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SERIES Q: SWITCHING AND SIGNALLING

Signalling requirements and protocols for the NGN –
Testing for next generation networks

Real-time multimedia service testing framework at the user-to-network interface of next generation networks

Recommendation ITU-T Q.3949

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SWITCHING AND SIGNALLING

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Recommendation ITU-T Q.3949

Real-time multimedia service testing framework at the user-to-network interface of next generation networks

Summary

Recommendation ITU-T Q.3949 describes the procedures, requirements, physical configurations and standard document sets for real-time multimedia service testing at the user-to-network interface (UNI) of next generation networks (NGNs).

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T Q.3949	2012-08-13	11

Keywords

Multimedia, NGN, service testing, UNI, video communication.

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.

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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

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Introduction

The World Telecommunication Standardization Assembly 2008 (WTSA-08) approved Resolution 76, "Studies related to conformance and interoperability testing, assistance to developing countries, and a possible future ITU Mark programme", and assigned to all ITU-T study groups the responsibility of developing conformance and interoperability Recommendations to improve the interoperability of next generation networks (NGNs). Recommendation ITU-T Q.3948 defines a voice over IP (VoIP) service testing framework at the NGN user-to-network interface (UNI), and provides a simple procedure for NGN service end-to-end testing that is useful for NGN operators and equipment vendors. A series of service testing framework specifications based on ITU-T Q.3948 is thus required. This Recommendation, ITU-T Q.3949, describes the multimedia service testing based on the methods in ITU-T Q.3948.

Recommendation ITU-T Q.3949

Real-time multimedia service testing framework
at the user-to-network interface of next generation networks

1   Scope

This Recommendation describes the real-time multimedia service testing framework at the user-to-network interface (UNI) in next generation networks (NGNs). This Recommendation defines the preparation for NGN multimedia service testing, physical configuration, test scenarios and test report production. The real-time multimedia service defined in this Recommendation covers services including voice and video communication, video conferencing and data sharing. Specifically, this Recommendation describes video communication service testing specifications. In the future, other multimedia services will be covered. The test check sheets described in clause 7.1 are useful for NGN operators, service providers and vendors when testing their services or products.

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 G.711]   Recommendation ITU-T G.711 (1984), *Pulse code modulation (PCM) of voice frequencies*.

[ITU-T H.264]   Recommendation ITU-T H.264 (2009), *Advanced video coding for generic audiovisual services*.

[ITU-T Q.3402]   Recommendation ITU-T Q.3402 (2008), *NGN UNI signalling profile (Protocol set 1)*.

[ITU-T Q.3903]   Recommendation ITU-T Q.3903 (2008), *Formalized presentation of testing results*.

[ITU-T Q.3945]   Recommendation ITU-T Q.3945 (2011), *Test specifications for next generation network services on model networks – Test set 1*.

[ITU-T Q.3948]   Recommendation ITU-T Q.3948 (2011), *Service testing framework for VoIP at the user-to-network interface of next generation networks*.

[ITU-T Y.2012]   Recommendation ITU-T Y.2012 (2010), *Functional requirements and architecture of next generation networks*.

[IETF RFC 3261]   IETF RFC 3261 (2002), *SIP: Session Initiation Protocol*.

[IETF RFC 3262]   IETF RFC 3262 (2002), *Reliability of Provisional Responses in Session Initiation Protocol (SIP)*.

[IETF RFC 3264]   IETF RFC 3264 (2002), *An Offer/Answer Model with Session Description Protocol (SDP)*.

[IETF RFC 3311]   IETF RFC 3311 (2002), *The Session Initiation Protocol (SIP) UPDATE Method*.

[IEFT RFC 3550]	IETF RFC 3550 (2003), *RTP: A Transport Protocol for Real-Time Applications*.
[IETF RFC 3551]	IETF RFC 3551 (2003), *RTP Profile for Audio and Video Conferences with Minimal Control*.
[IETF RFC 4028]	IETF RFC 4028 (2005), *Session Timers in the Session Initiation Protocol (SIP)*.
[IETF RFC 4566]	IETF RFC 4566 (2006), *SDP: Session Description Protocol*.
[IETF RFC 5391]	IETF RFC 5391 (2008), *RTP Payload Format for ITU-T Recommendation G.711.1*.
[IETF RFC 6184]	IETF RFC 6184 (2011), *RTP Payload Format for H.264 Video*.
[IETF RFC 6416]	IETF RFC 6416 (2011), *RTP Payload Format for MPEG-4 Audio/Visual Streams*.

3　Definitions

None.

4　Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

MPEG	Moving Picture Experts Group
NGN	Next Generation Network
NIT	Network Integration Test
PICS	Protocol Implementation Conformance Statements
PIXIT	Protocol Implementation Extra Information for Testing
QoS	Quality of Service
RFC	Request for Comments
RTCP	RTP Control Protocol
RTP	Real-Time Transport Protocol
SCF	Service Control Functions
SDP	Session Description Protocol
SIP	Session Initiation Protocol
TCP	Transmission Control Protocol
UA	User Agent
UDP	User Datagram Protocol
UNI	User-to-Network Interface

5　Conventions

None.

