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Amendment 1
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SERIES J: CABLE NETWORKS AND TRANSMISSION OF TELEVISION, SOUND PROGRAMME AND OTHER MULTIMEDIA SIGNALS

IPCablecom

IPCablecom Trunking Gateway Control Protocol (TGCP)

Amendment 1: TGCP Profile 2

ITU-T Recommendation J.171 (2002) – Amendment 1

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ITU-T Recommendation J.171

IPcablecom Trunking Gateway Control Protocol (TGCP)

Amendment 1

TGCP Profile 2

Summary

This amendment specifies Annex B of ITU-T Rec. J.171. As a consequence of specifying Annex B, the references and abbreviations clauses of the Recommendation have been updated.

Source

Amendment 1 to ITU-T Recommendation J.171 (2002) was approved by ITU-T Study Group 9 (2001-2004) under the ITU-T Recommendation A.8 procedure on 14 May 2003.

FOREWORD

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NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU [had/had not] received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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1) Amendments to clause 2 "References"

Amend clause 2 to read as follows:

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 references

The following references apply to both Annex A and Annex B:

– ITU-T Recommendation J.161 (2001), *Audio codec requirements for the provision of bidirectional audio service over cable television networks using cable modems*.

– ITU-T Recommendation J.170 (2002), *IPCablecom security specification*.

– IETF RFC 2327 (1998), *SDP: Session Description Protocol*.

The following references apply to Annex A only:

– ITU-T Recommendation J.162 (2001), *Network call signalling protocol for the delivery of time-critical services over cable television networks using data modems*.

The following references apply to Annex B only:

– ITU-T Recommendation H.248.1 (2002), *Gateway control protocol: Version 2*.

– ITU-T Recommendation H.248.2 (2000), *Gateway control protocol: Facsimile, text conversation and call discrimination packages*.

– IETF RFC 1035 (1987), *Domain names – Implementation and specification*.

– IETF RFC 2045 (1996), *Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies*.

– IETF RFC 2234 (1997), *Augmented BNF for Syntax Specifications: ABNF*.

2.2 Informative references

The following references apply only to Annex A:

– ITU-T Recommendation E.180/Q.35 (1998), *Technical characteristics of tones for the telephone system*.

– ITU-T Recommendation H.225.0 (2003), *Call signalling protocols and media stream packetization for packet-based multimedia communication systems*.

– ITU-T Recommendation H.245 (2003), *Control protocol for multimedia communication*.

– ITU-T Recommendation H.323 (2003), *Packet-based multimedia communications systems.*

– ITU-T Recommendation J.163 (2001), *Dynamic quality of service for the provision of real time services over cable television networks using cable modems*.

– ITU-T Recommendation Q.761 (1999), *Signalling System No. 7 – ISDN User Part functional description*.

– ITU-T Recommendation Q.762 (1999), *Signalling System No. 7 – ISDN User Part general function of messages and signals*.

– IETF RFC 1825 (1995), *Security Architecture for the Internet Protocol*.

– IETF RFC 1826 (1995), *IP Authentication Header*.

– IETF RFC 1889 (1996) *RTP: A Transport Protocol for Real-Time Applications*.

– IETF RFC 1890 (1996), *RTP: Profile for Audio and Video Conferences with Minimal Control*.

– IETF RFC 2326 (1998) *Real Time Streaming Protocol (RTSP)*.

– IETF RFC 2543 (1999), *SIP*: *Session Initiation Protocol*.

– IETF RFC 2705 (1999), *Media Gateway Control Protocol (MGCP) Version 1.0*.

– IETF Internet Draft (draft-huitema-sgcp-v1-02.txt), *Simple Gateway Control Protocol (SGCP)*.

– IETF Internet Draft (draft-taylor-ipdc-00.txt), *IPDC Base Protocol*.

– TCP/IP Illustrated, Volume 1 (2001), *The Protocols,* Addison-Wesley, 1994.

The following references apply only to Annex B:

– ITU-T Recommendation J.160 (2002), *Architectural framework for the delivery of time-critical services over cable television networks using cable modems*.

