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Protocol for multimedia application text conversation

ITU-T Recommendation T.140

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ITU-T RECOMMENDATION T.140

PROTOCOL FOR MULTIMEDIA APPLICATION TEXT CONVERSATION

Summary

This Recommendation specifies a text conversation protocol. The intention of this protocol is to be a common presentation level suitable for straightforward real-time text conversation in multimedia services and in text telephony.

It is based on ISO/IEC 10646-1 Universal Character Set 16-bit characters and features character-by-character transmission and a limited set of presentation controls.

Its application to the data conferencing environment is specified in Recommendation T.134.

Its application for plain text telephony in the PSTN is specified in Recommendation V.18.

Its application in video telephony is specified in Recommendations H.324 and H.245.

It is meant to be easily applied wherever there is a data channel available to carry the protocol.

Source

ITU-T Recommendation T.140 was prepared by ITU-T Study Group 16 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 6th of February 1998.

FOREWORD

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Recommendation T.140

PROTOCOL FOR MULTIMEDIA APPLICATION TEXT CONVERSATION

(Geneva, 1998)

1 Background

This is a brief description of the application environment where the protocol is intended to be used.

- 1) Text entered at one terminal is distributed to other terminals participating in the same session.
- 2) Text entered by one terminal is displayed in a window on that terminal and on others included in the session.
- 3) The character set is 16-bit ISO/IEC 10646-1 level 3, used in order to be useful on all markets with no or little extra configuration problems. The intention to use a specific subset of ISO/IEC 10646-1 can be signalled in the protocol.
- 4) The normal case is to transmit and display character by character as they are entered. Short time buffering (0.5 s) may be introduced by the transport mechanism in some configurations to reduce overhead. If used, the buffering is part of the transport mechanism used and is beyond the scope of this Recommendation.
- 5) The text entries from the different participants should be displayed in such a way that they can be easily read and the order of the entries perceived.
- 6) In case of multipoint use, the origin of the text should be displayed in connection to the text. The supporting multipoint protocol is assumed to supply the identification.
- 7) If characters from languages with writing directions right to left are supported, the implicit writing direction should also be supported according to rules in ISO/IEC 10646-1.
- 8) Editing and control functions from ISO/IEC 6429 and ISO/IEC 10646-1 are included for:
 - New line;
 - Erase last character;
 - Alert the user during a session;
 - Select graphic rendition.
- 9) A mechanism is defined for extending the protocol without disturbing communication with terminals implementing only limited versions.
- 10) Session control and transmission functions are needed from the implementation environment for:
 - Initiating and identifying a session;
 - Alerting on incoming calls (activate external signals; visual, audible or tactile);
 - Accepting a session;
 - Ending a session;
 - Transport the protocol data.

- 11) The protocol is suitable for application in:
- Point-to-point situations;
 - Multipoint conferencing when the session control functions provide the multipoint distribution services.
- 12) Support for use of the protocol is foreseen:
- in pure text conversation situations, or in combination with.
 - voice,
 - video,
 - data conferencing; or
 - in any combination of the above modes.

2 Scope

This Recommendation specifies a simple text conversation protocol. Its purpose is to offer a standardized way to perform conversations in text mode between terminals.

The described protocol is intended to be used in the following environments:

- As the text conversation protocol used between two devices using Recommendation V.18 modems for text telephony;
- As the text conversation protocol between nodes in a point-to-point or multipoint multimedia conference as specified in Recommendation T.134;
- As the point-to-point text conversation protocol between multimedia terminals using a logical data channel transport mechanism in cases when T.120 functionality is not available.

3 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 editions of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- ITU-T Recommendation T.134 (1998), *Text chat application protocol entity*.
- ITU-T Recommendation V.18 (1998), *Operational and interworking requirements for DCEs operating in the text telephone mode*.
- ISO/IEC 6429:1992, *Information technology – Control functions for coded character sets*.
- ISO/IEC 10646-1:1993, *Information technology – Universal Multiple-Octet Coded Character Set (UCS) – Part 1: Architecture and Basic Multilingual Plane*.

4 Definitions

This Recommendation defines the following terms:

4.1 session: A session is a logical connection between two or more user terminals for the purpose of exchanging information in text format on a real-time basis.

4.2 node: A terminal or group of terminals. A node can also incorporate a MCU for the purpose of coordinating multipoint sessions.

4.3 data channels: A communication path used to carry text and presentation control information.

4.4 origin identification: The user terminal may have an origin identification that can be used to identify the display of text from that terminal. The origin is specified by the surrounding transport protocol.

5 Abbreviations

This Recommendation uses the following abbreviations:

MCU Multipoint Control Unit

UCS Universal Multiple-Octet Coded Character Set

UTF UCS Transformation Format

6 Protocol

This Recommendation only addresses the session contents. The procedures used to establish a session are beyond the scope of this Recommendation.

