International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.248.49
(08/2007)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication procedures

Gateway control protocol: Session description protocol RFC and capabilities packages

ITU-T Recommendation H.248.49

ITU-T H-SERIES RECOMMENDATIONS

AUDIOVISUAL AND MULTIMEDIA SYSTEMS

For further details, please refer to the list of ITU-T Recommendations.

ITU-T Recommendation H.248.49

Gateway control protocol: Session description protocol RFC and capabilities packages

Summary

ITU-T Recommendation H.248.1 uses the session description protocol (SDP) to convey information in the local and remote descriptors of the text encoding of the protocol. Typically this SDP has been based on the use of IETF RFC 2327. New variants of SDP have been developed which contain some incompatibilities with IETF RFC 2327. ITU-T Recommendation H.248.49 allows a media gateway controller to firstly determine which SDP IETF RFC the media gateway is compliant to, as well as being able to determine the SDP capabilities. This allows greater interoperability between the media gateway controller and media gateway.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

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.

NOTE

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

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

CONTENTS

ITU-T Recommendation H.248.49

Gateway control protocol: Session description protocol RFC and capabilities packages

1   Scope

When the text encoding of [ITU-T H.248.1] is used, local descriptors (LD) and remote descriptors (RD) consisting of "session" descriptions are based on the session description protocol (SDP) (clause 7.1.8 of [ITU-T H.248.1]). As a result, SDP information elements are embedded in the H.248 protocol syntax. The encoder/decoder for H.248 Messages for Annex B of [ITU-T H.248.1] text mode therefore comprises of an SDP encoder/decoder in addition to the basic H.248 encoder/decoder.

There are multiple versions of H.248.1, and multiple variants of SDP [IETF RFC 2327], and [IETF RFC 4566]. H.248 versions and SDP variants are orthogonal in the sense, that principally any H.248 version could be operated with any SDP variant. However, there are dependencies due to the history concerning the different timelines of H.248.1 and SDP developments, e.g.,:

•   H.248.1 Version 1 (03/2002) is based on SDP [IETF RFC 2327];

•   H.248.1 Version 2 (05/2002) is based on SDP [IETF RFC 2327]; or

•   H.248.1 Version 3 (09/2005) is based on SDP [IETF RFC 2327].

The protocol versioning of H.248 and SDP, as well as backward compatibility, requires a negotiation mechanism to select a common H.248 protocol version as well as a common SDP RFC for the text-based encoding of LD and RD on MGC and MG side. Whereas H.248 protocol version negotiation is already supported by H.248 ServiceChange elements, an explicit mechanism is still missing for SDP version determination.

This Recommendation enables a media gateway controller to determine which SDP RFC a media gateway supports. Once the SDP RFC has been determined the media gateway controller can then indicate to the media gateway which SDP RFC version it will use.

SDP based on [IETF RFC 4566] may be of use when a media gateway controller is already using [IETF RFC 4566] in its call/session control protocols.

By setting a particular SDP RFC version, the MG will behave as if all references in H.248.1 to the use of [IETF RFC 2327] have been replaced by that particular version of SDP RFC.

In order for media gateway controllers and media gateways to be backward compatible, they shall support [IETF RFC 2327] even if a new SDP RFC is also supported.

In addition to providing a capability to determine the supported SDP RFC, this Recommendation provides the capability to determine which SDP parameters the MG supports.

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]   ITU-T Recommendation H.248.1 (2005), *Gateway control protocol: Version 3*.

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

[IETF RFC 3266]   IETF RFC 3266 (2002), *Support for IPv6 in Session Description Protocol (SDP)*.

[IETF RFC 4566]   IETF RFC 4566 (2006), *SDP: Session Description Protocol*.

3   Terms and definitions

3.1   Terms defined elsewhere

None.

3.2   Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1   AuditCapabilities.req: H.248.1 AuditCapabilities command request.

3.2.2   AuditValue.req: H.248.1 AuditValue command request.

3.2.3   SDP RFC: The IETF RFCs for SDP specifications are **not** explicitly denoted as "protocol versions" (Note 1). The H.248.49 property "SDP RFC" shall be related to the definition.

NOTE 1 – The SDP "v=" line is aimed at signalling the SDP protocol version. Nevertheless, all existing SDP RFCs [IETF RFC 2327] and [IETF RFC 3266] define protocol version 0 (see clause 5.1 in [IETF RFC 4566]: "The "v=" field gives the version of the Session Description Protocol. This memo defines version 0. There is no minor version number.")

