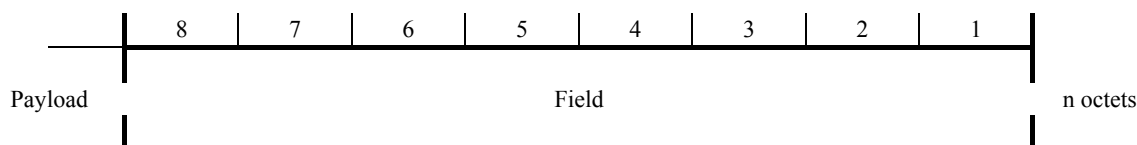
The coding of the parameter identifier field is specified in 7.2.2, Table 7-7 and the parameter compatibility field is coded as a compatibility field (see 7.4.1). The coding of the parameter length is a binary value indicating the number of octets in the parameter payload, i.e., the count does not include the octets in the parameter header.

Each parameter has a defined number of fields of defined type and in a particular order.

7.1.4 General format of fixed length fields

The general format of a fixed length field is shown in Table 7-3.

Table 7-3/Q.2630.3 – AAL type 2 field – Fixed length format

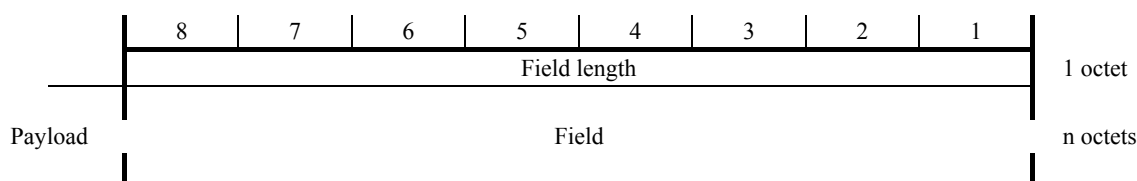


The field type is determined by the location of the field in the particular parameter.

7.1.5 General format of variable length fields

The general format of a variable length field is shown in Table 7-4.

Table 7-4/Q.2630.3 – AAL type 2 field – Variable length format



The coding of the field length is a binary value indicating the number of octets in the field payload, i.e., the count does not include the field length octet.

The field type is determined by the location of the field in the particular parameter.

7.2 Format and coding of the AAL type 2 signalling protocol messages

7.2.1 AAL type 2 signalling protocol messages

The AAL type 2 signalling protocol messages and their message identifiers are shown in Table 7-5.

Table 7-5/Q.2630.3 – AAL type 2 messages and the coding of the message identifiers

Message	Acronym	Message identifier
Block Confirm	BLC	0 0 0 0 0 0 0 1
Block Request	BLO	0 0 0 0 0 0 1 0
Confusion	CFN	0 0 0 0 0 0 1 1
Establish Confirm	ECF	0 0 0 0 0 1 0 0
Establish Request	ERQ	0 0 0 0 0 1 0 1
Modify Acknowledge	MOA	0 0 0 0 1 1 0 0
Modify Reject	MOR	0 0 0 0 1 1 0 1
Modify Request	MOD	0 0 0 0 1 1 1 0
Release Confirm	RLC	0 0 0 0 0 1 1 0
Release Request	REL	0 0 0 0 0 1 1 1
Reset Confirm	RSC	0 0 0 0 1 0 0 0
Reset Request	RES	0 0 0 0 1 0 0 1
Unblock Confirm	UBC	0 0 0 0 1 0 1 0
Unblock Request	UBL	0 0 0 0 1 0 1 1

7.2.2 Parameters of the AAL type 2 signalling protocol messages

The parameters of the AAL type 2 signalling protocol messages are shown in Table 7-6. The indications of "mandatory" and "optional" are for information only. The authoritative definition is given in clause 8 and Annex C. If any difference between the indications in this clause and the definitions in clause 8 and Annex C exists, the definitions in clause 8 take precedence.

Multiple presence of the same parameter in a single message is not permitted.

Table 7-6/Q.2630.3 (part 1 of 2) – Parameters of the AAL type 2 signalling protocol messages

Parameter	Message						
	ERQ	ECF	REL	RLC	MOD	MOA	MOR
Automatic Congestion Control	–	–	O	O	–	–	–
Cause	–	–	M	(Note 12)	–	–	M
Connection Element Identifier	M	–	–	O	–	–	–
Connection Priority	O	–	–	–	–	–	–
Destination E.164 Service Endpoint Address	(Note 2)	–	–	–	–	–	–
Destination NSAP Service Endpoint Address	(Note 2)	–	–	–	–	–	–
Destination Signalling Association Identifier (Note 1)	(Note 3)	M	M	M	M	M	M
Hop Counter	O	–	–	–	–	–	–
Link Characteristics	(Note 4)	–	–	–	(Note 4)	–	–
Modify Support for Service Specific Information	(Notes 4, 16)	(Note 4)	–	–	–	–	–
Modify Support for Link Characteristics	(Notes 4, 14)	(Note 4)	–	–	–	–	–
Originating Signalling Association Identifier	M	M	–	–	–	–	–
Origination E.164 Service Endpoint Address	(Note 5)	–	–	–	–	–	–
Origination NSAP Service Endpoint Address	(Note 5)	–	–	–	–	–	–
Path Type	(Note 6)	–	–	–	–	–	–
Preferred Link Characteristics	(Notes 4, 15)	–	–	–	–	–	–
Preferred Service Specific Information (Audio Extended)	(Notes 4, 7)	–	–	–	–	–	–
Preferred Service Specific Information (Multirate Extended)	(Notes 4, 7)	–	–	–	–	–	–
Preferred Transfer Capability (FBW)	(Notes 4, 8)	–	–	–	–	–	–
Preferred Transfer Capability (VBWS)	(Notes 4, 8)	–	–	–	–	–	–
Preferred Transfer Capability (VBWT)	(Notes 4, 8)	–	–	–	–	–	–
Served User Correlation ID	–	–	–	–	O	O	–
Served User Generated Reference	O	–	–	–	–	–	–

