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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS
Infrastructure of audiovisual services – Communication
procedures

**Gateway control protocol: International
CAS packages**

ITU-T Recommendation H.248.28



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Gateway control protocol: International CAS packages

Summary

The international CAS package (icas) provides an extension to the basic CAS packages, defining additional line signals and events required for international signalling protocols.

For some international protocols, such as some variants of the R2 signalling system, it would typically be necessary to implement the bcas, icas and casblk packages to fully support the interface. In addition, register signalling will require support of either the bcasaddr package for non-compelled signalling, or a package to perform compelled signalling.

This version of this Recommendation adds new read-only properties containing the current CAS state of the termination, to allow the MGC to resynchronize itself in the event that it loses track of this state.

Source

ITU-T Recommendation H.248.28 was approved on 13 January 2007 by ITU-T Study Group 16 (2005-2008) under the ITU-T Recommendation A.8 procedure.

FOREWORD

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ITU-T Recommendation H.248.28

Gateway control protocol: International CAS packages

1 Scope

The icas package presented in this Recommendation is an extension of the bcas package (as per definition of package extensions in [ITU-T H.248.1]). Any termination supporting this package must also support the bcas package.

Only signals and events related to generic international CAS signalling operation, both for automatic or semi-automatic working, have been considered for inclusion in the icas package. Some international signalling systems may require new supervisory (line) and call set-up control (register) signals to introduce features such as re-answering, trunk offering, re-ring, operator break-in, etc. As there is no single standard mechanism to implement such features (they vary from country to country), they have not been considered in this package. If these are required, it is expected they would be implemented by defining additional signals and events in new packages that either extend the bcas package or this icas package.

These packages are intended for use in analogue (one-way operation) or digital transmission systems (one-way or both-ways operations). The MGC should be unaware of the transmission details at the physical layer. The MG shall be provisioned with the actual signalling frequencies for inter-register signalling (for example 2-out-of-n in-band multi-frequency code with forward and backward compelled signalling for R2) along with their properties such as amplitude, tone duration, cadence, etc., and also their logical significance. Any timers that dictate the inter-register compelling actions shall be provisioned in the MG. For example in R2 the SF, E&M (for analogue) and "abcd" bits (for digital) line signalling parameters generated at the physical layer, along with their logical significance, are also assumed to be provisioned at the MG.

The support of these packages is optional.

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] ITU-T Recommendation H.248.1 (2005), *Gateway control protocol: Version 3*.

[ITU-T H.248.25] ITU-T Recommendation H.248.25 (/2007), *Gateway control protocol: Basic CAS packages*.

3 Definitions

None.

4 Abbreviations

This Recommendation uses the following abbreviations:

CAS	Channel Associated Signalling
E&M	Ear and Mouth
MG	Media Gateway
MGC	Media Gateway Controller
PDN	Packet Data Network
R2	Signalling System R2
SF	Single Frequency

5 International CAS package

Package name: International CAS package

PackageID: icas (0x007b)

Description: This package provides event and signal handling for terminations that support international CAS signalling.

Version: 2

Extends: bcas version 2

5.1 Properties

5.1.1 Trunk direction

Property name: Trunk direction

PropertyID: trdir (0x0001)

Description: Specifies whether the icas termination is an incoming, outgoing or both way trunk circuit.

Type: Enumeration

Possible values:	IC (0x0001)	Incoming.
	OG (0x0002)	Outgoing.
	BW (0x0003)	Both ways.

Default: Provisioned

Defined in: TerminationState descriptor

Characteristics: Read only

5.1.2 CAS near-end line state

Property name: CAS near-end line state

PropertyID: nels (0x0002)

Description: Specifies the current CAS near-end line state of the termination by reflecting the last applied line signal.