– IETF RFC 1889 (1996), *RTP: A Transport Protocol for Real-Time Applications*.

– IETF RFC 1890 (1996), *RTP Profile for Audio and Video Conferences with Minimal Control*.

2) Amendments to clause "3.2 Abbreviations"

Amend clause 3.2 to read as follows:

3.2 Abbreviations

This Recommendation uses the following abbreviations:

ASCII American Standard Code for Information Interchange

AVP Audio Visual Profile

DNS Domain Name System

IANA Internet Assigned Numbers Authority

IP Internet Protocol

IPSec Internet Protocol Security

ISUP	ISDN User Part
MG	Media Gateway
MGC	Media Gateway Controller
MGCP	Media Gateway Control Protocol
MIB	Management Information Base
MTA	Multimedia Terminal Adapter
MWD	Maximum Waiting Delay
NCS	Network-Based Call Signalling
NTP	Network Time Protocol
PSTN	Public Switched Telephone Network
QoS	Quality of Service
RTCP	RTP Control Protocol
RTO	Retransmission Timeout
RTP	Real-Time Transport Protocol
SDP	Session Description Protocol
SG	Signalling Gateway
SPI	Security Parameters Index
TGCP	Trunking Gateway Control Protocol
UDP	User Datagram Protocol
URI	Uniform Resource Identifier

3) New Annex B

Annex B

TGCP Profile 2

B.1 Scope

This annex specifies a profile of the H.248 protocol (ITU-T Rec. H.248.1, version 2 (05/2002)) for controlling media gateways between cable networks and the PSTN. This profile is known as Trunking Gateway Control Protocol (TGCP) version 1.

B.2 Architectural assumptions

This annex applies to the interface between a Media Gateway Controller and a Media Gateway sitting at the boundary between an IPCablecom network and the PSTN.

The overall architecture for interconnecting IPCablecom networks with the PSTN is described in ITU-T Rec. J.160.

B.3 Profile definition

This profile shall be entitled "TGCP_H248". The version number shall be "1". This name shall be returned by conforming gateways when sending a ServiceChange command as part of the initial registration of the MG. This profile is applicable to version 2 of ITU-T Rec. H.248.1 (05/2002).

B.4 Support of packages

B.4.1 Mandatory packages

The following packages shall be supported:

Table B.1/J.171 – Mandatory packages

Package Name	Id	Version	Defined in
Generic	g	1	ITU-T Rec. H.248.1 version 2 (05/2002), Annex E
Base Root	root	1	ITU-T Rec. H.248.1 version 2 (05/2002), Annex E
Continuity	ct	1	ITU-T Rec. H.248.1 version 2 (05/2002), Annex E
Network	nt	1	ITU-T Rec. H.248.1 version 2 (05/2002), Annex E
TDM Circuit	tdmc	1	ITU-T Rec. H.248.1 version 2 (05/2002), Annex E
ISUP Trunk Tones Generator	isuptn	1	See Annex B.A

B.4.2 Conditional packages

The following packages shall be supported under the specified conditions:

Table B.2/J.171 – Conditional packages

Package Name	Id	Version	Defined in	Condition
Fax/TextPhone/ Modem Tones Detection	ftmd	1	ITU-T Rec. H.248.2	Some of the codecs supported by the cable networks are not transparent to fax, modem or textphone signals.

B.5 Compatibility rules

This profile is based on ITU-T Rec. H.248.1 version 2 (05/2002). The compatibility rules for packages, signals, events, properties and statistics and the H.248 protocol are defined in ITU-T Rec. H.248.1 version 2 (05/2002).

B.6 Naming conventions

B.6.1 MG and MGC names

MG and MGC names shall be in the form of a domain name [IETF RFC 1035]. An example MGC name is: `mgc1.whatever.net`.