Table 7-6/Q.2630.3 (part 1 of 2) – Parameters of the AAL type 2 signalling protocol messages

Parameter	Message						
	ERQ	ECF	REL	RLC	MOD	MOA	MOR
Served User Transport	O	–	–	–	–	–	–
Service Specific Information (Audio Extended)	(Notes 9, 10)	–	–	–	(Notes 13, 17)	–	–
Service Specific Information (Audio)	(Notes 4, 9, 10)	–	–	–	–	–	–
Service Specific Information (Multirate Extended)	(Notes 9, 10)	–	–	–	(Notes 13, 17)	–	–
Service Specific Information (Multirate)	(Notes 4, 9, 10)	–	–	–	–	–	–
Service Specific Information (SAR-assured)	(Note 9)	–	–	–	–	–	–
Service Specific Information (SAR-unassured)	(Note 9)	–	–	–	–	–	–
TAR Controlled Connection	O	–	–	–	–	–	–
Test Connection Indicator	O	–	–	–	–	–	–
Transfer Capability (FBW)	(Note 11)	–	–	–	(Notes 13, 17)	–	–
Transfer Capability (VBWS)	(Note 11)	–	–	–	(Notes 13, 17)	–	–
Transfer Capability (VBWT)	(Note 11)	–	–	–	(Notes 13, 17)	–	–
Transfer Capability Support (TCS)	(Note 4)	(Note 4)	–	–	–	–	–

M Mandatory parameter

O Optional parameter

– Parameter not present

NOTE 1 – This row designates the Destination Signalling Association Identifier field in the message header.

NOTE 2 – Exactly one of these parameters must be present in an instance of the message.

NOTE 3 – The Destination Signalling Association Identifier field contains the value "unknown".

NOTE 4 – This parameter is only used for backward compatibility, i.e., for interworking with AAL type 2 nodes that conform only to ITU-T Recs Q.2630.1 [15] or Q.2630.2 [16] (see Annex C).

NOTE 5 – At most one of these parameters is present in an instance of the message.

NOTE 6 – If the path type parameter is not included, the path type shall be considered to be the network default stringent QoS class.

NOTE 7 – This parameter may only be included if "Modify Support for Service Specific Information" is included; at most one of these parameters is present in an instance of the message. If present it must refer to the same service specific information as the Service Specific Information parameter present in the same Establish Request message, i.e., Audio or Multirate.

NOTE 8 – This parameter must be included if a "Preferred Link Characteristics" and/or a "Preferred Service Specific Information" is included. At most one of these parameters is present in an instance of the message. If present, it must refer to the same transfer capability as the Transfer Capability parameter present in the same Establish Request message.

NOTE 9 – At most one of these parameters is present in an instance of the message.

Table 7-6/Q.2630.3 (part 1 of 2) – Parameters of the AAL type 2 signalling protocol messages

Parameter	Message						
	ERQ	ECF	REL	RLC	MOD	MOA	MOR
NOTE 10 – If the Modify Support for Service Specific Information parameter is included, this parameter shall also be included.							
NOTE 11 – Exactly one of these parameters is present in an instance of the message.							
NOTE 12 – The "Cause" parameter is present in the Release Confirm message if:							
a) the RLC is used to reject a connection establishment; or							
b) the cause reports unrecognized information received in the REL message.							
NOTE 13 – At most one of these parameters is present in an instance of the message, and only the same parameter that was present in the Establish Request message may be present.							
NOTE 14 – This parameter may be present only if the parameter "Link Characteristics" is present also.							
NOTE 15 – This parameter may be present only if the parameter "Modify Support for Link Characteristics" is present also.							
NOTE 16 – This parameter may be present only if one of the parameters "Service Specific Information (Audio)", "Service Specific Information (Audio Extended)", "Service Specific Information (Multirate)", and "Service Specific Information (Multirate Extended)" is present also.							
NOTE 17 – At least one of these parameters is present in an instance of the message.							

Table 7-6/Q.2630.3 (part 2 of 2) – Parameters of the AAL type 2 signalling protocol messages

Parameter	Message						
	RES	RSC	BLO	BLC	UBL	UBC	CFN
Cause	–	(Note 4)	–	(Note 4)	–	(Note 4)	M
Connection Element Identifier	M	–	M (Note 3)	–	M (Note 3)	–	–
Destination Signalling Association Identifier (Note 1)	(Note 2)	M	(Note 2)	M	(Note 2)	M	M
Originating Signalling Association Identifier	M	–	M	–	M	–	–
M Mandatory parameter O Optional parameter – Parameter not present NOTE 1 – This row designates the Destination Signalling Association Identifier field in the message header. NOTE 2 – The Destination Signalling Association Identifier field contains the value "unknown". NOTE 3 – The Channel Identifier field is set to "Null", but the Path Identifier includes a value identifying an AAL type 2 path. NOTE 4 – The "Cause" parameter is present only if the cause reports unrecognized information received.							

The identifiers of the AAL type 2 message parameters are defined in Table 7-7.

