



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.2934

(05/98)

SERIES Q: SWITCHING AND SIGNALLING

Broadband ISDN – B-ISDN application protocols for
access signalling

**Digital subscriber Signalling System No. 2 –
Switched virtual path capability**

ITU-T Recommendation Q.2934

(Previously CCITT Recommendation)

ITU-T Q-SERIES RECOMMENDATIONS

SWITCHING AND SIGNALLING

SIGNALLING IN THE INTERNATIONAL MANUAL SERVICE	Q.1–Q.3
INTERNATIONAL AUTOMATIC AND SEMI-AUTOMATIC WORKING	Q.4–Q.59
FUNCTIONS AND INFORMATION FLOWS FOR SERVICES IN THE ISDN	Q.60–Q.99
CLAUSES APPLICABLE TO ITU-T STANDARD SYSTEMS	Q.100–Q.119
SPECIFICATIONS OF SIGNALLING SYSTEMS No. 4 AND No. 5	Q.120–Q.249
SPECIFICATIONS OF SIGNALLING SYSTEM No. 6	Q.250–Q.309
SPECIFICATIONS OF SIGNALLING SYSTEM R1	Q.310–Q.399
SPECIFICATIONS OF SIGNALLING SYSTEM R2	Q.400–Q.499
DIGITAL EXCHANGES	Q.500–Q.599
INTERWORKING OF SIGNALLING SYSTEMS	Q.600–Q.699
SPECIFICATIONS OF SIGNALLING SYSTEM No. 7	Q.700–Q.849
DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 1	Q.850–Q.999
PUBLIC LAND MOBILE NETWORK	Q.1000–Q.1099
INTERWORKING WITH SATELLITE MOBILE SYSTEMS	Q.1100–Q.1199
INTELLIGENT NETWORK	Q.1200–Q.1999
BROADBAND ISDN	Q.2000–Q.2999
General aspects	Q.2000–Q.2099
Signalling ATM adaptation layer (SAAL)	Q.2100–Q.2199
Signalling network protocols	Q.2200–Q.2299
Common aspects of B-ISDN application protocols for access signalling and network signalling and interworking	Q.2600–Q.2699
B-ISDN application protocols for the network signalling	Q.2700–Q.2899
B-ISDN application protocols for access signalling	Q.2900–Q.2999

For further details, please refer to ITU-T List of Recommendations.

ITU-T RECOMMENDATION Q.2934

DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 2 – SWITCHED VIRTUAL PATH CAPABILITY

Summary

This Recommendation specifies the procedures for establishing, maintaining, and clearing of switched virtual path connections. It specifies extensions to Recommendations Q.2931 [1], Q.2961.1 [2], Q.2961.2 [3], Q.2961.3 [4], Q.2961.4 [5] and Q.2961.6 [6] to provide this capability.

Source

ITU-T Recommendation Q.2934 was prepared by ITU-T Study Group 11 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 15th of May 1998.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The 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 their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 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

The ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. The 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, the 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.

© ITU 1998

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the ITU.

CONTENTS

	Page
1	Scope 1
2	References 1
3	Definitions 2
4	Abbreviations 2
5	Description 3
6	Operational requirements 3
6.1	Provision and withdrawal 3
6.2	Requirements on the originating network side 3
6.3	Requirements on the destination network side 3
7	Primitive definitions and state definitions 3
7.1	Primitive definitions 3
7.2	State definitions 3
8	Coding requirements – Information elements 3
8.1	Broadband bearer capability 3
8.2	Connection identifier 4
8.3	Restart indicator 4
8.4	OAM traffic descriptor 4
9	Signalling procedures at the coincident S_B and T_B reference point 5
9.1	Call/connection establishment at the origination interface 5
9.1.1	Associated signalling 5
9.1.2	Non-associated signalling 5
9.2	Call/connection establishment at the destination interface 5
9.2.1	Associated signalling 5
9.2.2	Non-associated signalling 5
9.2.3	Compatibility check 6
9.3	Restart procedure 6
10	Procedures at the T_B reference point for interworking with private B-ISDNs 8
11	Interworking with other networks 8
11.1	Interworking with entities which do not support the SVP capability 8
11.2	Interworking with N-ISDN 8
12	Interactions 9