B.6.2 Termination identifiers

B.6.2.1 Physical Termination Identifiers

Termination identifiers representing physical trunks or trunks groups shall adhere to the following conventions:

- Termination names shall consist of a series of terms each separated by a slash ("/") that describe the physical hierarchy within the gateway:

`ds/<unit-type1>_<unit #>/<unit-type2>_<unit #>/…/<channel #>`

- The first term (`ds`) identifies the termination naming scheme used and the basic termination type.
- The last term is a decimal number that indicates the *channel* number at the lowest level of the hierarchy.
- Intermediate terms between the first term (`ds`) and last term (channel number) represent intermediate levels of the hierarchy and consist of <unit-type> and <unit #> separated by an underscore ("_") where:
  - the <unit-type> identifies the particular hierarchy level. Values of <unit-type> presently defined are: "s", "su", "oc3", "ds3", "e3", "ds2", "e2", "ds1", "e1" where "s" indicates a slot number and "su" indicates a sub-unit within a slot. Other values representing physical hierarchy levels that have not been included in this list but which follow the same basic naming rules will also be allowed;
  - the <unit #> is a decimal number which is used to reference a particular instance of a <unit-type> at that level of the hierarchy.
- The number of levels and naming of those levels is based on the physical hierarchy within the media gateway, as illustrated by the following examples:
  - a Media Gateway that has some number of DS1 interfaces:

    `ds/ds1_#/#`
  - a Media Gateway that has some number of OC3 interfaces, that contain channelized DS3 and DS1 hierarchies:

    `ds/oc3_#/ds3_#/ds1_#/#`
  - a Media Gateway that contains some number of slots with each slot having some number of DS3 interfaces:

    `ds/s_#/ds3_#/ds1_#/#`
- Some terminations may not contain all possible levels of a hierarchy; however, all levels supported by a given termination are contained in the termination naming scheme. For example, a DS3 without DS1 framing could be represented by the following naming scheme:

  `ds/s_#/ds3_#/#`
  - However, a DS3 *with* DS1 framing could not be represented by that naming scheme.

B.7 Topology descriptor

A Gateway conforming to this annex need not implement the topology descriptor. MGCs that expect to control gateways conforming to this annex shall not assume that topology descriptor is supported.

B.8 Multiplex descriptor

A Gateway conforming to this annex need not implement the mux descriptor. MGCs that expect to control gateways conforming to this annex shall not assume that mux descriptor is supported.

B.9 Transaction timers and re-transmission thresholds

All transaction timers as specified in ITU-T Rec. H.248.1 version 2 (05/2002) shall be supported here.

For this profile of H.248 the following default values are specified in relation to H.248 transaction timers and retransmission thresholds:

– LONG-TIMER: This shall have a default value of 30 seconds.

– T-MAX: This shall have a default value of 20 seconds.

– MAX-1: This shall have a default value of 5 re-transmissions.

– MAX-2: This shall have a default value of 7 re-transmissions.

NOTE – In all cases where this Recommendation specifies defaults, it should be noted that all of the properties of the timer or re-transmission thresholds described within H.248 itself remain in force. In particular this means that if H.248 states that a timer or re-transmission threshold may be later configured through provisioning, then this behaviour is also allowed.

B.10 Transport

Media Gateways shall implement UDP/ALF.

B.11 Service change procedures

The Media Gateway shall allow one primary and one or more secondary MGCs to be provisioned for registration.

B.12 Security

Media Gateways and Media Gateways Controllers shall implement security as described in the IPCablecom security specification (ITU-T Rec J.170).

B.13 Encoding

Conforming Media Gateways and Media Gateway Controllers shall support text encoding.

B.14 Use of SDP

The Local and Remote descriptors use SDP with certain modifications in the MGC to MG direction as specified in ITU-T Rec. H.248.1 version 2 (05/2002). Furthermore, trunking gateways conforming to this profile may make certain simplifying assumptions about the session descriptions as specified in the following.

SDP usage depends on the type of session, as specified in the "media" parameter. This annex only supports media of type "audio".

The SDP profile provided describes the use of the session description protocol in TGCP. The general description and explanation of the individual parameters can be found in IETF RFC 2327; however, below we detail what values are sent in the MGC to MG direction and what values are sent in the MG to MGC direction. Where the MG may choose a value of a particular parameter, wildcards are used. The use of wildcards shall be in accordance with H.248.1 procedures.