6 Preparation for testing

6.1 Test object

Test objects used in multimedia service are specified within multiple ITU-T Recommendations and other standards development organization (SDO) documents, as referenced in this Recommendation.

Figure 6-1 shows the block diagram for a SIP multimedia communication terminal.

Q.3949(12)_F01
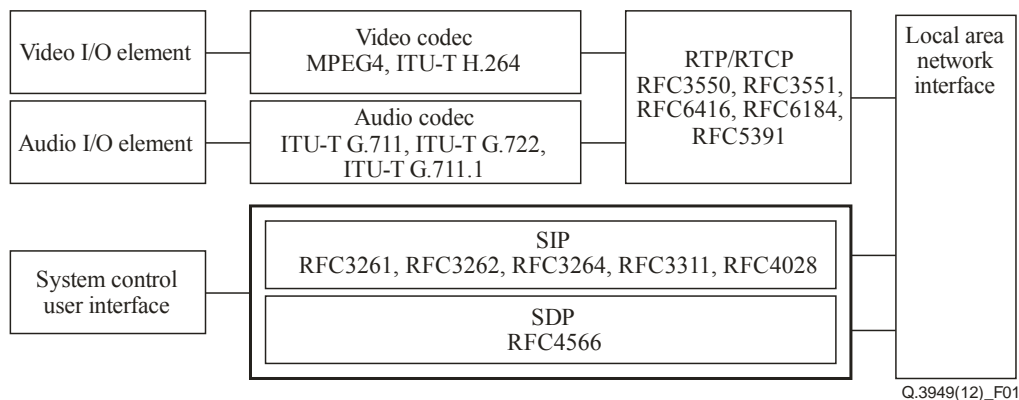
Figure 6-1 – SIP multimedia communication terminal

Test profiles should include a list of Recommendations related to the test object of multimedia service testing.

Table 6-1 shows the coding schemes and profiles for a SIP multimedia communication terminal.

Table 6-1 – SIP multimedia communication terminal coding schemes and profiles

Item		VoIP	MPEG-4	ITU-T H.264
Session Control		SIP (RFC 3261), SDP (RFC 4566)		
Capability Exchange		RFC 3264	RFC 3264, RFC 6416	RFC 3264, RFC 6184
SIP extensions		RFC 3262 (Reliability of provisional responses) RFC 3311 (UPDATE) RFC 4028 (Session Timers)		
Media Transfer		RTP (RFC 3550, RFC 3551), RTCP (RFC 3550 Option)		
		RFC 3551	Packetization mode (RFC 6416)	Packetization Mode (RFC 6184)
Video	QCIF mode	None	MPEG-4 Visual SP@L0	
	CIF mode		–	–
	SD mode		MPEG-4 Visual SP@L4a	ITU-T H.264 BP@L3
	HD mode		–	ITU-T H.264 BP@L3.1 ITU-T H.264 HP@L4
Audio		ITU-T G.711 μ/a-Law (Recommend), ITU-T G.722, ITU-T G.711.1 (Optional)		

6.2 Target interface

The UNI interface, shown in the lower left of Figure 6-2, is the target interface for which multimedia service testing is described in this Recommendation.
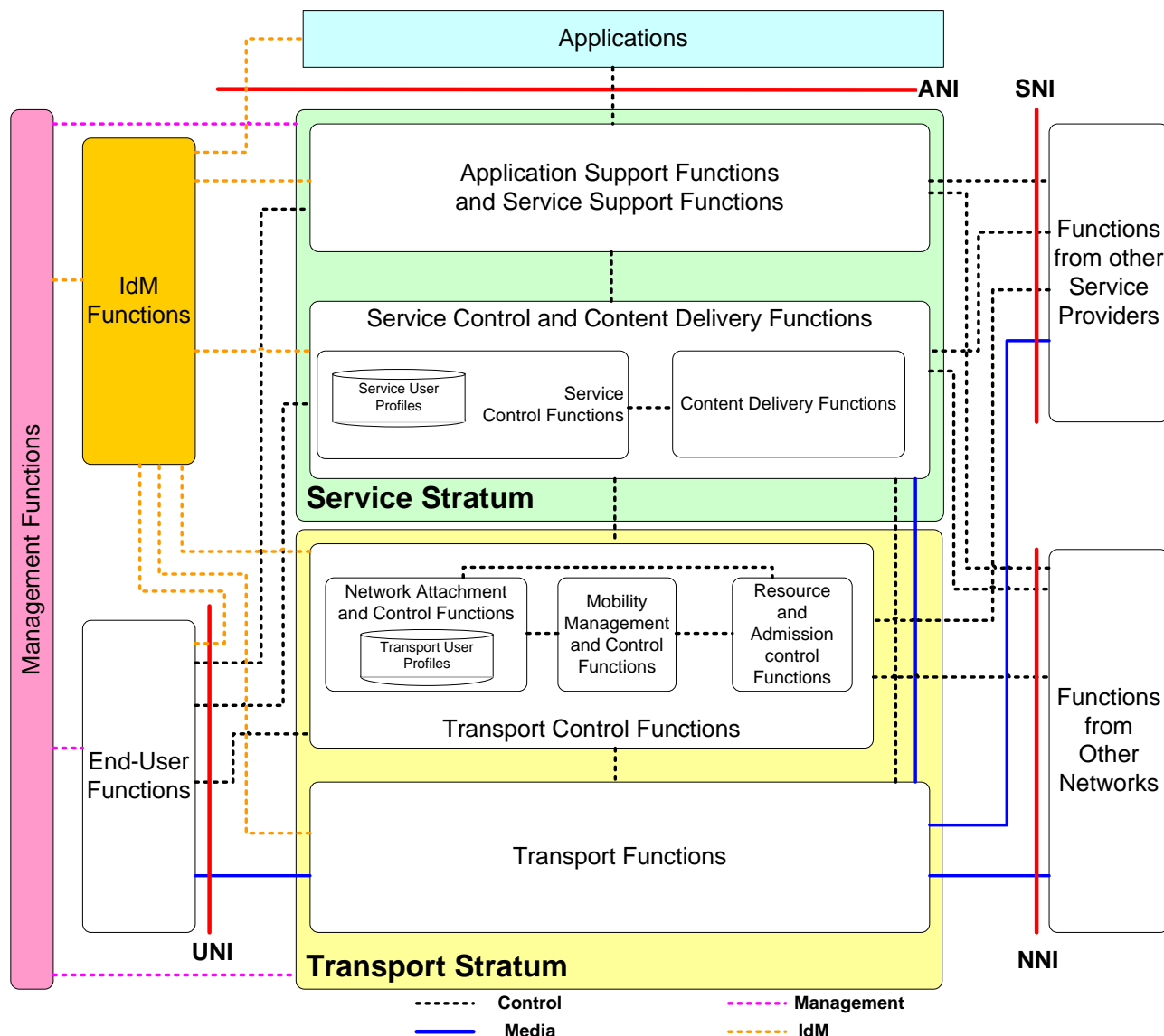
NOTE – Figure 6-2 is an exact replica of Figure 7-1 of [ITU-T Y.2012].