NOTE 2 – The SDP "o=" line contains the "version number of the session description" (field <sess-version>). This session version should not be confused with the SDP or H.248.1 protocol version.

4   Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

LD   Local Descriptor

MG   Media Gateway

MGC   Media Gateway Controller

RD   Remote Descriptor

SDP   Session Description Protocol

5   Conventions

None.

6   Session Description Protocol RFC Package

Package Name: Session Description Protocol RFC

PackageID: sdpr (0x00bb)

Description: This package allows the MGC to determine which SDP RFCs the MG supports. It also allows the MGC to choose and indicate to the MG which SDP RFC both the MG and the MGC can support and shall use for the control association.

Version: 1

Extends: None

6.1 Properties

6.1.1 SDP RFC

Property Name: SDP RFC

PropertyID: RFC (0x0001)

Description: This property indicates the supported SDP RFC.

Type: Integer

Possible values: The IETF RFC number that defines the SDP RFC.

E.g.,

2327 for RFC 2327

3266 for RFC 3266

NOTE – Support of RFC 3266 implies support of RFC 2327 also.

4566 for RFC 4566

Default: 2327

Defined in: TerminationState (Root Termination only)

Characteristics: Read/Write

6.2 Events

None.

6.3 Signals

None.

6.4 Statistics

None.

6.5 Error codes

6.5.1 Invalid SDP Syntax

Error Code #: 474

Name: Invalid SDP Syntax

Definition: The SDP received by the MG contains invalid or unexpected syntax according to the expected SDP RFC syntax.

Error Text in the Error Descriptor: None

Comment: The command is disregarded.

6.6 Procedures

6.6.1 Version determination and specification

As a general rule, upon establishment of a new H.248 control association and before the MGC has modified the MG's Root termination LocalControl descriptor property *sdpr/RFC*, both the MGC and the MG should implicitly assume that the default SDP [IETF RFC 2327] is used within this H.248 control association where [ITU-T H.248.1] version 1, 2 or 3 is used. However, this default may change if a H.248 profile is negotiated.

If the MGC wants to modify the SDP RFC to be used within this H.248 control association, it should first send an AuditCapability request for the Root termination with an Audit descriptor containing the LocalControl *sdpr/RFC* property, e.g.,

```
AuditCapability = ROOT {
  Audit {
    Media {
      LocalControl {
        sdpr/RFC
}}}}}
```

The MG's reply would then contain a list of all possible SDP RFC values the MG supports according to clause 7.2.6 of [ITU-T H.248.1].

The MGC may then issue a Modify request for the Root termination containing a LocalControl descriptor including the *sdpr/RFC* property with a single property value which should be equal to one of the values contained in the list the MG returned in the AuditCapability response. If the MG supports the requested SDP RFC, according to standard [ITU-T H.248.1] rules, it answers positively to the Modify request.

From this point in time onwards, the SDP exchanged between MGC and MG in local and remote descriptors is understood to comply to the SDP RFC set by the MGC in the Modify command on the Root termination. This is applicable to both text and binary implementations as binary implementations may use Annex C of [ITU-T H.248.1] SDP properties.

It is not recommended to change the Root termination property *sdpr/RFC* after the first call-related H.248 context had been created within the newly established H.248 control association. The MGC should only modify the *sdpr/RFC* property of the Root termination immediately after any ServiceChange procedure resulting in the setting or negotiation of the H.248.1 version and before the first local or remote descriptor is being exchanged between MGC and MG. If terminations are already instantiated at the setting of the *sdpr/RFC* property, the MGC and MG shall use the new SDP RFC for these terminations. If mismatches occur between the old and new SDP RFCs for these terminations for subsequent signalling altering the local and remote descriptors, then error code 474 "Invalid SDP Syntax" should be used.

6.6.2   Unsuccessful root property modification

If the MG receives a Modify request for the Root termination containing an unsupported *sdpr/RFC* SDP RFC value, it should answer with error code 449 "Unsupported or Unknown Parameter or Property value". In this case, the value of the *sdpr/RFC* property remains unchanged and the previously used SDP RFC syntax continues to the used.

6.6.3   Unsuccessful LD or RD descriptor modification

If the MG receives a Modify request to modify the LD or RD encoded according to a non-set SDP RFC value, it should answer with error code 474 "Invalid SDP Syntax".

