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Harmonizacija telekomunikacij in internetnega protokola prek omrežij (TIPHON), 3. izdaja - Izdaja PICS - Preskus medobratovalnosti

Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Release PICS; Interoperability test

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Foreword

This Technical Specification (TS) has been produced by ETSI Project Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON).

Introduction

The present document describes interoperability and compatibility tests for ITU-T Recommendation H.323 [5] entities concerning the different TIPHON scenarios. It is not intended to provide an exhaustive testing of all facets of ITU-T Recommendation H.323 [5] and SCN operation. Specific configurations were chosen to provide coverage of the more common commercial deployments.

The test cases specified in this test plan must be performed on many different platforms. Therefore, specific details on *how* to perform each test are not included, only instructions on *what* information must be exchanged are included.

1 Scope

The present document defines the interoperability test specifications for the following scenarios:

- PC to PC;
- PC to Phone;
- Phone to PC;
- Phone to Phone using IP;
- PC to PC using the SCN.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] ETSI TS 101 319: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Signalling for basic calls from a H.323 terminal to a terminal in a Switched-Circuit Network (SCN)".

[2] ETSI TS 101 804 (all parts): "Telecommunications and Internet protocol Harmonization Over Networks (TIPHON) Release 3; Release PICS".

[3] ETSI TS 101 329-5: "Telecommunications and Internet protocol Harmonization Over Networks (TIPHON) Release 3; Technology Compliance Specification; Part 5: Quality Of Service (QoS) measurement methodologies".

[4] ETSI TS 101 890 (all parts): "Telecommunications and Internet protocol Harmonization Over Networks (TIPHON) Release 3; Release PICS".

[5] ITU-T Recommendation H.323 (1999): "Packet-based multimedia communications systems" (See note).

[6] ITU-T Recommendation H.225.0 (1999): "Call signalling protocols and media stream packetization for packet-based multimedia communication systems".

[7] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[8] ITU-T Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".

[9] ITU-T Recommendation G.723.1 (1996): "Dual rate speech coder for multimedia communications transmitting at 5,3 and 6,3 kit/sec".

[10] ITU-T Recommendation G.729: "Coding of speech at 8 kbit/s using conjugate structure algebraic-code-excited linear-prediction (CS-ACELP)".

[11] ITU-T Recommendation H.245 (1999): "Control protocol for multimedia communication" (See note).

NOTE: The Interoperability Testing can be performed for any version of H.323, but this specification is applicable for the versions defined in clause 6.1 of the present document.

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

A	Audio
ACF	Admissions Confirm
ARJ	Admissions Reject
ARQ	Admissions Request
D	Data
DRQ	Disengage Request
GSM	Global System for Mobile communications
IE	Information Element
IP	Internet Protocol
ISDN	Intergrated Service Digital Networks
LCF	Location Confirm
LRJ	Location ReJect
LRQ	Location Request
(P)NNI	(Private) Network to Network Interface
PSTN	Public Switched Telephone Network
QoS	Quality of Service
SCN	Switched Circuit Networks
UNI	User-Network Interface

4 Test Strategy

The purpose of interoperability testing is to test compatibility with other products, which use the same TIPHON specifications.

Interoperability testing should be performed after a vendor has completed product and system testing with its own test procedures and/or using the TIPHON Conformance Test standards as defined in TS 101 804 (all parts) [2] and TS 101 890 (all parts) [4].

When performing interoperability testing for Signalling, the vendor's test procedures should include those contained in the present document.

Speech Quality Testing is considered to be a separate activity and is not a part of interoperability testing. TIPHON Speech Quality Testing procedures are defined in TS 101 329-5 [3].

5 Overview

For set up of equipment, the present document uses a number of basic configurations. These are used to run a certain number of tests.

The basic configurations are:

1) Terminal to Terminal;

2) Telephone to Terminal;

3) Telephone to Telephone using IP as a transit Network;

4) Terminal to Terminal using SCN as a transit Network.

Using these test configurations a number of different tests are performed. For example a call first from the Telephone to the Terminal and then the other way around or using different codex.

These tests can include a variety of special features like FastConnect, or QoS.

The number of Gatekeepers involved in these configurations depends on the actual executed test.

All the call flows shown in the tables are an example flows that should be followed if possible. In some cases not all the described messages occur.

6 Prerequisites

6.1 IP related

The following prerequisites are taken from TIPHON specifications:

- ITU-T Recommendation H.323 [5] (version 3, 1999) and TS 101 319 [1] shall be used;
- ITU-T Recommendation H.225.0 [6] (version 3, 1999) Fast Connect shall be used for all calls;
- ITU-T Recommendation H.245 [11] (version 6, 1999) Tunnelling shall be used whenever H.245 messages are exchanged;
- Gatekeeper Routed Signalling is mandatory;
- H.323 Terminals shall register to the Gatekeeper using an ITU-T Recommendation E.164 [7] alias only;
- Gateways shall register to the Gatekeeper using Prefixes only;
- Endpoints shall support the **keep Alive** procedure as specified in clauses 6.2.2 and 7.4.2 of ITU-T Recommendation H.323 [5];
- When Fast Connect procedure is used, the SETUP Message shall include the **fastStart** Parameter, and the fast parameter shall be returned in exactly one message up to and including the CONNECT Message.

