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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication procedures

Gateway control protocol: User interface elements and actions packages

Recommendation ITU-T H.248.3

ITU-T H-SERIES RECOMMENDATIONS

AUDIOVISUAL AND MULTIMEDIA SYSTEMS

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Recommendation ITU-T H.248.3

Gateway control protocol: User interface elements and actions packages

Summary

The packages in Recommendation ITU-T H.248.3 define a framework for specifying capabilities associated with user interface elements, such as text display, keys, dynamically labelled keys, indicators and alphanumeric input. In addition, specific extension packages for telephone keypads and telephone function keys are defined.

This Revision incorporates corrections to the Set Indicator signal "State" and "Indicator description" parameters.

NOTE – This Recommendation has been renumbered. It was previously known as Recommendation ITU-T H.248, Annex G.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.248 Annex G	2000-11-17	16
1.0	ITU-T H.248.3	2000-11-17	16
1.2	ITU-T H.248.3 (2000) Cor. 1	2004-03-15	16
2.0	ITU-T H.248.3	2013-03-16	16

FOREWORD

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Recommendation ITU-T H.248.3

Gateway control protocol: User interface elements and actions packages

1   Scope

This Recommendation defines a package that extends the applicability of the ITU-T H.248.1 Gateway control protocol. Specifically, the packages in Recommendation ITU-T H.248.3 define a framework for specifying capabilities associated with user interface elements, such as text display, keys, dynamically labelled keys, indicators and alphanumeric input. In addition, specific extension packages for telephone keypads and telephone function keys are defined.

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; 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. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T H.248.1]   Recommendation ITU-T H.248.1 (2013), *Gateway control protocol*: *Version 3*.

[ISO/IEC 10646]   ISO/IEC 10646:2012, *Information technology – Universal Coded Character Set (UCS)* and its Amendment 1 (2013).

3   Display Package

Package name:	Display Package
Package ID:	dis (0x0014)
Version:	1
Extends:	None.
Description:	This package defines properties and signals associated with text display user interface elements. See Procedures for details of operation.

3.1   Properties

3.1.1   Number of rows

Property name:	Number of rows
Property ID:	nrows (0x0001)
Description:	Maximum number of rows on the display.
Type:	integer
Possible values:	Zero upwards
Default:	None
Defined in:	TerminationState.
Characteristics:	ReadOnly.

3.1.2   Number of columns

Property name:	Number of columns
Property ID:	ncols (0x0002)
Description:	Maximum number of columns on the display.
Type:	integer
Possible values:	Zero upwards
Default:	None
Defined in:	TerminationState
Characteristics:	ReadOnly

3.1.3   Supported unicode code pages

Property name:	Supported unicode code pages
Property ID:	cdpgs (0x0003)
Description:	A list of supported unicode pages.
Type:	list of enumerated type
Possible values:	See example below
Default:	None
Defined in:	TerminationState
Characteristics:	ReadOnly.
Example:	If the text display element supports U+2500 → U+25ff, U+2600 → U+26ff and U+2700 → U+277f, this property would return "250, 258, 260, 268, 270" in cdpgs.
	Unicode page U+0000 → U+00ff shall be supported in all implementations.

3.1.4   Cursor row position

Property name:	Cursor row position
Property ID:	cr (0x0004)
Description:	This property indicates the row position of the cursor.
Type:	integer
Possible values:	0 upwards
Default:	None
Defined in:	TerminationState
Characteristics:	Read/Write

3.1.5   Cursor column position

Property name:	Cursor column position
Property ID:	cc (0x0005)
Description:	This property indicates the column position of the cursor.
Type:	integer

Possible values:	0 upwards
Default:	None
Defined in:	TerminationState
Characteristics:	Read/Write

NOTE – Row and column numbering begin at 0. A display's origin is row 0, column 0. The origin is at the top left corner.

3.2 Events

None.

3.3 Signals

3.3.1 Display

Signal name:	Display
Signal ID:	di (0x0001)
Description:	Display text.
Signal yype:	Brief
Duration:	Not applicable.

