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Broadband ISDN – B-ISDN application protocols for access signalling

Digital subscriber signalling system No. 2 (DSS2) – Generic identifier transport extensions

ITU-T Recommendation Q.2941.2

(Formerly CCITT Recommendation)

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ITU-T Recommendation Q.2941.2

Digital subscriber signalling system No. 2 (DSS2) – Generic identifier transport extensions

Summary

This Recommendation defines the use of DSS2 Generic identifier transport signalling capability to carry H.321 and H.310 End Station Identifier, H.245 portNumber, ATM VCC Identifier, ATM signalling VCC identifier, Internet related Identifiers and MPOA VPN Identifier. Instances of these identifiers may be carried in the Generic identifier transport information element as defined in Recommendation Q.2941.1.

Source

ITU-T Recommendation Q.2941.2 was prepared by ITU-T Study Group 11 (1997-2000) and approved under the WTSC Resolution 1 procedure on 3 December 1999.

FOREWORD

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

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

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSC Resolution 1.

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

NOTE

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

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

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

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ITU-T Recommendation Q.2941.2

Digital subscriber signalling system No. 2 (DSS2) – Generic identifier transport extensions

(Geneva, 1999)

1 Scope

This part of Recommendation Q.2941 defines DSS2 signalling capability to carry H.321 and H.310 End Station Identifiers, H.245 portNumber, ATM VCC Identifiers, ATM signalling VCC identifiers, Internet related Identifiers and MPOA VPN Identifiers. These identifiers are coded in the Generic identifier transport information element defined for the Broadband Integrated Services Digital network (B-ISDN) Digital Subscriber Signalling System No. 2 (DSS2) protocol.

This Recommendation is part of the DSS2 family of ITU-T Recommendations; it specifies extensions to Recommendations Q.2931 [1] and Q.2971 [2] and does not repeat states, information elements, messages and procedures contained therein, but only specifies extensions related to the use of the Generic identifier information element.

This Recommendation is applicable to equipment, supporting DSS2 signalling capabilities as defined, in particular, in Recommendations Q.2931 [1] and Q.2971 [2] attached at either side of a T_B reference point or coincident S_B and T_B reference point when used as an access to the public B-ISDN.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent addition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

[1] ITU-T Recommendation Q.2931 (1995), *Digital Subscriber Signalling System No. 2 – User-Network Interface (UNI) layer 3 specification for basic call/connection control*.

[2] ITU-T Recommendation Q.2971 (1995), *Digital Subscriber Signalling System No. 2 – User-Network Interface layer 3 specification for point-to-multipoint call/connection control*.

[3] ITU-T Recommendation Q.2941.1 (1997), *Digital Subscriber Signalling System No. 2 – Generic identifier transport*.

[4] ITU-T Recommendation H.321 (1998), *Adaptation of H.320 visual telephone terminals to B-ISDN environments*.

[5] ITU-T Recommendation H.310 (1998), *Broadband audiovisual communication systems and terminals*.

[6] ITU-T Recommendation Q. 2630.1 (1999), *AAL type 2 signalling protocol (capability set 1)*.

[7] ITU-T Recommendation H.323 (1999), *Packet-based multimedia communications systems*.

[8] ITU-T Recommendation H.245 (2000), *Control protocol for multimedia communication*.

[9] The ATM Forum, af-vtoa-0113.000 (1999), *ATM Trunking using AAL2 for Narrowband Services*.

[10] IETF RFC 3033 [<draft-ietf-mpls-git-uus-04.txt>] (2000), *The assignment of the information field and protocol identifier in the Q.2941 Generic identifier and Q.2957 user-to-user signalling for the Internet protocol*.

[11] The ATM Forum, af-mpoa-0129.000 (1999), *MPOA v1.1 Addendum on VPN support*.

[12] IEEE Std 802 (1990), *Local and Metropolitan Area Networks*: *IEEE Standards*: *Overview and Architecture, clause 5.1*.

3 Definitions

No new definitions are needed.