Figure 6-2 – UNI as the target interface (ITU-T Y.2012 NGN architecture overview)

6.3 Target Recommendation

[ITU-T Q.3402] defines the NGN UNI signalling profile (Protocol set 1), and is the target Recommendation for which multimedia service testing is described in this Recommendation.

6.4 Physical configuration

The physical configuration for multimedia service testing should define the functions needed for service testing. However, the physical configuration may depend on the target protocol. This clause shows the test configuration for two test cases of network under test (NUT): the network integration test (NIT) test case, and the interoperability testing of the end-to-end service test case.

Figure 6-3 shows one case of the general configuration of NIT for the multimedia service testing at UNI. In this figure, the reference machine is similar to the network. Figure 6-4 shows one case of the general configuration of multimedia interoperability testing of the end-to-end service.

**Figure 6-3 – General configuration case of NIT
for multimedia service testing**
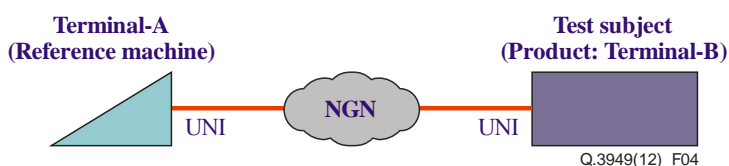
**Figure 6-4 – General configuration case of multimedia
interoperability testing of the end-to-end service**

6.5 Test scenarios of NIT

The following is an example of the NIT for multimedia service testing at UNI.

6.5.1 Test items

Following are several example test items:

a)   Terminal registration

b)   Negotiating SIP capabilities

c)   Audio and video behaviour of the terminal.

Refer to Table 6-2 for details.

Table 6-2 – List of sequences of NIT

No.	Sequence Name
1	Terminal registration
2	Call sending and Call receiving
3	Audio communication and Video communication
4	Update of Session Timer
5	Call disconnection
6	Deletion of terminal registration
7	Fall back reconnection

6.5.2 Execution flow

NGN service testing should be conducted in the following steps:

1)   Set the test object, target interface and target Recommendations.

2)   Set the physical configuration and target products.

3)   Define the test scenarios.

4)   Examine the service testing according to the test scenarios and analyse the test output.

Detail clauses are as follows.

