International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.3401

Amendment 1

(02/2008)

SERIES Q: SWITCHING AND SIGNALLING

Signalling requirements and protocols for the NGN – Service and session control protocols

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NGN NNI signalling profile (protocol set 1)

Amendment 1: Extensions of NGN NNI signalling profile including video and data services

Recommendation ITU-T Q.3401 (2007) – Amendment 1

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Recommendation ITU-T Q.3401

NGN NNI signalling profile (protocol set 1)

Amendment 1

Extensions of NGN NNI signalling profile including video and data services

Summary

Amendment 1 to Recommendation ITU-T Q.3401 contains extensions including video and data services to Recommendation ITU-T Q.3401 (2007), which supported only voice band services in the first version.

Source

Amendment 1 to Recommendation ITU-T Q.3401 (2007) was approved on 29 February 2008 by ITU-T Study Group 11 (2005-2008) under Recommendation ITU-T A.8 procedure.

FOREWORD

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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.

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.

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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/.

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Extensions of NGN NNI signalling profile including video and data services

1) Clause 1 – Scope

Modify the third paragraph as follows: add the words shown underlined and delete the words shown with strike-through:

For the protocol set 1 of the NGN NNI signalling profile, this Recommendation covers ~~the~~ multimedia (voice, video and data) which include ~~voiceband services such as~~ VoIP, multimedia telephony ~~(audio, text and so on)~~, DTMF ~~and~~, T.38 fax, and multimedia ring back and ringing tones and annoucements.

2) Clause 2.1 – ITU-T references

Modify the subclause title as follows: add the words shown underlined, and add the following new references:

2.1 ITU-T and ISO/IEC references

[ITU-T H.263] Recommendation ITU-T H.263 (2005), *Video coding for low bit rate communication*.

[ITU-T H.264] Recommendation ITU-T H.264 (2007), *Advanced video coding for generic audiovisual services*.

[ISO/IEC 14496-2] ISO/IEC 14496-2:2004, *Information technology – Coding of audio-visual objects – Part 2: Visual*.

[ISO/IEC 14496-3] ISO/IEC 14496-3:2005, *Information technology – Coding of audio-visual objects – Part 3: Audio*.

3) Clause 2.2.1 – Service-level signalling specifications

Add the following new reference:

[IETF RFC 4145] IETF RFC 4145 (2005), *TCP-Based Media Transport in the Session Description Protocol (SDP).*

4) Clause 2.2.2 – Transport-level specifications

Add the following new references:

[IETF RFC 3016] IETF RFC 3016 (2000), *RTP Payload Format for MPEG-4 Audio/Visual Streams*.

[IETF RFC 3711] IETF RFC 3711 (2004), *The Secure Real-time Transport Protocol (SRTP)*.

[IETF RFC 3984] IETF RFC 3984 (2005), *RTP Payload Format for H.264 Video*.

[IETF RFC 4629] IETF RFC 4629 (2007), *RTP Payload Format for ITU-T Rec. H.263 Video*.

5) Clause 4 – Abbreviations

Add the following new abbreviations:

DTMF Dual-Tone Multi-frequency

MPEG Moving Picture Experts Group

NGN Next Generation Network

VoIP Voice over IP

6) Clause 6 – Assumptions

Add the following words shown underlined to the fifth and seventh items:

5) ~~Only the n~~Network-to-network interface (NNI) is supported between two peering VoIP and also multimedia telephony carriers. There may be an IP transit network between two peering VoIP and multimedia telephony service providers.

7) RTP or SRTP is used for voice and video transport; other transport protocols may be used for data applications.

7) Clause 7 – Media Availability in a SIP Session

a) *Add a new clause title before the current text*

7.1 Consideration related to media packets

b) *Add a new clause 7.2*

7.2 Addition or deletion of any media stream

Any media session established across the NNI using SIP starts either with one kind of media type (e.g., voice) or with different kind of media types for multiple media streams (e.g., voice and video) by exchanging SDP offer/answer between the originating and terminating parties. Adding different type of media streams or removing any other kind of media streams is possible during the communication.

8) Clause 8.1 – Codec list

Add the text shown underlined and delete the word shown with strike-through:

NOTE 4 – For voice communication, w~~W~~hile any codec may be used within the codec list based on the bilateral agreement, it is recommended that the list contain AMR NB [EN 301 703], EVRC [TIA-127], G.729 [G.729], G.729A [G.729A], G.722.1 [G.722.1], ~~and~~ G.726 [G.726], and MPEG-4 Audio [ISO/IEC 14496-3]. To enable the provision of voice service with a superior quality, it is highly recommended that the list contain a wide-band codec such as AMR-WB [G.722.2], VMR-WB [TIA-1016], G.722 [G.722], G.729.1 [G.729.1]. To support hard of hearing, it is recommended that T.140 [T.140] is supported as a codec in the codec list. Where the interconnect is to an existing PSTN/ISDN, it is recommended that T.140 [T.140] is adapted to be carried over G.711 A/μ law [G.711]. For video communication, the codec list is recommended to contain H.263 [H.263], H.264 [H.264], and MPEG-4 Visual [ISO/IEC 14496-2]. For data communication, it is recommended that the networks establish bilateral agreements about the data applications used over the NNI.

