International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

V.150.1

Amendment 2

(05/2006)

SERIES V: DATA COMMUNICATION OVER THE TELEPHONE NETWORK

Interworking with other networks

Modem-over-IP networks: Procedures for the end-to-end connection of V-series DCEs

Amendment 2: ToIP and new SPRT data types support

ITU-T Recommendation V.150.1 (2003) – Amendment 2

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ITU-T Recommendation V.150.1

Modem-over-IP networks: Procedures for the end-to-end connection of V-series DCEs

Amendment 2

ToIP and new SPRT data types support

Summary

This Recommendation defines the inter-operation of two PSTN to IP network gateways that facilitate the end-to-end connection of V-series DCEs over an IP network. The principal characteristics of these gateways are: a mechanism to allow the transparent transport of modem signals end-to-end, a mechanism to allow the termination of modem signals at the gateways and the transport of the data between gateways, the definition of a transport protocol, which is suitable to relay data between gateways, and procedures to allow gateways to transition between Voice-over-Internet Protocol and Modem-over-Internet Protocol operation.

Amendment 1 added new code definitions to the SSE Protocol Reason Identifier Codes (RIC) contained in Table 12/V.150.1, which are intended to support the SSE protocol in ITU-T Rec. V.152 and the Text Relay.

Amendment 2 adds support to the Text-over-IP procedures defined in ITU-T Rec. V.151 and to new SPRT data types.

Source

Amendment 2 to ITU-T Recommendation V.150.1 (2003) was approved on 29 May 2006 by ITU-T Study Group 16 (2005-2008) under the ITU-T Recommendation A.8 procedure.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), 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 WTSA 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.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had 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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ToIP and new SPRT data types support

Modifications introduced by this amendment are shown in revision marks. Unchanged text is replaced by ellipsis (…). Some parts of unchanged texts (clause numbers, etc.) have been kept to indicate the correct insertion points.

…

1) Clause 2 References

Add the following new references

…

– ITU-T Recommendation V.92 (2000), *Enhancements to Recommendation V.90*.

– ITU-T Recommendation V.151 (2006), *Procedures for end-to-end connection of analogue PSTN text telephones over an IP network utilizing text relay.*

– ITU-T Recommendation V.152 (2005), *Procedures for supporting voice-band data over IP networks.*

– ITU-T Recommendation T.38 (2005), *Procedures for real-time Group 3 facsimile communication over IP networks.*

– ITU-T Recommendation X.680 (2002) | ISO/IEC 8824-1:2002, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation*.

…

2) Clause 3.2 Abbreviations

Add the following new abbreviations alphabetically.

…

ToIP Text over Internet Protocol

TR Text Relay

…

3) Clause 10 Operational modes of MoIP

Modifiy the following clause and Figure 4 as follows:

• • •

Other modes of operation that may be optionally provided by MoIP gateways are Fax over IP (FoIP) and Text over IP (ToIP). The procedures for FoIP are defined in ITU-T Rec. T.38. Procedures for ToIP are defined in ITU-T Rec. V.151.

~~Procedures for ToIP are beyond the scope of this Recommendation. The transitions between MoIP and FoIP/ToIP using the SSE protocol are for further study.~~

Figure 4 illustrates the relationship between these defined modes. At any given time, a MoIP gateway shall be either in or in transition to one of these modes.