Table 7-7/Q.2630.3 – Identifiers of the AAL type 2 message parameters

AAL type 2 Parameter	Ref.	Acronym	Identifier
Automatic Congestion Control	7.3.25	ACC	0 0 0 1 1 0 0 0
Cause	7.3.1	CAU	0 0 0 0 0 0 0 1
Connection Element Identifier	7.3.2	CEID	0 0 0 0 0 0 1 0
Connection Priority	7.3.26	CP	0 0 0 1 1 0 0 1
Destination E.164 Service Endpoint Address	7.3.3	DESEA	0 0 0 0 0 0 1 1
Destination NSAP Service Endpoint Address	7.3.4	DNSEA	0 0 0 0 0 1 0 0
Hop Counter	7.3.27	HC	0 0 0 1 1 0 1 0
Link Characteristics (Note)	7.3.5	LC	0 0 0 0 0 1 0 1
Modify Support for Link Characteristics (Note)	7.3.20	MSLC	0 0 0 0 1 1 1 0
Modify Support for Service Specific Information (Note)	7.3.21	MSSSI	0 0 0 0 1 1 1 1
Originating Signalling Association Identifier	7.3.6	OSAID	0 0 0 0 0 1 1 0
Origination E.164 Service Endpoint Address	7.3.23	OESEA	0 0 0 1 1 0 1 1
Origination NSAP Service Endpoint Address	7.3.24	ONSEA	0 0 0 1 0 1 0 1
Path Type	7.3.14	PT	0 0 0 1 0 0 0 0
Preferred Link Characteristics (Note)	7.3.19	PLC	0 0 0 1 0 0 0 1
Preferred Service Specific Information (Audio Extended) (Note)	7.3.17	PSSIAE	0 0 0 1 0 0 1 0
Preferred Service Specific Information (Multirate Extended) (Note)	7.3.18	PSSIME	0 0 0 1 0 0 1 1
Preferred Transfer Capability (FBW) (Note)	7.3.29	PFBW	0 0 0 1 1 1 0 0
Preferred Transfer Capability (VBWS) (Note)	7.3.30	PVBWS	0 0 0 1 1 1 0 1
Preferred Transfer Capability (VBWT) (Note)	7.3.31	PVBWT	0 0 0 1 1 1 1 0
Served User Correlation ID	7.3.22	SUCI	0 0 0 1 0 1 0 0
Served User Generated Reference	7.3.7	SUGR	0 0 0 0 0 1 1 1
Served User Transport	7.3.8	SUT	0 0 0 0 1 0 0 0
Service Specific Information (Audio Extended)	7.3.15	SSIAE	0 0 0 1 0 1 1 0
Service Specific Information (Audio) (Note)	7.3.9	SSIA	0 0 0 0 1 0 0 1
Service Specific Information (Multirate Extended)	7.3.16	SSIME	0 0 0 1 0 1 1 1
Service Specific Information (Multirate) (Note)	7.3.10	SSIM	0 0 0 0 1 0 1 0
Service Specific Information (SAR-assured)	7.3.11	SSISA	0 0 0 0 1 0 1 1
Service Specific Information (SAR-unassured)	7.3.12	SSISU	0 0 0 0 1 1 0 0
TAR Controlled Connection	7.3.28	TCC	0 0 0 1 1 1 1 1
Test Connection Indicator	7.3.13	TCI	0 0 0 0 1 1 0 1
Transfer Capability (FBW)	7.3.32	FBW	0 0 1 0 0 0 0 0
Transfer Capability (VBWS)	7.3.33	VBWS	0 0 1 0 0 0 0 1
Transfer Capability (VBWT)	7.3.34	VBWT	0 0 1 0 0 0 1 0
Transfer Capability Support (Note)	7.3.35	TCS	0 0 1 0 0 0 1 1
NOTE – In this Recommendation, this parameter is only used for backward compatibility, i.e., for interworking with AAL type 2 nodes that conform only to ITU-T Recs Q.2630.1 [15] or Q.2630.2 [16].			

7.3 Parameter specification of the AAL type 2 signalling protocol messages

7.3.1 Cause

The sequence of fields in the cause parameter is shown in Table 7-8.

Table 7-8/Q.2630.3 – Sequence of fields in the cause parameter

Field No.	Field	Ref.
1	Cause Value	7.4.16
2	Diagnostics	7.4.17

7.3.2 Connection element identifier

The sequence of fields in the connection element identifier parameter is shown in Table 7-9.

Table 7-9/Q.2630.3 – Sequence of fields in the connection element identifier parameter

Field No.	Field	Ref.
1	Path Identifier	7.4.3
2	Channel Identifier	7.4.4

<i>AAL type 2 Path Identifier</i>	<i>Channel Identifier</i>	<i>Meaning</i>
Null	Ignored	All AAL type 2 paths associated with a signalling transport association
Value	Null	AAL type 2 path identifier "Value"
Value	CID	Channel "CID" in AAL type 2 path identifier "Value"

7.3.3 Destination E.164 service endpoint address

The sequence of fields in the destination E.164 [10] service endpoint address parameter is shown in Table 7-10.

Table 7-10/Q.2630.3 – Sequence of fields in the destination E.164 service endpoint address parameter

Field No.	Field	Ref.
1	Nature of Address	7.4.13
2	E.164 Address	7.4.14

7.3.4 Destination NSAP service endpoint address

The sequence of fields in the destination NSAP [5] service endpoint address parameter is shown in Table 7-11.

Table 7-11/Q.2630.3 – Sequence of fields in the destination NSAP service endpoint address parameter

Field No.	Field	Ref.
1	NSAP Address	7.4.15

7.3.5 Link characteristics

The sequence of fields in the link characteristics parameter is shown in Table 7-12.