Due to the particular function of the trunking gateway within the IPCablecom system, the Remote descriptor is only sent in the MGC to MG direction once SDP has been received from the remote end of the call. If no SDP has yet been received from the remote end of the call, the MGC shall not send a Remote descriptor to the MG. MGs will however receive Remote descriptors once this specific stage of call set-up has been reached. The text indicates how the MG behaves with respect to each parameter contained within a Remote descriptor that is sent to the MG after remote-end SDP has been received by the MGC. In all cases the assumption in the text is that the Remote descriptor that is returned is fully specified in accordance with SDP (IETF RFC 2327). However, as is recognized in 7.1.8/H.248.1 version 2 (05/2002), the MG may modify the Remote descriptor contents (or even return an empty Remote descriptor) depending upon how the ReserveGroup and

ReserveValue LocalControl parameters are set. This Recommendation does not preclude such behaviour.

Any parameter not specified below should not be provided by any TGCP endpoint, and if such a parameter is received, it should be ignored.

B.14.1 Protocol version (v=)

```
v= <version>
v=     0
```

– *MGC to MG*
  - *Local Descriptor*: Shall be provided in accordance with SDP (IETF RFC 2327) (i.e., v=0).
  - *Remote Descriptor*: Shall be unchanged from what was received from the remote end.

– *MG to MGC*
  - *Local Descriptor*: No action taken by MG to alter this descriptor.
  - *Remote Descriptor*: No action taken by MG to alter this descriptor.

B.14.2 Origin (o=)

The origin field consists (o=) of 6 sub-fields in IETF RFC 2327 [3]:

```
o= <username> <session-ID>  <version> <network-type> <address-type>  <address>
o=     -      2987933615   29879 33615      IN            IP4     A3C47F2146789F0
```

Username

– *MGC to MG*
  - *Local Descriptor*: This parameter is set to the hyphen symbol "-".
  - *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

– *MG to MGC*
  - *Local Descriptor*: Hyphen *shall* be used as username when privacy is requested. Hyphen *should* be used otherwise.
  - *Remote Descriptor*: No action taken by MG to alter this descriptor.

Session-ID

– *MGC to MG*
  - *Local Descriptor*: This parameter is set to the "$" wildcard.
  - *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

– *MG to MGC*
  - *Local Descriptor*: MGs shall specify this parameter in accordance with SDP (IETF RFC 2327) for interoperability with non-IPCablecom clients.
  - *Remote Descriptor*: No action taken by MG to alter this descriptor.

Version

– *MGC to MG*
  - *Local Descriptor*: This is set to the hyphen symbol "-".
  - *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

– *MG to MGC*

- *Local Descriptor*: MGs shall specify this in accordance with SDP (IETF RFC 2327).
- *Remote Descriptor*: No action taken by MG to alter this descriptor.

Network Type

– *MGC to MG*

- *Local Descriptor*: The MGC shall set this parameter to type "IN".
- *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

– *MG to MGC*

- *Local Descriptor*: No action taken by MG to alter this descriptor.
- *Remote Descriptor*: No action taken by MG to alter this descriptor.

Address Type

– *MGC to MG*

- *Local Descriptor*: The MGC will set this parameter to address type "IP4".
- *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

– *MG to MGC*

- *Local Descriptor*: No action taken by MG to alter this descriptor.
- *Remote Descriptor*: No action taken by MG to alter this descriptor.

Address

– *MGC to MG*

- *Local Descriptor*: The MGC may send a "$" to allow the MG to choose a value for the address.
- *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

– *MG to MGC*

- *Local Descriptor*: MGs shall specify this parameter in accordance with SDP (IETF RFC 2327) for interoperability with non-IPCablecom clients.
- *Remote Descriptor*: No action taken by MG to alter this descriptor.

B.14.3 Session name (s=)

```
s= <session-name>
s=          -
```

– *MGC to MG*

- *Local Descriptor*: The MG shall insert a hyphen "-". The hyphen shall be used as the session name.
- *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

– *MG to MGC*

- *Local Descriptor*: The hyphen "-" shall be received.
- *Remote Descriptor*: No action taken by MG to alter this descriptor.

