INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

M.3620

(10/92)

MAINTENANCE: ISDN

PRINCIPLES FOR THE USE OF ISDN TEST CALLS, SYSTEMS AND RESPONDERS

Recommendation M.3620

FOREWORD

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Recommendation M.3620 was prepared by Study Group IV and was approved under the Resolution No. 2 procedure on the 5th of October 1992.

CCITT NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized private operating agency.

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PRINCIPLES FOR THE USE OF ISDN TEST CALLS, SYSTEMS AND RESPONDERS

(1992)

Abstract

This Recommendation provides the general principles associated with ISDN test calls originating from a test system and terminated by a test call responder. It lays down the requirements associated with test calls and lists the facilities that should be provided by a test call responder.

Keywords

– bearer type;

– ISDN network;

– ISDN nodes;

– ISDN test calls;

– teleservice;

– test access;

– test responders;

– test systems.

1 Overview

1.1 *General principles for ISDN test calls*

It is recognized that in the ISDN environment, use of controlled maintenance techniques outlined in Recommendation M.20 [1] will indicate areas where problems exist but not necessarily enable maintenance personnel to localize faults to specific equipment. To overcome this problem, the proposed ISDN test call facility should

– enable rapid localization and diagnosis of faults without disruption to the ISDN network;

– avoid or minimise testing across sections of the ISDN network not directly associated with a failure condition;

– verify repaired equipment/restored connections before return to service;

– aid commissioning of new services;

– enable testing of new network interworking.

1.2 *Attributes of ISDN test calls*

An ISDN test call may be steered and may generate diagnostic information. Where a failure would occur with live traffic, this should be unambiguously indicated (by actual failure or a failure message).

The technician seeking to generate an ISDN test call should be able to relate types of ISDN call set-ups on which users may have experienced difficulties, to types of test calls which are available to simulate them.

2 Test calls

2.1 *Test system functions*

2.1.1 *ISDN test call capabilities*

Complex combinations of services and parameters should be transparent to the test technician who would recognize these as different types of available test calls. The following would be available:

- any particular device or routing may be selected in combination with any available ISDN service;
- any available bearer type or teleservice may be selected in combination with some appropriate supplementary service;
- any invalid test call type should be abandoned by the test facility and indicated to the test technician;
- any ISDN call which would fail in service (because of unsupported services, for instance) should either fail as a test call or clearly indicate a failure condition;
- duplicate all types of valid ISDN call set-ups;
- route on destination;
- route selectively on bearer/equipment[1)].

2.1.2 *Identify failure situations*

The ISDN test system should display clear information on an attempted ISDN call set-up. This should include

- success or failure of the ISDN test call; and optionally;
- diagnostic information;
- display of call control messages.

2.1.3 *Verification of routing*

The correct routing of an International ISDN test call should be positively confirmed to the originating maintenance personnel. This confirmation could take the form of

- a coded message returned by the ISDN test termination giving the type and location of the termination or in its simplest form;
- a recorded announcement.

2.1.4 *Network performance test*

2.1.4.1 *Transmission tests*

An ISDN test facility should provide access to the bearer(s) established in the call set-up for the following applications:

- test of continuity and integrity to CCITT standards for digital circuits;
- trial interconnection for ISDN devices;
- telephony contact between test engineers.

2.1.4.2 *Tests for other parameters*

For further study.

2.1.5 *Single end testing*

An ISDN test termination shall enable single end testing by means of digital loopback as defined in Recommendation O.11.

The test termination referred to here would be accessed as a dial-up facility.

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1) It is recognized that this facility will only be available when an ISDN test station is part of the fabric of a switching unit.

2.2 *ISDN responder equipment*

The ISDN test termination could be associated with equipment capable of

– carrying out a pre-determined sequence of interactive tests;

– returning parameters and other service information to the originating test technician.

These uses have implications for digital ATME and testing protocols under TMN, and are considered to be beyond the scope of this Recommendation.

2.3 *ISDN responder facilities*

2.3.1 *Valid test calls*

The responder should respond automatically to any available bearer type or teleservice. This may be implemented in combination with some supplementary services.

2.3.2 *Test access*

A test access responder should have the capability to terminate calls from each of the available bearer capabilities (e.g. 64 kbit/s, 3.1 kHz or speech).

2.3.3 *Return messages*

In the event of a test call being successfully routed to a responder, the responder should return an intelligible message to the originating node. The message should include

– the responder's identity;

– the bearer capability (e.g. 64 kbit/s, 3.1 kHz or speech);

– the call teleservice (e.g. G4 Fax).

The message should be returned by one of the following means:

– in signalling user information provided by ISDN signalling;

– data returned over the bearer (i.e. in-band);

– voice message over the bearer.

2.3.4 *Test system to test responder interactions*

It is anticipated that on seizure, the following sequence of events would take place:

– the ISDN circuit termination would be seized;

– the return message would be returned using one of the methods discussed in § 3.3.3;

– the digital loopback would be established on the termination if required;

– the digital loopback would be disconnected if required;

– the bearer would be held available for interworking by the local test station with the distant end if required.

3 Destination of ISDN test calls

The ISDN test call system should have the capability to generate test calls to any ISDN signalling system or variant supported by the switching centre(s) with which it is associated.

3.1 *International ISDN nodes*

Test call facilities will be located at, and will operate between, major nodes on the international ISDN. Initially, it is proposed that these should be located on the national side of international gateways or at locations which are functionally equivalent.

3.2 *Other ISDN nodes*

It is recognized that the ISDN test call facilities defined in this Recommendation have possible implications throughout the ISDN network.

The location of ISDN test call facilities in National networks is subject to

– agreement between originating and receiving administrations;

– agreement between originating and transiting administrations;

– conformance to the general principles of testing "maintenance entities" as defined in Recommendation M.20 [1].

3.3 *Confidence testing*

The routing of ISDN test calls to ISDN test terminations associated with the same switch or switching complex shall be possible for confidence and local testing purposes.

Reference

[1] CCITT Recommendation M.20 *Maintenance philosophy for telecommunications networks.*