Table 7-12/Q.2630.3 – Sequence of fields in the link characteristics parameter

Field No.	Field	Ref.
1	Maximum CPS-SDU Bit Rate	(Note 1)
2	Average CPS-SDU Bit Rate	(Note 1)
3	Maximum CPS-SDU Size	(Note 2)
4	Average CPS-SDU Size	(Note 2)
NOTE 1 – This field is coded as a CPS-SDU Bit Rate field (see 7.4.11).		
NOTE 2 – This field is coded as a CPS-SDU Size field (see 7.4.12).		

7.3.6 Originating signalling association identifier

The sequence of fields in the originating signalling association identifier parameter is shown in Table 7-13.

Table 7-13/Q.2630.3 – Sequence of fields in the originating signalling association identifier parameter

Field No.	Field	Ref.
1	Originating Signalling Association	(Note)
NOTE – This field is coded as a Signalling Association Identifier field (see 7.4.2).		

7.3.7 Served user generated reference

The sequence of fields in the served user generated reference parameter is shown in Table 7-14.

Table 7-14/Q.2630.3 – Sequence of fields in the served user generated reference parameter

Field No.	Field	Ref.
1	Served User Generated Reference	7.4.10

7.3.8 Served user transport

The sequence of fields in the served user transport parameter is shown in Table 7-15.

Table 7-15/Q.2630.3 – Sequence of fields in the served user transport parameter

Field No.	Field	Ref.
1	Served User Transport	7.4.18

7.3.9 Service specific information (Audio)

The sequence of fields in the service specific information (audio) parameter is shown in Table 7-16.

Table 7-16/Q.2630.3 – Sequence of fields in the service specific information (audio) parameter

Field No.	Field	Ref.
1	Audio Service	7.4.6
2	Organizational Unique Identifier	7.4.5

7.3.10 Service specific information (Multirate)

The sequence of fields in the service specific information (multirate) parameter is shown in Table 7-17.

Table 7-17/Q.2630.3 – Sequence of fields in the service specific information (multirate) parameter

Field No.	Field	Ref.
1	Multirate Service	7.4.7

7.3.11 Service specific information (SAR-assured)

The sequence of fields in the service specific information (SAR-assured) parameter is shown in Table 7-18.

Table 7-18/Q.2630.3 – Sequence of fields in the service specific information (SAR-assured) parameter

Field No.	Field	Ref.
1	Segmentation and Reassembly (Assured Data Transfer)	7.4.8

7.3.12 Service specific information (SAR-unassured)

The sequence of fields in the service specific information (SAR-unassured) parameter is shown in Table 7-19.

Table 7-19/Q.2630.3 – Sequence of fields in the service specific information (SAR-unassured) parameter

Field No.	Field	Ref.
1	Segmentation and Reassembly (Unassured Data Transfer)	7.4.9

7.3.13 Test connection indicator

The test connection indicator parameter has no fields, i.e., the parameter length is always zero.

7.3.14 Path type

The sequence of fields in the path type parameter is shown in Table 7-20.

Table 7-20/Q.2630.3 – Sequence of fields in the path type parameter

Field No.	Field	Ref.
1	AAL Type 2 Path QoS Codepoint	7.4.21

If the path type parameter is not included, the path type shall be considered to be the network default stringent QoS class.

7.3.15 Service specific information (Audio Extended)

The sequence of fields in the service specific information (Audio Extended) parameter is shown in Table 7-21.

Table 7-21/Q.2630.3 – Sequence of fields in the service specific information (Audio Extended) parameter

Field No.	Field	Ref.
1	Audio extended service	7.4.19
2	Organizational unique identifier	7.4.5

7.3.16 Service specific information (Multirate Extended)

The sequence of fields in the service specific information (Multirate Extended) parameter is shown in Table 7-22.

Table 7-22/Q.2630.3 – Sequence of fields in the service specific information (Multirate Extended) parameter

Field No.	Field	Ref.
1	Multirate extended service	7.4.20

7.3.17 Preferred service specific information (Audio Extended)

The sequence of fields in the preferred service specific information (Audio Extended) parameter is shown in Table 7-23.

Table 7-23/Q.2630.3 – Sequence of fields in the preferred service specific information (Audio Extended) parameter

Field No.	Field	Ref.
1	Audio extended service	7.4.19
2	Organizational unique identifier	7.4.5

7.3.18 Preferred service specific information (Multirate Extended)

The sequence of fields in the preferred service specific information (Multirate Extended) parameter is shown in Table 7-24.

Table 7-24/Q.2630.3 – Sequence of fields in the preferred service specific information (Multirate Extended) parameter

Field No.	Field	Ref.
1	Multirate extended service	7.4.20

7.3.19 Preferred link characteristics

The sequence of fields in the preferred link characteristics parameter is shown in Table 7-25.

Table 7-25/Q.2630.3 – Sequence of fields in the preferred link characteristics parameter

Field No.	Field	Ref.
1	Maximum CPS-SDU Bit Rate	(Note 1)
2	Average CPS-SDU Bit Rate	(Note 1)
3	Maximum CPS-SDU Size	(Note 2)
4	Average CPS-SDU Size	(Note 2)
NOTE 1 – This field is coded as a CPS-SDU Bit Rate field (see 7.4.11).		
NOTE 2 – This field is coded as a CPS-SDU Size field (see 7.4.12).		

7.3.20 Modify support for link characteristics

The modify support for link characteristics parameter has no fields, i.e., the parameter length is always zero.

7.3.21 Modify support for service specific information

The modify support for service specific information parameter has no fields, i.e., the parameter length is always zero.

7.3.22 Served user correlation ID

The sequence of fields in the served user correlation ID parameter is shown in Table 7-26.

Table 7-26/Q.2630.3 – Sequence of fields in the served user correlation ID parameter

Field No.	Field	Ref.
1	Served User Correlation ID value	7.4.22

7.3.23 Origination E.164 service endpoint address

The sequence of fields in the origination E.164 [10] service endpoint address parameter is shown in Table 7-27.