9) Clause 10.1 – RFCs to be supported

Insert the following new line into Table 10-1:

Table 10-1 – RFCs to be supported

SIP Extensions	Title	M/O
IETF RFC 4145 [IETF RFC 4145]	TCP-Based Media Transport in the Session Description Protocol (SDP)	O

10) Clause 10.2.1.13 – Initiating a session

Add the following text shown underlined:

– When the initial INVITE includes an SDP offer, an SDP answer may be included either in the provisional reliable non-failure response to the INVITE (e.g., 183-Session-Progress sent reliably) or in the final non-failure response to the INVITE (i.e., 2xx), and, if not included in the provisional reliable non-failure response, shall be included in the final non-failure response. <u>If the final non-failure response includes an SDP answer, the same value of SDP may be included in the provisional unreliable non-failure response to the INVITE.</u>

11) Clause 10.2.1.20.5 – Allow

Add the following texts shown underlined and delete the words shown with strike-through:

The Allow header shall be supported as specified in RFC 3261 section 20.5 except as noted below.

The Allow header shall be present in the initial INVITE and the 2xx response to the initial INVITE.

The header value shall list all supported methods, ~~i.e., at a minimum~~ <u>e.g.,</u> INVITE, ACK, CANCEL, BYE, UPDATE, and PRACK.

<u>However, the SCF needs to prepare to receive messages without the Allow header field. The SCF should continue the call control even if the Allow header is not present in the initial INVITE and the 2xx response to the initial INVITE.</u>

12) Clause 10.2.1.20.11 – Content-Disposition

Add the following text between the second and third paragraphs:

If early media is provided by the application server model defined in [IETF RFC 3959], the Content-Disposition header shall include the "early-session" value as specified in [IETF RFC 3959].

13) Clause 10.2.1.20.15 – Content-Type

Add the following text to the end of this subclause:

If early media is provided by the application server model defined in [IETF RFC 3959], the content type "multipart/mixed" shall be supported as specified in [IETF RFC 2046] to specify different session types (e.g., normal session and early session). Each Content-Type encloses its specification by using the "boundary" tag in this header.

14) Clause 10.2.1.20.32 – Require

Add the following text to the end of this subclause:

If early media is provided by the application server model defined in [IETF RFC 3959] and UAC expects the UAS to support the process of the early media request, the Require header shall include the "early-session" value as specified in [IETF RFC 3959].

15) Clause 10.2.1.20.37 – Supported

Add the following text to the end of this subclause:

If early media is provided by the application server model defined in [IETF RFC 3959], the Supported header shall include the "early-session" value as specified in [IETF RFC 3959].

16) Clause 10.2.2.1 – Extended methods

Add the following text to the end of this subclause:

While communicating, addition of different media or removal of any media from earlier established media session should be performed by using re-INVITE instead of UPDATE with new media descriptions which contain modified SDP profiles according to the SDP offer/answer procedure.

17) Clause 10.3 – SDP profile

Add the following text to the end of this subclause:

If a media session across the NNI utilizes video, the media type "video" shall be supported. The media description specified in Table 10-7 (i.e., media codec, its attributes and values) is exchanged in a SIP/SDP message to set up a video connection.

18) Clause 11 – Transport-level profile

Insert the following new lines into Table 11-1:

Table 11-1 – Supported transport-level RFCs to be described in SIP/SDP messages

RFC	Title	M/O
RFC 3016 [IETF RFC 3016]	RTP Payload Format for MPEG-4 Audio/Visual Streams	O
RFC 3711 [IETF RFC 3711]	The Secure Real-time Transport Protocol (SRTP)	O
RFC 3984 [IETF RFC 3984]	RTP Payload Format for H.264 Video	O
RFC 4629 [IETF RFC 4629]	RTP Payload Format for ITU-T Rec. H.263 Video	O

19) Clause I.4 – IP-IP-(NNI)-IP-IP in Appendix I – Call/signalling flows

Add new subclauses I.4.3 and I.4.4:

I.4.3 Adding video session after a basic call setup

Figure I.9 shows a sequence of SIP messages for adding new media (e.g., video) after call set-up has been completed across NNI. A corresponding example of this is seen when two UAs first establish a voice connection and later decide to exchange video data (e.g., pictures, images) using the same connection. In this way, a video session is added by exchanging new SDP information which contains a set of audio and video attributes.

NOTE – Internal signalling messages within the IBC-FE and IBG-FEs are not shown.