	Page
12.1 Interactions with supplementary services.....	9
12.2 Interactions with other capabilities.....	9
13 Timers.....	9
14 Dynamic description (SDLs).....	9
Annex A – Valid combinations of bearer class, broadband transfer capability and ATM traffic descriptor parameters.....	9
Appendix I – Management of VPCI and bandwidth	14

Recommendation Q.2934

DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 2 – SWITCHED VIRTUAL PATH CAPABILITY

(Geneva, 1998)

1 Scope

This Recommendation specifies the procedures for establishing, maintaining, and clearing of switched virtual path connections by means of the Digital Subscriber Signalling System No. 2 (DSS 2) protocol in a point-to-point call/connection. The procedures are applicable at the T_B reference point or coincident S_B and T_B reference point (as defined in Recommendation I.413) of the Broadband-Integrated Services Digital Network (B-ISDN).

This Recommendation is part of the DSS 2 family of ITU-T Recommendations. It specifies extensions to Recommendations Q.2931 [1], Q.2961.1 [2], Q.2961.2 [3], Q.2961.3 [4], Q.2961.4 [5] and Q.2961.6 [6] and does not repeat states, information elements, messages and procedures contained therein but only specifies extensions related to the switched virtual path capability.

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 edition 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 and its Amendment 1* (1997).
- [2] ITU-T Recommendation Q.2961.1 (1995), *Digital subscriber Signalling System No. 2 – Additional traffic parameters: Additional signalling capabilities to support traffic parameters for the tagging option and the sustainable GII rate parameter set.*
- [3] ITU-T Recommendation Q.2961.2 (1997), *Digital subscriber Signalling System No. 2 – Additional traffic parameters: Support of ATM Transfer capability in the broadband bearer capability information element.*
- [4] ITU-T Recommendation Q.2961.3 (1997), *Digital subscriber Signalling System No. 2 – Additional traffic parameters: Signalling capabilities to support traffic parameters for the Available Bit Rate (ABR) ATM transfer capability.*
- [5] ITU-T Recommendation Q.2961.4 (1997), *Digital subscriber Signalling System No. 2 – Additional traffic parameters: Signalling capabilities to support traffic parameters for the ATM Block Transfer (ABT) ATM transfer capability.*
- [6] ITU-T Recommendation Q.2961.6 (1998), *Digital subscriber Signalling System No. 2 – Additional traffic parameters: Additional signalling procedures for the support of the SBR2 and SBR3 ATM transfer capabilities.*

- [7] ITU-T Recommendation Q.2962 (1998), *Digital subscriber Signalling System No. 2 – Connection characteristics negotiation during call/connection establishment phase.*
- [8] ITU-T Recommendation Q.2963.1 (1996), *Digital subscriber Signalling System No. 2 – Connection modification: Peak cell rate modification by the connection owner.*
- [9] ITU-T Recommendation Q.2963.2 (1997), *Digital subscriber Signalling System No. 2 – Connection modification: Modification procedures for sustainable cell rate parameters.*
- [10] ITU-T Recommendation Q.2963.3 (1998), *Digital subscriber Signalling System No. 2 – Connection modification – ATM traffic descriptor modification with negotiation by the connection owner.*
- [11] ITU-T Recommendation Q.2951 (1995), *Stage 3 description for number identification supplementary services using B-ISDN Digital subscriber Signalling System No. 2 (DSS 2) – Basic call.*
- [12] ITU-T Recommendation Q.2955 (1997), *Stage 3 description for community of interest supplementary services using B-ISDN Digital subscriber Signalling System No. 2 (DSS 2).*
- [13] ITU-T Recommendation Q.2957 (1995), *Stage 3 description for additional information transfer supplementary services using B-ISDN Digital subscriber Signalling System No. 2 (DSS 2) – Basic call.*
- [14] ITU-T Recommendation Q.2964.1 (1996), *Digital subscriber Signalling System No. 2 – Basic Look-ahead.*
- [15] ITU-T Recommendation Q.2959 (1996), *Digital subscriber Signalling System No. 2 – Call priority.*
- [16] ITU-T Recommendation I.371 (1996), *Traffic control and congestion control in B-ISDN.*
- [17] ITU-T Recommendation I.356 (1996), *B-ISDN ATM layer cell transfer performance.*

3 Definitions

The definitions of Annex J/Q.2931 [1] apply.

This Recommendation defines the following term:

switched virtual path connection: A virtual path connection controlled by signalling procedures.

4 Abbreviations

The definitions of Annex J/Q.2931 [1] apply.