3.3.1.1 Additional Parameters

3.3.1.1.1 Row

Parameter name:	Row
Parameter ID:	r (0x0001)
Description:	Insertion point row, relative to 0,0. Default is current cursor position.
Type:	Integer
Optional:	Yes
Possible values:	0 upwards.
Default:	Current cursor row position.

3.3.1.1.2 Column

Parameter name:	Column
Parameter ID:	c (0x0002)
Description:	Insertion point column, relative to 0,0
Type:	Integer
Optional:	Yes
Possible values:	0 upwards.
Default:	Current cursor column position.

3.3.1.1.3 String

Parameter name:	String
Parameter ID:	star (0x0003)
Description:	This parameter indicates the text string to be displayed.

Type:	String
Optional:	Yes
Possible values:	Any string.
Default:	Empty string (moves cursor position).

3.3.1.1.4 Attribute

Parameter name:	Attribute
Parameter ID:	a (0x0004)
Description:	The parameter assigns an attribute to the displayed text.
Type:	enumerated or list of enumerated.
Optional:	Yes
Possible values:	plain (0x0001), blink (0x0002), invert (0x0003), underline (0x0004)
Default:	Plain

3.3.2   Clear Display

Signal name:	Clear Display
Signal ID:	cld (0x0002)
Description:	This signal clears the entire display and resets the current cursor position to the origin (row 0, column 0).
Signal type:	Brief
Duration:	Not applicable.

3.3.2.1   Additional parameters

None.

3.4   Statistics

None.

3.5   Procedures

Unicode is supported to provide for multiple languages. The Unicode Standard, Version 2.0 or [ISO/IEC 10646] shall be the definitive standard intended when the term Unicode is used within the context of this Recommendation. All text display elements shall at least support the Unicode pages U+0000 → U+00ff as the basic character set. All text strings shall be encoded using UTF-8 as defined in [ISO/IEC 10646].

In the Display signal, text will be inserted beginning at the row and column given in the signal parameters, relative to 0,0. If no row and column parameters are given, the text will be inserted starting at the current cursor position. The current cursor position will always be advanced to the position immediately after the last character inserted.

Carriage return <Unicode U+000D> is supported in-string, and moves the text input to the beginning of the next line, clearing the remainder (if any) of the current line.

Text wrapping is not provided. A string will not word wrap to the next row. If a string cannot fit into the current row, it will be truncated without warning.

The attribute parameter applies to all characters contained in the current signal. If no attribute is provided, plain text will be displayed. For example, to turn on an attribute in the middle of a string, one would send a signal with a beginning sub-string of plain text, follow by a signal with the desired attribute(s) for the middle sub-string, and finishing with the signal containing the remaining sub-string of plain text.

4 Key package

Package name:	Key
Package ID:	key (0x0015)
Description:	This package defines the basic behaviour of key user interface elements. Specific key IDs are selected by name (keyid) from the list of keys. This package does not specify parameter values for keys.
	Intended to be extended by other packages which have key behaviour.
Version:	1
Extends:	None

4.1 Properties

None.

4.2 Events

4.2.1 Keydown

Event name:	keydown
Event ID:	kd (0x0001)
Description:	Detects key was pressed. If the key is already pressed when the keydown event is activated, the keydown event is reported as if keypress had just occurred.

4.2.1.1 EventDescriptor parameters

None.

4.2.1.2 ObservedEventDescriptor parameter

4.2.1.2.1 Key Identity

Parameter name:	Key Identity
Parameter ID:	keyid (0x0001)
Description:	This parameter indicates the identity of the key that was pressed.
Type:	Enumeration
Optional:	No
Possible values:	No values are specified in this package. Extensions to this package add possible values for keyid.
Default:	None

4.2.2   Keyup

Event name: keyup

Event ID: ku (0x0002)

Description: Detects key up.

4.2.2.1   EventDescriptor parameters

None.

4.2.2.2   ObservedEventDescriptor parameter

4.2.2.2.1 Key Identity

Parameter name: Key Identity

Parameter ID: keyid (0x0001)

Description: This parameter indicates the identity of the key that was released.

Type: Enumeration

Optional: No

Possible values: No possible values are specified in this package. Extensions to this package would add possible values for keyid.

Default: None

4.2.2.2.2 Duration

Parameter name: Duration

Parameter ID: duration (0x0002)

Description: Key press duration (key down to key up).