Type: Enumeration

Possible values:

- Idle (0x01) The CAS termination near-end is in the idle state.
- Seize (0x02) The CAS termination near-end is in the seize state.
- SeizeAck (0x03) The CAS termination near-end is in the seize acknowledge state.
- Answer (0x04) The CAS termination near-end is in the answer state.
- ClearFwd (0x05) The CAS termination near-end is in the clear forward state.
- ClearBack (0x06) The CAS termination near-end is in the clear back state.
- RelGrd (0x07) The CAS termination near-end is in the release guard state.

Default: The last applied line signal. If no line signal has been applied by the MGC, idle.

Defined In: TerminationState descriptor

Characteristics: Read only

5.1.3 Far-end line state

Property name: CAS far-end line state

PropertyID: fels (0x0003)

Description: Specifies the current CAS far-end line state of the termination by reflecting the last detected line event.

Type: Enumeration

Possible values:

- Idle (0x01) The CAS termination far-end is in the idle state.
- Seize (0x02) The CAS termination far-end is in the seize state.
- SeizeAck (0x03) The CAS termination far-end is in the seize acknowledge state.
- Answer (0x04) The CAS termination far-end is in the answer state.
- ClearFwd (0x05) The CAS termination far-end is in the clear forward state.
- ClearBack (0x06) The CAS termination far-end is in the clear back state.
- RelGrd (0x07) The CAS termination far-end is in the release guard state.

Default: The last detected line event. If no line event has been detected by the MGC, idle.

Defined in: TerminationState descriptor

Characteristics: Read only

5.2 Events

5.2.1 Subscriber line status

Event name: Subscriber line status

EventID: sls (0x0006)

Description: Reports the line status of the called subscriber.

EventsDescriptor parameters: None

ObservedEventsDescriptor parameters:

Subscriber line condition

Parameter name: Subscriber line condition
ParameterID: lsts (0x0001)
Description: Line conditions of the called subscriber.
Type: Enumeration
Optional: No
Possible values: SLB (0x0001) Subscriber line busy.
SLFC (0x0002) Subscriber line free, charge.
Default: None

5.2.2 Clear forward

Event name: Clear forward
EventID: cf (0x0007)
Description: This event applies to an incoming interface and is reported when a "clear" line signal occurs on the termination. The event is reported by the MG if either the timed transition to this line signal is detected or the line signal already exists. The condition against which the signal is verified is provisioned in the MG. The parameter "clear guard timing" can optionally be included.

EventsDescriptor parameters:

Clear guard timing

Parameter name: Clear guard timing
ParameterID: clgdt (0x0001)
Description: Specifies whether the MG shall start a clear guard timer for the receipt of the clear forward signal. If the clear guard timer expires prior to the detection of clear forward signal and the CAS failure event is active, the MG shall report a CAS failure event with a "cfto" error code. The timer value is provisioned on the MG.
Type: Boolean
Optional: Yes
Possible values: On when the clear guard timing is requested.
Off when the clear guard timing is turned off.
Default: Off

ObservedEventsDescriptor parameters: None

5.2.3 Clear back

Event name: Clear back
EventID: cb (0x0008)

Description: This event applies to an outgoing interface and is reported when a "clear back" line signal occurs on the termination. The event is reported by the MG if either the timed transition to this line signal is detected or the line signal already exists. The condition against which the signal is verified is provisioned in the MG. The parameter "clear guard timing" can optionally be included.

EventsDescriptor parameters:

Clear guard timing

Parameter name: Clear guard timing
ParameterID: clgdt (0x0001)
Description: Specifies whether the MG shall start a clear guard timer for the receipt of the "clear back" signal. If the clear guard timer expires prior to the detection of clear back signal and the CAS failure event is active, the MG shall report a CAS failure event with a "cbto" error code. The timer value is provisioned on the MG. If the clgdt parameter is not provided, the MG does not perform timing by default.
Type: Boolean
Optional: Yes
Possible values: On when the clear guard timing is requested.
Off when the clear guard timing is turned off.
Default: Off

ObservedEventsDescriptor parameters: None

5.2.4 CAS failure

Event name: CAS failure
EventID: casf (0x0005)
Description: Extends the bcas casf event to handle general failure or abnormal line and register signalling conditions associated with this package.