This Recommendation also uses the following abbreviations:

ATM	Asynchronous Transfer Mode
B-ISDN	Broadband-Integrated Services Digital Network
DSS 2	Digital subscriber Signalling System No. 2

5 Description

This Recommendation specifies the signalling protocol for establishing, maintaining, and releasing point-to-point, switched virtual path connections.

6 Operational requirements

6.1 Provision and withdrawal

It is a user and network option to provide the procedures described in this Recommendation. Some networks may not support these procedures when a VP cross-connect is used to connect the user to the network. If implemented, the procedures of this Recommendation may be provided as a subscription option to the served user on the origination side.

6.2 Requirements on the originating network side

See 6.1.

6.3 Requirements on the destination network side

See 6.1.

7 Primitive definitions and state definitions

7.1 Primitive definitions

Clause 8/Q.2931 [1] shall apply.

7.2 State definitions

No additional states to those specified in Recommendation Q.2931 [1] are required.

8 Coding requirements – Information elements

See clause 4/Q.2931 [1], clause 8/Q.2961.1 [2], clause 6/Q.2961.2 [3], clause 8/Q.2961.3 [4] and clause 8/Q.2961.4 [5]. This clause identifies the changes to support the switched virtual path capability.

8.1 Broadband bearer capability

The definition of the broadband bearer capability information element given in Recommendations Q.2961.2 [3], Q.2961.3 [4], Q.2961.4 [5] and Q.2961.6 [6] is extended as shown in Table 1 below. The following codepoint is added to the bearer class field in octet 5:

Table 1/Q.2934 –Broadband bearer capability information element

Bits (Octet 5)	
<u>5 4 3 2 1</u>	
1 1 0 0 0	Transparent VP Service

8.2 Connection identifier

The codepoint 100 shall be added to the preferred/exclusive field in octet 5 in Table 4-16/Q.2931 [1], and a Note 4 shall be added as follows:

Bits (Octet 5)

3 2 1

0 0 1 Exclusive VPCI; any VCI (see Note 4)

1 0 0 Exclusive VPCI; no VCI (see Note 4)

NOTE 4 – In the restart procedure, either "Exclusive VPCI; any VCI" or "Exclusive VPCI; no VCI" may be used to indicate a virtual path to be restarted.

Note 1 in Figure 4-22/Q.2931 [1] shall be replaced with the following Note:

NOTE 1 – If the preferred/exclusive field indicates "any VCI" or "no VCI", the VCI field shall be ignored.

8.3 Restart indicator

For the following two class field codepoints the semantics and Notes 2 and 3 shall be changed as follows:

Bits (Octet 5)

3 2 1

0 0 1 indicated switched virtual path or all virtual channels in the indicated VPC which are controlled via the signalling channel on which the RESTART message is sent (see Note 2)

0 1 0 all Switched Virtual Channels and switched virtual paths controlled by the layer 3 entity which sends the RESTART message (see Note 3)

NOTE 2 – The connection identifier information element shall be included and indicates the switched virtual path to be restarted or the virtual path connection in which all Switched Virtual Channels are to be restarted. The virtual channel identification field in the connection identifier information element is ignored.

NOTE 3 – The connection identifier information element is not included. All Switched Virtual Channels and paths controlled by the point-to-point signalling channel are to be restarted.

8.4 OAM traffic descriptor

In 4.5.24/Q.2931 [1], Figure 4-30/Q.2931 [1] and Table 4-22/Q.2931 [1], replace all occurrence of "OAM F5 flow" with "OAM F4 flow".

The following sentence is added to the last part of 4.5.24/Q.2931 [1]:

"OAM traffic descriptor information element is used for OAM F4 flow in case of SVP, and OAM F5 flow in case of SVC".

In 4.5.6/Q.2931 [1] and Annex I/Q.2931 [1], replace all occurrence of "OAM F5 flow" with "OAM F4 flow" except in the Note in I.3.

9 Signalling procedures at the coincident S_B and T_B reference point

This clause identifies changes to the procedures of Recommendations Q.2931 [1], Q.2961.1 [2], Q.2961.3 [4], Q.2961.4 [5] and Q.2961.6 [6] to support the switched virtual path capability.

9.1 Call/connection establishment at the origination interface

9.1.1 Associated signalling

Associated signalling does not apply when supporting switched virtual paths.