6.5.2.1 Basic connection sequences

The basic sequences of NGN multimedia communication service interoperability with NGN protocol are shown in Figures 6-5 and 6-6.
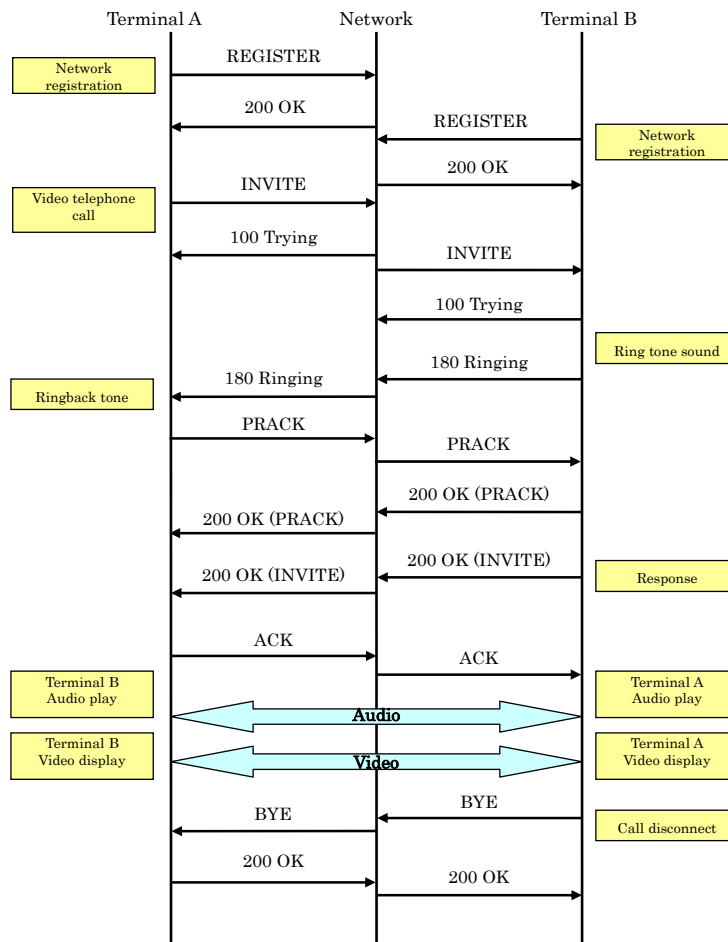
Figure 6-5 – Basic sequence of NGN multimedia communications
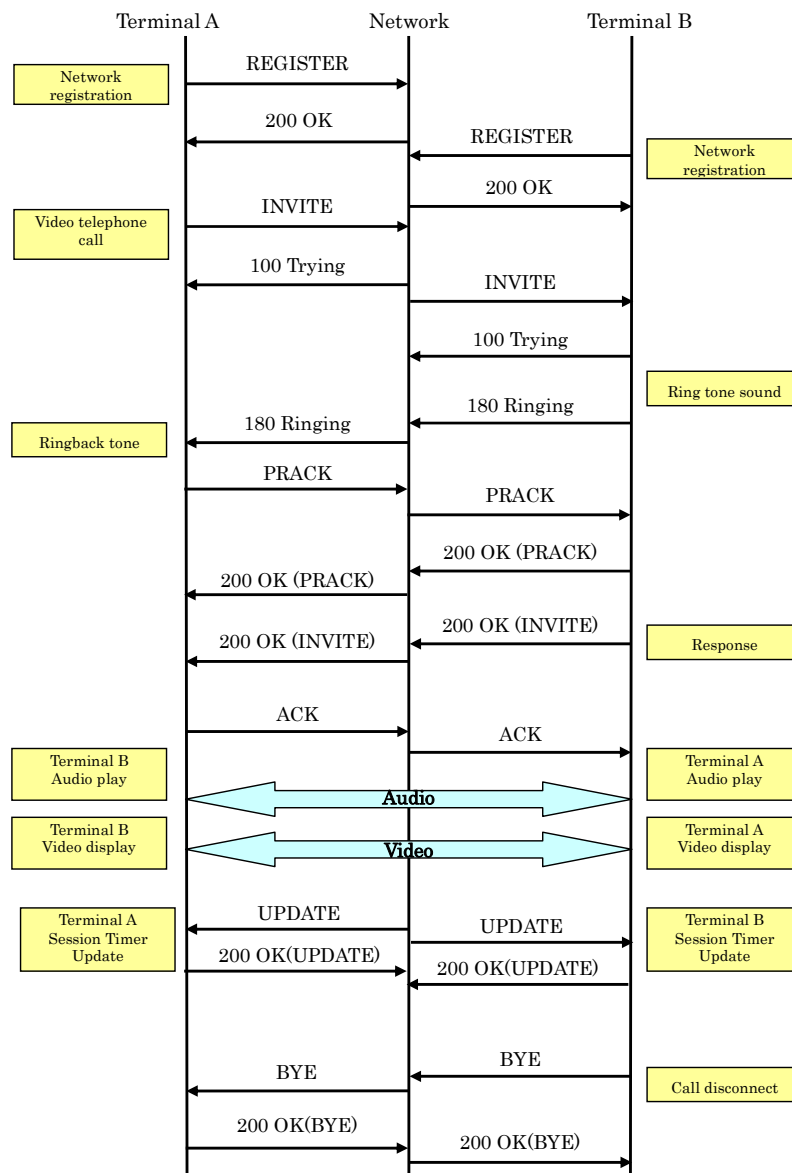
Figure 6-6 – Basic sequence of call origination to disconnection

6.5.2.2   SIP message regulations

Table 6-3 shows the information that should be described in the INVITE request for the NGN multimedia communication negotiation.

Table 6-3 – INVITE request regulations outline

Item	Content	Remarks
Request line	Method (= INVITE)	
	Request-URI	
	SIP-Version	
Header field	Via	
	From	
	To	
	Call-ID	
	CSeq	
	Max-Forwards	
	Contact	
	Content-Type	Necessary when SDP is used
	Content-Length	Necessary when SDP is used
	Route	
	P-Preferred-Identity	
	Privacy	
	Allow	
	Supported	
	Session-Expires	

6.5.2.3 SDP parameter regulations

6.5.2.3.1 SDP regulations outline

Table 6-4 is the SDP regulations outline. Only the essential parameters for the NGN multimedia communication negotiation are shown.

