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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication
procedures

Gateway control protocol: ITU-T H.248 SDP parameter identification and wildcarding

Recommendation ITU-T H.248.39

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Recommendation ITU-T H.248.39

Gateway control protocol: ITU-T H.248 SDP parameter identification and wildcarding

Summary

Recommendation ITU-T H.248.39 describes the principles used to identify a single session description protocol (SDP) sub-field and how to apply wildcarding to that sub-field. The sub-field may be fully specified, wildcarded (CHOOSE "\$" or ALL "*") or not significant "-". Being able to identify a single sub-field is of use when requesting the media gateway (MG) to choose a parameter, specifying a range or for the purposes of auditing. Further specification of how SDP can be wildcarded will assist in interoperation between a media gateway controller (MGC) and an MG.

This revision incorporates guidelines for the wildcarding of source-specific media attributes. It also includes a package to indicate MG support for advanced wildcarding procedures that allow a MGC to request multiple SDP parameter values and/or multiple SDP lines to be returned in response to a CHOOSE request. Additionally, it allows the linking of multiple CHOOSE wildcards so that they return the same value. Furthermore, a new maintain value wildcard is introduced to allow the retention of a previously set value to avoid repetition of redundant information.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
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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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Recommendation ITU-T H.248.39

Gateway control protocol: ITU-T H.248 SDP parameter identification and wildcarding

1 Scope

This Recommendation describes the principles to be used to identify a single session description protocol (SDP) sub-field and how to apply wildcarding to that sub-field. The sub-field may be fully specified, wildcarded (CHOOSE "\$" or ALL "**") or not significant "-" (see clause 5.2.2.2). Being able to identify a single sub-field is of use when requesting the MG to choose a parameter, specifying a range or for the purposes of auditing.

This Recommendation contains a package that allows a media gateway controller (MGC) to request multiple SDP parameter values and/or multiple SDP lines to be returned in response to a CHOOSE request. It also allows the linking of multiple CHOOSE wildcards so that they return the same value. A new "maintain value" wildcard, "~", is introduced, which is a short notation syntax (versus the fully specified SDP information) that allows performance optimization as well as the reduction of syntax errors (by avoiding the repetition of redundant information).

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*.

[ITU-T H.248.15] Recommendation ITU-T H.248.15 (2013), *Gateway control protocol: SDP H.248 package attribute*.

3 Definitions

3.1 Terms defined elsewhere

None.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ABNF	Augmented Backus–Naur Form
ATM	Asynchronous Transfer Mode
DTLS	Datagram Transport Layer Security
FFS	For further study
IP	Internet Protocol

LD	Local Descriptor
MG	Media Gateway
MGC	Media Gateway Controller
MIME	Multipurpose Internet Mail Extensions
RD	Remote Descriptor
RTCP	RTP Control Protocol
RTP	Real-time Transport Protocol
SDP	Session Description Protocol
SSRC	Synchronization Source
TLS	Transport Layer Security
UDP	User Datagram Protocol
VoATM	Voice over ATM
VoIP	Voice over IP

5 ITU-T H.248 wildcarding guiding principles

5.1 General ITU-T H.248 wildcarding principles

The overriding guidance provided by clause 7.1.8.1.1.1 of [ITU-T H.248.1] on the use of CHOOSE in the session description protocol (SDP) is: "the use of CHOOSE is allowed in place of a single parameter value".

Subsequent principles are:

- 1) In any SDP scheme each mandatory element SHALL therefore be represented by a single CHOOSE "\$".
- 2) Any part that contain text tokens (e.g., those in " ") that are mandatory SHALL also be included in the wildcard command.
- 3) Optional parts of an SDP scheme should not be included unless the wildcard or value applies to them.
- 4) When an item specifies a wildcard for a single sub-field, this applies to the nested augmented Backus–Naur form (ABNF) in that parameter.

