

# ITU-T

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STANDARDIZATION SECTOR  
OF ITU

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(08/2012)

### SERIES Q: SWITCHING AND SIGNALLING

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

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

# 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.

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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*.

- [IETF 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.

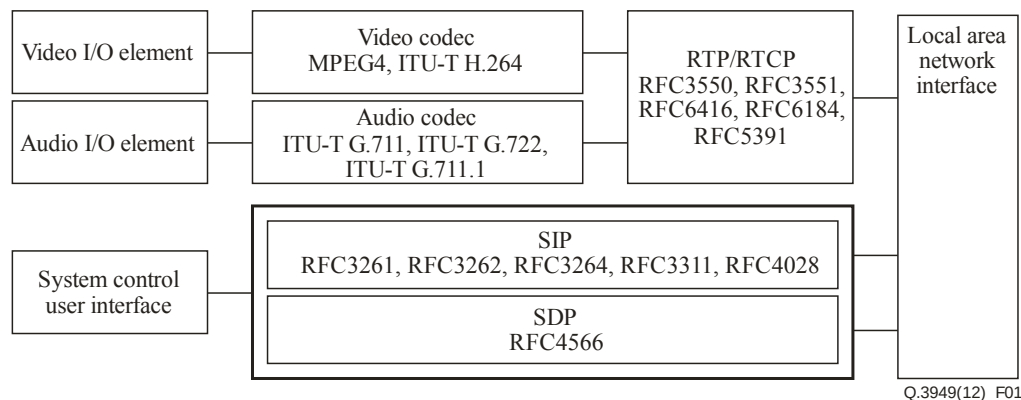


**Figure 6-1 – SIP multimedia communication terminal**

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)<br>RFC 3311 (UPDATE)<br>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<br>ITU-T H.264 HP@L4 |
| Audio               |           | ITU-T G.711 $\mu$ /a-Law (Recommend),<br>ITU-T G.722, ITU-T G.711.1 (Optional)                    |                               |                                          |