7 Session description protocol capabilities package

Package Name: Session Description Protocol Capabilities Package

PackageID: sdpc (0x00bc)

Description: This package allows the MGC to determine which SDP capabilities are supported on the MG. The IANA SDP parameters registry http://www.iana.org/assignments/sdp-parameters provides a list of parameters that may be implemented on a MG. By auditing the properties respectively corresponding to these parameters, the MGC can determine the parameters and their values that it can use.

The support of parameters associated with the following registries can be determined:
– proto
– bwtype
– nettype
– addrtype
– enckey
– att-field (session level)
– att-field (both session and media level)
– att-field (media level only)
– att-field (unknown level)
– content
– group SDP attribute
– rtcp-fb attribute
– ack and nack
– RTSP Key management

Where parameters include the SLASH "/", these instances should be replaced with a "\" in order to meet the ABNF syntax rules for the VALUE construct.

Version: 1

Extends: None

7.1 Properties

7.1.1 Proto Registry

Property Name: Proto Registry

PropertyID: proto (0x0001)

Description: This property represents the values that can be associated with the type "proto".

Type: Sub-list of String

Possible values: As per the "SDP name" values associated with the "proto" registry at http://www.iana.org/assignments/sdp-parameters.

E.g., RTP\AVP

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.1.2 Bwtype Registry

Property Name:	Bwtype Registry
PropertyID:	bwtype (0x0002)
Description:	This property represents the values that can be associated with the type "bwtype".
Type:	Sub-list of String
Possible values:	As per the "SDP name" values associated with the "bwtype" registry at http://www.iana.org/assignments/sdp-parameters.
	E.g., CT
Default:	Provisioned
Defined in:	TerminationState
Characteristics:	Read-only

7.1.3 Nettype Registry

Property Name:	Nettype Registry
PropertyID:	nettype (0x0003)
Description:	This property represents the values that can be associated with the type "nettype".
Type:	Sub-list of String
Possible values:	As per the "SDP name" values associated with the "Nettype" registry at http://www.iana.org/assignments/sdp-parameters.
	E.g., IN
Default:	Provisioned
Defined in:	TerminationState
Characteristics:	Read-only

7.1.4 Addrtype Registry

Property Name:	Addrtype Registry
PropertyID:	addrtype (0x0004)
Description:	This property represents the values that can be associated with the type "addrtype".
Type:	Sub-list of String
Possible values:	As per the "SDP name" values associated with the "addrtype" registry at http://www.iana.org/assignments/sdp-parameters.
	E.g., IP4
Default:	Provisioned
Defined in:	TerminationState
Characteristics:	Read-only

7.1.5   Enckey Registry

Property Name: Enckey Registry

PropertyID: enckey (0x0005)

Description: This property represents the values that can be associated with the type "enckey".

Type: Sub-list of String

Possible values: As per the "SDP name" values associated with the "enckey" registry at http://www.iana.org/assignments/sdp-parameters.

                  E.g., clear

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.1.6   Att-field (session level) Registry

Property Name: Att-field (session level)

PropertyID: attsess (0x0006)

Description: This property represents the values that can be associated with the type "att-field (session level)".

Type: Sub-list of String

Possible values: As per the "SDP name" values associated with the "att-field (session level)" registry at http://www.iana.org/assignments/sdp-parameters.

                  E.g., cat

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.1.7   Att-field (both session and media level) Registry

Property Name: Att-field (session and media level)

PropertyID: attsessmed (0x0007)

Description: This property represents the values that can be associated with the type "att-field (session and media level)".

Type: Sub-list of String

Possible values: As per the "SDP name" values associated with the "att-field (session and media level)" registry at http://www.iana.org/assignments/sdp-parameters.

                  E.g., lang

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.1.8 Att-field (media level only) Registry

Property Name: Att-field (media level only)

PropertyID: attmed (0x0008)

Description: This property represents the values that can be associated with the type "att-field (media level only)".

Type: Sub-list of String

Possible values: As per the "SDP name" values associated with the "att-field (media level only)" registry at http://www.iana.org/assignments/sdp-parameters.

     E.g., ptime

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.1.9 Att-field (unknown level) Registry

Property Name: Att-field (unknown level)

PropertyID: attunk (0x0009)

Description: This property represents the values that can be associated with the type "att-field (unknown level)".

Type: Sub-list of String

Possible values: As per the "SDP name" values associated with the "att-field (unknown level)" registry at http://www.iana.org/assignments/sdp-parameters.

