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Technical Specification

Digital Broadband Cable Access to the PublicTelecommunications Network; IP Multimedia Time Critical Services; Part 13: Trunking Gateway Control Protocol; Sub-part 1: H.248 option

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN).

The present document is part 13, sub-part 1 of a multi-part deliverable. Full details of the entire series can be found in part 1 [9].

Introduction

The present document defines a solution based on ITU-T Recommendation H.248.1 [1]. The solution based on MGCP is defined in TS 101 909-13-2 [10].

Where alternative solutions for the same interface are being considered, interoperability issues between the various IPCablecom system components need to be addressed.

1 Scope

The present document specifies a profile of the ITU-T Recommendation H.248 protocol [1] for controlling media gateways between cable networks and the PSTN. This profile is known as Trunking Gateway Control Protocol (TGCP) version 1.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1] ITU-T Recommendation H.248.1: "Gateway control protocol: Version 2".

[2] ETSI TS 101 909-2: "Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 2: Architectural framework for the delivery of time critical services over cable Television networks using cable modems".

[3] ETSI TS 101 909-3: "Access and Terminals (AT); Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 3: Audio Codec Requirements for the Provision of Bi-Directional Audio Service over Cable Television Networks using Cable Modems".

[4] ETSI TS 101 909-11: "Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 11: Security".

[5] IETF RFC 2327: "SDP: Session Description Protocol".

[6] IETF RFC 1889: "RTP: A Transport Protocol for Real-Time Applications".

[7] IETF RFC 2234: "Augmented BNF for Syntax Specifications: ABNF".

[8] IETF RFC 1890: "RTP Profile for Audio and Video Conferences with Minimal Control".

[9] ETSI TS 101 909-1: "Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 1: General".

[10] ETSI TS 101 909-13-2: "Digital Broadband Cable Access to the Public Telecommunications Network; IP Multimedia Time Critical Services; Part 13: Trunking Gateway Control Protocol; Sub-part 2: MGCP option".

[11] IETF RFC 2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".

[12] ITU-T Recommendation J.170: "IPCablecom security specification".

[13] ITU-T Recommendation J.171: "IPCablecom Trunking Gateway Control Protocol (TGCP)".

[14] ITU-T Recommendation H.248.2: "Gateway control protocol: Facsimile, text conversation and call discrimination packages".

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ALF	Application Level Framing
AVP	Audio Video Profile
DNS	Domain Name System
IP	Internet Protocol
MG	Media Gateway
MGC	Media Gateway Controller
MTA	Message Transfer Agent
PSTN	Public Switched Telephone Network
RTCP	Real-time Transfer Control Protocol
RTP	Real-time Transfer Protocol
SDP	Session Description Protocol
SPI	Security Parameters Index
TGCP	Trunking Gateway Control Protocol
UDP	User Data Protocol
URI	Universal Resource Identifier

4 Architectural assumptions

The present document applies to the interface between a Media Gateway Controller and a Media Gateway sitting at the boundary between a packet cable network and the PSTN.

The overall architecture for interconnecting packet cable networks with the PSTN is described in TS 101 909-2 [2].

5 Profile definition

This profile shall be entitled "TGCP_H248". The version number shall be 1.0. 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 if ITU-T Recommendation H.248.1 [1].

5.1 Support of packages

5.1.1 Mandatory packages

The following packages shall be supported.

Table 1: Mandatory packages

Package name	Id	Version	Defined in
Generic	g	1	ITU-T Recommendation H.248.1 [1], annex E
Base Root	root	1	ITU-T Recommendation H.248.1 [1], annex E
Continuity	ct	1	ITU-T Recommendation H.248.1 [1], annex E
Network	nt	1	ITU-T Recommendation H.248.1 [1], annex E
TDM Circuit	tdmc	1	ITU-T Recommendation H.248.1 [1], annex E
ISUP Trunk Tones Generator	isuptn	1	ITU-T Recommendation J.171 [13], annex B

5.1.2   Optional packages

Void.

5.1.3   Conditional packages

The following optional packages shall be supported under the specified conditions.

Table 2: Conditional packages

Package name	Id	Version	Defined in	Condition
Fax/TextPhone/ Modem Tones Detection	ftmd	1	ITU-T Recommendation H.248.2 [14]	Some of the codecs supported by the cable networks are not transparent to fax, modem or textphone signals.

5.2   Compatibility rules

This profile is based on ITU-T Recommendation H.248.1 [1]. The compatibility rules for packages, signals, events, properties and statistics and the H.248 protocol are defined in ITU-T Recommendation H.248.1 [1].

5.3   Naming conventions

5.3.1   MG and MGC names

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

Reliability is provided by the following precautions:

- MGs and MGCs are identified by their domain name, not their network addresses. Several addresses can be associated with a domain name. If a command cannot be forwarded to one of the network addresses, implementations shall retry the transmission using another address.