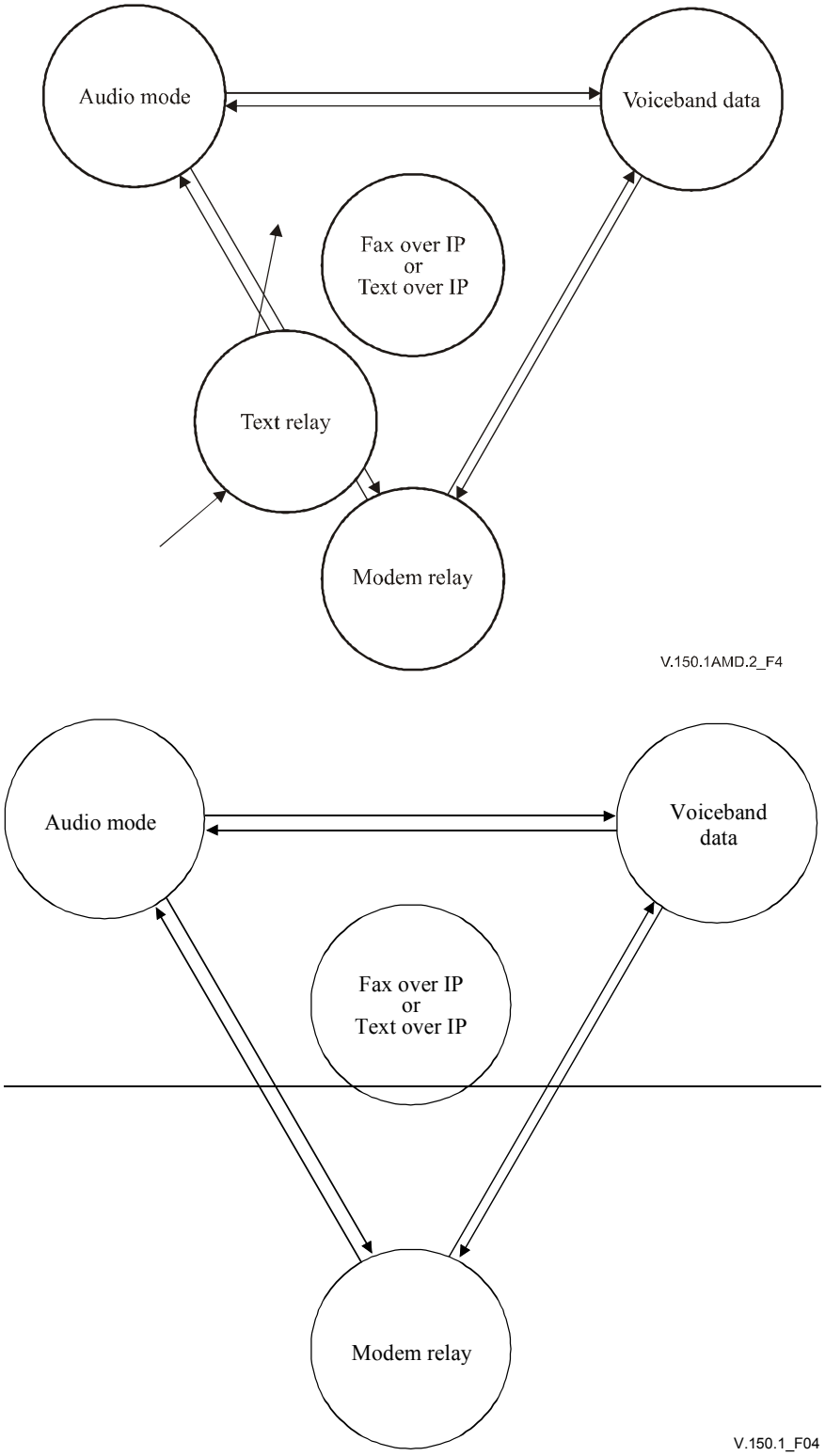


Figure 4/V.150.1 – MoIP operational modes and transition state

• • •

4) Clause 15.3 Gateway call discrimination messages

Modify Table 11 as follows:

• • •

Table 11/V.150.1 – Call discrimination messages

Title	Transport channel	Event codes (decimal)	Functional description of message content	Comments
• • •				
Fax Relay	SSE (Note)	4	Switch to FoIP	Procedures for this media switch are for further study
Text Relay	SSE (Note)	5	Switch to ~~ToIP~~Text Relay	Procedures used for this media switch are defined in ITU-T Rec. V.151~~are for further study~~
Text Probe	SSE (Note)	6	Switch to Text Probe state	Procedures used for this media switch are defined in ITU-T Rec. V.151
NOTE – The SSE protocol is defined in Annex C. The Event codes are defined also in the same annex.				