B.14.4 Session and media information (i=)

```
i= <session-description>
```

This field is not used in TGCP. If the field is present in any form, it will be ignored.

B.14.5 URI (u=)

```
u= <URI>
```

This field is not used in TGCP. If the field is present in any form, it shall be ignored.

B.14.6 E-mail address and phone number (e=, p=)

```
e= <e-mail-address>
p= <phone-number>
```

These fields are not used in TGCP. If these fields are present in any form, they shall be ignored.

B.14.7 Connection data (c=)

The connection data consists of 3 sub-fields:

```
c= <network-type> <address-type> <connection-address>
c=      IN              IP4         10.10.111.11
```

Network Type

– *MGC to MG*
  - *Local Descriptor*: Type "IN" shall be used.
  - *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

– *MG to MGC*
  - *Local Descriptor*: Type "IN" shall be present in this field in the Local descriptor received from the MGC. The parameter is echoed back to the MGC with no action being taken by the MG to alter this parameter.
  - *Remote Descriptor*: No action taken by MG to alter this descriptor.

Address Type

– *MGC to MG*
  - *Local Descriptor*: Type "IP4" shall be used.
  - *Remote Descriptor*: MGC takes no additional action.

– *MG to MGC*
  - *Local Descriptor*: Type "IP4" shall be present in this field in the Local descriptor received from the MGC. The parameter is echoed back to the MGC with no action being taken by the MG to alter this parameter.
  - *Remote Descriptor*: No action taken by MG to alter this descriptor.

Connection Address

– *MGC to MG*
  - *Local Descriptor*: The MGC may send a "$" to allow the MG to choose a value for the address on which it wishes to receive media streams for this call. Otherwise the address previously chosen (if any) may continue to be used for this call.
  - *Remote Descriptor*: MGC takes no additional action.

– *MG to MGC*
  - *Local Descriptor*: MGs shall fill this field with a unicast IP address at which the application will receive the media stream. Thus a TTL value shall not be present and a

"number of addresses" value shall not be present. The field shall not be filled with a fully qualified domain name instead of an IP address.

- *Remote Descriptor*: Supplied by the remote end. A unicast IP address or a fully qualified domain name shall be present. No action taken by MG to alter this descriptor.

B.14.8 Bandwidth (b=)

```
b= <modifier>: <bandwidth-value>
b=     AS    :         64
```

– *MG to MGC*

- Bandwidth information is optional in SDP but it should always be included. When an rtpmap or a non well-known codec (i.e., not defined in ITU-T Rec. J.161) is used, the bandwidth information shall be used.

– *MGC to MG*

- Bandwidth information should be included. If a bandwidth modifier is not included, the receiver shall assume reasonable default bandwidth values for well-known codecs.

If the guidelines above result in the bandwidth parameter being included, then it shall be included as follows:

Modifier

– *MGC to MG*

- *Local Descriptor*: Echoed back to MG if MG to MGC communication has already produced a value for this field. If, however, this is the first Local descriptor to be sent to the MG, then the MGC shall set the modifier to type "AS".
- *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

– *MG to MGC*

- *Local Descriptor*: Type "AS" shall be present.
- *Remote Descriptor*: No action taken by MG to alter this descriptor.

Bandwidth Value

– *MGC to MG*

- *Local Descriptor*: Echoed back to MG if MG to MGC communication has already produced a value for this field. If this is the first Local descriptor to be sent to the MG, then the field shall be filled with the maximum bandwidth requirement of the media stream in kbit/s.
- *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

– *MG to MGC*

- *Local Descriptor*: The maximum bandwidth requirement of the stream in kbit/s shall be present.
- *Remote Descriptor*: No action taken by MG to alter this descriptor.

B.14.9 Time, repeat times and time zones (t=, r=, z=)

```
t= <start-time> <stop-time>
t=   36124033       0
r= <repeat-interval> <active-duration> <list-of-offsets-from-start-time>
z= <adjustment-time> <offset>
```

– *MGC to MG*

  • *Local & Remote Descriptors*: If any of these fields are present in the SDP received from the MG, they should be ignored. MGCs shall not send "$". If a line is included in the descriptor, then the line shall be included in its entirety. If particular fields within a line cannot be included, then the line shall not be included.