Table 7-27/Q.2630.3 – Sequence of fields in the origination E.164 service endpoint address parameter

Field No.	Field	Ref.
1	Nature of Address	7.4.13
2	E.164 Address	7.4.14

7.3.24 Origination NSAP service endpoint address

The sequence of fields in the origination NSAP [5] service endpoint address parameter is shown in Table 7-28.

Table 7-28/Q.2630.3 – Sequence of fields in the origination NSAP service endpoint address parameter

Field No.	Field	Ref.
1	NSAP Address	7.4.15

7.3.25 Automatic congestion control

The sequence of fields in the Automatic congestion control parameter is shown in Table 7-29.

Table 7-29/Q.2630.3 – Sequence of fields in the automatic congestion control parameter

Field No.	Field	Ref.
1	AAL type 2 Node Automatic Congestion Level	7.4.23

7.3.26 Connection priority

The sequence of fields in the connection priority parameter is shown in Table 7-30.

Table 7-30/Q.2630.3 – Sequence of fields in the connection priority parameter

Field No.	Field	Ref.
1	Priority	7.4.24

7.3.27 Hop counter

The sequence of fields in the hop counter parameter is shown in Table 7-31.

Table 7-31/Q.2630.3 – Sequence of fields in the hop counter parameter

Field No.	Field	Ref.
1	AAL type 2 Hop Counter	7.4.25

7.3.28 TAR controlled connection

The TAR Controlled Connection parameter has no fields, i.e., the parameter length is always zero.

7.3.29 Preferred fixed bandwidth transfer capability

The sequence of fields in the preferred fixed bandwidth transfer capability parameter is shown in Table 7-32.

Table 7-32/Q.2630.3 – Sequence of fields in the preferred fixed bandwidth transfer capability parameter

Field No.	Field	Ref.
1	Peak CPS bit rate	(Note 1)
2	CPS token bucket size associated with Peak CPS bit rate	(Note 2)
3	Maximum allowed CPS packet size	7.4.28
NOTE 1 – This field is coded as a CPS Bit rate field (see 7.4.26).		
NOTE 2 – This field is coded as a CPS Token Bucket Size field (see 7.4.27).		

7.3.30 Preferred variable bandwidth stringent transfer capability

The sequence of fields in the preferred variable bandwidth stringent transfer capability parameter is shown in Table 7-33.

Table 7-33/Q.2630.3 – Sequence of fields in the preferred variable bandwidth stringent transfer capability parameter

Field No.	Field	Ref.
1	Peak CPS bit rate	(Note 1)
2	CPS token bucket size associated with Peak CPS bit rate	(Note 2)
3	Maximum allowed CPS packet size	7.4.28
4	Source Traffic Type	7.4.29
NOTE 1 – This field is coded as a CPS Bit rate field (see 7.4.26).		
NOTE 2 – This field is coded as a CPS Token Bucket Size field (see 7.4.27).		

7.3.31 Preferred variable bandwidth tolerant transfer capability

The sequence of fields in the preferred variable bandwidth tolerant transfer capability parameter is shown in Table 7-34.

Table 7-34/Q.2630.3 – Sequence of fields in the preferred variable bandwidth tolerant transfer capability parameter

Field No.	Field	Ref.
1	Peak CPS bit rate	(Note 1)
2	CPS token bucket size associated with Peak CPS bit rate	(Note 2)
3	Sustainable CPS bit rate	(Note 1)
4	CPS token bucket size associated with Sustainable CPS bit rate	(Note 2)
5	Maximum allowed CPS packet size	7.4.28
NOTE 1 – This field is coded as a CPS Bit rate field (see 7.4.26).		
NOTE 2 – This field is coded as a CPS Token Bucket Size field (see 7.4.27).		

7.3.32 Fixed bandwidth transfer capability

The sequence of fields in the fixed bandwidth transfer capability parameter is shown in Table 7-35.

Table 7-35/Q.2630.3 – Sequence of fields in the fixed bandwidth transfer capability parameter

Field No.	Field	Ref.
1	Peak CPS bit rate	(Note 1)
2	CPS token bucket size associated with Peak CPS bit rate	(Note 2)
3	Maximum allowed CPS packet size	7.4.28
NOTE 1 – This field is coded as a CPS Bit rate field (see 7.4.26).		
NOTE 2 – This field is coded as a CPS Token Bucket Size field (see 7.4.27).		

7.3.33 Variable bandwidth stringent transfer capability

The sequence of fields in the variable bandwidth stringent transfer capability parameter is shown in Table 7-36.

Table 7-36/Q.2630.3 – Sequence of fields in the variable bandwidth stringent transfer capability parameter

Field No.	Field	Ref.
1	Peak CPS bit rate	(Note 1)
2	CPS token bucket size associated with Peak CPS bit rate	(Note 2)
3	Maximum allowed CPS packet size	7.4.28
4	Source Traffic Type	7.4.29
NOTE 1 – This field is coded as a CPS Bit rate field (see 7.4.26).		
NOTE 2 – This field is coded as a CPS Token Bucket Size field (see 7.4.27).		

7.3.34 Variable bandwidth tolerant transfer capability

The sequence of fields in the variable bandwidth tolerant transfer capability parameter is shown in Table 7-37.

Table 7-37/Q.2630.3 – Sequence of fields in the variable bandwidth tolerant transfer capability parameter

Field No.	Field	Ref.
1	Peak CPS bit rate	(Note 1)
2	CPS token bucket size associated with Peak CPS bit rate	(Note 2)
3	Sustainable CPS bit rate	(Note 1)
4	CPS token bucket size associated with Sustainable CPS bit rate	(Note 2)
5	Maximum allowed CPS packet size	7.4.28
NOTE 1 – This field is coded as a CPS Bit rate field (see 7.4.26).		
NOTE 2 – This field is coded as a CPS Token Bucket Size field (see 7.4.27).		

