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MAINTENANCE: ISDN

APPLICATION OF MAINTENANCE PRINCIPLES TO STATIC MULTIPLEXED ISDN BASIC RATE ACCESS

Recommendation M.3605

FOREWORD

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Recommendation M.3605 was revised 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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Recommendation M.3605

APPLICATION OF MAINTENANCE PRINCIPLES TO STATIC MULTIPLEXED ISDN BASIC ACCESS

(Melbourne 1988 as Rec. I.605; revised and renumbered in 1992)

Abstract

This Recommendation defines capabilities and functions used by the network to maintain static multiplexed ISDN basic rate access.

Keywords

– ISDN;

– maintenance;

– subscriber access;

– V_4 interface.

1 Scope of application

This Recommendation covers the maintenance of the static multiplexed basic rate access, controlled by the network, and describes the operations and maintenance aspects of the V_4 interface.

The V_4 interface is defined in Recommendation Q.512 [7]. The specification of the operations and maintenance aspects of the V_4 interface is the subject of this Recommendation.

This Recommendation follows the maintenance principles as defined in Recommendation M.20 [1] and applies to the basic rate access connected to the exchange via a static multiplexer.

The principle of controlled maintenance is applied for maintaining the static multiplexed basic rate access.

Controlled maintenance is a method of sustaining a desired technical performance by the systematic application of supervision, testing and performance sampling in order to minimize preventive maintenance and to reduce corrective maintenance.

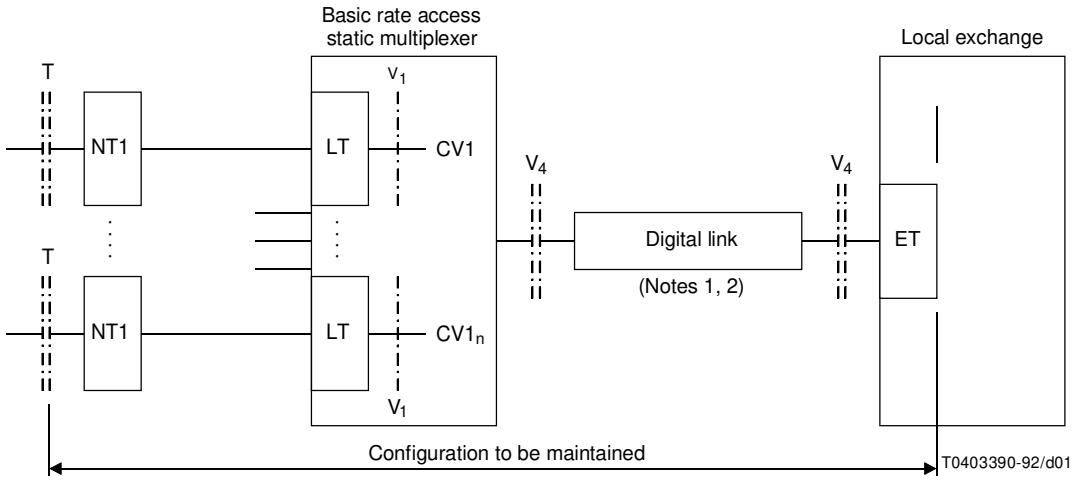
2 Network configuration for maintenance activities

Figure 1/M.3605 shows the general reference configuration of the static multiplexed basic rate access, connected via a digital link to the Exchange Termination (ET).

3 Relationship to the maintenance of the basic rate access

The same principles as given in Recommendation M.3603 [5] for the ISDN basic rate accesses directly connected to the local exchange, should be applied. Therefore, the NT1 and LT for the basic rate accesses connected via a basic rate access static multiplexer to the local exchange must have the same functions as NT1 and LT for the basic rate accesses connected directly to the local exchange.

The loopback mechanism must be implemented according to Recommendation M.3603 [5].



Note 1 – The digital link, as defined in Recommendation G.701 [2], can make use of a variety of transmission techniques and media complying with Recommendations G.703 [3] and G.704 [4].

Note 2 – The digital link may not be present (co-located configuration).

FIGURE 1/M.3605

Equipment configuration for maintenance of the static multiplexed basic rate access

In order to support these principles, operation and maintenance information has to be exchanged between the digital section for the ISDN basic rate access and the exchange termination (ET). This information is conveyed in the CV1-channel, which is defined in Recommendation Q.512 [7]. This CV1-channel is shown in Figure 2/M.3605.

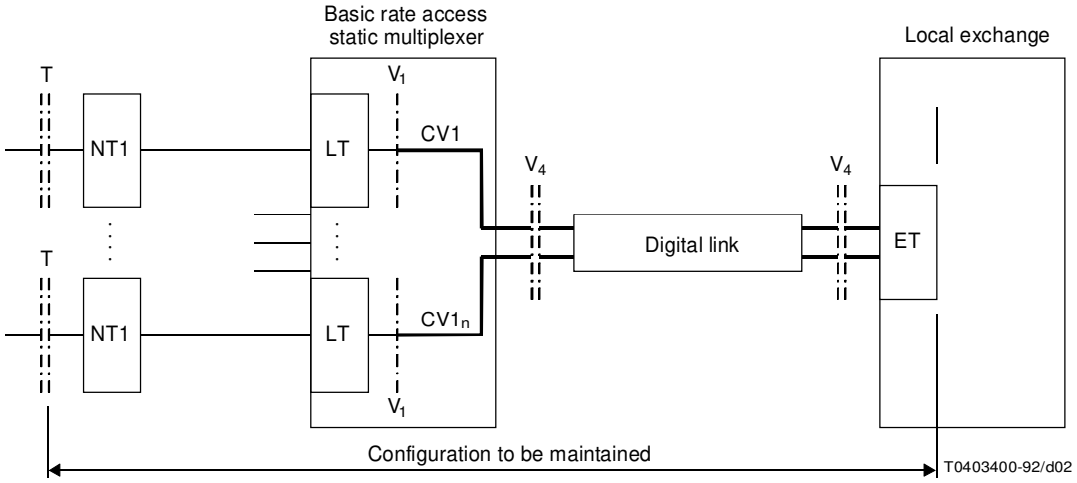


FIGURE 2/M.3605

Information exchange between the digital section for the ISDN basic rate access and the local exchange termination (ET)

