JT-X31
Support of Packet-Mode Terminal Equipment by an ISDN and Interface Specification

1. Relations with international standards

JT-X31 is based on ITU-T Recommendation X.31 approved at the WTSC-93 in March 1993.

2. Summary of departures from ITU-T Recommendations

(1) User access capabilities in Case A
Section 3.1.2. of ITU-T Recommendation X.31 describes how DTEs belonging to user classes 8 to 11 and 30 of Recommendation X.1 can be supported in Case A.
In JT-X31, the 56kb/s DTE case was added because a network in Japan supporting 56kb/s packet mode DTEs exists and requires support in ISDN.

(2) Call offering with SAPI=16 link on D-channel
As described in the note in Section 6.2.2.3 of Recommendation X.31, some networks may offer SAPI=16 broadcast-call-offering procedures.
In JT-X31, SAPI=16 procedures are not defined because they are to be supported only for an interim period and no need is recognized. In additioin, it is defined in Recommendation X.31 that terminals implementing SAPI=16 procedures should also implement SAPI=0 procedures for portability.

(3) Options for transferring the ISDN address of the PSPDN port to the TA
Section 7.3.3.1.2 of Recommendation X.31 describes, as a fourth option, to transfer the ISDN address of the PSPDN port to the TA. Where the address is downloaded by the network via the S reference point.
In JT-X31, this option is not defined because a discussion on this issue is premature and deleting this option would avoid confusion.

(4) Rate adaption supported by TA in Case A
Rate adaption methods supported by TA function are described in Section 7.3.2 of Recommendation X.31. It is described in this Section that the method indicated in Recommendation X.30/I.461 may be supported as an alternative to HDLC interframe flag stuffing in Case A.
In JT-X31, Recommendation V.110/I.463 is additionally quoted as a reference Recommendation for the same reason as described in (1) above.

(5) Test loops for TA
Test loops for TA are described in Section 7.6 of Recommendation X.31.
In JT-X31, these are not described in the main text, but in a supplement, because there still exists some unclearness (e.g., regarding procedures) and implementation is unlikely.

3. Others

(1) Selectable items
At least one alternative to each main item described in the following Table can be selected to satisfy the services provided by JT-X31. It is, however, necessary to confirm the conformity of the alternatives selected by a terminal and a network, respectively, when the terminal is connected to the network according to this Standard.

Selectable Items

No.	Items (reference Sections)	Alternatives	Relations between alternatives	Offering or selecting side	Remarks
1	Service(s) provided (1)	1 Case A: PSPDN service 2 Case B: ISDN virtual circuit service	A	Network	
2	Connection type(s) provided (1,2.2)	1 Semi-permanent connection 2 Switched-connection	A	Network	
3	Multiplexing at layer 3 onto a single B channel by NT2 (2)	1 Provided 2 Not provided	A	User	
4	DTE identification by using Q.931 protocol (2.1)	1 DTE identification not provided 2 DTE identification provided	E O	Network	Case A
5	DCE identification by using Q.931 protocol (2.1, 2.2)	1 DCE identification not provided 2 DCE identification provided	E O	Network	Case A
6	DTE identification procedures defined in Recommendation X.32 (2.1)	1 DTE identification not provided 2 DTE identification provided	E O	Network	Case A
7	Network to which DTE is subscribed (3.1.1)	1 PSPDN 2 ISDN	A	Network	Case A
8	Numbering plan with which DTE is associated (3.1.1)	1 DTE is only associated with one or more E. 164 numbers (note 1). 2 DTE is associated with one or more E.164 numbers and one or more X.121 numbers (note 2). Note 1: (i) DTE is associated with one E.164 number. (ii) DTE is associated with multiple E.164 numbers. Note 2: (i) DTE is associated with one X.121 number. (ii) DTE is associated with multiple X.121 numbers.	A E O E O	Network	Case A
9	Providing notification classes for incoming calls (3.1.4, 3.2.3)	1 On subscription basis 2 Not on subscription basis	A	Network	
10	Notification classes for incoming calls (3.1.4, 3.2.3)	1 No notification class 2 Conditional notification class 3 Unconditional notification class (note 3) Note 3:This class can be offered in Case B only.	A	Network	