9.1.2 Non-associated signalling

In order to request the establishment of a switched virtual path the user shall set the bearer class field of the bearer capability information element in the SETUP message to "Transparent VP Service", and shall indicate one of the following in the connection identifier information element:

- c) No indication is included (i.e. the connection identifier information element is not included in the SETUP message); or
- d) Exclusive VPCI; no VCI.

In case c), the network selects any available VPCI.

In case d), if the indicated VPCI is available, the network selects it for the call.

The selected VPCI is indicated in the connection identifier information element in the first message returned by the network in response to the SETUP message (e.g. CALL PROCEEDING). The VP associated signalling field is coded as "explicit indication of VPCI". The preferred/exclusive field is coded as "exclusive VPCI; no VCI".

In case c), if the network is not able to allocate a VPCI, a RELEASE COMPLETE message with Cause #45 "*No VPCI/VCI available*" is sent by the network.

In case d), if the indicated VPCI is not available, a RELEASE COMPLETE message with Cause #35 "*Requested VPCI/VCI not available*" is sent by the network.

9.2 Call/connection establishment at the destination interface

9.2.1 Associated signalling

Associated signalling does not apply when supporting switched virtual paths.

9.2.2 Non-associated signalling

When the establishment of a switched virtual path is requested (i.e. the bearer class field of the bearer capability information element in the SETUP message indicates "Transparent VP Service"), the network shall indicate one of the following:

- c) No indication is included (i.e. the connection identifier information element is not included in the SETUP message); or
- d) Exclusive VPCI; no VCI.

In case c), the user selects any available VPCI.

In case d), if the indicated VPCI is available, the user selects it for the call.

The selected VPCI is indicated in the connection identifier information element in the first message returned by the user in response to the SETUP message (e.g. CALL PROCEEDING). The VP associated signalling field is coded as "explicit indication of VPCI". The preferred/exclusive field is coded as "exclusive VPCI; no VCI". If the connection identifier information element is not present in the first response message, the connection identifier in the SETUP message shall be assumed.

In case c), if the user is not able to allocate a VPCI, a RELEASE COMPLETE message with Cause #45 "No VPCI/VCI available" is sent by the user.

In case d), if the indicated VPCI is not available, a RELEASE COMPLETE message with Cause #35 "Requested VPCI/VCI not available" is sent by the user.

9.2.3 Compatibility check

Subclause 5.2.2.2.1/Q.2931 [1] shall apply. Only broadband category 1 compatibility information is applicable to switched virtual paths. Currently, no equivalent broadband category 2 compatibility information is defined for switched virtual paths.

9.3 Restart procedure

This subclause identifies changes to the restart procedures of Recommendation Q.2931 [1] to support the switched virtual path capability. The changes are shown under the specific section headers of Recommendation Q.2931 [1].

5.5/Q.2931 Restart procedure:

Replace line 1 of paragraph 2 by:

The restart procedure is used to return a Switched Virtual Channel, all Switched Virtual Channels in a virtual path, a switched virtual path, or all Switched Virtual Channels and switched virtual paths controlled by the signalling virtual channel to the idle condition.

Replace line 3 of Note by:

In the case where the same Switched Virtual Channel(s) or switched virtual path(s) are specified, they shall not be considered free for reuse until all relevant restart procedures are completed.

5.5.1/Q.2931 Sending RESTART:

5.5.1.1/Q.2931 Normal procedure

Replace paragraph 1 by:

A RESTART message is sent by the network or user equipment in order to return Switched Virtual Channels or switched virtual paths to the idle condition. The Restart indicator information element shall be present in the RESTART message to indicate whether an "Indicated Switched Virtual Channel", "indicated switched virtual path or all Switched Virtual Channels in a virtual path" or "all Switched Virtual Channels and switched virtual paths controlled by the layer 3 entity" are to be restarted. If the Restart indicator information element is coded as "indicated Switched Virtual Channel" or "indicated switched virtual path or all Switched Virtual Channels in a virtual path", then the connection identifier information element shall be present to indicate which Switched Virtual Channel or switched virtual path is to be returned to the idle condition. If the Restart indicator information element is coded as "all Switched Virtual Channels and switched virtual paths controlled by the later 3 entity", then the connection identifier information element shall not be included.