EventsDescriptor parameters: None

ObservedEventsDescriptor parameters:

Error code

Parameter name: Error code
ParameterID: ec (0x0001)
Description: Describes the CAS failure reason.
Type: Enumeration
Optional: No

Possible values:

CFTO (0x0006)	Clear forward time out.
CBTO (0x0007)	Clear back time out.
CNG (0x0008)	Congestion: Encountered network congestion.
DISC (0x0009)	Information signalled by the MGC is inappropriate at the compelling stage at MG and hence discarded.

Default: None

5.2.5 Release guard

Event name: Release guard

EventID: rlg (0x0009)

Description: This event applies to an incoming interface and is reported when a "release guard" line signal occurs on the termination. The event is reported by the MG if either the timed transition to this line signal is detected or the line signal already exists. The condition against which the signal is verified is provisioned in the MG.

EventsDescriptor parameters: None

ObservedEventsDescriptor parameters: None

5.2.6 Congestion

Event name: Congestion

EventID: cng (0x000a)

Description: This event applies to an outgoing interface and is reported when a "network congestion" line signal occurs on the termination. The event is reported by the MG if either the timed transition to this line signal is detected or the line signal already exists. The condition against which the signal is verified is provisioned in the MG.

EventsDescriptor parameters: None

ObservedEventsDescriptor parameters: None

5.3 Signals

5.3.1 Congestion

Signal name: Congestion

SignalID: cng (0x0005)

Description: This signal applies to the network congestion signal on a termination. It arises when at the MGC the call setup attempt fails owing to unavailability of PDN resources or encounters network congestion while routing on PDN.

Signal type: Brief

Duration: Provisioned

Additional parameters: None

5.3.2 Clear forward

Signal name: Clear forward

SignalID: cf (0x0006)

Description: This signal applies to an outgoing interface and is used to clear a call in the forward direction. The signal that is actually sent on the physical termination is provisioned in the MG.

Signal type: Brief

Duration: Provisioned

Additional parameters: None

5.3.3 Clear back

Signal name: Clear back

SignalID: cb (0x0007)

Description: This signal applies to an incoming interface and is used to clear a call in the backward direction. The signal that is actually sent on the physical termination is provisioned in the MG.

Signal type: Brief

Duration: Provisioned

Additional parameters: None

5.3.4 Subscriber line status

Signal name: Subscriber line status

SignalID: sls (0x0008)

Description: Applies to the called subscriber line status information signal.

Signal Type: Brief

Duration: Provisioned

Additional parameters:

Subscriber line condition

Parameter name: Subscriber line condition

ParameterID: lsts (0x0001)

Description: Line conditions of the called subscriber.

Type: Enumeration

Optional: No

Possible values: SLB (0x0001) Subscriber line busy.
SLFC (0x0002) Subscriber line free, charge.

Default: None

5.3.5 Release guard

Signal name: Release guard

SignalID: rlg (0x0009)

Description: This signal applies to an outgoing interface and is used to apply a release guard signal on the trunk. The signal that is actually sent on the physical termination is provisioned in the MG.

Signal type: Brief

Duration: Provisioned

Additional parameters: None

5.4 Statistics

5.4.1 Call duration

Statistic name: Call duration

StatisticID: cd (0x0001)

Description: Provides the cumulative duration of time the termination is in an active call context, i.e., from the point of applying or receiving the "answered" signal until the point of release ("clear-forward" or "clear-back") initiation.

Type: Double

Possible values: Any positive integer in seconds

Level: Termination

5.5 Procedures

5.5.1 Glare mitigation

Glare conditions shall be resolved as stated in 6.5.1/H.248.25.