4 Abbreviations

This Recommendation uses the following abbreviations:

AAL ATM Adaptation layer

IANA Internet Assigned Number Authority

IETF Internet Engineering Task Force

IPv4 Internet protocol version 4

IPv6 Internet protocol version 6

ISUP ISDN user part

MPLS Multiprotocol label switching

MPOA Multiprotocol encapsulation over ATM

ST2+ Internet Stream protocol version 2

VCC Virtual channel connection

VCID Virtual channel identifier

VPN Virtual private network

5 Description

The Generic identifier transport signalling capability allows the generation and transport by the B-ISDN of identifiers used by different distributed applications. The Generic identifier transport capability is a signalling capability for exchanging identifiers between an originating entity and a peer entity. The transport of the following identifiers is defined in this Recommendation:

– ATM VCC Identifier.
– ATM signalling VCC identifier.
– H.310 and H.321 End Station identifier.
– Internet related identifiers.
– MPOA VPN identifier.
– H.245 portNumber.

5.1 ATM VCC Identifier

The ATM VCC Identifier is used to uniquely identify a VCC.

5.2 ATM signalling VCC Identifier

This identifier is used in ATM Forum specifications on ATM trunking [9].

5.3 H.321 and H.310 End Station Identifier

The End Station Identifier is used to provide an end station ATM address to either a terminal or an AAL type 1 and 5 conversion gateway. This identifier is used to facilitate interworking between AAL type 1 based terminals and AAL type 5 based terminals which are defined in Recommendations H.321 [4] and H.310 [5]. See Annex C/H.310 [5] and clause 7/H.321 [4] for the procedures.

5.4 Internet related identifiers

The Internet related identifier is used to uniquely identify a VCC to be used for a specific Internet Session or Resource between two entities.

5.5 MPOA VPN identifier

The MPOA VPN identifier is used to uniquely identify MPOA VPN service providers and their customers.

5.6 H.245 portNumber

H.245 portNumber is used to correlate one or two (in the forward and backward directions) RTP media stream(s) to an ATM VCC.

The use of Generic application transport information element to transport the H.245 portNumber for H.323 over ATM is described in Annex C/H.323 [7]. The H.245 portNumber is defined in 7.3/H.245 [8].

6 Operational requirements

Some networks may provide this capability only by subscription to the calling and called users.

7 Primitives

No new primitives are required to support this capability.

8 Coding requirements

8.1 Messages

No additional specification is required in this Recommendation. Refer to Recommendation Q.2941.1 [3].

8.2 Information element

For the sake of clarity, the Generic identifier transport information element defined in Recommendation Q.2941.1 [3] is reproduced in Appendix I. The maximum length of the Generic identifier transport information element has been extended to 63 octets. The identifiers defined in this Recommendation require the following additional coding:

Identifier related standard/application (octet 5) (Note 1)

Bits

8 7 6 5 4 3 2 1	
0 0 0 0 0 0 0 1	Code point used in Recommendation Q.2941.1 [3]
0 0 0 0 0 0 1 0	Code point used in Recommendation Q.2941.1 [3]
0 0 0 0 0 0 1 1	IPv4 (Note 2)
0 0 0 0 0 1 0 0	ST2+ (Note 2)
0 0 0 0 0 1 0 1	IPv6 (Note 2)
0 0 0 0 0 1 1 0	MPLS (Note 2)
0 0 0 0 0 1 1 1	af-mpoa-0129.000 [11] (Note 3)
0 0 0 0 1 0 0 0	af-vtoa-0113.000 [9] (Note 4)
0 0 0 0 1 0 0 1	Recommendation Q. 2630.1 [6] (Note 5)
0 0 0 0 1 0 1 1	Recommendation H.323 [7] (Note 6)

All other values are reserved.

NOTE 1 – This field identifies a user of the DSS2 using the identifier(s) coded in octet group 6 and possibly the subsequent octet groups. An identifier type may be used by different standard/application and a standard/application may require different identifier types to be carried in the same instance of the Generic identifier transport information element.

NOTE 2 – These code points identify an IPv4, ST2+, IPv6, MPLS or an experiment/organization-specific related identifier coded in octet group 6. For the exact definitions, use and coding, IETF relevant specifications shall be consulted. In case of divergence, they take precedence over this Recommendation. Examples of coding are provided in Appendix II.

NOTE 3 – This code point identifies ATM Forum MPOA specification [11]. For the exact definition, use and coding of the corresponding identifier(s), ATM Forum specifications shall be consulted. In case of divergence, they take precedence over this Recommendation. An example of coding is provided in Appendix II.