Table 6-4 – SDP regulations outline

	Line type, parameter	Regulations	Remarks
m	<media>	Fixed as "Video"	Media type used
	<port>	Set the port number for RTP stream reception	RTCP Reception port number = this port number + 1
	<transport>	Fixed as "RTP/AVP"	
	<fmt list>	"96"-"127" (*)	

Table 6-4 – SDP regulations outline

Line type, parameter			Regulations	Remarks
a	(Value attribute) rtpmap	\<payload type\>	Specify the RTP payload type value of (*)	
		\<encoding name\>	Fixed as "MP4V-ES" for MPEG-4 Fixed as "H264" for ITU-T H.264	
		\<clock rate\>	Fixed as "90000"	
	(Value attribute) fmtp	\<payload type\>	Specify the RTP payload type value of (*)	RTP dynamic payload value
		\<profile-level-id\>	MPEG-4: For SD mode: SP@L4a For QCIF mode: SP@L0	
			ITU-T H.264: For HD mode: BP@L3.1 HP@L4 For SD mode: BP@L3	
		\<config\>	Specify "Config" that wishes to send	Encoder config information
		\<packetization-mode\>	Single NAL mode: "0" (default) Non-interleaved mode (FU-A): "1"	

6.5.2.3.2 Details of the SDP regulations

1)   m

Specify the attribute of the video media you wish to use.

Description format:

> m=\<media\>\<port\>\<transport\>\<fmt list\>

Example of the setting:

> m=video 18624 RTP/AVP 98

> The port example has to be an even number.

The OFFER side can specify more than one encoding format of the video media. The ANSWER side can choose only one encoding format from the OFFER side's requests and return it to the OFFER side. If there is no encoding format available, the ANSWER side MUST change only the port number in m line to 0 and return it to the OFFER side.

•   \<media\>

Only "video" is allowed.

•   \<port\>

Specify the port number for the RTP stream reception.

Specify the even port number for the RTP reception number.

The RTCP reception port number is the RTP reception port number + 1, which is an odd number.

- <transport>

    Only "RTP/AVP" is allowed. (Specify the transport protocol)

- <fmt list>

    Specify the RTP dynamic payload type value.

    The OFFER side can define the RTP dynamic payload type values of the video encoding. More than one value can be specified.

    The OFFER side describes the value from the left to the right, from the high priority to the low priority.

    The ANSWER side can choose only one payload type value from the values specified by the OFFER side. The ANSWER side MUST specify the dynamic payload value without changing anything and ANSWER to the OFFER side.

2)   a

Specify the video session information for each media.

    Description format:

    (In the case of the value attribute)

        a=<attribute>:<value>

    Example of the setting:

    (In the case of the value attribute)

        a=rtpmap:<payload type> <encoding name>/<clock rate>

            [/<encoding parameter>]

        a=fmtp:<payload type> <profile-level-id> <config>

- How to handle the value attribute of rtpmap:

    – Describe <payload type> with the RTP dynamic payload value indicated in <fmt list> of the m line.

    – Describe <encoding name> with the name of the video encoding. It is fixed as "MP4V-ES" for MPEG-4 Visual and as "H264" for ITU-T H.264.

    – Specify <clock rate> with the clock rate. It is fixed as "90000".

    – It is not necessary to describe <encoding parameter>. When described, it would be ignored.

- How to handle the value attribute of fmtp:

    – Specify the parameter of the MPEG-4 stream or the ITU-T H.264 stream to be sent.

        This will not be the target of the negotiation.

    – Specify <payload type> with the RTP dynamic payload value which is indicated in both the <fmt list> of the m line and rtpmap of the line.

    – Specify <profile-level-id> with the level to be supported. In MPEG-4 Visual, set SP@L4a for SD mode and SP@L0 for QCIF mode. In ITU-T H.264, set BL@L3.1 or HP@L4 for HD mode and BP@L3 for SD mode.

    – Specify <config> with the MPEG-4 encoder configuration information. This is not necessary for ITU-T H.264.

6.5.2.4   SDP negotiation method

When deciding on a video encoding format, it is recommended to use the method specifying the m line and the a line with the video encoding formats on the OFFER side, and choosing only one format on the ANSWER side.

