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

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**Gateway control protocol: Enhanced analog  
lines packages**

ITU-T Recommendation H.248.26

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## **ITU-T Recommendation H.248.26**

### **Gateway control protocol: Enhanced analog lines packages**

#### **Summary**

This Recommendation defines two packages that provide support for extended line supervision and metering analog lines capabilities for H.248.

#### **Source**

ITU-T Recommendation H.248.26 was approved by ITU-T Study Group 16 (2001-2004) under the ITU-T Recommendation A.8 procedure on 14 July 2003.

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# ITU-T Recommendation H.248.26

## Gateway control protocol: Enhanced analog lines packages

### 1 Scope

The Analog Line Supervision Package defined in Annex E/H.248.1 supports basic telephony services, using on-hook and off-hook events, and a ringing signal. Some telephony services delivered over analog line terminations have additional supervisory signalling requirements that are not met by the Analog Line Supervision package. The packages defined in this Recommendation are intended to meet the needs of the following supervisory signalling functions:

Line-side answer supervision: this function provides a positive notification to a calling line that the called line has answered. This notification may be used by customer premises equipment, for example, to begin timing the call for local billing or charging purposes.

Network disconnect: many switching systems provide this signal following the termination of an active call if a party remains off-hook for some period of time following the other party going on-hook. The network disconnect notification may be used by customer premises equipment to release resources associated with the call.

Metering pulses: metering services provide subscribers with real-time information about charging of calls in progress. These services make use of customer premises equipment that shows a count of "units" consumed by chargeable calls, where each unit has a fixed monetary value. To increment the counter in the metering equipment, the switching system sends certain kinds of pulses over the line, either during the call or immediately following termination of the call. These pulses typically consist of short bursts of 12 kHz or 16 kHz tones, although other types of metering pulse such as brief periods of polarity reversal or 50 Hz tones are also seen.

To meet these needs, two supplemental packages are introduced:

The Extended Analog Line Supervision package is defined as an extension of the Basic Analog Line Supervision package, and includes two new signals: Line-Side Answer Supervision and Network Disconnect. This package provides support for all the Loop-Start supervisory signalling requirements identified by Telcordia's GR-506-CORE.

The Automatic Metering Package provides a means to apply metering pulses on an analog line termination. The package includes:

- signals requesting the automatic application of pulses at fixed intervals as well as the application of pulse bursts;
- statistics that may be used to track the actual number of pulses applied; and
- an event that may be used to trigger periodic reporting of the count of pulses applied.

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.

## **2.1 Normative Reference**

- ITU-T Recommendation H.248.1 (2002), *Gateway Control Protocol: Version 2*.

## **2.2 Informative Reference**

- Telcordia GR-506-CORE (1996), *Local Switching System Generic Requirements – Signalling for Analog Interfaces*.

## **3 Definitions**

None.

## **4 Abbreviations**

This Recommendation uses the following abbreviations:

MG Media Gateway

MGC Media Gateway Controller

## **5 Extended analog line supervision package**

PackageID: xal (0x0043)

Version: 1

Extends: al (0x0009) version 1

This package defines events and signals necessary to support analog telephony services where line-side answer supervision and/or network disconnect capabilities are required.

### **5.1 Properties**

None.

### **5.2 Events**

None.

### **5.3 Signals**

#### **5.3.1 Line-side answer supervision**

SignalID: las (0x0003)

Description:

Indicates that the called party has answered. The signal that is sent on the line is provisioned in the MG. Typically this signal involves a reversal of polarity of the current feed on the line.

Signal Type: OnOff

Additional parameters: None

### 5.3.2 Network Disconnect

SignalID: nd (0x0004)

Description:

Indicates that the far-end party has disconnected. The signal that is sent on the line is provisioned in the MG. Typically this signal involves a brief removal of the dc voltage on the line.

Signal Type: Brief

Duration: Provisioned

Additional parameters: None

### 5.4 Statistics

None.