     E.g., eecid

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.1.10 Content Registry

Property Name: Content Registry

PropertyID: content (0x000a)

Description: This property represents the values that can be associated with the type content.

Type: Sub-list of String

Possible values: As per the "SDP name" values associated with the "content" registry at http:www.iana.org/assignments/sdp-parameters.

     E.g., slides

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.1.11 Group SDP Attribute Registry

Property Name: Group SDP Attribute Registry

PropertyID: group (0x000b)

Description: This property represents the values that can be associated with the "group" SDP attribute.

Type: Sub-list of String

Possible values: As per the "Token" values associated with the "group" SDP attribute registry at http://www.iana.org/assignments/sdp-parameters.

    E.g., FID

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.1.12 RTCP-FB Attributes Values

Property Name: RTCP-FB Attributes Values

PropertyID: rtcpfbval (0x000c)

Description: This property represents the values that can be associated with the "rtcp-fb" attribute.

Type: Sub-list of String

Possible values: As per the "Value Name" values associated with the "rtcp-fb attribute value" registry at http://www.iana.org/assignments/sdp-parameters.

    E.g., trr-int

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.1.13 "ack" Attributes Values

Property Name: "ack" Attributes Values

PropertyID: ackval (0x000d)

Description: This property represents the values that can be associated with the "ack" attribute.

Type: Sub-list of String

Possible values: As per the "Value Name" values associated with the "ack attribute value" registry at http://www.iana.org/assignments/sdp-parameters.

    E.g., rpsi

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.1.14 "nack" Attributes Values

Property Name: "nack" Attributes Values

PropertyID: nackval (0x000e)

Description: This property represents the values that can be associated with the "nack" attribute.

Type: Sub-list of String

Possible values: As per the "Value Name" values associated with the "nack attribute value" registry at http://www.iana.org/assignments/sdp-parameters).

                     E.g., sli

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.1.15 SDP/RTSP Key management protocol identifier values

Property Name: SDP/RTSP Key management protocol identifier values

PropertyID: kmpidval (0x000f)

Description: This property represents the values that can be associated with the "SDP/RTSP Key management protocol identifiers".

Type: Sub-list of String

Possible values: As per the "Value Name" values associated with the "SDP/RTSP Key management protocol identifiers" registry at http://www.iana.org/assignments/sdp-parameters.

                     E.g., mikey

Default: Provisioned

Defined in: TerminationState

Characteristics: Read-only

7.2   Events

None.

7.3   Signals

None.

7.4   Statistics

None.

7.5   Error codes

As per clause 6.5.1.

7.6 Procedures

Auditing of the local and remote descriptors to determine SDP capabilities may return varying results depending on the implementation.

In order to determine which SDP capabilities are supported on a MG in a standardized way, the MGC should perform an AuditValue.req on the properties defined in this package. A wildcarded AuditValue.req on the package may be used to determine all SDP capabilities, e.g., "*sdpc/**".

The parameters and their values that may be returned are defined in the IANA SDP parameter registry.

As a result of the AuditValue.req, the MG should return the values supported by it. Where multiple values are supported, these shall be returned as a sub-list. If the MG cannot support a SDP parameter corresponding to a property audit by the MGC, the MG should return empty value for the property to the MGC.

Appendix I

Comparison of SDP variants between RFC 4566 and RFC 2327

(This appendix does not form an integral part of this Recommendation)

This appendix provides a comparison between the two core RFCs for SDP.

I.1 Introduction

Local descriptor (LD) and remote descriptor (RD) consisting of "session" descriptions are based on the session description protocol (SDP) when *text encoding* is used for the H.248 gateway control protocol (see clause 7.1.8 of [ITU-T H.248.1]). SDP information elements are as a consequence embedded in the H.248 protocol syntax. The "*text codec*" for H.248 Messages (i.e., the encoder/decoder for Annex B of [ITU-T H.248.1] text mode) comprises therefore an SDP encoder/decoder in addition to the basic H.248 encoder/decoder.