– *MG to MGC*

  • *Local & Remote Descriptors*: Time shall be present; start time may be zero, but should be the current time, and stop time should be zero. Repeat Times, and Time Zones should not be used, if they are used it should be in accordance with SDP (IETF RFC 2327).

B.14.10 Encryption keys

```
k= <method>
k= <method>: <encryption-keys>
```

Security services for IPCablecom are defined by the IPCablecom Security Specification (ITU-T Rec. J.170). The security services specified for RTP (IETF RFC 1889) and RTCP do not comply with those of the Audio Video Profile for Conferences with Minimal control (IETF RFC 1890), and SDP (IETF RFC 2327). In the interest of interoperability with non-IPCablecom devices, the "k" parameter will therefore not be used to convey security parameters.

– *MGC to MG*

  • *Local & Remote Descriptors*: This field should be ignored.

– *MG to MGC*

  • *Local & Remote Descriptors*: This field shall not be used and should be ignored by the MG if received from the MGC.

B.14.11 Attributes (a=)

```
a=     <attribute>: <value>
a=     rtpmap: <payload type> <encoding name>/<clock rate>
                                                [/<encoding parameters>]
a=     rtpmap:     0           PCMU      / 8000
a=     X-pc-codecs: <alternative 1> <alternative 2> …
a=     X-pc-secret: <method>:<encryption key>
a =    X-pc-csuites-rtp: <alternative 1> <alternative 2> …
a =    X-pc-csuites-rtcp: <alternative 1> <alternative 2> …
a =    X-pc-spi-rtcp: <value>
a =    X-pc-bridge: <number-ports>
a=     <attribute>
a=     recvonly
a=     sendrecv
a=     sendonly
a=     ptime
```

– *MG to MGC*

  • *Local Descriptor*: One or more of the "a" attribute lines specified below may be included. An attribute line not specified below should not be used.

  • *Remote Descriptor*: No action taken by MG to alter this descriptor.

– *MGC to MG*

- *Local Descriptor*: One or more of the "a" attribute lines specified below may be included and shall be acted upon accordingly. "a" attribute lines not specified below may be present but shall be ignored.
- *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

rtpmap

– *MGC to MG*

- *Local Descriptor*: This field shall be used in accordance with SDP (IETF RFC 2327). It may be used for well-known as well as well as non well-known codecs. The encoding names used are provided in a separate IPCablecom specification (see ITU-T Recs. J.161 and J.170).
- *Remote Descriptor*: Parameter received from the far end. MGC takes no additional action.

– *MG to MGC*

- *Local Descriptor*: When used, the field shall be used in accordance with SDP (IETF RFC 2327). It may be used for well-known as well as well as non well-known codecs. The encoding names used are provided in a separate IPCablecom specification (see ITU-T Recs J.161 and J.170).
- *Remote Descriptor*: No action taken by MG to alter this descriptor.

X-pc-codecs

When dealing with the X-pc-codecs attribute the ReserveGroup and ReserveValue H.248.1 properties shall follow behaviour analogous to that used within ITU-T Rec. H.248.1 for these properties with respect to codecs in an "m=" line.

– *MGC to MG*

- *Local Descriptor*: If this is the first Local descriptor to be sent to the MG, the MGC may send "$" to allow the MG to choose one or more values. If, however, MGC/MG communication has already resulted in a list of codecs being chosen for this parameter, then the MGC shall simply echo this list back to the MG – i.e., no further action is taken by the MGC.
- *Remote Descriptor*: Supplied by the remote end. Conveys a list of codecs that the remote termination is capable of using for this connection. The codecs shall not be used until signalled through a media (m=) line.

– *MG to MGC*

- *Local Descriptor*: MGs shall send this field such that it contains a list of alternative codecs that the termination is capable of using for this connection. The list is ordered by decreasing degree of preference, i.e., the most preferred alternative codec is the first one in the list. A codec is encoded similarly to "encoding name" in rtpmap.
- *Remote Descriptor*: No action taken by MG to alter this descriptor.