Replace lines 3 and 4 of paragraph 2 by:

Receipt of a RESTART ACKNOWLEDGE message stops timer T316 and indicates that the Switched Virtual Channel(s)/switched virtual path(s) and associated resources [e.g. call reference value(s)] can be freed for reuse. The Null state will be entered after the Switched Virtual Channel/switched virtual path and call reference value are released.

Replace paragraph 4 by:

Calls associated with restarted Switched Virtual Channel(s)/switched virtual path(s) shall be cleared towards the remote parties using Cause #41, "*Temporary failure*".

5.5.1.2/Q.2931 Exceptional procedures

Replace line 2 of paragraph 1 by:

While timer T316 is running, the Switched Virtual Channel(s)/switched virtual path(s) being restarted shall not be used to support new calls requested using the call set-up procedures.

Replace line 6 of paragraph 1 by:

The Switched Virtual Channel(s)/switched virtual path(s) is considered to be in an out-of-service condition until maintenance action has been taken.

Replace paragraph 2 by:

If a RESTART ACKNOWLEDGE message is received indicating a different set of Switched Virtual Channel(s)/switched virtual path(s) from the set indicated in the RESTART message, the RESTART ACKNOWLEDGE message shall be discarded.

5.5.2/Q.2931 Receipt of RESTART:

5.5.2.1/Q.2931 Normal procedures

Replace line 1 of paragraph 1 by:

Upon receiving a RESTART message the recipient shall enter the Restart state associated to the global call reference and start timer T317; it shall then initiate the appropriate internal actions to return the specified Switched Virtual Channel(s)/switched virtual path(s) to the idle condition and release all call references associated with it.

Replace paragraph 2 by:

Calls associated with restarted Switched Virtual Channel(s)/switched virtual path(s) shall be cleared towards the remote parties using Cause #41, "*Temporary failure*".

Replace paragraph 3 by:

Even if all the specified Switched Virtual Channel(s)/switched virtual path(s) are in the idle condition, or already in the process of restart to the idle condition, receiving entity shall transmit a RESTART ACKNOWLEDGE message to the originator upon receiving a RESTART message.

Replace paragraph 4 by:

If the Restart indicator information element is coded as "all Switched Virtual Channels and switched virtual paths controlled by the layer 3 entity which sends the RESTART message", then all calls on all interfaces associated with the signalling virtual channel shall be cleared.

In paragraph 5, replace all occurrences of "all user plane virtual channels in the indicated VPC controlled via the signalling virtual channel in which the RESTART message is sent" by "indicated switched virtual path or all Switched Virtual Channels in a virtual path".

In paragraph 7, replace all occurrences of "virtual channels" by "Switched Virtual Channels and switched virtual paths".

5.5.2.2/Q.2931 *Exceptional procedures*

Replace paragraphs 2, 3 and 4 by:

If the Restart indicator information element is coded as "all Switched Virtual Channels and switched virtual paths controlled by the layer 3 entity which sends the RESTART message" and a connection identifier information element is included, the connection identifier information element is treated as described in 5.6.8.3/Q.2931 [1].

If the Restart indicator information element is coded as "indicated Switched Virtual Channel" or "indicated switched virtual path or all Switched Virtual Channels in a virtual path" and the connection identifier information element is not included, then the procedures in 5.6.7.1/Q.2931 [1] shall be followed.

If the Restart indicator information element is coded as "indicated Switched Virtual Channel" or "indicated switched virtual path or all Switched Virtual Channels in a virtual path" and the connection identifier information element contains an unrecognized VPCI, then the procedures in 5.6.7.2/Q.2931 [1] shall be followed.

If the restart Indicator information element in the received RESTART message is coded "indicated Switched Virtual Channel" and the VPCI indicated in Connection identification information element is being used for an active switched virtual path, then the procedures in 5.6.7.2/Q.2931 [1] shall be followed.

10 Procedures at the T_B reference point for interworking with private B-ISDNs

The procedures of clause 9 apply.

11 Interworking with other networks

11.1 Interworking with entities which do not support the SVP capability

If an entity which does not support the SVP capability described in this Recommendation receives a broadband bearer capability information element identifying the transparent VP service in a SETUP message, it shall follow the procedures described in 5.6, 5.7 and 5.8/Q.2931 [1].

11.2 Interworking with N-ISDN

For SVPs interworking with an N-ISDN entity is not possible. SVP call/connection requests shall be rejected at the interworking point with Cause #63 "Service or option not available, unspecified".