The typical SDP negotiation sequence is shown in Figure 6-7.
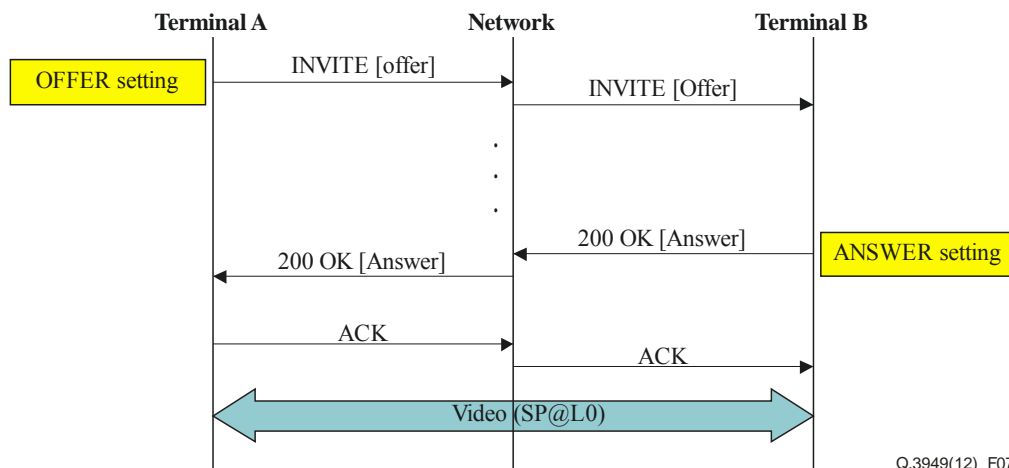
Figure 6-7 – Typical SDP negotiation sequence

In the example in Figure 6-8, the sending side (terminal A) sends the video stream with a capability at the lower profile level (Simple Profile@Level 0) that the receiving side wishes to use.

```
SDP OFFER Information

m=audio 10000 RTP/AVP 0 96
a=rtpmap:0 PCMU/8000
a=rtpmap:96 telephone-event/8000
a=fmtp:96 0-15
a-ptime:20
m=video 51372 RTP/AVP 98 99
a=rtpmap:98 MP4V-ES/90000
a=fmtp:98 profile-level-id=3; config=xxxx
a=rtpmap:99 MP4V-ES/90000
a=fmtp:99 profile-level-id=8; config=yyyy
```

```
SDP ANSWER Information

m=video 53000 RTP/AVP 99
a=rtpmap:99 MP4V-ES/90000
a=fmtp:99 profile-level-id=8; config=zzzz
```

Figure 6-8 – Example of the sequence of the SDP negotiation

6.6 Test scenario of multimedia interoperability testing of the end-to-end service

This clause shows the detailed steps for each test to prevent the omission of multimedia interoperability testing of the end-to-end service. This step should be tested after NIT confirmation in clause 6.5 above.

Figure 6-9 shows a sample of the general configuration of multimedia interoperability testing of the end-to-end service. Following this, is a sample that shows the testing steps.

UA: User agent, PS: Proxy server, RS: Redirect server, REG: Registration server

Figure 6-9 – General configuration of multimedia interoperability testing of the end-to-end service

6.6.1 Test items

Following is a sample of test items:

a)   Register UA in the server.

b)   "Calling UA" calls "Receiving UA". Check PRACK request and OK response.

c)   If the call is not received, attempt the call again up to three times. If the call is still not received, check the communication conditions, the registration information, etc. If something is wrong with these conditions, then retry from a); otherwise, consider this as a communication error and conduct procedure g).
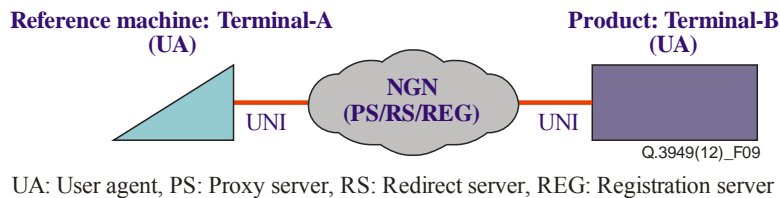
d)   After confirming the connection, the receiving UA checks that it can properly receive the audio, video (if requested), and other test items from the other terminal in accordance with the items listed. Also, the encoding mode that has executed the communication for the caller or the receiver must be recorded respectively for Calling UA or Receiving UA.

e)   Continue the communication for at least three minutes. Then, check if all the items have been tested. Check if the session timer is updated by UPDATE request and OK response.

f)   Both the caller and the receiver must confirm that the communication can be disconnected properly.

g)   Switch roles of the caller and the receiver, and repeat test items a) through f).

Test criteria of each test items should be described to clarify the conformance test verifications.

Table 6-5 is a sample of test criteria.

Table 6-5 – Test criteria

No.	Item		Judging standard
1		Terminal registration	Confirm receiving the correct response from Network.
2		Deletion of terminal registration	Confirm receiving the correct response from Network.
3		Confirmation of Audio communications	Confirm the communication of audio and the video in each mode for more than 3 minutes.
4	Sending side (Terminal A)	Confirmation of Video communications	Confirm PRACK request and OK response. Confirm and record RTP format
5		Confirmation of RTP packet format	Record the maximum transmission rate capability that was exchanged.
6		Update of Session Timer	Confirm the session timer is updated by UPDATE request and OK response at least one time.
7		Call disconnection	Confirm that Terminal disconnected properly when Terminal disconnected.