Type: Integer

Optional: No

Possible values: 0 upwards in milliseconds

Default: None

4.3   Signals

None.

4.4   Statistics

None.

4.5   Procedures

None.

5 Keypad package

Package name: Keypad

Package ID: kp (0x0016)

Description: This package defines the keypad user interface element. The keypad package is used to represent a standard 10 digit key pad plus the '*', '#', A, B, C and D keys. Keypad may be used in conjunction with digit maps, similar to dtmf tone detection package.

Additional Keyid values, and mapping to DigitMap symbols (as described in clause 7.1.14 of [ITU-T H.248.1]):

Name	Description	DigitMap Symbol
k0 (0x0001)	Keypad digit 0	'0'
k1 (0x0002)	Keypad digit 1	'1'
k2 (0x0003)	Keypad digit 2	'2'
k3 (0x0004)	Keypad digit 3	'3'
k4 (0x0005)	Keypad digit 4	'4'
k5 (0x0006)	Keypad digit 5	'5'
k6 (0x0007)	Keypad digit 6	'6'
k7 (0x0008)	Keypad digit 7	
k8 (0x0009)	Keypad digit 8	'8'
k9 (0x000a)	Keypad digit 9	'9'
ks (0x000b)	Keypad digit *	'E' or 'e'
ko (0x000c)	Keypad digit #	'F' or 'f'
kA (0x000d)	Keypad digit A	'A' or 'a'
kB (0x000e)	Keypad digit B	'B' or 'b'
kC (0x000f)	Keypad digit C	'C' or 'c'
kD (0x0010)	Keypad digit D	'D' or 'd'

Version: 1

Extends: key version 1

5.1 Properties

None.

5.2 Events

5.2.1 DigitMap Completion Event

Event name: DigitMap Completion Event

Event ID: ce (0x0003)

Description: Generated when a digit map completes as described in clause 7.1.14 of [ITU-T H.248.1]. Form of this event is identical to its definition in DTMF Detection Package (dd), clause E.6.2 of [ITU-T H.248.1].

5.2.1.1 EventsDescriptor parameters

Digit map processing is activated only if a digit map parameter is present, specifying a digit map by name or by value. Other parameters such as a KeepActive flag or embedded Events or Signals Descriptors may be present.

5.2.1.2 ObservedEventsDescriptor parameters

5.2.1.2.1 DigitString

Parameter name:	DigitString
Parameter ID:	ds (0x0001)
Description:	The portion of the current dial string as described in clause 7.1.14 of [ITU-T H.248.1] which matched part or all of an alternative event sequence specified in the digit map.
Type:	String of digit map symbols (possibly empty) returned as a quotedString.
Optional:	No
Possible values:	A sequence of the characters "0" through "9", "A" through "F", and the long duration modifier "Z".
Default:	None

5.2.1.2.2 Termination Method

Parameter name:	Termination Method
Parameter ID:	meth (0x0003)
Description:	indicates the reason for generation of the event. See the procedures in clause 7.1.14 of [ITU-T H.248.1].
Type:	Enumeration
Optional:	No
Possible values:	"UM" (0x0001) Unambiguous match
	"PM" (0x0002) Partial match, completion by timer expiry or unmatched event
	"FM" (0x0003) Full match, completion by timer expiry or unmatched event
Default:	None

5.3 Signals

None.

5.4 Procedures

None.

6 Label Key package

Package name: Label Key

Package ID: labelkey (0x0017)

Description: This package defines the basic behaviour of labelled key user interface elements. Key labels may be used, for example, to provide information to the MGC regarding preconfigured telephone key assignments, allowing telephone moves and changes outside the initial administrative domain without requiring reconfiguration of keys. May also be used to provide static label information on the telephone user interface, identifying key function to the user without the need for manual labelling.

Specific keys are addressed by name (keyid) from the list of keys. This package does not specify parameter values for keys.

Intended to be extended by other packages which have key behaviour.

Version: 1

Extends: key version 1

6.1 Properties

6.1.1 Key List

Property name: Key List

Property ID: keylist (0x0001)

Description: Keylist property allows auditing and setting of keyid/label mapping. Label size is also given. This package defines syntax only; no specific keys are defined. See derived packages for the actual keyid lists.

