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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication procedures

Gateway control protocol: Enhanced Alerting packages

Recommendation ITU-T H.248.23

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Recommendation ITU-T H.248.23

Gateway control protocol: Enhanced Alerting packages

Summary

Recommendation ITU-T H.248.23 defines two packages that provide enhanced alerting and data transfer capabilities for Recommendation ITU-T H.248.1.

This revision includes updated procedures that discuss how to handle race conditions when the dwa signal is used. A clarification is added to the pattern parameter as to what signal should be used.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.248.23	2003-07-14	16
1.1	ITU-T H.248.23 (2003) Cor. 1	2004-03-15	16
2.0	ITU-T H.248.23	2005-01-08	16
2.1	ITU-T H.248.23 (2005) Cor. 1	2006-05-29	16
3.0	ITU-T H.248.23	2013-03-16	16

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.

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Introduction

This Recommendation provides definitions for several supplemental packages for Recommendation ITU-T H.248.1. These packages define alternative signalling for ringing, add the capability for distinctive call waiting tones and address support of functionality for enhanced telephony services which utilize data transfer to the customer premises equipment.

Recommendation ITU-T H.248.23

Gateway control protocol: Enhanced Alerting packages

1 Scope

This Recommendation defines two packages that provide enhanced alerting and data transfer capabilities for [ITU-T H.248.1]. The support of these packages is optional.

There is a direct mapping between the alert/ri pattern parameter, alert/cw pattern parameter, and to the andisp/dwa pattern parameter. Ringing patterns and call waiting patterns are paired to allow for distinctive alerting sets. In expanding this parameter in the future, it would be desirable to expand the alert/ri, alert/cw, and andisp/dwa signals together, maintaining the distinctive pattern pairings. This will continue to allow the andisp/dwa signal to have a definition independent of the alerting method, linking it only to the alerting style (pattern).

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*.

3 Definitions

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ADSI Analogue Display Services Interface

AOC Advice of Charge

BCLID Bulk Calling Line Identification

CAS CPE Alerting Signal

CLASS Custom Local Area Subscriber Services

CPE Customer Premises Equipment

DT-AS Dual Tone Alerting Signal

MDMF Multiple Data Message Format

MG Media Gateway

MGC Media Gateway Controller

MIB Management Information Base

MWI Message Waiting Indicator

RP-AS Ring Pulse Alerting Signal

SAS Subscriber Alerting Signal

SDMF Single Data Message Format

SMS Short Message Service

TAS Terminal Alerting Signal

5 Enhanced Alerting Package

Package name: Enhanced Alerting Package

Package ID: alert (0x003b)

Description: This package defines enhanced alerting signals for analogue lines.

Version: 2

Extends: None

5.1 Properties

None.

5.2 Events

None.

5.3 Signals

5.3.1 Ring

Signal name: Ring

Signal ID: ri (0x0001)

Description: Applies ringing to the line

Signal type: TimeOut

Duration: Provisioned

5.3.1.1 Additional parameters

5.3.1.1.1 Pattern

Parameter name: Pattern

Parameter ID: pattern (0x0001)

Description: The pattern is an abstract indication of the distinctive alerting pattern that will be applied to the line. The actual cadence/frequency combination is known by the media gateway. Ring patterns repeat until the signal times out, or is interrupted.

Type: Integer

Optional: Yes

Possible values: 1-256 (0x0001-0x0100)

Default: 1

5.3.1.1.2 Tone Direction

Parameter name: Tone Direction

Parameter ID: btd (0x0002)

Description: The tone direction indicates in which direction the signal shall proceed with respect to the centre of the context. "Internal" denotes that the signal shall proceed toward the centre of the context from the termination, while "external" denotes that the signal shall proceed toward the edge of the context. "Both" indicates that the signal shall proceed in both directions. Note that using the playtone signal to generate this signal will prevent the capability to use the directionality parameter.

Type: Enumeration

Optional: Yes

Possible values:
ext (0x0001)
int (0x0002)
both (0x0003)

Default: ext

5.3.2 Ringsplash

Signal name: Ringsplash

Signal ID: rs (0x0002)

Description: Applies ringsplash to the line. Ringsplash is a short burst of ringing, typically in the range of 500 milliseconds in duration. The duration is provisioned in the MG.