• • •

5) Clause 15.4 Modem relay status messages

Modify Table 16 as follows:

• • •

Table 16/V.150.1 – List of modem relay messages

Message Name	Message ID (decimal)	Transport Channel	Description
• • •			
I_FRAME	21	1 or 3	Framed Data (optional)
I_OCTET-CS	22	1 or 3	Octet with sequence number (Optional)
I_CHAR-STAT-CS	23	1 or 3	Character with static and sequence number (Optional)
I_CHAR-DYN-CS	24	1 or 3	Character with dynamic and sequence number (Optional)
Reserved	~~22~~25-99	N/A	Reserved for use by ITU-T
VENDOR	100-127	N/A	Vendor specific messages

6) 15.4.1 Initialization message (INIT)

Modify Table 17 as follows:

• • •

Table 17/V.150.1 – INIT definitions

INIT bits MSB:LSB	Definition
• • •	
4:15	**Optional MoIP Data types**. This field indicates the optional data types that are supported by the gateway's receiver. Support is indicated by a value of binary ONE in the appropriate bit position. A binary ZERO indicates no support. b4: I_RAW-BIT support b5: I_FRAME support b6: I_CHAR-STAT support b7: I_CHAR-DYN support b8: I_OCTET-CS support b9: I_CHAR-STAT-CS support b10: I_CHAR-DYN-CS support b11~~8~~…b15: Reserved for ITU-T; these bits are set to zero by the transmitter and not interpreted by the receiver.

7) Clause 15.4.5 CONNECT message

Modify Table 25 as follows:

• • •

Table 25/V.150.1 – CONNECT definitions

CONNECT bits MSB:LSB	Definition
• • •	
49:63	**Available Data Types**: This field indicates the data types available for use by the peer gateway. b49: Octet without format with no DLCI. Indication of this data type is only valid for the symmetrical non-error configuration. b50: I_RAW-BIT b51: I_FRAME b52: I_CHAR-STAT b53: I_CHAR-DYN b54: I_OCTET-CS b55: I_CHAR-STAT-CS b56: I_CHAR-DYN-CS b57~~4~~…b63: Reserved for ITU-T; these bits are set to zero by the transmitter and not interpreted by the receiver.
• • •	

• • •

8) New clauses 15.4.11.8, 15.4.11.9 and 15.4.11.10

Add the following new clauses

15.4.11.8 Octet with sequence number (I_OCTET-CS)

The format of this data type message is given in Figure 20a.

r	msgID	CS	Octets

Figure 20a/V.150.1 – Octet with sequence number

In this message:

r is a 1-bit field reserved for future use by the ITU-T. Message senders shall set this field to 0. Message receivers shall ignore the value of this field.

MsgID is a 7-bit field whose value identifies the message; unique values are assigned to the octet compressed raw data message and the bit compressed raw data message.

CS Character sequence number. This two-byte field is initialized to zero upon establishment of SPRT connection. CS is incremented by one after each character is transmitted into the IP network (modulo 65536). The sequence number in the SPRT packet represents the sequence number for the first character in the SPRT packet payload.

Octets is a sequence of octet user-data.

This data type is the same as Octet without formatting (I-Octet) but with an additional sequence number field. The CS field provides a character sequence number that can be used by the MoIP application to generate the correct number of fill characters when there is packet loss detected in the IP network.

15.4.11.9 Character with static and sequence number (I_CHAR-STAT-CS)

The format of this data type message is given in Figure 20b.

r	msgID	r	D	P	S	**CS**	Data in octet format

Figure 20b/V.150.1 – Character with static and sequence number format

In this message:

r is a 1-bit field reserved for future use by the ITU-T. Message senders shall set this field to 0. Message receivers shall ignore the value of this field.

MsgID is a 7-bit field whose value identifies the message; a unique value is assigned to the I_CHAR data type.

CS Character sequence number. This two-byte field is initialized to zero upon establishment of SPRT connection. CS is incremented by one after each character is transmitted into the IP network (modulo 65536). The sequence number in the SPRT packet represents the sequence number for the first character in the SPRT packet payload.

D is a 2-bit field indicating the number of data bits:

0-5 bits; 1-6 bits; 2-7 bits; 3-8 bits.

P is a 3-bit field indicating the parity type:

0 – unknown; 1 – none; 2 – even parity; 3 – odd parity; 4 – space parity; 5 – mark parity; 6 – reserved; 7 – reserved.

S is a 2-bit field indicating the number of stop bits:

0-1 stop bit; 1-2 stop bits; 2 – reserved; 3 – reserved.

Octets is an integer number of octets representing start-stop characters.

This data type is the same as Character with Static format (I_CHAR-STAT) with an additional character sequence field. The CS field provides a character sequence number that can be used by the MoIP application to generate the correct number of fill characters when there is packet loss detected in the IP network.

15.4.11.10 Character with dynamic and sequence number (I_CHAR-DYN-CS)

The format of this data type message is the same as for Character with Static and sequence number format.