The core SDP is specified in [IETF RFC 4566], which obsoletes [IETF RFC 2327]. There are many additional RFCs available, which extend SDP. Figure I.1 illustrates the purpose of this Appendix and indicates *only some* other SDP RFCs, which may be of particular importance for H.248/SDP implementations.
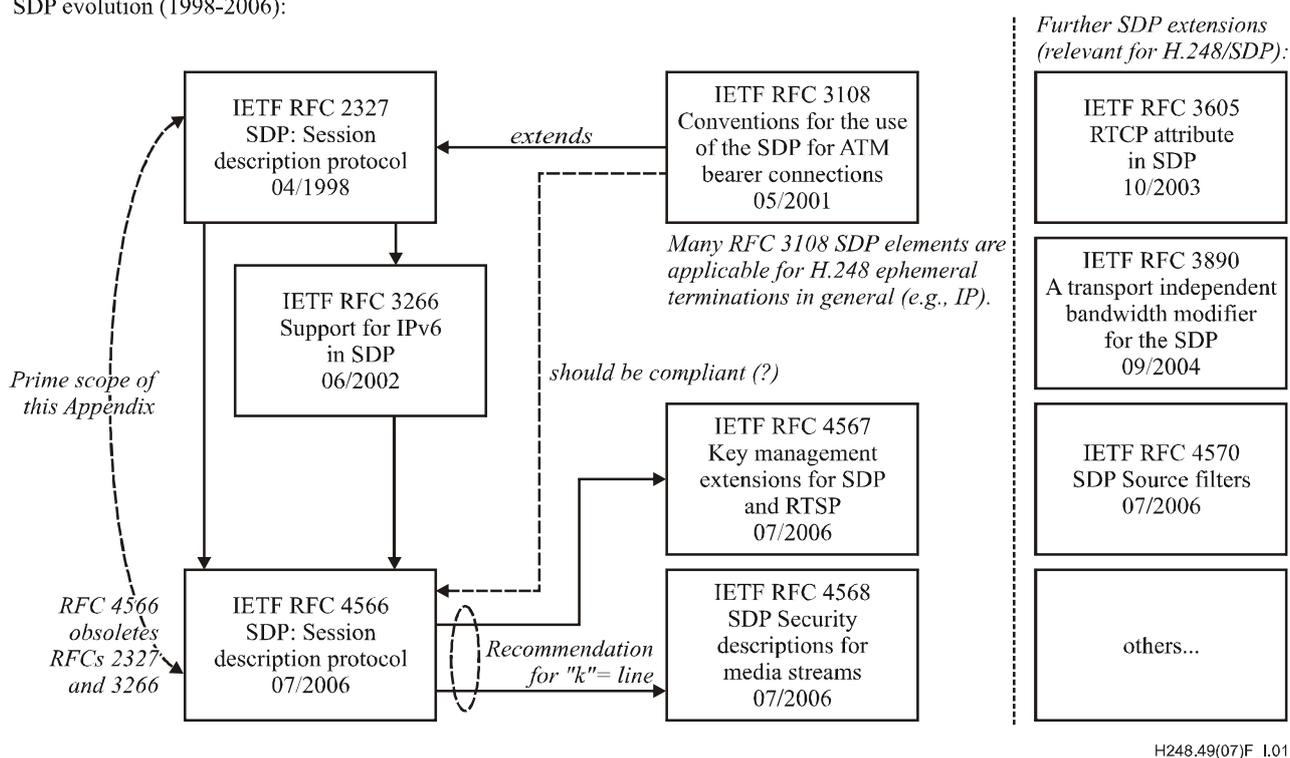

Figure I.1 – SDP evolution and primary scope of this appendix

The differences between [IETF RFC 4566] and [IETF RFC 2327] are listed in clause I.2. Specific conclusions for H.248/SDP implementations are summarized in clause I.3.

I.1.1 Warning

The analysis of this appendix is based on a reverse engineering activity. The list of identified differences might be therefore incomplete. Implementers are also encouraged to check the latest maintenance updates (IETF RFC Errata):

• IETF RFC 2327: see http://www.RFC-editor.org/cgi-bin/erratasearch.pl?RFC=2327

• IETF RFC 4566: see http://www.RFC-editor.org/cgi-bin/erratasearch.pl?RFC=4566

I.2 RFC 4566 versus RFC 2327

Protocol syntax and semantics are compared below.

I.2.1 SDP line specification (RFC 4566, clause 5)

This clause compares the SDP "`<type>=<value>`" structures. Only different specifications are listed here.

I.2.1.1 RFC 4566, clause 5.2: Origin, "o=" line

Table I.1 – RFC 4566 versus RFC 2327 – SDP specification – "o=" line

Item	RFC 4566	RFC 2327	Impact?
1.	o=<username> <sess-id> <sess-version> <nettype> <addrtype> <unicast-address>	o=<username> <session id> <version> <network type> <address type> <address>	No. Description is different, but SDP grammar is identical (see clause I.2.4).