### 5.5 Procedures

The Network Disconnect signal is typically used when a called or calling party remains off-hook after the other party has hung up. In these circumstances, some telephony services provide dial tone to the off-hook phone after a period of several seconds has elapsed. The Network Disconnect signal would normally be applied just prior to the re-application of dial tone on the line.

## 6 Automatic metering package

PackageID: amet (0x0044)

Version: 1

Extends: none

This package supports the automated application of repetitive metering pulses to an analog line termination. It provides a facility whereby the actual number of metering pulses applied to the termination can be periodically reported to the MGC for verification purposes.

### 6.1 Properties

None.

### 6.2 Events

#### 6.2.1 Periodic report

EventID: pr (0x0001)

Description:

This event is used in conjunction with the "enable metering" and "metering pulse burst" signals defined in this package. It is detected when the value of the "pulse count since last report" statistic reaches the value specified in the "report period" parameter.

This event does not have any parameters for the observed event descriptor since it will be reported only when "pulse count since last report" is equal to "report period", which is a value already known to the MGC.

This event is not detected when the application of signals is stopped due to a MG failure, a customer line state event (e.g., on-hook), or by an explicit command from the MGC. The MGC needs to read the value of the statistic "pulse count since last report" in those cases, using an AuditValue command.

EventsDescriptor parameters:

*Report Period*

ParameterID: rp (0x0001)

Type: Integer

Possible values: Any positive integer

Description:

This parameter specifies the period of metering reports in terms of pulse counts. There is no default value for this parameter, and it must be specified with a non-zero value.

ObservedEventsDescriptor parameters: None

### **6.3 Signals**

#### **6.3.1 Enable Metering**

SignalID: em (0x0001)

Description:

This signal starts the automatic generation of metering pulses on the termination. The type and duration of the pulses to be applied are provisioned in the MG.

Signal Type: OnOff

Duration: Variable

Additional parameters:

*Pulse Count*

ParameterID: pc (0x0001)

Type: Integer

Possible values: Any non-negative integer

Description:

This parameter specifies the number of metering pulses to be applied to the termination. If the value of this parameter is zero, or if no value is supplied for this parameter, then the repetitive application of metering pulses shall continue until stopped by other mechanisms (for example, the detection of an event, or the replacement of the Signals Descriptor).

*Pulse Repetition Interval*

ParameterID: pri (0x0002)

Type: Integer

Possible values: Any positive integer

Description:

This parameter specifies the interval over which the pulses specified in the pulse count should be issued, or, if the pulse count is 0 or not present, the interval between pulses, in milliseconds. For a specified non-zero pulse count, it represents the time over which the pulses should occur. It is up to the MG to perform the appropriate calculations to determine the pulse interval. For a zero or unspecified pulse count, it represents the time that should elapse between the leading edge of a pulse and the leading edge of the succeeding pulse. There is no default value for this parameter, and the MGC should always provide a positive non-zero value.

### 6.3.2 Metering pulse burst

SignalID: mpb (0x0002)

Description:

This signal causes a burst of metering pulses to be applied to the termination.

Signal Type: Brief

Duration: Variable

Additional parameters:

#### *Burst Pulse Count*

ParameterID: bpc (0x0001)

Type: Integer

Possible values: Any positive integer

Description:

This parameter specifies the number of metering pulses to be applied as a burst on the line. The type, duration and pulse repetition interval for the metering pulses comprising the burst are provisioned in the MG. The default value of this parameter, which shall apply if the parameter is omitted from the SignalsDescriptor, is 1.

## 6.4 Statistics

### 6.4.1 Current pulse count

StatisticID: cpc (0x0001)

Description:

This statistic represents the total number of metering pulses that have been applied on an analog line termination since the last time its value was reset to zero by means of the "enable metering" signal defined in this package.