6.1 Required session control functions

The session control functions are implemented with functions external to the channel and may be different for each transport mechanism. Although not part of this Recommendation, the following parameters and functions are required and should be specified for each implementation environment.

- Protocol identity: Registered value for the initial version of the T.140 protocol.
- Destination node: An address valid in the environment where the protocol is used.
- Originating node: An address for the node where the text originates.
- User identity: Name and other valid identifications for an end user.
- Data: Data for transmission from the text conversation protocol.

During session establishment, the protocol identity connected to Recommendation T.140 should be signalled.

The following conceptual session functions are needed to support a T.140 session.

Table 1/T.140 – Functions in the session layer

Function title	Purpose	Parameters
Prepare session	Announce readiness to accept invitations to sessions (may be a local function)	Supported T.140 protocol
Initiate session	Ask for a session with a specified node	Destination node, originating node and user identity, T.140 protocol
Accept session	Accept to enter a session	Accepted protocol, accepting user identity
Deny session	Refuse to enter a session	Refusing user identity
Disconnect session	Leave a session	
Data	Transmit data to one or all members of a session	Data from the presentation protocol, destination node or all

6.1.1 Requirements on the data transmission functions

A data channel is set up with mechanisms specific to each environment where the protocol is implemented. Text is transmitted to the data channel from the text conversation protocol character by character.

The requirements and the specific mechanisms for buffering are beyond the scope of this Recommendation. However, if buffering is provided in the data channel, it should not delay transmission more than 0.5 s and should not be related to complete lines of input. Any grouping of data into blocks for transmission should be transparent to the text protocol.

Data from one node shall be delivered in the same order as it was transmitted.

6.2 Presentation protocol functions

The protocol functions of the protocol are invoked by transmission of protocol data elements in the channel established by the session control functions.

The following parameters are used in specific protocol functions.

<i>Parameter</i>	<i>Purpose</i>
Text content	Text from one source in a session.
Display characteristics	As defined in SGR of ISO/IEC 6429.
UCS subset	An ISO-registered subset of ISO/IEC 10646-1.
Function	Protocol function.

Table 2 gives an overview over the presentation protocol functions.

Table 2/T.140 – Protocol functions

Function	Purpose	Parameters
Alert user in session	Intended to cause an alerting signal from the user terminal during a session	
Erase last character	Used to erase the last character	
Identify UCS subset	Indicate intended subset within ISO/IEC 10646-1	UCS subset
Interrupt	Initiate mode change	
New line	Move current display position to the next line	
Text	Text to display in conversation	A character of text
Application protocol function	Extended control function	Function and parameters (to be defined)
Select graphic rendition	Suggests display attributes for the following text	Colours, fonts and other display characteristics

7 Code elements

Characters shall be sent, ordered in octets. If implemented in a user terminal, the terminal should also provide for local display of transmitted characters. The character set shall conform to the two-octet version of ISO/IEC 10646-1.

All terminals implementing this Recommendation shall support the characters in the "IRV" and "Latin-1 supplement" in ISO/IEC 10646-1. Support for other parts of ISO/IEC 10646-1 is optional.

Presentation control functions are coded according to the principles of ISO/IEC 6429. ISO/IEC 6429 control functions shall be padded with 00 characters as specified in ISO/IEC 10646-1.

In transmission, all code elements shall be transformed to the UTF-8 form of ISO/IEC 10646-1.

The following control sequences are included in this protocol.

<i>Name</i>	<i>Code</i>	<i>Usage</i>
BEL	0007	Bell: Provides for alerting during an active session.
BS	0008	Back Space: Erases the last entered character.
NEW LINE	2028	Line separator.
CR LF	000D 000A	A supported, but not preferred, way of requesting a new line.
INT	ESC 0061	Interrupt (used to initiate mode negotiation procedure).
SGR	009B Ps 006D	Select Graphic Rendition: Ps is rendition parameters specified in ISO/IEC 6429.
SOS	0098	Start of String: Used as a general protocol element introducer.

ST	009C	String Terminator: End of SOS string.
ESC	001B	Escape: Used in control strings.
Byte order mark	FEFF	Zero width, no-break space: Used for synchronization.

7.1 Code signature and synchronization

The ZERO WIDTH NO-BREAK SPACE character (FEFF) shall be inserted in the beginning of the session.

The reception of ZERO WIDTH NO-BREAK SPACE shall be used as a tool to verify the right byte-order within the characters (see ISO/IEC 10646-1).

8 Detailed coding and procedures

8.1 Text

Purpose: Transfer text to display as text in the receiving window of the peer terminal(s).

Code: Character according to ISO/IEC 10646-1, level 3.

Procedure: Text contents is the default protocol element in a session. Thus, if characters are received that are not recognized as part of other protocol elements, they shall be regarded as text from the peer partner in a session and shall be decoded and displayed as text.