NOTE 4 – This code point identifies ATM Forum ATM VCC trunking specification [9]. For the exact definition, use and coding of the corresponding identifier(s), ATM Forum specifications shall be consulted. In case of divergence, they take precedence over this Recommendation. An example of coding is provided in Appendix II.

NOTE 5 – When the identifier related standard/application field refers to Recommendation Q.2630.1 [6], the identifier is used to uniquely identify an ATM VCC used by two AAL type 2 signalling peer entities defined in Recommendation Q.2630.1 [6]. An example is provided in Appendix II.

NOTE 6 – When the identifier related standard/application field refers to Recommendation H.323 [7], a H.245 portNumber defined in Recommendation H.323 [7] is coded in octet group 6. An example is provided in Appendix II.

Identifier type (octet 6, 7, ... , N)

Bits

8 7 6 5 4 3 2 1	
0 0 0 0 0 0 0 1	Session (Notes 1, 2)
0 0 0 0 0 0 1 0	Resource (Notes 3, 4)
0 0 0 0 0 0 1 1	End Station (Note 5)
0 0 0 0 0 1 1 1	MPOA VPN identifier (Note 6)
0 0 0 0 1 0 0 0	ATM VCC identifier (Notes 7, 8)
0 0 0 0 1 0 0 1	Signalling VCC identifier (Note 9)
0 0 0 0 1 0 1 1	H.245 portNumber (Note 10)
0 0 0 1 0 0 0 0 to 1 1 1 1 1 1 0 1	Reserved (Note 11)

1 1 1 1 1 1 1 0 Experimental/organization specific identifier (Note 12)
1 1 1 1 1 1 1 1 Reserved

NOTE 1 – This code point was originally defined in Recommendation Q.2941.1 [3].

NOTE 2 – When the standard/application field (octet 5) is coded as "IPv4, ST2+ or IPv6", a Session identifier is coded in the identifier value field of octet group 6. The maximum length of the Session identifier type is 56 octets. For the maximum length of the Session identifier type used in IETF specifications, refer to the IETF appropriate specifications.

NOTE 3 – This code point was originally defined in Recommendation Q.2941.1 [3].

NOTE 4 – When the standard/application field (octet 5) is coded as "MPLS", a MPLS VCID is coded in octet group 6 as a "Resource" identifier. The maximum length of the Resource identifier type is 56 octets. For the maximum length of the Resource identifier type used in IETF specifications, refer to the IETF appropriate specifications.

NOTE 5 – This code point is defined in Recommendation Q.2941.1 [3].

NOTE 6 – When the standard/application field (octet 5) is coded as "MPOA", a MPOA VPN identifier is coded in octet group 6. The maximum length for this identifier is 7 octets.

NOTE 7 – When the standard/application field (octet 5) is coded as "ATM Forum ATM VCC trunking application", an ATM VCC Identifier may be coded in octet group 6. The length of this identifier is two octets.

NOTE 8 – When the standard/application field (octet 5) refers to Recommendation Q.2630.1 [6] the ATM VCC identifier coded in octets 6.1 to 6.4 corresponds to octets 1 to 4, respectively, of the path identifier defined in 7.4.3/Q.2630.1 [6]. The length of this identifier is four octets.

NOTE 9 – When the standard/application field (octet group 5) is coded as "ATM Forum ATM VCC trunking application" a signalling VCC Identifier may be coded in octet group 6. The maximum length of this identifier is two octets.

NOTE 10 – When the standard/application field (octet 5) is coded as Recommendation H.323 [7] a H.245 portNumber is coded in octet group 6 according to the rules defined in Recommendation H.323 [7]. The length is 2 octets.

NOTE 11 – When the standard/application field (octet 5) does not refer to an IETF document, the assignment of this range of code points is under the responsibility of ITU-T DSS2 rapporteur group. Only when the identifier related standard/application field (octet 5) refers to IETF document, the identifiers assigned to this range of code points is performed by IANA.

NOTE 12 – When the identifier related standard/application field (octet 5) refers to an IETF specification (IPv4, ST2+, IPv6 or MPLS) an experiment/organization-specific identifier is coded in octet group 6. The first 3 octets of octet group 6 contain the Organizationally unique identifier (OUI) as specified in IEEE 802-1990 section 5.1 [12].

9 Procedures

9.1 General procedures

No additional Q.2931 [1] procedures are required. The procedures of Recommendation Q.2941.1 [3] apply.