11	Subclasses when not belonging to a notification class (3.1.4, 3.2.3.1)	1 Semipermanent connections to PH/AU 2 Userinitiated switchedconnections	A	Network	
12	Subclasses when belonging to conditional notification class (3.1.4, 3.2.3.2)	1 Network has information related to the state of the user's packet-access channel. (i) Network rejects the call when no additional calls should be added to the in-use packet-access channel. (ii) Network uses Q.931 procedures in an attempt to activate another channel for the purpose of delivering additional calls, when no additional calls should be added to the in-use packet-access channel. 2 Network has no information related to the state of the user's packet-access channel.	A A	Network	
13	In-use packet-access channel identification for conditional notification class (3.2.3.2)	1 Doesn't use subaddress 2 Uses subaddress	E O	Network	Case B
14	How to identify the terminal connected to semi-permanent B channel in case of unconditional notification class (3.2.3.3)	1 Use the non-automatic assignment of TEI 2 Not use the non-automatic assignment of TEI	A	Network	Case B
15	Mapping information for conditional notification class (3.2.3.4)	1 Called address and called subaddress 2 Others	E O	Network	Case B
16	Information mapping from the X.25 incoming call packet to the Q.931 message (3.2.3.4)	1 Do mapping 2 Don't mapping	E O	Network	Case B
17	Allocating number at the S/T reference point (4.1)	1 One E.164 number is allocated to one user-network interface. 2 Multiple E.164 numbers are allocated to one user-network interface.	E O	Network	
18	Ways of selecting a specific Terminal in the ISDN (4.1)	1 By means of MSN/DDI 2 By means of ISDN Subaddress	O	User	
19	Channel type selection (4.3.1, 6.2.2)	1 The terminal that is to accept the call will indicate the channel type to be used. 2 The network has information on which channel type will be used for the incoming call.	A	Network	Case B

20	Three physical types of semi-permanent connections (6)	1 Physical layer is semi-permanently established between the terminal and the PH/AU. 2 Data link and physical layers are semi-permanently established between the terminal and the PH/AU.	A	Network	
21	Providing the connection to the AU (6.1.1)	1 On the basis of the call setup information (e.g., called party number identifying an AU, transit network selection, etc.) 2 On the basis of a subscription time agreement	A	Network	Case A
22	Sending a CONNECT ACKNOWLEDGE message on receipt of the CONNECT message (6.1.2.1)	1 Not send 2 Send	E O	User	Case B
23	Implementation of timer T320 (6.3.2)	1 Implement 2 Not Implement	A	Network	Case B
24	Cause mapping If an ISDN access connection is rejected by the destination user using Q.931 messages, the X.25 virtual call shall be cleared using a clear indication packet with (6.4.4.1)	1 Setting cause #0 "DTE originated" with diagnostic #0, "no additional information" 2 Mapping some Q.931 cause to corresponding X.25 causes	A	Network	Case B
25	Action to the terminal that responds positively to the Q.931 SETUP message associated with the conditional notification class in case of premature clearing. (6.4.3)	1 The access connection is cleared. 2 The access connection is established and timer T320 is started. Upon expiration of timer T320, the access connection is cleared.	A	Network	Case B
26	Cause mapping (6.4.4.1)	1 The AU chooses to follow the procedures in Section 6.4.4. 2. The AU chooses not to follow the procedures in Section 6.4. 4.2	A	Network	Case A
27	Cause mapping for premature clearing of the incoming call (6.4.4.2)	1 Provides the cause mapping of X.25 to Q.931 2 Copying the cause from the X.25 clear indication to a Q.931 cause	A	Network	Case B
28	Rate adaption (7.3.2)	1 HDLC interframe flag stuffing 2 The method indicated in Recommendation X.30/I.461 or Recommendation V.110/I.463	A	Network	Case A

29	Implementation of the TA (7.3.3)	1 The TA acts only on layer 1. 2 The TA acts also on layer 2 and/or 3.	A	User	
30	Conditions for initiating B channel (7.3.3.1.1, 3.2.3.4)	1 Semi-permanent B channel 2 By actions at the R reference point. In this case, the following conditions are possible. (i) Hot-line access (ii) Full circuit-switched selection access	A A	1 Network 2 User	
31	Transferring the ISDN address of the PSPDN port to the TA (7.3.3.1.2)	1 Semi-permanent B channel at the S/T reference point 2 The address is conveyedacross the R reference point. 3 The address is conveyed across the human/machine interface of the TA.	A	1 Network 2, 3 User	Case A

Legend : E=Essential
O=Optional
A=Alternative

(2) Issues for further study

Issues for further study

No.	Reference	Issues for further study
1	General service aspect (1)	Application of H channel access at S/T interface
2	Reference configurations (2)	Multiplexing at layer 2 within a B channel
3	Unconditional notification class (3.2.3.3)	The terminal identification for PVC services
4	Terminal interface identification (4.1)	The terminal identification for PVC services
5	Table 6-4/ JT-X31	Mapping between information elements in Q.931 SETUP message and parameters for the following information in X.25 incoming call packet -Abit -Bilateral closed user group -Priority -Protection

6	Table 7-1/ JT-X31 note	The difference between the V.25bis direct call mode and operation according to Section 1.3 (V-series interfaces)
7	AppendixIII Restart Procedure immediately after establishing the link layer	Details of restart procedure