Table 6-5 – Test criteria

No.	Item		Judging standard
8		Fall back reconnection	Confirm that returning an error response with the correct code for setting the warning capability mismatch and recalling and establishing to ensure communication dropped capability.
1	Receiving side (Terminal B)	Terminal registration	Confirm receiving the correct response from Network.
2		Deletion of terminal registration	Confirm receiving the correct response from Network.
3		Confirmation of Audio communications	Confirm the communication of audio and the video in each mode for more than 3 minutes.
4		Confirmation of Video communications	Confirm PRACK request and OK response.
5		Confirmation of RTP packet format	Record the maximum transmission rate capability that was exchanged.
6		Update of Session Timer	Confirm the session timer is updated by UPDATE request and OK response at least one time.
7		Call disconnection	Confirm that Terminal disconnected properly when Terminal disconnected.
8		Fall back reconnection	Confirm that returning an error response with the correct code for setting the warning capability mismatch and recalling and establishing to ensure communication dropped capability.

7 Analysis of test results

Upon completion of testing, test event, examination log, state and other test outputs are produced. The results of the entire test suite performed on the target device are analysed to determine support of, and to confirm interoperability with, the NGN multimedia service. In addition, these results and their analysis should be compared with the specifications of all referenced Recommendations.

7.1 Test report production

This clause shows the methods to make a summary of the examinations for the test result successes and failures and shows the detailed items required for success of the tests in order to illustrate the results of the conformance test.

The test result will show two items about NIT for service testing and multimedia interoperability testing of the end-to-end service.

Sheet 1 and sheet 2, provided in clauses 7.1.1 and 7.1.2 respectively, show sample verification sheets. The results of service testing should be formalized in accordance with [ITU-T Q.3903], which describes the requirements for completion, saving and analysis of the testing results.

7.1.1 Sheet 1: NGN multimedia service interoperability test check sheet (MPEG-4)

Sheet 1: NGN multimedia service Interoperability Test Check Sheet (MPEG-4)

[Filled in by]

Company/Organization	
Person in charge	
TEL	
FAX	

Test date   [(year)   (month)   (date)   :   ~   :   ]
Test location   [   ]
UA A   [Company/Organization: Model type:]
UA B   [Company/Organization: Model type:]
Network   [Company/Organization: Model type:]

List of test items

No.	Item		Judging standard	Result (Yes or No)	Remarks (problems, etc.)
1		Terminal registration	Confirm receiving the correct response from Network.		
2		Deletion of terminal registration	Confirm receiving the correct response from Network.		
3	Sending side (Terminal A)	Confirmation of audio communication	Confirm the communication of audio and the video in each mode. Record the mode used.		Sending side encoding mode Receiving side encoding mode
4		Confirmation of video communication			Sending side encoding mode Receiving side encoding mode Sending side transmission rate [kbit/s] Receiving side transmission rate [kbit/s]
5		Confirmation of the RTP packet format	Confirm that the DCI information is sent through [IETF RFC 6416] (a). Confirm that VP is sent through [IETF RFC 6416] (b).		When transmitted through (a), check at (a). When transmitted through (b), check at (b).
6		Update of Session Timer	Confirm the session timer is updated by UPDATE request and OK response at least one time.		
7		Call disconnection	Confirm that Terminal disconnected properly when Terminal disconnected.		

List of test items

No.		Item	Judging standard	Result (Yes or No)	Remarks (problems, etc.)
8		Fall back reconnection	Confirm that returning an error response with the correct code for setting the warning capability mismatch and recalling and establishing to ensure communication dropped		Warning code Recalling contents
9		Terminal registration	Confirm receiving the correct response from Network.		
10		Deletion of terminal registration	Confirm receiving the correct response from Network.		
11		Confirmation of the audio communication			Sending side encoding mode Receiving side encoding mode
12	Sending side (Terminal B)	Confirmation of the video communication	Confirm the communication of audio and the video in each mode. Record the mode used.		Sending side encoding mode Receiving side encoding mode Sending side transmission rate [kbit/s] Receiving side transmission rate [kbit/s]
13		Confirmation of the RTP packet format	Confirm that the DCI information is sent through [IETF RFC 6416] (a). Confirm that VP is sent through [IETF RFC 6416] (b).		When transmitted with (a), check at (a). When transmitted with (b), check at (b).
14		Update of Session Timer	Confirm the session timer is updated by UPDATE request and OK response at least one time.		
15		Call disconnection	Confirm that Terminal disconnected properly when Terminal disconnected.		
16		Fall back reconnection	Confirm that returning an error response with the correct code for setting the warning capability mismatch and recalling and establishing to ensure communication dropped capability.		Warning code Recalling contents

7.1.2 Sheet 2: NGN multimedia service interoperability test check sheet (ITU-T H.264)

Sheet 2: NGN multimedia service Interoperability Test Check Sheet (ITU-T H.264)

[Filled in by]

Company/Organization	
Person in charge	
TEL	
FAX	

Test date   [(year)   (month)   (date)   :   ~   :   ]
Test location [   ]
UA A   [Company/Organization: Model type:]
UA B   [Company/Organization: Model type:]
Network   [Company/Organization: Model type:]

List of test items

No.	Item		Judging standard	Result (Yes or No)	Remarks (problems, etc.)
1		Terminal registration	Confirm receiving the correct response from Network.		
2		Deletion of terminal registration	Confirm receiving the correct response from Network.		
3	Sending side (Terminal A)	Confirmation of audio communication			Sending side encoding mode Receiving side encoding mode
4		Confirmation of video communication	Confirm the communication of audio and the video in each mode. Record the mode used.		Sending side encoding mode Receiving side encoding mode Sending side transmission rate [kbit/s] Receiving side transmission rate [kbit/s]
5		Confirmation of the RTP packet format	Confirm the packetization mode of [IETF RFC 6184]		When transmitted with Single NAL Unit, fill in Yes. Otherwise, fill in No.
			Confirm that the PPS/SPS is transmitted.		When transmitted, fill in Yes. When not transmitted, fill in No.
6		Update of Session Timer	Confirm the session timer is updated by UPDATE request and OK response at least one time.		
7		Call disconnection	Confirm that Terminal disconnected properly when Terminal disconnected.		