9.2 Procedure for the use of AAL type 2 identifier

Specific DSS2 procedures for using AAL type 2 identifier, for VCC identification are defined in this subclause.

When the ATM SVC is used for the carriage of the AAL2 connections between adjacent AAL2 nodes, the Generic identifier transport information element can be used for the transfer of AAL type 2 path identifier between AAL type 2 signalling peer entity.

In the SETUP message, the generic identifier transport information element shall be coded as follows:

– Octet 5 shall be set to "0 0 0 0 1 0 0 1" to identify Recommendation Q.2630.1 [6].

– Octet 6 shall be set to "0 0 0 0 1 0 0 0" to denote the ATM VCC identifier.

– Octet 6.1 (identifier length) shall be set to four.

– Octets 6.2 to 6.5 shall contain AAL type 2 path identifier defined in 7.4.3/Q.2630.1 [6] and coded in octets 1 to 4 respectively of the path identifier.

The Calling party number information element shall be used to identify the peer AAL type 2 node as defined in Recommendation Q.2630.1 [6], initiating VCC establishment. The Called party number information element shall identify the AAL type 2 signalling entity terminating the VCC. If the information contained in octets 6.1 to 6.4 is not acceptable to the AAL type 2 node identified by the called party number information element, then VCC establishment shall be released.

To resolve a dual seizure condition occurring when both AAL type 2 signalling peer entities allocate the same ATM VCC identifier, the Calling party information element is used to identify the other peer entity. When an AAL type 2 signalling entity recognizes a dual seizure, it will execute DSS2 release procedures after the receipt of the SETUP message.

APPENDIX I

This appendix reproduces the format of the Generic identifier transport information element defined in Recommendation Q.2941.1 [3]. It is provided for the sake of clarity and completeness. See Figure I.1.

8	7	6	5	4	3	2	1	Octets
Generic identifier transport information element								
0	1	1	1	1	1	1	1	1
Information element instruction field								
ext. 1	Coding standard		Flag	Res.	IE action ind.			2
Length of contents of information element								3 4
Identifier related standard/application								5
Identifier type								6 (Note)
Identifier length								6.1
								6.2
Identifier value								to
								6.m
Identifier type								N*
Identifier length								N.1*
								N.2*
Identifier value								to
								N.n*

NOTE – Octet group 6 can be repeated to form new octet groups numbered sequentially: octet group 7, 8, ... , N.

Figure I.1/Q.2941.2 – Generic identifier transport information element

APPENDIX II

This appendix provides examples of the coding of the identifiers defined in this Recommendation. For the exact definitions, use and coding of the identifiers, the appropriate specifications, standards or ITU-T Recommendation must be consulted. In case of divergence, they take precedence over this Recommendation.

II.1 Example of coding of the ATM Forum ATM VCC Identifier for Trunking

See Figure II.1.

8	7	6	5	4	3	2	1	Octets
Identifier related standard/application								5
0	0	0	0	1	0	0	0	
Identifier type = ATM VCC identifier								6 (Note 1)
0	0	0	0	1	0	0	0	
Identifier length = 2								6.1
ext. 0	Flag	X	X	X	X	X	X	6.2 (Notes 2, 3)
ext. 1	X	X	X	X	X	X	X	6.3

NOTE 1 – This identifier is also known as ATM VCC identifier for trunking.

NOTE 2 – X = A binary coded ATM VCC Identifier for Trunking value in the range of 0 to $2^{13} - 1$.

NOTE 3 – The Flag identifies the AAL type entity that originated the identifier. The originating side always sets the Flag to zero and the other side to one. The purpose of the Flag is to resolve the ambiguity arising when both ends simultaneously select the same identifier value.

Figure II.1/Q.2941.2 – Example of coding of the ATM VCC Identifier for Trunking

II.2 Example of coding of Q.2630.1 [6] ATM VCC Identifier

See Figure II.2.

8	7	6	5	4	3	2	1	Octets
Identifier related standard/application								5
0	0	0	0	1	0	0	1	
Identifier type = ATM VCC identifier								6
0	0	0	0	1	0	0	0	
Identifier length = 4								6.1
X	X	X	X	X	X	X	X	6.2
X	X	X	X	X	X	X	X	6.3 (Note)
X	X	X	X	X	X	X	X	6.4
X	X	X	X	X	X	X	X	6.5

NOTE – Octets 6.1 to 6.4 contain octets 1 to 4, respectively, of the path identifier defined in 7.4.3/Q.2630.1 [6].