The functions which are allocated within this CV1-channel are defined in Recommendation G.960 [8] on the digital section for the ISDN basic rate access.

These functions can be classified according to

– activation/deactivation procedures;
– error and status reporting to the ET;
– fault localization within the digital section for the ISDN basic rate access;
– conveyance of control information from the ET to the digital section of the ISDN basic rate access.

4 Maintenance of the digital link and basic rate access static multiplexer

4.1 *Fault detection*

Unlike the ISDN basic rate access, the digital link and basic rate access static multiplexer are always in the active state (as seen by the exchange). Continuous automatic supervision, supervising the correct functioning of layer 1 up to the basic rate access static multiplexer, is operating. This supervision is called continuous automatic supervision on layer 1.

4.1.1 *Functions applied to the ET*

The functions which are allocated to the ET are listed below:

– detection of loss of incoming signal;
– detection of loss of frame alignment;
– detection of AIS;
– detection of RAI;
– generation of the frame signal;
– CRC code generation;
– RAI generation;
– CRC monitoring of the incoming signal (basic rate access static multiplexer to the ET);
– detection of CRC error information;
– CRC error reporting (ET to the basic rate access static multiplexer) (optional);
– AIS generation.

The implementation of these functions should be the same as for the ET in the ISDN primary rate access, as defined in Recommendation M.3604 [6] for the exchange termination (ET).

4.1.2 *Functions applied to the basic rate access static multiplexer*

The functions which are allocated to the basic rate access static multiplexer are listed below:

– detection of loss of incoming signal;
– detection of loss of frame alignment;
– detection of AIS;
– detection of RAI;
– generation of the frame signal;
– CRC code generation;
– CRC monitoring of the incoming signal (network to basic rate access static multiplexer) and detection of CRC error information (if provided from the ET);
– CRC error reporting (basic rate access static multiplexer to the ET).

The implementation of these functions should be the same as for the NT2 in the primary rate access, as defined in Recommendation M.3604 [6].

In addition, the following functions are allocated to the basic rate access static multiplexer:

– sending of AIS on the V_4 interface, in case of a defect in the basic rate access static multiplexer between the V_1 reference point and the V_4 interface of the static multiplexer;

– signalling to all the basic rate accesses the condition "out of service due to failure", in the case of a defect occurring in the basic rate access static multiplexer, between the V_1 reference point and the V_4 interface of the static multiplexer, and in the digital link.

4.1.3 *Functions allocated to the digital links*

The functions, which are allocated to the digital links are:

– detection of loss of incoming signal on either end and within the digital link;

– generation and transmission of AIS within the digital link.

4.2 *System protection*

When a fault is detected in the digital link or basic rate access static multiplexer, which has an adverse effect on the availability and/or functionality of all the ISDN basic rate accesses, all the ISDN basic rate accesses connected via this digital link and basic rate access static multiplexer are considered to be "out of service due to failure" and call attempts may be rejected.

When a fault is detected in the digital link or basic rate access static multiplexer, which has an adverse effect on the availability and/or functionality of only one basic rate access, then this particular basic rate access is considered to be "out of service due to failure" and call attempts may be rejected.

4.3 *Fault information*

When a fault is detected in the basic rate access static multiplexer or digital links, this should be reported to the OAMC by a message.

4.4 *Fault localization*

When a fault is detected in the digital link, additional information for fault localization may be required from other network management entities.

4.5 *Logistic delay time*

See Recommendation M.20 [1].

4.6 *Fault correction*

See Recommendation M.20 [1].

4.7 *Verification*

The verification that the fault has been corrected is performed on demand of the OAMC.

4.8 *Restoration*

After a fault has been rectified and the correct operation of all the accesses verified (during which time the accesses will be in either the "out of service due to failure" or "degraded transmission" conditions), the accesses shall be returned to the "in service" condition. The mechanism/procedure for returning the accesses to the "in service" condition (e.g. automatic or manual) is not a subject of this Recommendation.

4.9 *Overall performance measurements*

See Recommendation M.3603 [5] for the performance related to the digital section of the basic rate access, and Recommendation M.3604 [6] for the V_4 digital section.

References

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

[2] CCITT Recommendation G.701 *Vocabulary of digital transmission and multiplexing, and pulse code modulation (PCM) terms*.

[3] CCITT Recommendation G.703 *Physical/electrical characteristics of hierarchical digital interfaces*.

[4] CCITT Recommendation G.704 *Functional characteristics of interfaces associated with network nodes*.

[5] CCITT Recommendation M.3603 *Application of maintenance principles to ISDN basic rate access*.

[6] CCITT Recommendation M.3604 *Application of maintenance principles to ISDN primary rate access*.

[7] CCITT Recommendation Q.512 *Exchange interfaces for subscriber access*.

[8] CCITT Recommendation G.960 *Digital section for ISDN basic rate access*.