I.2.1.2 RFC 4566, clause 5.6: Email Address and Phone Number, "e=" and "p=" lines

Table I.2 – RFC 4566 versus RFC 2327 – SDP specification – "e=" and "p=" lines

Item	RFC 4566	RFC 2327	Impact?
2.	Inclusion of an email address or phone number is OPTIONAL. Note that the previous version of SDP specified that either an email field or a phone field MUST be specified, but this was widely ignored. The change brings the specification into line with common usage.	Either an email field or a phone field MUST be specified.	Yes. A RFC 4566 implementation peering a RFC 2327 implementation should include either a "e=" or a "p=" line when considering strict backward compatibility.

I.2.1.3 RFC 4566, clause 5.7: Connection Data, "c=" line

Table I.3 – RFC 4566 versus RFC 2327 – SDP specification – "c=" line

Item	RFC 4566	RFC 2327	Impact?
3.	c=\<nettype\> \<addrtype\> \<connection-address\>	c=\<network type\> \<address type\> \<connection address\>	No. Description is different, but SDP grammar is identical (see clause I.2.4).

I.2.1.4 RFC 4566, clause 5.8: Bandwidth, "b=" line

Table I.4 – RFC 4566 versus RFC 2327 – SDP specification – "b=" line

Item	RFC 4566	RFC 2327	Impact?
4.	b=\<bwtype\>: \<bandwidth\>	b=\<modifier\>: \<bandwidth-value\>	No. Description is different, but SDP grammar is identical (see clause I.2.4).

I.2.1.5 RFC 4566, clause 5.10: Repeat times, "r=" line

Table I.5 – RFC 4566 versus RFC 2327 – SDP specification – "r=" line

Item	RFC 4566	RFC 2327	Impact?
5.	r=\<repeat interval\> \<active duration\> \<offsets from start-time\>	r=\<repeat interval\> \<active duration\> \<list of offsets from start-time\>	No. Description is different, but SDP grammar is identical (see clause I.2.4).

I.2.1.6 RFC 4566, clause 5.12: Encryption Keys, "k=" line

Table I.6 – RFC 4566 versus RFC 2327 – SDP specification – "k=" line

Item	RFC 4566	RFC 2327	Impact?
6.	MAY be used to convey encryption keys. A simple mechanism for key exchange is provided by the key field ("k="), although this is primarily supported for compatibility with older implementations and its use is NOT RECOMMENDED. Work is in progress to define new key exchange mechanisms for use with SDP RFC 4567 and RFC 4568, and it is expected that new applications will use those mechanisms.	Entirely supported.	Yes. A RFC 4566 implementation peering a RFC 2327 implementation may have to include an RFC 2327 compliant "k=" line when considering strict backward compatibility.

I.2.1.7   RFC 4566, clause 5.14: Media descriptions, "m=" line

Table I.7 – RFC 4566 versus RFC 2327 – SDP specification – "m=" line

Item	RFC 4566	RFC 2327	Impact?
7.	m=\<media\> 　　\<port\> 　　\<proto\> 　　\<fmt\> 　　...	m=\<media\> 　　\<port\> 　　\<transport\> 　　\<fmt list\>	No. Description is different, but SDP grammar is identical (see clause I.2.4).
8.	Supported media types: "audio", "video", "text", "application", "message", - -	Supported media types: "audio", "video", - "application", - "data", "control"	No. No. Yes, backward compatibility. No. Yes, backward compatibility. Yes, forward compatibility. Yes, forward compatibility.

I.2.2   SDP attribute specification (RFC 4566, clause 6)

I.2.2.1   RFC 4566, "a=" attribute

The ABNF syntax of [IETF RFC 2327] does not support the use of "-" in an attribute name however despite stating that attribute names must be in the US-ASCII subset of ISO/IEC 10646/UTF-8. The ABNF syntax of [IETF RFC 4566] was updated to support the inclusion of "-" to address this inconsistency. Therefore, the use of attribute names containing "-" is problematic for RFC 2327 implementations as several examples of attribute names containing "-" were registered prior to the definition of [IETF RFC 4566]. RFC 2327 implementers may consider exceptions when parsing an "a=" where attribute names containing "-" are involved.

Beyond the addition of "-" in attribute names, the RFC 4566 ABNF "token" syntax defines additional characters (see item 22 in clause I.2.4.2) that would also pose similar problems.