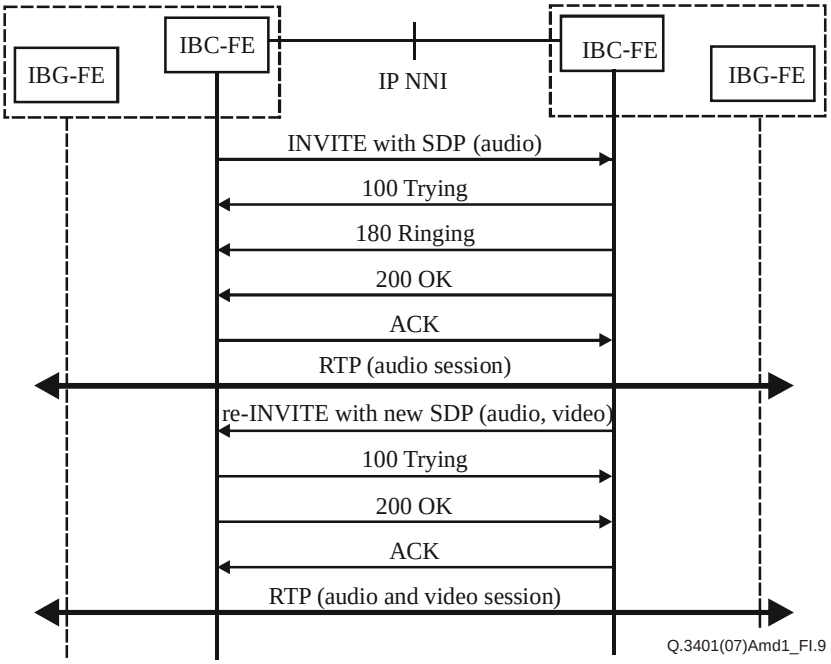

Figure I.9 – Adding video session after a basic call set-up

I.4.4 Early media session with multimedia and voice conversation by the application server model

Figure I.10 shows a sequence of SIP messages for a basic audio call with an early media session which uses audio and video to provide a ring back tone at the SIP NNI. This example is based on the application server model specified in [IETF RFC 3959], and other call flows may be used to provide early media. Note that in this example, SIP UAs in the calling and called parties have capabilities to manage audio and video. Additionally, UA in the called party might have previously registered in the ring back tone service.

Part 1 of Figure I.10 depicts a sequence of SIP messages for early media session where the calling party sends an initial INVITE message with the SDP description about early media. UAS in a server for the called party responds to this INVITE message with a 18x response message (e.g., 180 or 183) with its SDP description. After receiving a 18x message, the early session is established between both parties and finally the calling party receives a multimedia ring back tone from a server of the called party (e.g., media server).

In part 2 of Figure I.10, after the early media session has been completed, both parties have voice conversation, since UA in the called party sent 200 OK with SDP answer which contains only audio in a 183 response message as shown in the previous part.

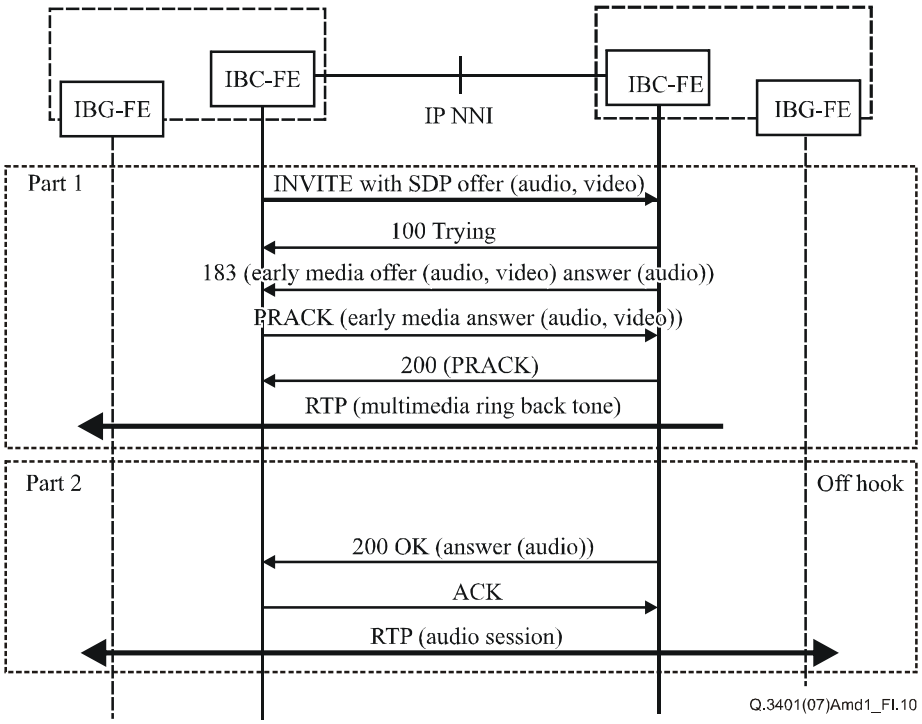

Figure I.10 – Early media session with multimedia and voice conversation by the application server model

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Printed in Switzerland
Geneva, 2008