Figure II.2/Q.2941.2 – Example of coding of Q.2630.1 ATM VCC Identifier

II.3 Example of coding of IPv4 session identifier

See Figure II.3.

8	7	6	5	4	3	2	1	Octets
Identifier related standard/application								5
0	0	0	0	0	0	1	1	
Identifier type = Session identifier								6 (Note)
0	0	0	0	0	0	0	1	
Identifier length = 13								6.1
Source IPv4 address								6.2 to 6.5
Destination IPv4 address								6.6 to 6.9
Protocol								6.10
Source port								6.11 to 6.12
Destination port								6.13 to 6.14

NOTE – This specific session identifier is intended for use only with the explicit reservation. If wildcard associations are needed at a later date, another identifier type will be used.

Figure II.3/Q.2941.2 – Example of coding of the IPv4 session identifier

II.4 Example of coding of ST2+ session identifier

See Figure II.4.

8	7	6	5	4	3	2	1	Octets
Identifier related standard/application								5
0	0	0	0	0	1	0	0	
Identifier type = Session identifier								6
0	0	0	0	0	0	0	1	
Identifier length = 6								6.1
								6.2
Stream ID (Note)								…
								6.7

NOTE – Octets 6.2 to 6.7 contain the Stream ID (SID)

Figure II.4/Q.2941.2 – Example of coding of the ST2+ session identifier

II.5 Example of coding of IPv6 session identifier

See Figure II.5.

8	7	6	5	4	3	2	1	Octets
Identifier related standard/application								5
0	0	0	0	0	1	0	1	
Identifier type = Session identifier								6 (Note)
0	0	0	0	0	0	0	1	
Identifier length = 37								6.1
Source IPv6 address								6.2 to 6.17
Destination IPv6 address								6.18 to 6.33
Protocol								6.34
Source port								6.35 to 6.36
Destination port								6.37 to 6.38

NOTE – This specific session identifier is intended for use only with the explicit reservation. If wildcard associations are needed at a later date, another identifier type will be used.

Figure II.5/Q.2941.2 – Example of coding of the IPv6 session identifier

II.6 Example of coding of MPLS VCID identifier

See Figure II.6.

8	7	6	5	4	3	2	1	Octets
Identifier related standard/application								5
0	0	0	0	0	1	1	0	
Identifier type = Resource identifier								6
0	0	0	0	0	0	1	0	
Identifier length = 4								6.1
								6.2
MPLS VCID								…
								6.5

Figure II.6/Q.2941.2 – Example of coding of MPLS VCID identifier

II.7 Example of coding of ATM Forum MPOA VPN identifier

See Figure II.7.

Identifier related standard/applications								
0	0	0	0	0	1	1	1	5
Identifier type = MPOA VPN identifier								
0	0	0	0	0	1	1	1	6
Identifier length = 7								6.1
OUI (Note 1)								6.2
								6.3
								6.4
OUI-specific VPN index value (Note 2)								6.5
								6.6
								6.7
								6.8

NOTE 1 – Organizationally Unique Identifier (OUI), is specified in IEEE 802-1990 [12].

NOTE 2 – A 4-octet integer value identifying the MPOA VPN identifier; this value is allocated by the organization identified by the OUI.

Figure II.7/Q.2941.2 – Example of coding of MPOA VPN identifier

II.8 Example of coding of H.245 portNumber for H.323

See Figure II.8.

8	7	6	5	4	3	2	1	Octets
Identifier related standard/application								5
0	0	0	0	1	0	1	1	
Identifier type = H.245 portNumber								6
0	0	0	0	1	0	1	1	
Identifier length = 2								6.1
								6.2
16-bit binary coded H245 portNumber								6.3-6.4

Figure II.8/Q.2941.2 – Example of coding of H.245 portNumber

APPENDIX III

Guidelines for the setting of the instruction indicators

This appendix provides guidelines for the setting of the instruction indicator field in the Generic identifier transport information element. An implementation may choose to set the instruction indicator differently, depending on possible specific requirements.

Recommended setting of the instruction indicator for the information element is as follows:

Flag: "Follow explicit instructions"

Action indicator: "clear call"

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