Signal type: Brief

Duration: Provisioned

5.3.2.1 Additional parameters

5.3.2.1.1 Tone Direction

Parameter name: Tone Direction

Parameter ID: btd (0x0001)

Description: The tone direction indicates in which direction the signal shall proceed with respect to the centre of the context. "Internal" denotes that the signal shall proceed toward the centre of the context from the termination, while "external" denotes that the signal shall proceed toward the edge of the context. "Both" indicates that the signal shall proceed in both directions. Note that using the playtone signal to generate this signal will prevent the capability to use the directionality parameter.

Type: Enumeration

Optional: Yes

Possible values:
ext (0x0001)
int (0x0002)
both (0x0003)

Default: ext

5.3.3 Call Waiting

Signal name: Call Waiting

Signal ID: cw (0x0003)

Description: Generate call waiting indication. The cw signal definition takes a pattern parameter, to allow generation of distinctive waiting tones.

Signal type: Brief

Duration: Varies by pattern

5.3.3.1 Additional parameters

5.3.1.1.1 Pattern

Parameter name: Pattern

Parameter ID: pattern (0x0001)

Description: The pattern is an abstract indication of the distinctive alerting pattern that will be applied to the line. The actual cadence/frequency combination is known by the media gateway. Call wait patterns do not repeat.

Type: Integer

Optional: Yes

Possible values: 1-256 (0x0001-0x0100)

Default: 1

5.3.1.1.2 Tone Direction

Parameter name: Tone Direction

Parameter ID: btd (0x0002)

Description: The tone direction indicates in which direction the signal shall proceed with respect to the centre of the context. "Internal" denotes that the signal shall proceed toward the centre of the context from the termination, while "external" denotes that the signal shall proceed toward the edge of the context. "Both" indicates that the signal shall proceed in both directions. Note that using the playtone signal to generate this signal will prevent the capability to use the directionality parameter.

Type: Enumeration

Optional: Yes

Possible values:

ext	(0x0001)
int	(0x0002)
both	(0x0003)

Default: ext

5.4 Statistics

None.

5.5 Procedures

The frequencies and cadences for the signals in this package shall be provisioned. This provisioning may occur through the use of a MIB.

6 Analogue Display Signalling Package

Package name: Analogue Display Signalling Package

Package ID: andisp (0x003c)

Description: This package defines signalling for data features for analogue lines. These features may include Caller ID, Short Message Service, ADSI, Message Waiting Indicator and others.

Version: 2

Extends: alert (0x003b) version 2

6.1 Properties

None.

6.2 Events

None.

6.3 Signals

6.3.1 Display with Alerting

Signal name: Display with Alerting

Signal ID: dwa (0x0004)

Description: Sends the display information to the CPE. This signal indicates that the data must be applied in conjunction with alerting – either power ringing, or call waiting. Therefore, this signal implies alerting, which will be appropriately applied to the CPE by the gateway, based upon the on-hook/off-hook status of the line. The alerting portion of the signal occurs even if the termination is not equipped to receive the data portion.

Signal type: Brief

NOTE – Explicit changes to the signal duration affect the ringing/call waiting portion of the signal, if applicable. The data transmission should be considered Brief.

Duration: Variable depending upon the data transferred

6.3.1.1 Additional parameters

6.3.1.1.1 Display Data Block

Parameter name: Display Data Block

Parameter ID: ddb (0x0001)

Description: The Display Data Block contains the message data with any required checksum to be sent to the CPE. Binary encoding is the binary data itself, while text encoding shall carry the data as a big-endian encoded hex string. For example, in North America for basic Caller ID, this would be the SDMF or MDMF construct, including the checksum. The default value is an empty data block which will be silently discarded by the gateway.

Once the signal is processed, failure to transmit the display data portion of the signal for any reason SHALL NOT generate an Error

Descriptor. This includes attempts to transmit to a CPE that is not equipped to handle the data. Application of the alerting portion of the signal should proceed as if there had been no display data transmission request in the first place. This includes errors in the data itself, or a bad checksum.

Type: Octet String

Optional: Yes

Possible values: See description

Default: Empty

6.3.1.1.2 Pattern

Parameter name: Pattern

Parameter ID: pattern (0x0002)

Description: The pattern is an abstract indication of the distinctive alerting pattern that will be applied to the line. If data is to be applied without alerting, the data signal should be used.