This data type allows a change of format. The character format may be changed dynamically during a MR session. The CS field provides a character sequence number that can be used by the MoIP application to generate the correct number of fill characters when there is packet loss detected in the IP network.

15.4.12 Vendor-specific messages (VENDOR)

• • •

9) Clause 16 Start-up mode of operation

Modifiy Table 31 as follows:

• • •

Table 31/V.150.1 – MoIP initial modes

Additional supported modes by MoIP gateway		Start as
Facsimile-over-IP (T.38) and/or Text-over-IP (V.151)	Voice-over-IP	
No	No	Modem-over-IP
No	Yes	Voice-over-IP
Yes	No	Modem-over-IP
Yes	Yes	Voice-over-IP

10) Clause 17

Modify Clause 17 as follows:

17 Facsimile interworking requirements

~~The support and interworking of FoIP gateways with MoIP gateways is for further study.~~

The support and interworking of FoIP Gateways with MoIP Gateways is defined in Annex F/T.38.

11) Clause 18

Modify Clause 18 as follows:

18 Text telephony interworking requirements

~~The support and interworking of ToIP gateways with MoIP gateways is for further study.~~

Methods and procedures for the support of PSTN text telephones is defined in ITU-T Rec. V.151 for Text Relay and ITU-T Rec. V.152 for VBD.

For gateways that implement both this Recommendation and ITU-T Rec. V.151, the following needs to be considered.

Firstly, since the default media switching methods for this Recommendation and ITU-T Rec. V.151 are different, it is required that Gateways that support both mechanisms shall consider the use of the SSE protocol in the V.151 procedures to be required in order to allow for correct interoperation.

In general, and with the exception of three cases, the application of the V.151 discrimination procedures for the detection text telephones during the (a, a) state can be added to the (a, a) of this Recommendation. On detection and validation of a text telephone signal, V.151 procedures will apply.

Two of the exceptions are the handling of the Answer Tone signals. This includes V.25 ANS and V.8 ANSam. For consistency with V.151, the VBD method of handling these signals should be used as described in 20.4.7.

The third exception is that the gateway is receiving a V.8 signal (i.e., indicated by detecting ANSam), then the gateway shall follow the procedures of this Recommendation unless it discovers that the V.8 CM signal contains a call function indicating that it is a text device. At this point, the V.151 procedures are followed.

NOTE – Detection and validation of a V.8 CI signal also containing a text device call function could initiate a switch to V.151 procedures.

19 Call set up procedures

• • •

12) Clause C.2.5 Text Relay (TR)

Modify the following clause as follows:

This media stream consists of the transport of sequences of text characters as defined in ITU-T Rec. V.151. The Text Relay media state is included in the MIME media type "audio/t140c".

C.2.6 Text Probe (TP)

This is an intermediary state entered by gateways that support Text Relay as defined by ITU-T Rec. V.151. It is used to provide a stable state by which gateways can perform text telephone type discrimination (probing) before validating and entering the Text Relay state.

~~is a simple sequence of text characters. This is primarily used in TDD (Telecommunications Device for the Disabled) applications~~.

C.3 RTP packet format for state signalling events

• • •

13) Clause C.5.2 List of state signalling events

Modify Table C.1 as follows:

• • •

Table C.1/V.150.1 – Coding of the media states

Event encoding (Decimal)	Indicated media state
0	Reserved for future use by ITU-T
1	Initial Audio
2	Voice Band Data (VBD)
3	Modem Relay
4	Fax Relay
5	Text Relay
6	Text Probe
~~6~~7-31	Reserved for future use by ITU-T
32-63	Vendor-defined

14) Clause C.5.3 SSE protocol operation

Add the following new value to the list.

• • •

t: Text Relay (TR).

tp: Text Probe (TP).

• • •

15) Clause C.5.5 SSE reason identifier codes

Modify as follows:

The SSE Reason Identifier Codes (RIC) values and formats for MoIP, VBD and ToIP gateways are described in 15.3.1.

16) Annex D

Modify as follows:

Annex D

Procedures for voiceband data only mode of operation

The procedures for Voice Band Data only mode of operation are defined in ITU-T Rec. V.152.