List of test items

No.		Item	Judging standard	Result (Yes or No)	Remarks (problems, etc.)
8		Fall back reconnection	Confirm that returning an error response with the correct code for setting the warning capability mismatch and recalling and establishing to ensure communication dropped.		Warning code Recalling contents
9		Terminal registration	Confirm receiving the correct response from Network.		
10		Deletion of terminal registration	Confirm receiving the correct response from Network.		
11		Confirmation of the audio communication			Sending side encoding mode Receiving side encoding mode
12	Sending side (Terminal B)	Confirmation of the video communication	Confirm the communication of audio and the video in each mode. Record the mode used.		Sending side encoding mode Receiving side encoding mode Sending side transmission rate [kbit/s] Receiving side transmission rate [kbit/s]
13		Confirmation of the RTP packet format	Confirm the packetization mode of [IETF RFC 6184]		When transmitted with Single NAL Unit, fill in Yes. Otherwise, fill in No.
			Confirm that the PPS/SPS is transmitted.		When transmitted, fill in Yes. When not transmitted, fill in No.
14		Update of Session Timer	Confirm the session timer is updated by UPDATE request and OK response at least one time.		
15		Call disconnection	Confirm that Terminal disconnected properly when Terminal disconnected.		
16		Fall back reconnection	Confirm that returning an error response with the correct code for setting the warning capability mismatch and recalling and establishing to ensure communication dropped.		Warning code Recalling contents

Appendix I

The applicable testing items for ITU-T Q.3945 (The types and list of NGN services testing on the Model networks. Test set 1)

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

This Recommendation is based on the test items described in [ITU-T Q.3945]. Table I.1 describes the comparison between ITU-T Q.3945 and the test items described this Recommendation.

Table I.1 – Comparison between ITU-T Q.3945 and ITU-T Q.3949

Contents of ITU-T Q.3945		ITU-T Q.3949
1	Scope	–
2	References	–
3	Definitions	–
3.1	Terms defined elsewhere	–
4	Abbreviations and acronyms	–
5	Conventions	–
6	NGN services classification for testing (test set 1)	Consistency Described as "Multimedia services"
7	Requirements to NGN service testing approach	–
7.1	Model network requirements for providing NGN service testing	Consistency Described in "Figure 6-2 target interface"
7.2	NGN services test programme	–
7.2.1	Common service parameters testing	–
7.2.2	NP and QoS parameters of service testing	FFS
7.3	NGN services test specification	–
7.3.1	Common characteristic of services testing	–
7.3.1.1	Service scenarios and logic of service testing	Consistency Described MM testing as NGN service testing
7.3.1.2	Call flow testing for service realization	Consistency Described in Table 6-2: List of sequences of NIT
7.3.1.3	Emergency accessibility testing	–
7.3.1.4	Customer's terminal identification testing. (This clause should provide the test's specifications for services in case of emergency situation.)	Consistency Described in Table 6-5: Test criteria

Table I.1 – Comparison between ITU-T Q.3945 and ITU-T Q.3949

Contents of ITU-T Q.3945		ITU-T Q.3949
7.3.1.5	Coding testing	Consistency Described in Table 6-1: SIP multimedia communication terminal coding schemes and profiles and Table 6-5: Test criteria "Confirmation of Audio communications" "Confirmation of Video communications" "Confirmation of RTP packet format" "Fall back reconnection"
7.3.1.6	Numeration and addressing for providing service	NA The test target is only end-to-end terminal capability testing, not network testing.
7.3.1.7	The service statistic testing	NA The test target is only end-to-end terminal capability testing, not network testing.
7.3.1.8	Information security testing	NA The test target is only end-to-end terminal capability testing, not network testing.
7.3.1.9	Customer profile testing	NA The test target is only end-to-end terminal capability testing, not network testing.
7.3.1.10	Service profile testing	NA The test target is only end-to-end terminal capability testing, not network testing.
7.3.1.11	QoS and NP testing for a service	NA The test target is only end-to-end terminal capability testing, not network testing.
8	Formalization of service testing results	Consistency Described in Sheet 1, Sheet 2 and [ITU-T Q.3903] as recommendation
FFS: For further study, NA: Not applicable.		

Bibliography

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

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

[b-TTC JT-Q3402(E)]   TTC JT-Q3402(E) (2011), *The difference between TTC JT-Q3402 and ITU-T Q.3402 – NGN UNI Signalling Profile (Protocol Set 1)*. <http://www.ttc.or.jp/jp/document_list/pdf/e/STD/JT-Q3402(E)v1.pdf>

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