X-pc-secret

– *MGC to MG*

- *Local Descriptor*: If previous MGC/MG communication has not resulted in the selection of the end to end secret then MGCs may send "$" for both the method and encryption key to allow the MG to choose values for these parameters.
- *Remote Descriptor*: Supplied by the remote end and passed on to the MG unchanged.

– *MG to MGC*

- *Local Descriptor*: MGs shall specify an end-to-end secret to be used for RTP and RTCP security. The secret is encoded similarly to the encryption key (k=) parameter of SDP (IETF RFC 2327) with the following constraints:

  The encryption key shall not contain a ciphersuite, only a passphrase.

  The <method> specifying the encoding of the pass-phrase shall be either "clear" or "base64" as defined in MIME part 1 (IETF RFC 2045), except for the maximum line length which is not specified here. The method "clear" shall not be used if the secret contains any characters that are prohibited in SDP.

- *Remote Descriptor*: No action taken by MG to alter this descriptor.

X-pc-csuites-rtp

X-pc-csuites-rtcp

– *MGC to MG*

- *Local Descriptor*: The MGC may send "$" to allow the MG to choose one or more values. Alternatively, it may convey a list of ciphersuites that the remote endpoint is capable of using for this connection. Any other ciphersuite than the first in the list cannot be used until signalled through a new ciphersuite line with the desired ciphersuite listed first.
- *Remote Descriptor*: Supplied by the remote end and passed on to the MG unchanged.

– *MG to MGC*

- *Local Descriptor*: MGs shall encode this field such that it contains a list of ciphersuites that the termination is capable of using for this connection (respectively RTP and RTCP); the list in Local and Remote shall be the same. The first ciphersuite listed is what the termination is currently expecting to use. Any remaining ciphersuites in the list represent alternatives ordered by decreasing degree of preference, i.e., the most preferred alternative ciphersuite is the second one in the list. A ciphersuite is encoded as specified below:

```
ciphersuite =      [AuthenticationAlgorithm] "/" [EncryptionAlgorithm]
AuthenticationAlgorithm = 1*(ALPHA/DIGIT/"-"/"_")
EncryptionAlgorithm      =      1*(ALPHA/DIGIT/"-"/"_")
```

  where ALPHA, and DIGIT are defined in IETF RFC 2234 [11]. Whitespaces are not allowed within a ciphersuite. The following example illustrates the use of ciphersuite:

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  The actual list of ciphersuites is provided in the IPCablecom Security specification (ITU-T Rec. J.170).

- *Remote Descriptor*: No action taken by MG to alter this descriptor.

X-pc-spi-rtcp

– *MGC to MG*

- *Local Descriptor*: The MGC may send "$" to allow the MG to choose a value. This field conveys the IPSec SPI to be used when sending RTCP packets over IPSec. The field shall be present when RTCP security is used.
- *Remote Descriptor*: Supplied by the remote end and passed on to the MG unchanged.

– *MG to MGC*

- *Local Descriptor*: The MG shall encode this field so that it contains the IPSec Security Parameter Index (SPI) to be used when sending RTCP packets to the termination for

the media stream in question. The SPI is a 32-bit identifier encoded as a string of up to 8 hex characters. The field shall be supplied when RTCP security is used.

- *Remote Descriptor*: No action taken by MG to alter this descriptor.

X-pc-bridge

– *MGC to MGC*

- *Local & Remote Descriptors*: TGCP endpoints shall ignore this attribute if received.

– *MG to MGC*

- *Local & Remote Descriptors*: TGCP endpoints shall not use this attribute.

ptime

– *MGC to MG*

The ptime should always be provided and when used it shall be used in accordance with SDP (IETF RFC 2327). When an rtpmap or non well-known codec is used, the ptime shall be provided.

- *Local Descriptor*: ptime will be included with an appropriate value within the Local descriptor in such cases.
- *Remote Descriptor*: Supplied by the remote end and passed on to the MG unchanged.

– *MG to MGC*

- *Local Descriptor*: The field shall be used in accordance with SDP (IETF RFC 2327). When "ptime" is present, the MG shall use the ptime in the calculation of QoS reservations. If "ptime" is not present, the MG shall assume reasonable default values for well-known codecs.
- *Remote Descriptor*: No action taken by MG to alter this descriptor.