~~This annex is reserved and the procedures for Voice Band Data only mode of operation are for further study. Equipment that implements VBD only mode of operation that will be defined by this annex will be compatible but not compliant with this Recommendation.~~

• • •

17) Appendix IV

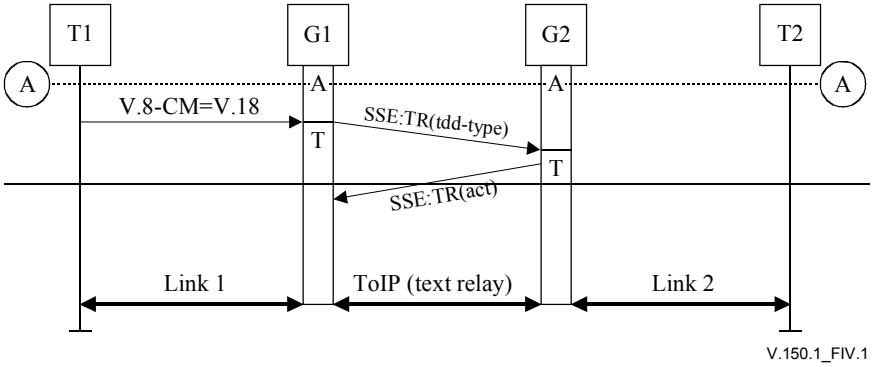
Modify as follows:

Appendix IV

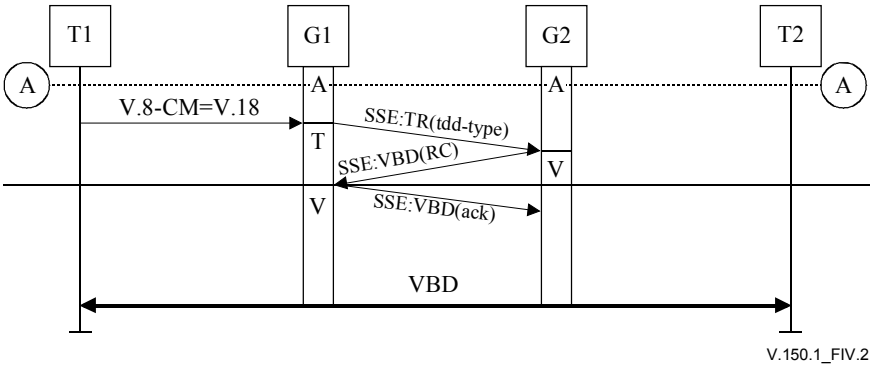
Call discrimination call flows suitable for use for text-over-IP

The call flow and procedures for the support of Text-over-IP applications are defined in ITU-T Rec. V.151 for Text Relay and ITU-T Rec. V.152 for VBD.

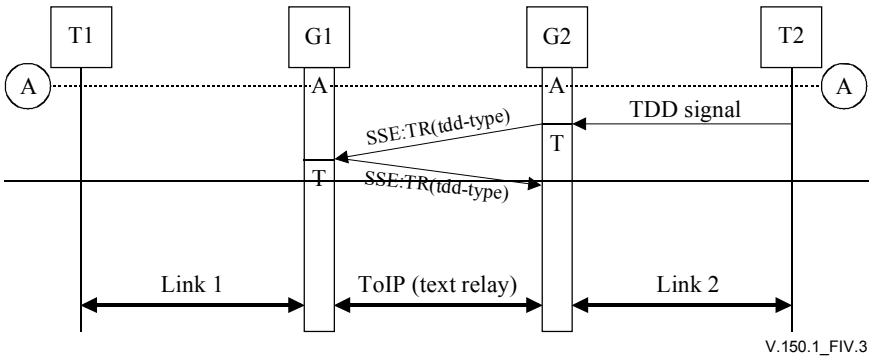
~~The call flow diagrams included in this appendix describe procedures that may be suitable for use with text over IP applications. They are not official procedures, but are for information only.~~



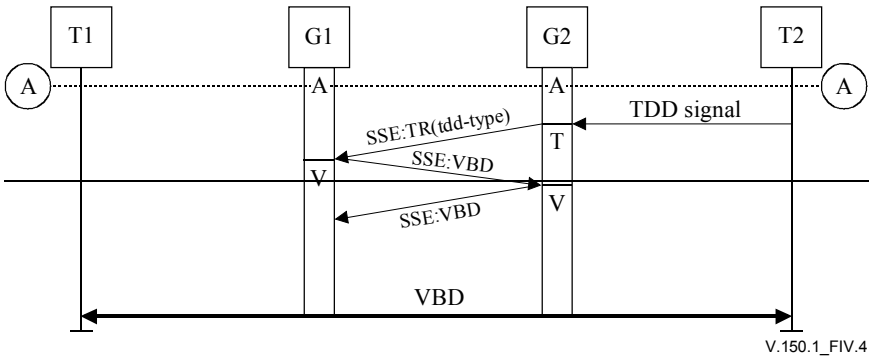
~~Figure IV.1/V.150.1 – V.18 to V.18 into text relay~~