7.3.35 Transfer capability support

The transfer capability support parameter has no fields, i.e., the parameter length is always zero.

7.4 Field specification of the AAL type 2 signalling protocol parameters

7.4.1 Compatibility

The structure of the compatibility field is shown in Table 7-38; the field is a fixed size field of 1 octet.

Table 7-38/Q.2630.3 – Structure of the compatibility field

8	7	6	5	4	3	2	1	Octet 1
pass-on not possible				general action				
reserved	send notification indicator	instruction indicator		reserved	send notification indicator	instruction indicator		

The following codes are used in the subfields of the compatibility information field.

- a) *Send notification indicator*
 - 0 Do not send notification.
 - 1 Send notification.
- b) *Instruction indicator*
 - 00 Pass on message or parameter (see Note 1).
 - 01 Discard parameter (see Note 2).
 - 10 Discard message.
 - 11 Release Connection.

NOTE 1 – When used in a "pass-on not possible" instruction indicator, value "00" is interpreted so as to release the connection.

NOTE 2 – When used as message compatibility field, value "01" should not be used. If received, it is interpreted so as to discard the message.

7.4.2 Signalling association identifier

The structure of the signalling association identifier field is shown in Table 7-39; the field is a fixed size field of 4 octets.

Table 7-39/Q.2630.3 – Structure of the signalling association identifier field

8	7	6	5	4	3	2	1	
Signalling association identifier								Octet 1
								Octet 2
								Octet 3
								Octet 4

The coding is implementation dependent.

If the signalling association identifier is used as a destination signalling association identifier that is not known, the field is set to zero indicating the value "unknown".

If the signalling association identifier is used as an originating signalling association identifier, the value zero shall not be used.

7.4.3 AAL type 2 path identifier

The structure of the AAL type 2 path identifier field is shown in Table 7-40; the field is a fixed size field of 4 octets.

Table 7-40/Q.2630.3 – Structure of the AAL type 2 path identifier field

8	7	6	5	4	3	2	1	
AAL type 2 path identifier								Octet 1
								Octet 2
								Octet 3
								Octet 4

The coding is implementation dependent. It identifies unambiguously an AAL type 2 path between a pair of adjacent AAL type 2 nodes. A value of "0" in all octets indicates "Null"; therefore, the all zero code cannot be used to identify an AAL type 2 path.

NOTE – When the AAL type 2 path is a switched VCC between two adjacent AAL type 2 nodes, the procedure defined in 9.2/Q.2941.2 [27] may be used to assign the AAL type 2 path identifier field value at the time of the VCC establishment.

7.4.4 Channel identifier

The structure of the channel identifier field is shown in Table 7-41; the field is a fixed size field of 1 octet.

Table 7-41/Q.2630.3 – Structure of the channel identifier field

8	7	6	5	4	3	2	1	
Channel identifier								Octet 1

The coding reflects the Channel Identifier (CID) as specified in ITU-T Rec. I.363.2 [1]. CID values permitted in this field range from "8" to "255" inclusive. A value of "0" indicates "Null".

7.4.5 Organizational unique identifier

The structure of the organizational unique identifier field is shown in Table 7-42; the field is a fixed size field of 3 octets.

Table 7-42/Q.2630.3 – Structure of the organizational unique identifier field

8	7	6	5	4	3	2	1	
Organizational unique identifier								Octet 1
								Octet 2
								Octet 3

The coding reflects the Organizational Unique Identifier (OUI) specified by IEEE 802-2001 [11] clause 5.1.

7.4.6 Audio service

The audio service for the AAL type 2 is defined in ITU-T Rec. I.366.2 [8]. The structure of the audio service field is shown in Table 7-43; the field is a fixed size field of 5 octets.

Table 7-43/Q.2630.3 – Structure of the audio service field

8	7	6	5	4	3	2	1	
Profile Type		Reserved						Octet 1
Profile identifier								Octet 2
FRM	CMD	MF-R2	MF-R1	DTMF	CAS	FAX	A-/μ-Law	Octet 3
Maximum length of frame mode data								Octet 4
								Octet 5

The following codes are used in the subfields of the audio service field:

a) *Profile type*

- 00 The "Profile Identifier" designates a profile specified in ITU-T Rec. I.366.2 [8]; the organizational unique identifier field in the same parameter is ignored.
- 01 The "Profile Identifier" designates a profile specified by an organization designated by the organizational unique identifier field in the same parameter.
- 10 The "Profile Identifier" designates a custom profile; the organizational unique identifier field in the same parameter is ignored.
- 11 Reserved.

b) *Profile identifier*

The "Profile Identifier" designates a profile as specified in either ITU-T Rec. I.366.2 [8], by an organization designated by the organizational unique identifier field in the same parameter, or a custom profile depending of the value of the "Profile Type".

- c) FRM 0: Transport of frame mode data disabled
 1: Transport of frame mode data enabled
- CMD 0: Transport of circuit mode data (64 kbit/s) disabled
 1: Transport of circuit mode data (64 kbit/s) enabled
- MF-R2 0: Transport of multi-frequency R2 dialled digits disabled
 1: Transport of multi-frequency R2 dialled digits enabled
- MF-R1 0: Transport of multi-frequency R1 dialled digits disabled
 1: Transport of multi-frequency R1 dialled digits enabled

- DTMF 0: Transport of dual tone multi-frequency dialled digits disabled
1: Transport of dual tone multi-frequency dialled digits enabled
- CAS 0: Transport of channel associated signalling disabled
1: Transport of channel associated signalling enabled
- FAX 0: Transport of demodulated facsimile data disabled
1: Transport of demodulated facsimile data enabled
- A-/μ-Law 0: Interpretation of generic PCM coding: A-Law
1: Interpretation of generic PCM coding: μ-Law

7.4.7 Multirate service

The multirate service for the AAL type 2 is defined in ITU-T Rec. I.366.2 [8]. The structure of the multirate service field is shown in Table 7-44; the field is a fixed size field of 3 octets.