12 Interactions

12.1 Interactions with supplementary services

The support of the SVP capability described in this Recommendation has no impact on the support of the CLIP, CLIR, COLP, COLR, DDI, SUB, MSN, CUG, and UUS supplementary services as specified in Recommendations Q.2951 [11], Q.2955 [12], and Q.2957 [13].

12.2 Interactions with other capabilities

If negotiation of SVP connection characteristics during call/connection set-up is supported, the procedures of Recommendation Q.2962 [7] apply. In this case, the connection characteristics of the SVP may be negotiated during call/connection establishment by means of the alternative traffic descriptor or the minimum acceptable traffic descriptor.

If connection modification is supported for SVPs, the procedures of Recommendations Q.2963.1 [8] and Q.2963.2 [9] apply.

If connection modification with negotiation is supported for SVPs, the procedures of Recommendation Q.2963.3 [10] apply.

The support of the SVP capability described in this Recommendation has no impact on the support of Look-ahead and Call Priority capabilities as specified in Recommendations Q.2964.1 [14] and Q.2959 [15].

13 Timers

See clause 7/Q.2931 [1]. No additional timers are defined.

14 Dynamic description (SDLs)

See Annex A/Q.2931 [1]. No additional SDLs are defined.

ANNEX A

Valid combinations of bearer class, broadband transfer capability and ATM traffic descriptor parameters

The parameters specified in the broadband bearer capability information element, and the ATM traffic descriptor information element of the SETUP message shall be consistent. Table A.1 shows the valid combinations of the bearer class, BTC, and ATM traffic descriptor parameters for the SVP capability.

NOTE 1 – The BTC values considered in Table A.1 are the ones applicable at the time of publication of this Recommendation. This does not preclude other combinations to be defined in future when new BTC values are specified.

If a SETUP message is received with a broadband bearer capability information element containing any other combination of values in octet 5 and octet 5a than those specified in Table A.1, a RELEASE COMPLETE message shall be returned with Cause #65, "*Bearer capability not supported*".

If the combination of traffic parameters, excluding the tagging field, in a SETUP message is not a valid combination specified in Table A.1 for the received values of octet 5 and octet 5a in the broadband bearer capability information element, it shall be considered an unsupported combination of traffic parameters and a RELEASE COMPLETE message shall be returned with Cause #73, "*Unsupported combination of traffic parameters*".

Table A.1 identifies the ATM transfer capability requested for the given direction of the connection. The implicitly requested QoS row in Table A.1 identifies the QoS requested when the QoS Class is 0. In addition, Table A.1 identifies the I.371 [16] ATM transfer capability that supports the requested ATM transfer capability and the I.356 [17] QoS class that supports the implicitly requested QoS.

NOTE 2 – Recommendation I.371 [16] constrains the ATM transfer capability to be the same for both directions of a connection.

Table A.2 identifies the ATM transfer capability which may be used to enable backward compatibility with ATCs not defined in Recommendation I.371 [16]. There is not a one-to-one correspondence between the codepoints of the BTC field and the ATM Transfer Capability (ATC) defined in Recommendation I.371 [16]. This is in part due to the need to be backward compatible with the first edition of Recommendation Q.2931 [1] (1995) and also due to the implicit association of End-to-end timing requirements for some of the BTC codepoints.

At the S_B reference point or coincident S_B/T_B reference point, a user compliant to this Recommendation shall not use these combinations in a transmitted SETUP message, but shall be able to accept these combinations on reception. A network compliant to this Recommendation shall relay these combinations.

Table A.1/Q.2934 –Valid combinations of traffic related parameters in the SETUP message

<i>Broadband bearer capability</i>								
Bearer class	VP	VP	VP	VP	VP	VP	VP	VP
BTC (value)	7	11	19	12	16	17	20	21
<i>Traffic descriptor for a given direction</i>								
PCR (CLP = 0)								
PCR (CLP = 0 + 1)	S	S	S	S	S	S	S	S
{SCR, MBS} (CLP = 0)							S	S
{SCR, MBS} (CLP = 0 + 1)		S	S		Opt (Note 4)	Opt (Note 4)		
ABR MCR				S				
PCR (RM)					S	S		
Tagging (Note 2)	N	N	N	N	N	N	N	N
End-to-end timing required (Note 3)	Y	N	Y	N	Y	N	N	N
<i>For the given direction:</i>								
<i>Requested ATC [4]</i>	DBR	SBR1	SBR1	ABR (Note 5)	ABT-DT (Note 6)	ABT-IT (Note 6)	SBR2 (Note 7)	SBR3 (Note 7)
<i>Implicitly requested QoS when the QoS class is 0</i>	Class 1	Class 2	(Note 1)	Class 3	Class 1	Class 2	Class 3	Class 3
<i>For the given direction:</i>								
<i>I.371 [14] ATC that supports the requested ATC</i>	DBR	SBR1	SBR1	ABR	ABT-DT	ABT-IT	SBR2	SBR3
<i>I.356 [15] QoS class that supports the implicitly requested QoS</i>	Class 1	Class 2	Class 1	Class 3	Class 1	Class 2	Class 3	Class 3