Units:

Pulses (integer number). For binary encoding, this value is encoded as per type "Integer" in Clause A.2/H.248.1.

### 6.4.2 Pulse count since last report

StatisticID: pcslr (0x0002)

Description:

This statistic represents the number of metering pulses that have been applied on an analog line termination since the last meter report event, or since the last time its value was reset to zero by means of the "enable metering" signal defined in this package. The recognition of the periodic report event and generation of a corresponding notification resets the value of this statistic to zero.

Units:

Pulses (integer number). For binary encoding, this value is encoded as per type "Integer" in Clause A.2/ H.248.1.

## 6.5 Procedures

On receiving a SignalsDescriptor containing the signal em, an MG shall set the values of the statistics cpc and pcslr to zero. The MG shall apply the first metering pulse to the termination immediately, and then apply subsequent metering pulses at intervals as determined by the specified value of the pulse repetition interval parameter pri. If the pulse count is greater than 0, then the MG shall determine the appropriate interval between pulses by dividing the pulse repetition interval value by the pulse count. In the event that the interval determined is not integral, then it is the responsibility of the MG to adjust the individual intervals to avoid long-term rounding errors. If the pulse count is zero, or not present, then the MG shall issue a new pulse at intervals equal to the pulse repetition interval.

The MG shall increment by one the values of the pulse count statistics cpc and pcslr for each metering pulse that is applied to the termination, regardless of whether the pulse was generated as a result of the em signal or as a result of the mpb signal.

If the value of the parameter pc associated with the signal em is non-zero, then the repetitive application of metering pulses should be continued until the number of pulses sent, excluding any pulses due to concurrent mpb signals, is equal to the value of the parameter pc. In this case, the MGC should include a SignalType parameter in the Signals Descriptor, specifying the signal type Brief, to override the OnOff signal type for the signal em.

If the value of the parameter pc is zero, or if this parameter is not supplied by the MGC, then the repetitive application of metering pulses should continue until either an event (other than pr) is detected, or until the SignalsDescriptor is replaced with a new SignalsDescriptor that does not include the signal em. Any pulses applied due to a concurrent mpb signal shall be applied for the em signal in addition to the required repetitive pulses.

If following the application of any metering pulse (regardless of whether it was generated as a result of the signal em or as a result of the signal mbp), the EventsDescriptor contains the event pr, and if the value of pcslr is equal to the value of the EventsDescriptor parameter rp, then the pr event shall be notified, and the value of the statistic pcslr shall be reset to zero. The detection of the event pr shall not cause the termination of the signal em or the signal mbp, even if the KeepActive flag is not set for the pr event.

The repetition rate for the application of metering pulses to the termination may be changed during a call by writing a new SignalsDescriptor containing the signal em, specifying a new value of the pulse repetition interval parameter pri. In this case, the SignalsDescriptor should contain a KeepActive flag for the signal em, and the MG should transition to the new pulse repetition interval after the next metering pulse has been applied.

A metering pulse burst may be applied while a metered call is in progress, for example, to take account of a chargeable mid-call action by the subscriber. In this case, the MGC should send a new SignalsDescriptor that contains the em signal with a KeepActive flag, together with the mpb signal. The MG should continue to apply metering pulses at the repetition interval specified by the pri parameter of the em signal, while in addition applying the metering pulse burst. The MG should ensure that the pulses comprising the pulse burst are applied in such a manner as not to interfere with the pulses comprising the repetitive background metering, respecting any minimum inter-pulse interval that may be needed to ensure proper recognition of pulses by customer premises equipment.

When an MG is generating metering pulses as a result of an active em signal, and receives a new SignalsDescriptor containing an em signal with a KeepActive flag, it shall not reset the values of the statistics cpc and pcslr to zero.

The detection of an event such as on-hook while a metering pulse is being applied to a termination should not cause truncation of the pulse. Once a pulse has started to be applied, the application of the pulse should continue for the full duration provisioned in the MG.



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