Type: String

Possible values: String using the following format {{keyid, label, label_size}, ...}

Default: None

Defined in: TerminationState

Characteristics: Read/Write

6.2 Events

None.

6.3 Signals

None.

6.4 Procedures

None.

7 Function Key package

Package name: Function Key

Package ID: kf (0x0018)

Description: Common telephone function keys are defined in this package. This allows, for example, line keys and other function keys to be implemented without specific knowledge of the physical layout of the telephone.

Additional keyid values in keyup and keydown events and keylist property:

Name	Description
kh (0x0011)	Hookswitch
kl (0x0012)	Hold
kc (0x0013)	Conference
kt (0x0014)	Transfer
l001-l999 (0x0015-0x03fb)	Set of line keys
f001-f999 (0x03fc-0x07e2)	Set of assignable function keys

Version: 1

Extends: labelkey version 1

7.1 Procedures

Function Keys may have well-known names (keyid) associated with function, for example "hookswitch", "hold", etc. These well know names identify the purpose of the particular key on the actual device. Function Keys may also be assigned a label identifier by the MGC. This approach avoids assumptions and/or the requirement for application level knowledge of device-specific configuration of the physical resources to derive intended function of keys.

Function Keys can be correlated with physically associated Indicators using Function Key keyid and Indicator indid. If the IDs are identical, the MGC application can safely assume that the key and indicator are physically (or otherwise) associated on the actual device. Again, this avoids assumptions and/or the requirement for application level knowledge of device-specific layout of the physical resources. See also the Indicator package (ind).

NOTE – The key sense of hookswitch (keyid = kh) is a special case. Key up indicates the hookswitch is depressed (i.e., handset is nominally on hook). Key down indicates the hookswitch is lifted (i.e., handset is nominally off hook). This allows for sensible use of the duration parameter in the keyup event which will normally give the duration the handset was off-hook.

8 Indicator package

Package name:	Indicator
Package ID:	ind (0x0019)
Description:	This package defines the basic behaviour of indicator user interface elements. Specific indicators are addressed by name (indid) from the list of indicators. Indicators may have well-known names (indid) associated with function, for example "message waiting", "hold", "line active", etc. This allows, for example, indicators to be implemented without specific knowledge of the physical layout of the telephone.
	Intended to be possible to extend by other packages which have indicator behaviour.
Version:	1
Extends:	None

8.1 Properties

8.1.1 Indicator List

Property name:	Indicator List
Property ID:	indlist (0x0001)
Description:	Indicator List property allows auditing and setting of indid/label mapping. Label size is also given. This package defines syntax only; no specific indicators are defined. See derived packages for the actual indid lists.
Type:	String
Possible values:	String using the following format: {{indid, label, label_size}, ...}
Default:	None
Defined in:	TerminationState.
Characteristics:	Read/Write

8.2 Events

None.

8.3 Signals

8.3.1 Set Indicator

Signal name:	SetIndicator
Signal ID:	is (0x0001)
Description:	The signal sets the indicator state.
Signal type:	Brief
Duration:	Not applicable (See "Signal Procedures").

8.3.1.1 Additional parameters

8.3.1.1.1 Indictor description

Parameter name:	Indicator description
Parameter ID:	Indid (0x0001)
Description:	This parameter specifies the indicator to be set.
Type:	Enumeration
Optional:	No
Possible values:	

Name	Description
off(0x0000)	Off
il (0x0001)	Hold
ic (0x0002)	Conference
l001-l999 (0x0003-0x03e9)	Set of line indicators
f001-f999 (0x03fa-0x07e0)	Set of assignable function indicators
ir (0x07e1)	Ringer/Alerter indication
im (0x07e2)	Message waiting indicator

NOTE – Values 0x03ea to 0x03f9 are reserved.

Default:	None

8.3.1.1.2 State

Parameter name:	State
Parameter ID:	state (0x0002)
Description:	This parameter specifies the state of the associated indicator.
Type:	Enumeration
Optional:	Yes
Possible values:	on (0x0001) off (0x0002) blink (0x0003) fast_blink (0x0004) slow_blink (0x0005).
Default:	off

8.4 Statistics

None.