I.2.2.2   RFC 4566, clause 6: "a=fmtp" attribute

Table I.8 – RFC 4566 versus RFC 2327 – SDP specification – "a=fmtp" attribute

Item	RFC 4566	RFC 2327	Impact?
9.	a=fmtp:\<format\> \<format specific parameters\>	a=fmtp:\<format\> \<format specific parameters\>	Yes. RFC 4566 clarified the use as following: "At most one instance of this attribute is allowed for each format." This was added to maintain the mapping to media type parameters. Implementers should be aware that there are uses which leverage multiple instances of the "a=fmtp" SDP attribute per media format, e.g., RFC 3189.

I.2.2.3 RFC 4566, clause 6: "a=maxptime" attribute

**Table I.9 – RFC 4566 versus RFC 2327 –
SDP specification – "a=maxptime" attribute**

Item	RFC 4566	RFC 2327	Impact?
10.	a=maxptime: <maximum packet time>	–	Yes, not backward compatible.

I.2.2.4 RFC 4566, clause 6: "a=inactive" attribute

Table I.10 – RFC 4566 versus RFC 2327 – SDP specification – "a=inactive" attribute

Item	RFC 4566	RFC 2327	Impact?
11.	a=inactive	–	Yes, not backward compatible.

I.2.2.5 RFC 4566, clause 6: "a=orient" attribute

Table I.11 – RFC 4566 versus RFC 2327 – SDP specification – "a=orient" attribute

Item	RFC 4566	RFC 2327	Impact?
12.	a=orient: <orientation>	a=orient: <whiteboard orientation>	No. Description is different, but SDP grammar is identical (see clause I.2.4).

I.2.3 Experimental parameters in some SDP lines

The RFC 2327 "x-" prefix notation for experimental parameters is disallowed or deprecated in [IETF RFC 4566]. This affects the following SDP lines or attributes, which had an "x-" support in [IETF RFC 2327].

**Table I.12 – RFC 4566 versus RFC 2327 –
SDP specification – SDP lines with experimental parameters**

Item	RFC 4566	RFC 2327	Impact?
13.	"b=" line: "X-" for <bwtype> Use of the "X-" prefix is NOT RECOMMENDED.	"b=" line: "X-" for <modifier> Use of the "X-" prefix is principally allowed.	No backward compatibility issue. Forward compatibility should be also no issue because RFC 4566 parser MUST ignore "unknown" modifiers.
14.	"a=" line: "X-" not allowed If an attribute is received that is not understood, it MUST be ignored by the receiver.	"a=" line: "X-" allowed Unregistered attributes should begin with "X-" to prevent inadvertent collision with registered attributes. In either case, if an attribute is received that is not understood, it should simply be ignored by the receiver.	ditto

Table I.12 – RFC 4566 versus RFC 2327 –
SDP specification – SDP lines with experimental parameters

Item	RFC 4566	RFC 2327	Impact?
15.	"a=rtpmap" attribute: "X-" not allowed.	"a=rtpmap" attribute: "X-" allowed. Experimental encoding formats can also be specified using rtpmap. RTP formats that are not registered as standard format names must be preceded by "X-".	No backward compatibility issue, but forward compatibility problem.

I.2.4 SDP grammar (RFC 4566, clause 10)

The SDP grammar was revised. There are two types of changes:

- Renaming of tokens;
- Extension of grammar.

Both changes are not backward compatible (BC) in different manners. Token renaming requires a local adaptation of the "SDP served user instance" concerning an aligned token naming scheme. Grammar extensions are principally not interoperable between different SDP variants.

I.2.4.1   Token renamings

See Table I.13.

Table I.13 – RFC 4566 versus RFC 2327 – SDP grammar – Token renamings

Item	RFC 4566	RFC 2327	Impact?
16.	session-description = proto-version origin-field session-name-field information-field uri-field email-fields phone-fields connection-field bandwidth-fields time-fields key-field attribute-fields media-descriptions	announcement = proto-version origin-field session-name-field information-field uri-field email-fields phone-fields connection-field bandwidth-fields time-fields key-field attribute-fields media-descriptions	Token renaming
17.	origin-field = %x6f "=" username SP sess-id SP sess-version SP nettype SP addrtype SP unicast-address CRLF	origin-field = "o=" username space sess-id space sess-version space nettype space addrtype space addr CRLF	Token renaming
18.	connection-address = multicast-address / unicast-address	connection-address = multicast-address | addr	Token renaming
19.	email-address = address-and-comment / dispname-and-address / addr-spec address-and-comment = addr-spec 1*SP "(" 1*email-safe ")" dispname-and-address = 1*email-safe 1*SP "<" addr-spec ">"	email-address = email | email "(" email-safe ")" | email-safe "<" email ">" email = ;defined in RFC 822	Token renaming
20.	"k=" line: The "*key-data*" token (RFC 2327) was replaced by the "*text*" and "*base64*" token in RFC 4566.		Token renaming
21.	Others: *TBD*.		