B.14.12 Media announcements (m=)

Media Announcements (m=) consists of 3 sub-fields:

```
m= <media> <port> <transport> <format>
m=  audio   3456   RTP/AVP        0
```

Media

– *MGC to MG*

- *Local Descriptor*: This parameter shall be set by the MGC to the "audio" media type.
- *Remote Descriptor*: Parameter received from the remote end and passed on to the MG unchanged.

– *MG to MGC*

- *Local Descriptor*: The "audio" media type will be received from the MGC.
- *Remote Descriptor*: No action taken by MG to alter this descriptor.

Port

– *MGC to MG*

- *Local Descriptor*: The MGC may send a "$" to allow the MG to choose a value for the port on which it wishes to receive media streams for this call. Otherwise, the port number previously chosen (if any) should continue to be used for this call.
- *Remote Descriptor*: Received from the remote end. Passed on unchanged to the MG.

– *MG to MGC*

- *Local Descriptor*: Upon receiving a Local descriptor with a "$" wildcard, the MG shall choose a port at which it wishes to receive media. This port shall be placed in place of

the "$" wildcard in the Local descriptor passed within the next (and subsequent) MG to MGC message(s).

- *Remote Descriptor*: Supplied by the remote end. Contains the port on the remote gateway to which this MG will send media. No action taken by MG to alter this descriptor.

Transport

– *MGC to MG*

- *Local Descriptor*: This parameter will be set to "RTP/AVP".
- *Remote Descriptor*: Parameter received from the remote end and passed on to the MG unchanged.

– *MG to MGC*

- *Local Descriptor*: This parameter will be received by the MG set to "RTP/AVP".
- *Remote Descriptor*: Supplied by the remote end. No action taken by MG to alter this descriptor.

Media Formats

– *MGC to MG*

- *Local Descriptor*: In accordance with ITU-T Rec. H.248.1, this field may be underspecified (through the use of the "$" wildcard) or overspecified. If the MGC wishes to request the MG to choose which media formats it wishes to use for the call, then the MGC shall provide a "$" wildcard. If the MGC wishes to suggest that the MG selects a media format from a list of possible media formats, then it shall provide a list of appropriate media types in accordance with SDP (IETF RFC 2327).
- *Remote Descriptor*: Parameter received from the remote end and passed on to the MG unchanged.

– *MG to MGC*

- *Local Descriptor*: The MG shall select a media type either autonomously (if a "$" wildcard was received) or from the overspecified list of media types supplied by the MGC. Upon completion of this choice, the Local descriptor will contain the selected media type for the call.
- *Remote Descriptor*: Supplied by the remote end. No action taken by MG to alter this descriptor.

B.15 Timestamp

Media Gateways are not required to include timestamps in Notify or ServiceChange commands.

B.16 Digitmap

Media Gateways are not required to support digit maps.

Annex B.A

ISUP Trunk Tones Generator Package for ITU-T Rec. H.248

ISUP Trunk Tones Generator Package

PackageID: isuptn (0x006c)

Version: 1

Extends: tonegen version 1

This package defines the ISUP trunk tones played from a trunk gateway as signals and extends the allowed values of the tl parameter of playtone in tonegen.

Properties

None.

Events

None.

Signals

Ringing Tone

SignalID: rt (0x0010)

Generate ringing tone. The physical characteristic of ringing tone is available in the gateway.

Signal Type: TimeOut

Duration: Provisioned

Additional parameters:

None

Additional values:

rt is defined as a tone id for playtone

The other tones of this package are defined in exactly the same way. A table with all signal names and signal IDs is included. Note that each tone is defined as both a signal and a tone id, thus extending the basic tone generation package.

Signal Name	Signal ID/tone id
Ringing Tone	rt (0x0010)
Congestion Tone	ct (0x0011)

Statistics

None.

Procedures

NOTE – These tones correspond to those defined in ITU-T Rec. E.180/Q.35. See ITU-T Rec. E.180/Q.35 for definition of the meanings of these tones.

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