5.2 Specific wildcarding principles for ITU-T H.248 embedded SDP

5.2.1 IETF SDP wildcards

The core SDP [b-IETF RFC 2327], as well as its successor [b-IETF RFC 4566], does *not* specify any wildcards. SDP lines are therefore always *fully specified*.

[b-ITU-T H.248.49] provides, *inter alia*, complementary information concerning relationship and usage of ITU-T H.248 and the various IETF RFCs on SDP.

5.2.2 SDP wildcards introduced by specifications other than ITU-T H.248.1

Wildcards are used (by the MGC) for *resource management* and/or the indication of particular *modes of operation* at the MG bearer level (aware versus agnostic). The scope of SDP wildcards in ITU-T H.248 messages is therefore limited to SDP media descriptions (see clause 7.1.8.1.1.2 of [ITU-T H.248.1]), within the Local Descriptor (LD) and the Remote Descriptor (RD).

5.2.2.1 Wildcard "-"

Wildcard "-", meaning "not significant" (or "agnostic", "unaware"), was introduced (in 2005) by the so-called "H.248 Ia profile version 1" (see clause 5.15 of [b-ETSI ES 283 018]), motivated by control needs in dedicated "IP-to-IP interworking modes" in border gateways (see clause G.2.2 of [b-ETSI TR 183 068]).

5.2.2.2 Wildcards "r", "l" and "[0-F]"

This Recommendation introduces the wildcarded value response "r", line response "l", interlinkage "[0-F]" and the maintain value "~" wildcards via the "Advanced SDP Wildcarding Package" (see clause 9).

6 Identification of single parameters

The clauses below define which parts of the SDP are classified as "single sub-fields (values)" for the purposes of ITU-T H.248.1 wildcarding. Each of these sub-fields may be fully specified, designated as CHOOSE "\$", designated as ALL "*" or designated as not significant "-". The sub-fields should not be partially wildcarded.

Each of the examples indicates what type of wildcarding is not valid. It also highlights some valid types of wildcarding and what should be returned.

NOTE 1 – For the purposes of the examples below, "?" is used to denote the potential wildcards:

- "\$" CHOOSE,
- "*" ALL,
- "-" "not significant". (See Note 2 below)

NOTE 2 – Not to be confused with clause B.2 of [ITU-T H.248.1] encoding for NULL Context (see also clause 5.2.2.2).

ABNF grammar, in subsequent clauses, is copied from Appendix A (SDP Grammar) of [b-IETF RFC 2327] and other IETF RFCs concerning SDP extensions.

NOTE 3 – Even though [b-IETF RFC 2327] is replaced by clause 9 of [b-IETF RFC 4566]), references to [b-IETF RFC 2327] have been used because [ITU-T H.248.1] specifies the use of this RFC for SDP.

6.1 Protocol version

Table 6-1 – Protocol version

SDP Specification:	
Definition: (Clause 6 of [b-IETF RFC 2327])	v= (protocol version)
ABNF: (Appendix A of [b-IETF RFC 2327])	proto-version = "v=" 1*DIGIT CRLF
ITU-T H.248/SDP encoding example with applied wildcarding:	Result:
v=?	Is valid. It would give v= 1*DIGIT The only parameter that may be wildcarded is 1*DIGIT.

6.2 Owner/Creator

Table 6-2 – Owner/Creator

SDP Specification:	
Definition: (Clause 6 of [b-IETF RFC 2327])	o= (owner/creator and session identifier)
ABNF: (Appendix A of [b-IETF RFC 2327])	origin-field = "o=" username space sess-id space sess-version space nettype space addrtype space addr CRLF
ITU-T H.248/SDP encoding examples with applied wildcarding:	Results:
o=? o=? ? o=? ? ? o=? ? ? ? o=? ? ? ? ?	Are all invalid. There are six mandatory parameters: "username", "sess-id", "sess-version", "nettype", "addrtype" and "addr".
o=? ? ? ? ? ?	Would return: o=username sess-id sess-version nettype addrtype addr

6.3 Session name

Table 6-3 – Session name

SDP Specification:	
Definition: (Clause 6 of [b-IETF RFC 2327])	s= (session name)
ABNF: (Appendix A of [b-IETF RFC 2327])	session-name-field = "s=" text CRLF
ITU-T H.248/SDP encoding example with applied wildcarding:	Result:
s=?	Is valid. It would give s=text The only parameter that may be wildcarded is "text".