- MGs and MGCs may move to another platform. The association between a logical name (domain name) and the actual platform are kept in the Domain Name Service (DNS). MG and MGC shall keep track of the record's time-to-live read from the DNS. They shall query the DNS to refresh the information if the time-to-live has expired.

5.3.2   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 to 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.

5.4   Topology descriptor

A Gateway conforming to the present document need not to implement topology. MGCs that expect control gateway conforming to the present document shall not assume that topology is supported.

5.5   Multiplex descriptor

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

5.6   Transaction timers

All transaction timers as specified in ITU-T Recommendation H.248.1 [1] shall be supported here.

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

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

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

- 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 ITU-T Recommendation H.248.1 [1] specifies defaults, it should be noted that all of
the properties of the timer or re-transmission thresholds described within ITU-T Recommendation
H.248.1 [1] 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

5.7   Transport

Media Gateways shall implement UDP/ALF.

5.8   Service change procedures

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

5.9   Security

Media Gateways and Media Gateways Controllers shall implement as described in the IPCablecom security
specification (ITU-T Recommendation J.170 [12]).

5.10   Encoding

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

5.11   Use of SDP

The Local and Remote descriptors use SDP with certain modifications in the MGC to MG direction as specified in
ITU-T Recommendation H.248.1 [1]. 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. The present document 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 RFC 2327 [5], 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 ITU-T Recommendation
H.248.1 [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 (RFC 2327 [5]). However, as is recognized in
clause 7.1.8 of ITU-T Recommendation H.248.1 [1], 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. ITU-T Recommendation H.248.1 [1] 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.

5.11.1   Protocol version (v=)

v= <version>
v= 0

- MGC to MG:

    - *Local Descriptor:* Shall be provided in accordance with SDP (RFC 2327[5]) (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.

5.11.2   Origin (o=)

The origin field consists (o=) of 6 sub-fields in RFC 2327 [5]:

o= <username> <session-ID> <version>   <network-type> <address-type>   <address>
o=   -   2987933615 2987933615   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 (RFC 2327 [5]) 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 (RFC 2327 [5]).

    - *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 (RFC 2327 [5]) for interoperability with non-IPCablecom clients.

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

5.11.3   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.

5.11.4   Session and media information (i=)

i= <session-description>

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

5.11.5   URI (u=)

u= <URI>

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

5.11.6   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.

5.11.7   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.

5.11.8   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 TS 101 909-3 [3]) 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.

5.11.9   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 and 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 and 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 (RFC 2327 [5]).

5.11.10 Encryption keys

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

Security services for IPCablecom are defined by the IPCablecom Security TS 101 909-11 [4]. The security services specified for RTP RFC 1889 [6] and RTCP do not comply with those of the Audio Video Profile for Conferences with Minimal control (RFC 1890 [8]), and SDP (RFC 2327 [5]). 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 and Remote Descriptors*: This field should be ignored.

- MG to MGC:

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

5.11.11 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*: The field shall be used in accordance with RFC 2327 [5]. 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 TS 101 909-3 [3] and TS 101 909-11 [4]).

  - *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 RFC 2327 [5]. 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 TS 101 909-3 [3] and TS 101 909-11 [4]).

  - *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 Recommendation H.248.1 [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 (RFC 2327 [5]) 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 of RFC 2045 [11], 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

    - *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 RFC 2234 [7]. Whitespaces are not allowed within a ciphersuite. The following example illustrates the use of ciphersuite:

        ▪ 62/51

        The actual list of ciphersuites is provided in the IPCablecom Specification TS 101 909-11 [4].

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

- MG to MGC:

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

<<Not Described in J.171. Delete to Align with SG9>>

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<<Not Described in J.171. Delete to Align with SG9>>

ptime

- MGC to MG:

    The ptime should always be provided and when used it shall be used in accordance with SDP (RFC 2327 [5]). 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 (RFC 2327 [5]). When "ptime" is present, the MTA shall use the ptime in the calculation of QoS reservations. If "ptime" is not present, the MTA shall assume reasonable default values for well-known codecs.

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

5.11.12 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 Recommendation H.248.1 [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 (RFC 2327 [5]).

  - *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.

5.12 Timestamp

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

5.13 Digits maps

Media Gateways are not required to support digit maps.

Annex A (informative):
Bibliography

- IETF RFC 2401: "Security Architecture for the Internet Protocol".

- IETF RFC 2402: "IP Authentication Header".

- IETF RFC 2543: "SIP: Session Initiation Protocol".

History

Document history		
V1.1.1	March 2002	Publication
V1.2.1	May 2004	Publication