Failure to apply the patterned signal SHOULD generate an Error Descriptor, as would any failed attempt to apply a signal. Typically, error 513, "Media Gateway unequipped to generate requested Signals" would apply.

Type: Integer

Optional: Yes

Possible values: 1-256 (0x0001-0x0100)

Default: 1

6.3.1.1.3 Tone Direction

Parameter name: Tone Direction

Parameter ID: btd (0x0003)

Description: The tone direction indicates in which direction the signal shall proceed with respect to the centre of the context. "Internal" denotes that the signal shall proceed toward the centre of the context from the termination, while "external" denotes that the signal shall proceed toward the edge of the context. "Both" indicates that the signal shall proceed in both directions. Unspecified tone direction shall default to "external". Note that using the playtone signal to generate this signal will prevent the capability to use the directionality parameter.

Type: Enumeration

Optional: Yes

Possible values:

ext	(0x0001)
int	(0x0002)
both	(0x0003)

Default: ext

6.3.2 Generic Data Signalling

Signal name: Generic Data Signalling

Signal ID: data (0x0005)

Description: Sends data not associated with alerting to the CPE. Examples of this would be Analogue Display Services Interface (ADSI), Message Waiting Indicator, Short Message Service, or Advice of Charge. ADSI is used for advanced features such as context-specific softkeys, and in-phone visual data editing.

Signal type: Brief

Duration: Variable depending on data transfer

6.3.2.1 Additional parameters

6.3.2.1.1 Data Block

Parameter name: Data Block

Parameter ID: db (0x0001)

Description: The Data Block contains the message data with any required checksum to be sent to the CPE. Binary encoding is the binary data itself, while text encoding shall carry the data as a big-endian encoded hex string. The default value is an empty data block which will be acted upon as if there were data (such as playing a TAS tone to the set).

Failure to transmit the data for any reason, excepting Megaco message formatting errors, SHALL NOT generate an Error Descriptor. Call processing should proceed as if there had been no data transmission request in the first place. This includes errors in the data itself, or a bad checksum.

Type: Octet String

Optional: Yes

Possible values: See description

Default: Empty

6.3.2.1.2 Terminal Alerting Signal

Parameter name: Terminal Alerting Signal

Parameter ID: tas (0x0002)

Description: The TAS is the method to alert the set that data is forthcoming. In the offhook signalling case, the TAS parameter shall specify either the DT-AS (dt) or no TAS (nt). Use of the rp or lr values in the offhook case shall be treated as if dt were signalled.

Type: Enumeration

Optional: Yes

Possible values:

dt	(0x0001) Dual Tone Alerting Signal (DT-AS)
rp	(0x0002) Ring Pulse Alerting Signal (RP-AS)
lr	(0x0003) Line Reversal followed by DT-AS
nt	(0x0004) No TAS

Default: Provisioned

6.3.2.1.3 Tone Direction

Parameter name: Tone Direction

Parameter ID: btd (0x0003)

Description: The tone direction indicates in which direction the signal shall proceed with respect to the centre of the context. "Internal" denotes that the signal shall proceed toward the centre of the context from the termination, while "external" denotes that the signal shall proceed toward the edge of the context. "Both" indicates that the signal shall proceed in both directions. Unspecified tone direction shall default to "external". Note that using the playtone signal to generate this signal will prevent the capability to use the directionality parameter.

Type: Enumeration

Optional: Yes

Possible values:

ext	(0x0001)
int	(0x0002)
both	(0x0003)

Default: ext

6.3.3 Error Tone

Signal name: Error Tone

Signal ID: err (0x0006)

Description: Provides for a tone to be played to the subscriber indicating that an error has occurred (for example, bad input). The physical characteristic of error tone is provisioned in the gateway.

Signal type: Brief

Duration: Provisioned

6.3.3.1 Additional parameters

6.3.3.1.1 Tone Direction

Parameter name: Tone Direction

Parameter ID: btd (0x0001)

Description: The tone direction indicates in which direction the signal shall proceed with respect to the centre of the context. "Internal" denotes that the signal shall proceed toward the centre of the context from the termination, while "external" denotes that the signal shall proceed toward the edge of the context. "Both" indicates that the signal shall proceed in both directions. Unspecified tone direction shall default to "external". Note that using the playtone signal to generate this signal will prevent the capability to use the directionality parameter.