Table 7-44/Q.2630.3 – Structure of the multirate service field

8	7	6	5	4	3	2	1	
FRM	Reserved		Multiplier n for n × 64 kbit/s					Octet 1
Maximum length of frame mode data								Octet 2
								Octet 3

- FRM 0: Transport of frame mode data disabled
1: Transport of frame mode data enabled

n $1 \leq n \leq 31$ Multiplier for $n \times 64$ kbit/s

7.4.8 Segmentation and reassembly (Assured data transfer)

The segmentation and reassembly service for the AAL type 2 is defined in ITU-T Rec. I.366.1 [9]. The structure of the segmentation and reassembly (assured data transfer) field is shown in Table 7-45; the field is a fixed size field of 14 octets.

Table 7-45/Q.2630.3 – Structure of the segmentation and reassembly (assured data transfer) field

8	7	6	5	4	3	2	1	
Maximum length of SSSAR-SDU in the forward direction								Octet 1
								Octet 2
								Octet 3
Maximum length of SSSAR-SDU in the backward direction								Octet 4
								Octet 5
								Octet 6
Maximum length of SSCOP-SDU in the forward direction								Octet 7
								Octet 8
Maximum length of SSCOP-SDU in the backward direction								Octet 9
								Octet 10
Maximum length of SSCOP-UU in the forward direction								Octet 11
								Octet 12
Maximum length of SSCOP-UU in the backward direction								Octet 13
								Octet 14

7.4.9 Segmentation and reassembly (Unassured data transfer)

The structure of the segmentation and reassembly (unassured data transfer) field is shown in Table 7-46; the field is a fixed size field of 7 octets.

Table 7-46/Q.2630.3 – Structure of the segmentation and reassembly (unassured data transfer) field

8	7	6	5	4	3	2	1	
Maximum length of SSSAR-SDU in the forward direction								Octet 1
								Octet 2
								Octet 3
Maximum length of SSSAR-SDU in the backward direction								Octet 4
								Octet 5
								Octet 6
TED	Reserved							Octet 7

TED 0: Transmission Error Detection disabled
1: Transmission Error Detection enabled

7.4.10 Served user generated reference

The structure of the served user generated reference field is shown in Table 7-47; the field is a fixed size field of 4 octets.

Table 7-47/Q.2630.3 – Structure of the served user generated reference field

8	7	6	5	4	3	2	1	
Served user generated reference								Octet 1
								Octet 2
								Octet 3
								Octet 4

7.4.11 CPS-SDU bit rate

The structure of the CPS-SDU bit rate field is shown in Table 7-48; the field is a fixed size field of 4 octets.

Table 7-48/Q.2630.3 – Structure of the CPS-SDU bit rate field

8	7	6	5	4	3	2	1	
CPS-SDU bit rate in the forward direction								Octet 1
								Octet 2
CPS-SDU bit rate in the backward direction								Octet 3
								Octet 4

This field may be used to convey the maximum CPS-SDU bit rate or the average CPS-SDU bit rate.

The maximum CPS-SDU bit rate is defined as the maximum bandwidth, available to the AAL type 2 served user in the specified direction. The maximum bandwidth is the maximum ratio of the amount of bits transported during the inter-departure time between two subsequent CPS-SDUs, and that inter-departure time. Allowed values are 0 to 2048 kbit/s. The granularity is 64 bit/s.

The average CPS-SDU bit rate is defined as the total expected amount of bits transported in the specified direction during the holding time of the connection, divided by the holding time of the connection. The average bit rate is also expected to be valid for the time interval between any two active periods. Allowed values are 0 to 2048 kbit/s. The granularity is 64 bit/s.

7.4.12 CPS-SDU size

The structure of the CPS-SDU size field is shown in Table 7-49; the field is a fixed size field of 2 octets.

Table 7-49/Q.2630.3 – Structure of the CPS-SDU size field

8	7	6	5	4	3	2	1	
CPS-SDU size in the forward direction								Octet 1
CPS-SDU size in the backward direction								Octet 2

This field may be used to convey the maximum CPS-SDU size or the average CPS-SDU size.

The maximum CPS-SDU size is defined as the largest CPS-SDU size, in octets, allowed to be sent in the specified direction during the holding time of the connection. Allowed values are 1 to 45.

The average CPS-SDU size is defined in the specified direction as the expected number of transported octets divided by the number of transported CPS-SDUs during the holding time of the connection. The average CPS-SDU size is also expected to be valid for the time interval between any two active periods. Allowed values are 1 to 45.

7.4.13 Nature of address

The structure of the nature of address field is shown in Table 7-50; the field is a fixed size field of 1 octet.

Table 7-50/Q.2630.3 – Structure of the nature of address field

8	7	6	5	4	3	2	1	
Reserved	Nature of address code							Octet 1

The "nature of address code" has the following meaning:

0000000	Spare
0000001	Subscriber number (national use)
0000010	Unknown (national use) (Note 1)
0000011	National (significant) number
0000100	International number
0000101	Network-specific number (national use) (Note 2)
0000110 to 1101111	} Spare
1110000 to 1111110	} Reserved for national use
1111111	Spare

NOTE 1 – This codepoint is used when the type of number is indicated using the digits in the E.164 Address field. The E.164 Address field is organized according to the network dialling plan; e.g., prefix digits might be present; in addition, escape digits may also be present.