6.4 URI of description

Table 6-4 – URI of Description

SDP Specification:	
Definition: (Clause 6 of [b-IETF RFC 2327])	u=* (URI of description)
ABNF: (Appendix A of [b-IETF RFC 2327])	uri-field = ["u=" uri CRLF] uri= ;defined in [b-IETF RFC 1630]
ITU-T H.248/SDP encoding example with applied wildcarding:	Result:
FFS.	—

6.5 Email address

Table 6-5 – Email address

SDP Specification:	
Definition: (Clause 6 of [b-IETF RFC 2327])	e=* (email address)
ABNF: (Appendix A of [b-IETF RFC 2327])	email-fields = *("e=" email-address CRLF) email-address = email email "(" email-safe ")" email-safe "<" email ">" email = ;defined in [b-IETF RFC 822]
ITU-T H.248/SDP encoding example with applied wildcarding:	Result:
FFS.	—

6.6 Phone number

Table 6-6 – Phone number

SDP Specification:	
Definition: (Clause 6 of [b-IETF RFC 2327])	p=* (phone number)
ABNF: (Appendix A of [b-IETF RFC 2327])	<pre> phone-fields = *("p=" phone-number CRLF) phone-number = phone phone "(" email-safe ")" email-safe "<" phone ">" phone = "+" POS-DIGIT 1*(space "-" DIGIT) </pre>
ITU-T H.248/SDP encoding example with applied wildcarding:	Result:
FFS.	—

6.7 Encryption key

Table 6-7 – Encryption key

SDP Specification:	
Definition: (Clause 6 of [b-IETF RFC 2327])	k=* (encryption key)
ABNF: (Appendix A of [b-IETF RFC 2327])	<pre> key-field = ["k=" key-type CRLF] key-type = "prompt" "clear:" key-data "base64:" key-data "uri:" uri key-data = email-safe "~" " There is one mandatory field "key-type". </pre>
ITU-T H.248/SDP encoding examples with applied wildcarding:	Results:
k=?	Would give k=key-type
k=?:?	Would give k=key-type:key-data where key-type is "clear" or "base64", k=key-type:uri where key-type is "uri".

6.8 Time description

Table 6-8 – Time description

SDP Specification:	
Definition: (Clause 6 of [b-IETF RFC 2327])	t= (time the session is active)
ABNF: (Appendix A of [b-IETF RFC 2327])	time-fields = 1*("t=" start-time space stop-time * (CRLF repeat-fields) CRLF) [zone-adjustments CRLF]
ITU-T H.248/SDP encoding examples with applied wildcarding:	Results:
t=?	Is invalid. There are two mandatory parameters "start-time" and "stop-time".
t=? ?	Would give t=start-time stop-time
NOTE – For repeat-fields and zone-adjustments see below.	

6.9 Repeat

Table 6-9 – Repeat

SDP Specification:	
Definition: (Clause 6 of [b-IETF RFC 2327])	r=* (zero or more repeat times)
ABNF: (Appendix A of [b-IETF RFC 2327])	repeat-fields = "r=" repeat-interval space typed-time 1*(space typed-time)
ITU-T H.248/SDP encoding examples with applied wildcarding:	Results:
r=?	Is invalid. There are two mandatory parameters "repeat-interval" and "typed-time".
r=? : ?	Would give r=repeat-interval typed-time
r=? ? ?	Would give r=repeat-interval typed-time typed-time