5.5.2 Signal procedures

A line signal must always be present on a CAS interface. Therefore the icas signals defined here, as with the bcas signals, shall be considered to be state changes in the line signal state rather than as persistent signals in themselves. The state change shall be considered to be completed instantaneously by the MG. Consequently there is no active signal to be terminated by any subsequent event detection.

The MG shall maintain the existing line signal on the CAS interface until such a time as the MGC sends a new bcas or icas signal to the MG.

5.5.3 Property procedures

The nels property shall reflect the most recently successfully applied line signal from the MGC. As per the requirements in clause 5.5.2, the line signal shall not change without explicit instruction from the MGC and therefore the nels property shall also require explicit signal application in order to alter its value. If the MGC has not applied a signal to this termination, then the value is idle.

The fels property shall reflect the most recent line event detected by the MG. The property shall be updated upon detection of the event, and shall not depend upon the success or failure of the reporting of the event to the MGC. If the MG has not detected an event, then the value is idle.

Note that the default value for the properties are defined as the last applied signal or detected event. This has the effect of negating the "reset" of the properties due to a subtract command by making the MG reset the property to its current value. This is necessary to provide continuity for the properties and to align the values to the actual working of the CAS interface.

6 CAS blocking package

Package name: CAS blocking package

PackageID: casblk (0x007c)

Description: This package provides the capability of exchanging maintenance state between the MGC and the MG for terminations realizing any CAS protocol.

Version: 1
Extends: None

6.1 Properties

6.1.1 Near-end line state

Property name: Near-end line state
PropertyID: nels (0x0002)
Description: Specifies the current CAS near-end line state of the termination by reflecting the last applied line signal.
Type: Enumeration
Possible values:
 Idle (0x01) The CAS termination near-end is in the idle state.
 Block (0x08) The CAS termination near-end is in the blocked state.
Default: The last applied line signal. If no line signal has been applied by the MGC, idle.
Defined in: TerminationState descriptor
Characteristics: Read only

6.1.2 Far-end line state

Property name: Far-end line state
PropertyID: fels (0x0003)
Description: Specifies the current CAS far-end line state of the termination by reflecting the last detected line event.
Type: Enumeration
Possible values:
 Idle (0x01) The CAS termination far-end is in the idle state.
 Block (0x08) The CAS termination far-end is in the blocked state.
Default: The last detected line event. If no line event has been detected by the MG, idle.
Defined in: TerminationState descriptor
Characteristics: Read only

6.2 Events

6.2.1 Block

Event name: Block
EventID: blk (0x0001)
Description: Indicates that the remote end has blocked the termination.
EventsDescriptor parameters: None
ObservedEventsDescriptor parameters: None

6.2.2 Unblock

Event name: Unblock
EventID: ublk (0x0002)

Description: Indicates that the remote end has unblocked the termination, removing the busy condition.

EventsDescriptor parameters: None

ObservedEventsDescriptor parameters: None

6.3 Signals

6.3.1 Block

Signal name: Block

SignalID: blk (0x0001)

Description: This signal indicates that the MG should render the termination blocked for the remote end. Removal of this signal results in the termination being idled.

Signal type: Brief

Duration: Provisioned

Additional parameters: None

6.4 Statistics

None.

6.5 Procedures

6.5.1 Property procedures

The nels property shall reflect the most recent successfully applied line signal from the MGC. As per the requirements in clause 5.5.2, the line signal shall not change without explicit instruction from the MGC and therefore the nels property shall also require explicit signal application in order to alter its value. If the MGC has not applied a signal to this termination, then the value is idle.

The fels property shall reflect the most recent line event detected by the MG. The property shall be updated upon detection of the event, and shall not depend upon the success or failure of the reporting of the event to the MGC. If the MG has not detected an event, then the value is idle.

Note that the default value for the properties are defined as the last applied signal or detected event. This has the effect of negating the "reset" of the properties due to a subtract command by making the MG reset the property to its current value. This is necessary to provide continuity for the properties and to align the values to the actual working of the CAS interface.

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