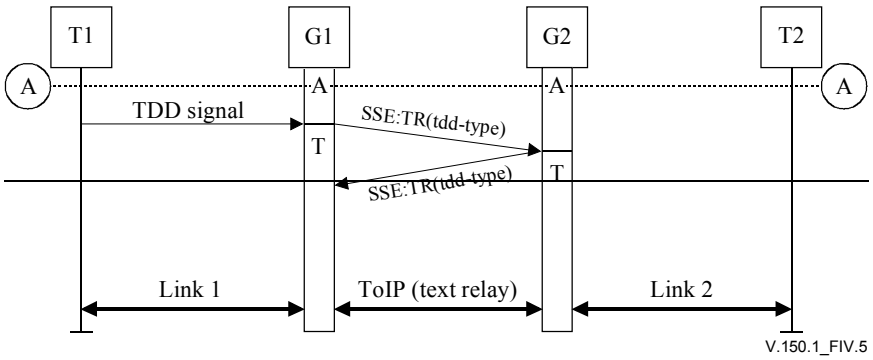
~~Figure IV.2/V.150.1 – V.18 toV.18 into VBD~~



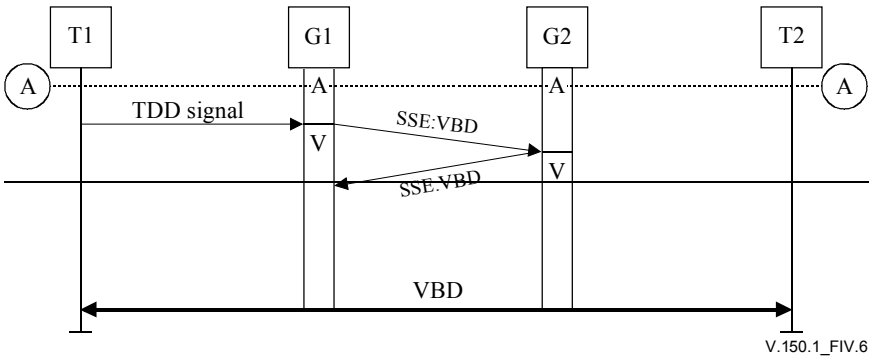
~~Figure IV.3/V.150.1 – Non-V.18 to non-V.18 (T2 first) into text relay~~



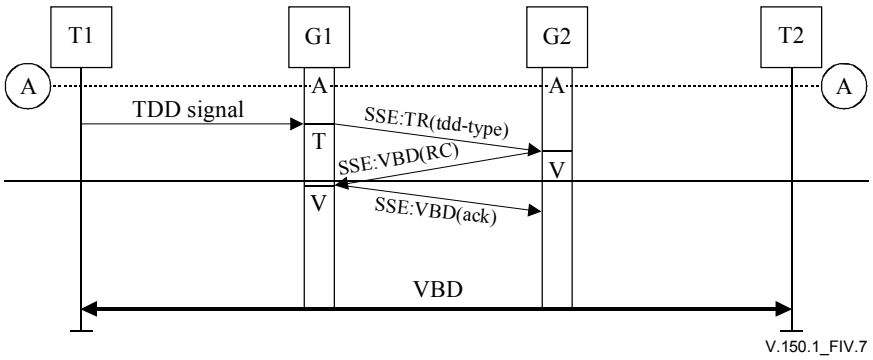
~~Figure IV.4/V.150.1 – Non-V.18 to non-V.18 (T2 first) into VBD~~



~~Figure IV.5/V.150.1 – Non-V.18 to non-V.18 (T1 first) into text relay~~



~~Figure IV.6/V.150.1 – Non-V.18 to non-V.18 (T1 first) into VBD~~



~~Figure IV.7/V.150.1 – TDD fallback with incompatible gateway types~~

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