



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.3909

(11/2011)

SERIES Q: SWITCHING AND SIGNALLING

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

The framework and overview on NGN conformance and interoperability testing

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Draft New Recommendation ITU-T Q.3909

The framework and overview on NGN conformance and interoperability testing

Summary

This Recommendation describes the framework and overview on NGN conformance testing and interoperability testing. The Recommendations for the conformance testing and interoperability testing will be constructed with a single framework Recommendation and a series of Recommendations which include detailed specifications for functions, protocols, services, QoS, security & mobility testing.

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The framework and overview on NGN conformance and interoperability testing

1 Scope

This Recommendation describes the framework and overview on next generation network (NGN) conformance testing and interoperability testing. The Recommendations for the conformance testing and interoperability testing will be constructed with a single framework Recommendation and a series of Recommendations which include detailed specifications for each functions, protocols, services, QoS and security & mobility testing.

The framework Recommendation defines four step approaches as follows;

- Step 1: Define the target (service, application, protocol, function.)
- Step 2: Define specifications (Protocol, Service, QoS)
- Step 3: Define test specifications to examine tests
- Step 4: Build up test bed and examine tests

The framework Recommendation includes procedures, requirements, an architecture and base recommendations as well as a scope, references and definitions. It will be general and provide overview descriptions for NGN conformance testing and the interoperability testing.

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.

- [ITU-T X.290] Recommendation ITU-T X.290 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – General concepts.*
- [ITU-T X.291] Recommendation ITU-T X.291 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Abstract test suite specification.*
- [ITU-T X.292] Recommendation ITU-T X.292 (2002), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – The Tree and Tabular Combined Notation (TTCN).*
- [ITU-T X.293] Recommendation ITU-T X.293 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Test realization.*
- [ITU-T X.294] Recommendation ITU-T X.294 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Requirements on test laboratories and clients for the conformance assessment process.*
- [ITU-T X.295] Recommendation ITU-T X.295 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications Protocol*

- profile test specification.*
- [ITU-T X.296] Recommendation ITU-T X.296 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Implementation conformance statements.*
- [ITU-T X-Sup.4] ITU-T X-series Recommendations –Supplement 4 (2008), *ITU-T X.290-series – Supplement on generic approach to interoperability testing*
- [ITU-T X-Sup.5] R ITU-T X-series Recommendations –Supplement 5 (2008), *ITU-T X.290-series – Supplement on interoperability testing framework and methodology*
- [ITU-T Y.2012] Recommendation ITU-T Y.2012 (2006), *Functional requirements and architecture of the NGN release 1*
- [ITU-T Y.2014] Recommendation ITU-T Y.2014 (2008), *Network attachment control functions in next networks*
- [ITU-T Y.2021] Recommendation ITU-T Y.2021 (2006), *IMS for Next Generation Networks*
- [ITU-T Y.2111] Recommendation ITU-T Y.2111 (2011), *Resource and admission control functions in Next Generation Networks*
- [ITU-T Y.2211] Recommendation ITU-T Y.2211 (2007), *IMS-based real-time conversational multimedia services over NGN*
- [ITU-T Q.3900] Recommendation ITU-T Q.3900 (2006), *Methods of testing and model network architecture for NGN technical means testing as applied to public telecommunication networks*

3 Definitions

None

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ACR	Anonymous Communication Rejection
ANI	Application Network Interface
AOC	Advice Of Charge
ATS	Abstract Test Suite
CB	Communication Barring
CCBS	Completion of Communication to Busy Subscriber
CDIV	Communication DIVersion
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
COLP	COConnected Line identification Presentation
COLR	COConnected Line identification Restriction
CONF	CONFeRence
CRBT	Customized Ring-Back Tone
CRT	Customized Ringing Tone
CW	Communication Waiting

CWBS	Converged Web Browsing Services
ECT	Explicit Communication Transfer
HOLD	Communication HOLD
ICS	Implementation Conformance Statement
GW	GateWay
IMS	IP Multimedia Subsystem
IOPT	InterOPerability Testing
IPTV	Internet Protocol TeleVision
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
IXIT	Implementation eXtra Information for Testing
MCID	Malicious Communication IDentification
MDS	Managed Delivery System
MWI	Message Waiting Indication
NACF	Network Attachment Control Function
NNI	Network Network Interface
NUT	Network Unit Test
OIP	Originating Identification Presentation
OIR	Originating Identification Restriction
RC	Reverse Charging
P/S/I-CSCF	Proxy/Serving/Interrogating-Call Session Control Function
PCTR	Protocol Conformance Test Report
PETS	Parameterized Executable Test Suite
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation Extra Information for Testing
PSTN	Public Switched Telephone Network
PTS	Profile Test Specification
RACF	Resource and Admission Control Function
RC	Reverse Charging
RGW	Residential GateWay
RL	Requirements List
SCS	System Conformance Statement
SCTR	System Conformance Test Report
SDP	Service Delivery Platform
SNI	Service Network Interface

SoA	Service oriented Architecture
TIP	Terminating Identification Presentation
TIR	Terminating Identification Restriction
UE	User Equipment
UNI	User Network Interface
UPT	Universal Personal Telecommunication
VoIP	Voice over IP

5 Overview of NGN conformance testing and interoperability testing

Two kinds of test methodologies exist as a test methodology to confirm the function of NGN standard. The test methodologies are supplemented each other relation. The test methodologies are Interoperability testing and Conformance testing.

Conformance and interoperability testing are both effective and useful approaches to the testing of standardized protocol implementations, although it is unlikely that one will ever fully replace the other.

Conformance testing for NGN is able to show that a particular implementation complies with the protocol requirements specified in the associated base standard.

However, it is difficult for such testing to be able to prove that the implementation will interoperate with similar implementations in other products.

On the other hand, interoperability testing for NGN can clearly demonstrate that two or more implementations will cooperate to provide the specified end-to-end functions but cannot easily prove that either of them conforms to the detailed requirements of the protocol specification.

The purpose of interoperability testing is not only to show that target products from different manufacturers can work together, but also to show that these products can interoperate using a specific protocol.

Figure 1 shows that the fundamental elements for defining NGN conformance testing and interoperability testing specification process. These tests are actual solutions to achieve NGN interoperability. Four step approaches are described in this Recommendation.

- Step 1: Define the target (service, application, protocol, function.)
- Step 2: Define specifications (Protocol, Service, QoS)
- Step 3: Define test specifications to examine tests
- Step 4: Build up test bed and examine tests