NOTE 2 – This codepoint is used to indicate an administration/service number specific to the serving network.

7.4.14 E.164 address

The structure of the E.164 address field is shown in Table 7-51; the field is a variable size field.

Table 7-51/Q.2630.3 – Structure of the E.164 address field

8	7	6	5	4	3	2	1	
Field length								Octet 1
Reserved				First hexadecimal digit of address				Octet 2

				Last hexadecimal digit of address				Octet n

7.4.15 NSAP address

The structure of the NSAP [5] address field is shown in Table 7-52; the field is a fixed size field of 20 octets.

Table 7-52/Q.2630.3 – Structure of the NSAP address field

8	7	6	5	4	3	2	1	
NSAP								Octet 1
								Octet 20

7.4.16 Cause value

The structure of the cause value field is shown in Table 7-53; the field is a fixed size field of 2 octets.

Table 7-53/Q.2630.3 – Structure of the cause value field

8	7	6	5	4	3	2	1	
Reserved						Coding standard		Octet 1
Reserved	Cause							Octet 2

Coding Standard

- 00 ITU-T standardized coding as described in ITU-T Recs Q.850 [6] and Q.2610 [7]
- 01 ISO/IEC standard (Note)
- 10 National standard (Note)
- 11 Standard defined for the network (either public or private) present on the network side of the interface (Note)

NOTE – These other coding standards should be used only when the parameter contents cannot be represented with the ITU-T standardized coding.

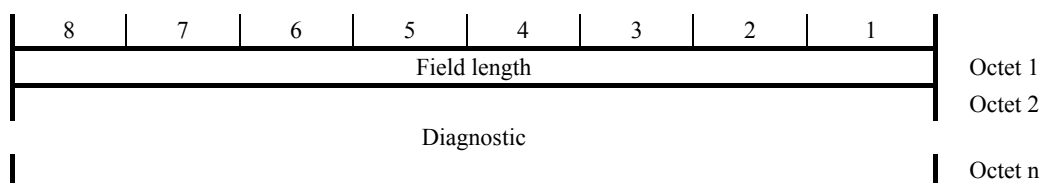
The procedures defined in clause 8 make use of ITU-T standardized codes described in ITU-T Recs Q.850 [6] and Q.2610 [7]. The codes are listed here for convenience. If there exists any difference in the names and codepoints of the following causes, the definitions in ITU-T Recs Q.850 and Q.2610 take precedence.

<i>Code</i>	<i>Cause Description</i>
1	Unallocated (unassigned) number
3	No route to destination
25	Exchange routing error
31	Normal, unspecified
34	No circuit/channel available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
44	Requested circuit/channel not available
47	Resource unavailable, unspecified
93	AAL parameters cannot be supported
95	Invalid message, unspecified
96	Mandatory information element is missing
97	Message type non-existent or not implemented
99	Information element/parameter non-existent or not implemented
100	Invalid information element contents
102	Recovery on timer expiry
110	Message with unrecognized parameter, discarded
111	Protocol error, unspecified

7.4.17 Diagnostics

The structure of the diagnostics field is shown in Table 7-54; the field is a variable size field.

Table 7-54/Q.2630.3 – Structure of the diagnostics field



The coding is specified in ITU-T Rec. Q.2610 [7] except when associated with one of the following causes:

- Message type non-existent or not implemented;
- Information element/parameter non-existent or not implemented; or
- Message with unrecognized parameter discarded.

In these cases, the Diagnostics field is shown in Table 7-55; the field is a variable size field.

Table 7-55/Q.2630.3 – Structure of the diagnostics field for compatibility causes

8	7	6	5	4	3	2	1	
Field length								Octet 1
Message identifier								Octet 2
first			Parameter identifier					Octet 3
pair			Field number					Octet 4
second			Parameter identifier					Octet 5
pair			Field number					Octet 6
last			Parameter identifier					
pair			Field number					Octet n

The diagnostics field for compatibility always starts – after the field length – with an octet containing the copy of the Message Identifier (of the message that gave rise to a compatibility diagnostic) followed by 0 to 125 octet pairs each containing a parameter identifier and a field number. If the field number octet is zero, the whole parameter is designated.

7.4.18 Served user transport

The structure of the served user transport field is shown in Table 7-56; the field is a variable size field.

Table 7-56/Q.2630.3 – Structure of the served user transport field

8	7	6	5	4	3	2	1	
Field length								Octet 1
								Octet 2
Served user transport								Octet n

The served user transport length can be from 1 to 254 octets.

7.4.19 Audio extended service

The Audio Extended service for the AAL type 2 is defined as "audio service" in ITU-T Rec. I.366.2 [14]. The structure of the audio extended service field is shown in Table 7-57; the field is a fixed size field of 5 octets.

Table 7-57/Q.2630.3 – Structure of the audio extended service field

8	7	6	5	4	3	2	1	
Profile type		Reserved			LB	RC	SYN	Octet 1
Profile identifier								Octet 2
FRM	CMD	MF-R2	MF-R1	DTMF	CAS	FAX	A-/μ-Law	Octet 3
Maximum length of frame mode data								Octet 4
								Octet 5

The following codes are used in the subfields of the audio service field:

a) *Profile type*

- 00 The "Profile Identifier" designates a profile specified in ITU-T Rec. I.366.2 [14], the organizational unique identifier field in the same parameter is ignored.
- 01 The "Profile Identifier" designates a profile specified by an organization designated by the organizational unique identifier field in the same parameter.