I.2.4.2   Grammar extensions

See Table I.14.

Table I.14 – RFC 4566 versus RFC 2327 – SDP grammar – Grammar extensions

Item	RFC 4566	RFC 2327	Impact?
22.	; Generic for other address families extn-addr = non-ws-string NOTE – This extension is applicable for unicast and multicast addresses.	Not defined	Grammar extension
23.	The "*token*" (RFC 4566) corresponds to "*alpha-numeric*" (RFC 2327) field. The grammar or "*token*" was extended to a superset of "*alpha-numeric*":		
	token = 1*(token-char) token-char = %x21 / %x23-27 / %x2A-2B / %x2D-2E / %x30-39 / %x41-5A / %x5E-7E	alpha-numeric = ALPHA | DIGIT DIGIT = "0" | POS-DIGIT POS-DIGIT = "1"|"2"|"3"|"4"|"5"|"6"|"7"|"8"|"9" ALPHA = "a"|"b"|"c"|"d"|"e"|"f"|"g"|"h"|"i"|"j"|"k"| "l"|"m"|"n"|"o "|"p"|"q"|"r"|"s"|"t"|"u"|"v"| "w"|"x"|"y"|"z"|"A"|"B"|"C"|"D"|"E"|"F"|"G"| "H"|"I"|"J"|"K"|"L"|"M"|"N"|"O"|"P"|"Q"|"R"| "S"|"T"|"U"|"V"|"W"|"X"|"Y"|"Z"	
	Result: Additional grammar of "*token*": %x21 / %x23-27 / %x2A-2B / %x2D-2E / %x5E-60 / %x7B-7E i.e., the ASCII characters: "!", "#", "$", "%", "&", "'", "*", "+", "-", ".", "^", "_", "`", "{", "|", "}", "~". The "*Token*" is used in RFC 4566 SDP fields: (a) *nettype*, (b) *addrtype*, (c) *bwtype*, (d) *att-field*, (e) *media*, (f) *fmt*, and (g) *proto*.		
24.	Others: *TBD*.		

I.2.4.3 Summary of impacted SDP lines

The above changes may affect the following SDP lines, see Table I.15.

Table I.15 – RFC 4566 versus RFC 2327 – Summary of impacted SDP lines

Item	RFC 4566	Change
25.	**Session description**	
	v= (protocol version)	No
	o= (originator and session identifier)	No
	s= (session name)	No
	i=* (session information)	No
	u=* (URI of description)	No
	e=* (email address)	Yes
	p=* (phone number)	No
	c=* (connection information)	No
	b=* (zero or more bandwidth information lines)	No
	z=* (time zone adjustments)	No
	k=* (encryption key)	Yes
	a=* (zero or more session attribute lines)	Yes
26.	**Time description**	
	t= (time the session is active)	No
	r=* (zero or more repeat times)	No
27.	**Media description, if present**	
	m= (media name and transport address)	Yes
	i=* (media title)	No
	c=* (connection information -- optional if included at session level)	No
	b=* (zero or more bandwidth information lines)	No
	k=* (encryption key)	Yes
	a=* (zero or more media attribute lines)	Yes

I.2.4.4 Grammar baseline

See Table I.16.

Table I.16 – RFC 4566 versus RFC 2327 – ABNF usage

Item	RFC 4566	RFC 2327	Impact?
28.	ABNF according to RFC 4234	ABNF according to RFC 2234	None.

This table is for information only. The underlying ABNF syntax does not have any implication on SDP implementations.

I.3 Specific impact on H.248/SDP

All identified changes in the SDP specification may principally affect H.248/SDP interfaces. Particular attention should be given to the two SDP lines for *media name and transport address* ("m=") and *media attribute* ("a=") specifications.

SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	**Audiovisual and multimedia systems**
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	Telecommunication management, including TMN and network maintenance
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality, telephone installations, local line networks
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks, open system communications and security
Series Y	Global information infrastructure, Internet protocol aspects and next-generation networks
Series Z	Languages and general software aspects for telecommunication systems