When supported by the terminal, the received character shall be displayed in the receiving window, using the rules for displaying ISO/IEC 10646-1 characters and the rules for implicit and explicit writing direction.

A receiving user terminal shall display some representation of a character even if the character is not supported by the terminal.

8.2 Erase last character

Purpose: Erase the last character sent from the display at the receiving end.

Code: BS: 0008.

Procedure: On the receiving end: Move the insertion point to the last character and erase it.

Combined characters are erased as a unit, with one BS erasing the whole character even if it is combined from more than one component.

Control sequences (like CR LF) are erased in one operation.

NOTE – The same action shall be taken on the local display.

8.3 New line

Purpose: Move the insertion point for text to the beginning of the next line in the display window.

Preferred code: LINE SEPARATOR: 2028.

Accepted code: CR LF: 000D 000A.

8.4 Alert user in session

Purpose: Intended to cause an alerting indication at the receiving terminal during a session.

NOTE 1 – Users may have a need to indicate the receipt of an alerting signal through such mechanisms as flashing the screen or through the triggering external devices such as lights or vibrators.

NOTE 2 – This function should not be intermixed with the need for external alerting caused by incoming calls or incoming connect requests.

Code: BEL: 0007.

Procedure: Sent during a session to activate alerting signals.

8.5 Interrupt

Purpose: To initiate a request for a mode change.

Coding: INT: ESC 0061.

Procedure: After receiving INT, the terminal stops the data transmission, disconnects the data session and prepares for connection in a new mode as requested by the user. Can be used to revert to voice telephone mode when appropriate.

8.6 Identify UCS subset

Purpose: Announce an intention to use a standardized subset of ISO/IEC 10646-1.

Coding: Defined by ISO for each UCS subset.

Procedure: A sending terminal entering a specific language area can send the "Identify UCS Subset" indication to the receiving terminal. The intention of this function is to prepare the terminal for display of characters from a specific subset of ISO/IEC 10646-1.

8.7 Application protocol function

Purpose: Identify coding of extensions to the protocol, so that the extensions can be introduced unilaterally without disturbing the display.

Coding: SOS, function code, parameter string, ST.

Where: The function code is one ISO/IEC 10646-1 character uniquely identifying the function.

The parameter string shall not be more than 255 ISO/IEC 10646-1 characters in length and shall not include the ST character.

Procedure: The receiving terminal shall function according to the request. The whole function shall be ignored by a terminal not supporting it. For terminals supporting the extended function, they will have an effect specified for that function.

If no trailing ST is received after the maximum length of the parameter string, the protocol reverts to normal element decoding mode.

Currently defined application protocol functions are:

- Unsupported request, with function code "?" = 003F;
- Indicate ENHANCED profile, with function code "_" = 005F.

8.8 Select graphic rendition

Purpose: Propose display attributes for the following text.

Coding: 009B, Ps, 006D, where Ps indicates the suggested display attribute(s) according to ISO/IEC 6429.

Procedure: The transmitting terminal sends the "select graphics rendition" on user command. The normal action is to set the graphics rendition of subsequently received text according to the rules of the cumulative graphics rendition combination mode of ISO/IEC 6429. The receiving terminal may or may not obey the display attribute, depending on both its capabilities and the preferences of the user.

It should present some distinguishable representation of the display attribute.

NOTE – The default parameter value 0 requests a return to default rendition.

APPENDIX I

Display arrangements

Display of text is suggested to be horizontal.

The display of text from the members of the conversation should be arranged so that the text from each participant is clearly readable, and its source and the relative timing of entered text is visualized in the display. Mechanisms for looking back in the contents from the current session should be provided. The text should be displayed as soon as it is received.

Examples of display arrangements

Two examples of possible display arrangements are given here.

One window per source

One possible way of arranging the display is to have one window per source, including one window for the user of the terminal itself. The identity of the source can be displayed in the window header. The windows can be placed side by side. At end of line, word wrapping should be used.

The window contents can be chronologically ordered so that its position relative to lines in the other windows indicates when it was received relative to the other.

ANNE	EVE
Hi, this is Anne.	Oh, hello Anne, I am glad you are calling! It's been long since we met!
Yes, have you heard that I will come to Paris in November?	No, that's new to me. What brings you here?

Figure I.1/T.140 – A possible way to display a conversation with one window each

One window for the whole session

Another way to arrange the display is to have one common window. The text from each participant can be displayed with its source identity as a label. With two participants, the character flow can be character by character, thus maintaining two logical insertion points. With more participants it can be acceptable to buffer text until a NEW LINE is received, and then display it in the window with a label indicating the source.

<EVE>This is Eve.
<ANN>Hi, this is Anne.
<EVE>Oh, hello Anne, I am glad you are calling! It's been long since we met!
<ANN>Have you heard that I am coming to Paris in November?
<EVE>No, that's new to me. What brings you here?

Figure I.2/T.140 – A possible way to display a conversation in a common window

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