Table A.1/Q.2934 –Valid combinations of traffic related parameters in the SETUP message (concluded)

Notes relatives to Table A.1/Q.2934:

NOTE 1 – The implicitly requested QoS class in this case is not defined in Recommendation I.356 [17].

NOTE 2 – If tagging is not specified but requested by a user, or if tagging is specified for a combination but not supported by a network, the call shall proceed without tagging being applied.

NOTE 3 – This information is not signalled.

NOTE 4 – Optional. When not specified, SCR (CLP = 0 + 1) is equal to 0 and MBS (CLP = 0 + 1) is equal to 1.

NOTE 5 – For the definition of this ATC see Recommendation Q.2961.3 [4].

NOTE 6 – For the definition of this ATC see Recommendation Q.2961.4 [5].

NOTE 7 – For the definition of this ATC see Recommendation Q.2961.6 [6].

A blank in the table means that the traffic parameter is not applicable for this combination.

PCR Peak Cell Rate

SCR Sustainable Cell Rate

MBS Maximum Burst Size

ABR MCR ABR Minimum cell rate

RM Resource Management

S Specified

Opt Optional

For the tagging row,

Y Yes

N No or No indication

Y/N Either "Yes" or "No or No Indication"

Table A.2/Q.2934 – Valid combinations of Traffic related parameters in the SETUP message supported for backward compatibility

<i>Broadband bearer capability</i>						
Bearer class	VP	VP	VP	VP	VP	VP
BTC (value)	5	5	absent or 10	absent or 10	9	9
<i>Traffic descriptor for a given direction</i>						
PCR (CLP = 0)		S				
PCR (CLP = 0 + 1)	S	S	S	S	S	S
{SCR, MBS} (CLP = 0)			S		S	
{SCR, MBS} (CLP = 0 + 1)				S		S
Tagging (Note 9)	N	Y/N	Y/N	N	Y/N	N
End-to-end timing required	Y	Y	N	N	Y	Y
<i>For the given direction:</i>						
<i>Requested ATC [4]</i>	(Note 1)	(Note 1)	(Note 4)	(Note 6)	(Note 4)	(Note 6)
<i>Implicitly requested QoS when the QoS class is 0</i>	(Note 2)	(Note 2)	Class 3	(Note 5)	(Note 7)	(Note 7)
<i>For the given direction:</i>						
<i>I.371 [14] ATC that supports the requested ATC</i>	DBR	DBR (Note 3)	(Note 4)	SBR1	(Note 8)	SBR1
<i>I.356 [15] QoS class that supports the implicitly requested QoS</i>	Class 1	Class 1	Class 3	Class 2		Class 1

NOTE 1 – The requested capability in this case is not defined in Recommendation I.371 [16] and differs from the DBR ATM transfer capability (see Recommendation I.371 [16]) only in that selective discardability of CLP = 1 cells may apply.

NOTE 2 – The implicitly requested QoS class in this case is not defined in Recommendation I.356 [17] and differs from QoS class 1 (see Recommendation I.356 [17]) in that the CLR commitment is only for CLP = 0 cells.

NOTE 3 – PCR (CLP = 0) is ignored and tagging is not performed.

NOTE 4 – The requested or provided capability in this case is not defined in Recommendation I.371 [16] and differs from the SBR2/SBR3 ATM transfer capability as defined in Recommendation I.371 [16] and supported by the signalling procedures specified in Recommendation Q.2961.6 [6], in that tagging is applied only locally according to the procedures described in Recommendation Q.2961.1 [2].

NOTE 5 – The implicitly requested QoS class corresponds to QoS class 3 (see Recommendation I.356 [17]).