8.5 Procedures

8.5.1 General

Indicators can be co-related with physically associated Function Keys using Indicator indid and Function Key keyid. If the IDs are identical, the MGC application can safely assume that the key and indicator are physically (or otherwise) associated on the actual device. This avoids assumptions and/or the requirement for application level knowledge of device-specific layout of the physical resources. See also the Function Keys package (kf in clause 7).

8.5.2   Signal procedures

Each addressed indicator always has a certain state. The *SetIndicator* signal shall therefore be considered to control state changes rather than as persistent signal associated with a period of time of length greater than zero.

9   Soft Keypackage

Package name:	Soft Key
Package ID:	ks (0x001a)
Description:	Softkeys are a combination of a Function Key and a display user interface element, sharing some behaviour of each. Softkeys are intended to be dynamically updated by the MGC, based on the current state and context of the application controlling the MG. Since the display aspect and the key aspect are explicitly bound together, this avoids assumptions and/or the requirement for application level knowledge of device-specific layout of the physical resources.
	See Procedures for details.
Version:	1
Extends:	labelkey version 1

9.1   Properties

9.1.1   Number of soft keys

Property name:	Number of softkeys
Property ID:	nskeys (0x0002)
Description:	Maximum number of individual softkeys.
Type:	Integer
Possible values:	0 upwards
Default:	None
Defined in:	TerminationState
Characteristics:	ReadOnly

9.1.2   Display size

Property name:	Display size
Property ID:	sz (0x0003)
Description:	Maximum number of characters that can be displayed in each softkey.
Type:	Integer
Possible values:	0 upwards
Default:	None
Defined in:	TerminationState
Characteristics:	ReadOnly

9.1.3 Supported Unicode code pages

Property name:	Supported Unicode code pages
Property ID:	cdpgs (0x0004)
Description:	a list of supported Unicode pages
Type:	list of enumerated type
Possible values:	See procedures.
Default:	None
Characteristics:	ReadOnly
Defined in:	TerminationState

9.2 Signals

Signal name:	SetDisplay
SignalID:	sd (0x0001)
Description:	Set softkey dynamic display content.

9.2.1 Additional parameters

9.2.1.1 Keyid

Parameter Name:	keyed
Parameter ID:	k (0x0001)
Description:	This parameter indicates the identity of the softkey.
Type:	Enumeration
Optional:	No
Possible values:	sk1-sk999 (0x0001-0x03e7)
Default:	None

9.2.1.2 Display Content

Parameter name:	displayContent
Parameter ID:	d (0x0002)
Description:	<description>
Type:	String
Optional:	No
Possible values:	See procedures.
Default:	None

9.3 Procedures

The display aspect is a subset of the Display (dis) package. Unicode is supported to provide for multiple languages (see [ISO/IEC 10646]), and all SoftKey elements shall at least support the Unicode pages U+0000 → U+00ff as the basic character set. All text strings shall be encoded using UTF-8. If a string cannot fit into the display area, it will be truncated without warning.

The key aspect, including Events and labelling, derives directly from Label Key and Key packages. Softkey identifiers (keyid) are indexed 1, 2...N. N (nskeys) is the maximum number of softkeys supported by the MG implementation. Refer to the Label Key (labelkey) and Key (key) packages for further details.

10   Ancillary Input package

Package name: Ancillary Input

Package ID: anci (0x001b)

Description: The ancillary input package is used to enter user alphanumeric information such as text input or scan data, which is forwarded to the MGC for processing. The information is presented as a Unicode character encoded in UTF-8 format (see [ISO/IEC 10646]).

Version: 1

Extends: None

10.1   Properties

None.

10.2   Events

Event name: Character input

Event ID: ch (0x0001)

Description: A character has been input.

10.2.1   EventDescriptor parameters

None.

10.2.2   ObservedEventDescriptor parameters

10.2.2.1   Identity

Parameter Name: Id

Parameter ID: id (0x0001)

Description: Indicates the character that was input.

Type: character

Optional: No

Possible values: (UTF-8 character)

Default: None

10.3   Signals

None.

10.4   Statistics

None.

10.5   Procedures

None.

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