6.2 SCN related

To identify the different types of SCN interfaces the following shall be considered:

- If the SCN interface is an UNI interface, the gateway can play either the "role" of the user or of the network side.
- If the SCN interface is an (P)NNI interface, the gateway (or two gateways connected by the IP) can offer two types of services in principle:
  - transparent transfer of SCN Signalling across IP connections;
  - signalling interworking between SCN and IP "transit nodes".
- (P)NNIs are located between Originating, Transit and Terminating Network nodes.

7 Parameter for each test

There are some extra parameters that can be selected for each test:

7.1 Audio Codec

As TIPHON is not only focussing on the call establishment but also on the Media stream, the audio Codec should be an extra parameter that should vary from test to test:

Here is a list of all Codec that are defined in ETSI TIPHON:

- ITU-T Recommendation G.711 [8];
- ITU-T Recommendation G.723.1 [9];
- ITU-T Recommendation G.729 [10];
- GSM Full Rate;
- GSM Half Rate.

Which Codec is selected should be specified prior to the test.

7.2 Number of intermediate Gatekeepers

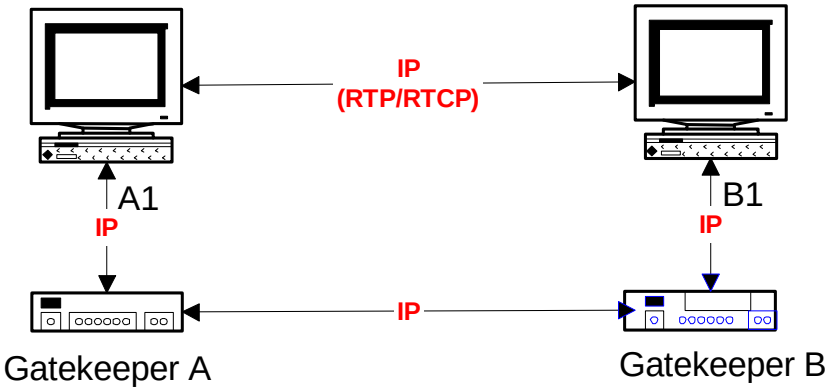
All tests can be executed with one or more Gatekeepers. The Number of Gatekeepers is just another parameter for these tests.

The description has to be extended accordingly, if more than 2 Gatekeepers are involved.

If only one Gatekeeper is participating in a scenario, simply mark the not relevant lines of the table with n.a. in the succeeded column and simply ignore them.

8 Configurations

8.1 Terminal to Terminal



NOTE: Gatekeeper B is only present in specific test cases.

Figure 1: Terminal to Terminal

All tests can be executed with one or more Gatekeepers. The Number of Gatekeepers is just another parameter for these tests.

Table 1: Terminal to Terminal

Direction	Description	Test Flow	Extra feature	Comment
A1 → B1	Successful call	8.1.1	Fast connect	TIPHON Scenario 0
B1 → A1	Successful call	8.1.1	Fast connect	TIPHON Scenario 0
A1 → B1	Successful call	8.1.3	Fast connect fallback	TIPHON Scenario 0
B1 → A1	Successful call	8.1.3	Fast connect fallback	TIPHON Scenario 0
A1 → D	Basic **un**successful call	8.1.2		TIPHON Scenario 0
B1 → D	Basic **un**successful call	8.1.2		TIPHON Scenario 0

8.1.1 Successful call from a H.323 Terminal to another H.323 Terminal

This test verifies the TIPHON Scenario-0 service where the Originating Terminal and the Terminating Terminal are registered with the same Gatekeeper or where the two Gatekeepers have a trusted relationship.

Table 2: Successful call from a H.323 Terminal to another H.323 Terminal

No.	Action	Succeeded
1	Both Terminal A1 and the Terminal B1 shall register with their respective Gatekeeper(s).	
2	Terminal A1 initiates a call using an E.164 address.	
3	Terminal A1 sends ARQ to Gatekeeper A.	
4	Gatekeeper A issues LRQ (uni/multicast) to Gatekeeper B (see note).	
5	Gatekeeper B returns LCF(see note).	
6	Gatekeeper A returns ACF.	
7	Terminal A1 sends SETUP its Gatekeeper (including fast connect options).	
8	Gatekeeper A forwards SETUP to Gatekeeper B(see note).	
9	Gatekeeper B forwards SETUP to Terminal B1.	
10	Terminating Terminal B1 performs ARQ/ACF sequence.	
11	Terminal B1 sends an ALERT Message back.	
12	The User at Terminal A1 should be informed that the other Terminal is alerting.	
13	After Terminal B1 has accepted the call, the CONNECT message should travel back to the originating Terminal A1.	
14	Media is exchanged and Media connection is evaluated.	
15	Terminal A1 terminates the call_and sends a RELEASE_COMPLETE and a DRQ to its Gatekeeper.	
16	The Gatekeeper(s) forward(s) the RELEASE_COMPLETE to the Terminal B1.	
17	The User at Terminal B1 should be informed that the remote peer terminated the call.	
18	The Terminal B1 should send the DRQ to its Gatekeeper.	

NOTE: Only present if this test is run with two Gatekeepers.

8.1.2 Unsuccessful call from H.323 Terminal to another H.323 Terminal

This test verifies the TIPHON Scenario-0 service where the Originating Terminal and the Terminating Terminal should be registered with the same Gatekeeper or where the two Gatekeepers have a trusted relationship, but the connection fails as the Terminating Terminal is not registered.