Type: Enumeration

Optional: Yes

Possible values:

ext	(0x0001)
int	(0x0002)
both	(0x0003)

Default: ext

6.4 Statistics

None.

6.5 Procedures

The data block parameter of the andisp/dwa and andisp/data signals always includes the checksum, if the data format specifies one. However, the signals do not include other data link parameters such as the Channel Seizure or Mark indications. These other parameters are generated by the MG.

The following examples show how to build a Signals descriptor to deliver Caller ID to a CPE. The andisp/dwa signal is designed to stand alone, and be independent of on-hook/off-hook status.

To apply ringing (via the alert package) for a normal call, the following signals descriptor is used:

Signals{alert/ri{pattern=1}}

To apply standard ringing and signal the Caller ID information, the following signals descriptor is used:

Signals{andisp/dwa{ddb=8020010830353138313631350 20A3931393535353030303007084A6F686E20446F65D8,pattern=1}}

In this example, the data block is North American MDMF, or ETSI Call Setup Caller ID signalling, indicating a call at 4:15 PM, May 18 from John Doe at (919) 555-0000. The checksum is included (D5). For encoding information, see [b-Telcordia GR-30-CORE] or [b-ETSI EN 300 659-1], [b-ETSI EN 300 659-2] and [b-ETSI EN 300 659-3].

This signalling implies standard ringing, and any other signalling necessary to deliver the Caller ID to the set between the first and second ring.

For the UK, Caller ID info is delivered by ringsplashing the set, sending the DWA data, and then applying normal ringing. The signal this descriptor used is the following:

Signals{andisp/dwa{ddb=8020010830353138313631350 20A3931393535353030303007084A6F686E20446F65D8,pattern=1}}

NOTE – This is the same as the previous example, since TAS should be provisioned for the gateway's location.

Call Waiting ID follows the same principles. For normal call waiting, the tone is requested as follows:

Signals{alert/cw{pattern=1}}

To perform Call Waiting ID (off-hook signalling), the descriptor is identical to the on-hook case:

Signals{andisp/dwa{ddb=8020010830353138313631350 20A3931393535353030303007084A6F686E20446F65D8,pattern=1}}

This signalling implies both application of call waiting tone, and any other signalling necessary to perform the Caller ID function. For North America and ETSI countries, it requests that the gateway apply call wait tone, then apply the CAS/DT-AS, and send down the Caller ID info after receipt of the ACK digit. If the MGC wants notification of the ACK digit, it should be requested in the Events descriptor. Any location-specific signalling requirements in the set-up of the DWA delivery are implied within the signal.

Bulk Calling Line ID is handled in the same way as Caller ID, except the Generic Data signal is used. Transmission of the Caller ID data proceeds as normal for on-hook transmission without ringing. Similar procedures are used for delivery of Advice of Charge data, Short Message Service data, Message Waiting Indicator data, etc.

For ADSI, there are constraints similar to the off-hook data with alerting around ACK digits and softkey/digit responses. Any responses that the MGC wishes to be made aware of should be requested in the Events descriptor. Digitmaps may be used for this application.

There is a possible race condition where an MGC might apply the dwa signal intending power ringing and data to be applied, but before the signal reaches the MG, the termination undergoes a transition to offhook. The result is that the signal would apply a call waiting tone in the interim, while the MG reports the offhook and the MGC responds with updated Events and Signals Descriptors. It may be desirable to prevent any possibility of this race condition occurring. To achieve this, implementations may embed the andisp/dwa signal on the onhook event with its strict parameter set to "state". This will enforce that the dwa signal is only applied if the termination is still onhook when the command arrives at the MG.

Binary encoding SHALL carry the binary data. Text encoding SHALL carry the data as a hex string encoded as big-endian hex data.

Bibliography

[b-Telcordia GR-30-CORE] Telcordia GR-30-CORE, Issue 2 (1998), *LSSGR: Voice Band Data Transmission*.

[b-ETSI EN 300 659-1] ETSI EN 300 659-1, V1.3.1 (2001), *Access and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 1: On-hook data transmission.*

[b-ETSI EN 300 659-2] ETSI EN 300 659-2, V1.3.1 (2001), *Access and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 2: Off-hook data transmission.*

[b-ETSI EN 300 659-3] ETSI EN 300 659-3, V1.3.1 (2001), *Access and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and* related*) services; Part 3: Data link message and parameter codings*.

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