NOTE 6 – The requested capability in this case is not defined in Recommendation I.371 [16] and differs from the SBR1 ATM transfer capability (see Recommendation I.371 [16]) only in that selective discardability of CLP = 1 cells may apply.

Table A.2/Q.2934 – Valid combinations of Traffic related parameters in the SETUP message supported for backward compatibility (concluded)

NOTE 7 – The implicitly requested QoS class in this case is not defined in Recommendation I.356 [17] and differs from QoS class 3 (see Recommendation I.356 [17]) in that end-to-end timing is required.

NOTE 8 – There is no combination recommended in Recommendation I.356 [17].

NOTE 9 – If tagging is not specified but requested by a user, or if tagging is specified for a combination but not supported by a network, the call shall proceed without tagging being applied.

A blank in the table means that the traffic parameter is not applicable for this combination.

PCR Peak Cell Rate

SCR Sustainable Cell Rate

MBS Maximum Burst Size

S Specified

For the tagging row,

Y Yes

N No or No indication

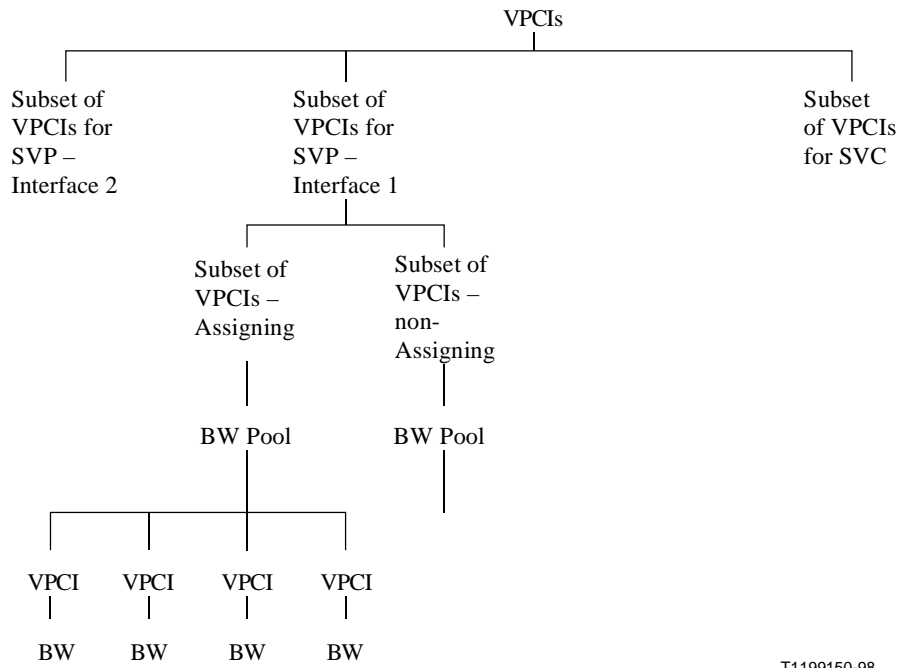
Y/N Either "Yes" or "No or No Indication"

APPENDIX I

Management of VPCI and bandwidth

Mutually exclusive subsets of VPCIs need to be defined for Switched Virtual Channel (SVC) connections and Switched Virtual Path (SVP) connections. For SVPs, subsets should be defined on a physical interface basis.

When sending a SETUP message the initiating entity would first try to select a VPCI from the subset(s) of VPCIs allocated for SVPs. Based on the connection request, bandwidth will be assigned to this VPCI from the pool of bandwidth associated with the VPCI subset the selected VPCI belongs to. The selected VPCI will be signalled in the connection identifier information element together with other parameters in the SETUP. If there is no available VPCI belonging to the subset(s) of VPCIs allocated for SVPs, or the available bandwidth is insufficient to satisfy the connection request, the entity will request the remote entity to allocate VPCI and bandwidth, i.e. the SETUP will be sent without the connection identifier information element.



T1199150-98

Figure I.1/Q.2934 – Management of VPCI and bandwidth resources between the entities at the UNI

ITU-T RECOMMENDATIONS SERIES

Series A	Organization of the work of the ITU-T
Series B	Means of expression: definitions, symbols, classification
Series C	General telecommunication statistics
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	TMN and network maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality, telephone installations, local line networks
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks and open system communications
Series Y	Global information infrastructure
Series Z	Programming languages