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**INTEGRATED SERVICES DIGITAL
NETWORK (ISDN)**

OVERALL NETWORK ASPECTS AND FUNCTIONS

**ISDN NETWORK CAPABILITIES
FOR THE SUPPORT OF THE
TELEACTION SERVICE**

ITU-T Recommendation I.376

(Previously "CCITT Recommendation")

FOREWORD

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation I.376 was prepared by ITU-T Study Group 13 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 19th of March 1995.

NOTE

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

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SUMMARY

Teleaction in ISDN is a future alternative to dedicated alarm network and modem based solutions of today. The solutions for teleaction applications today are mostly proprietary. The harmonization of service parameters and classes of security has not been specified by ITU-T (former CCITT), but by the International Electrotechnical Committee (IEC). The dedicated teleaction network were made to offer a service with better security than the one offered by solutions based on PSTN technology.

The advantages of implementing such applications in ISDN are:

- the customer access is expected to be less expensive in the case where the ISDN access is used for several services;
- operation, administration and maintenance can be integrated more easily with other services;
- the user-network interface will be standardized;
- teleaction applications can be combined with other ISDN services into new applications (e.g. Teleaction and Videophony).

The purpose of this Recommendation is to describe the ISDN network capabilities required for the provision of teleaction teleservice in an ISDN environment.

Recommendation I.376**ISDN NETWORK CAPABILITIES FOR THE SUPPORT
OF THE TELEACTION SERVICE***(Geneva, 1994)***0 Scope**

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1 Introduction

Teleaction in ISDN is a future alternative to dedicated alarm networks and modem based solutions of today. The solutions for teleaction applications today are mostly proprietary. The harmonization of service parameters and classes of security has not been specified by ITU-T (former CCITT), but by the International Electrotechnical Committee (IEC). The dedicated teleaction networks were made to offer a service with better security than the one offered by solutions based on PSTN technology.

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2 Abbreviations

For the purposes of this Recommendation, the following abbreviations apply:

CRF	Connection Related Functions
DSS1	Digital Subscriber Signalling System No. 1
EUT	End User Terminal
FMBS	Frame Mode Bearer Service
HLF	High Layer Functions
ISDN	Integrated Services Digital Network
SPT	Services Provider Terminal
TMF	Teleaction Management Function
USBS	User Signalling Bearer Service

3 Objectives of Teleaction

The Teleaction teleservice consists of a class of applications characterized by a number of basic properties:

- they are interactive applications;
- they have normally a low throughput as compared to the traditional information transfer rate of ISDN-channels;
- they involve very short messages between terminals and usually a single host;
- they involve a large number of low cost terminals;

- they require protection against unauthorized access and modification of messages;
- they require a supervised mode of information transfer providing at least some error protection;
- they have stringent requirements on the response time to individual transactions, and the availability/reliability of the service.

The applications of the Teleaction teleservice in ISDN may be divided into two broad categories, each with its own network implications and specific security functions. These two categories are:

- 1) applications without other specific requirements regarding service reliability and security functions than those offered by the bearer service, called hereafter non-sensitive applications; and
- 2) applications with additional security and reliability requirements, called hereafter sensitive applications.

Applications of the Teleaction teleservice are for example:

- telemetry;
- remote process control;
- meter reading;
- alarm surveillance; and
- funds transactions.

Several levels of security will have to be regarded in providing Teleaction teleservice in ISDN, ensuring reliable communication paths between end-users and between end-users and service providers, preventing from unauthorized access to protected data. This may require the introduction of a Teleaction Management Function (TMF) within the basic ISDN-network. Clause 4 describes network-based basic functions and higher layer messaging transport protocols for this purpose.

4 Functional requirements

For some Teleaction applications, a separate unit called the Teleaction Management Function (TMF) within the public ISDN network, fulfils two major security requirements. The TMF ensures that the relevant application/terminal is functioning, and that any disruption of service is immediately reported to the Service Provider Terminal or to the associated end-user terminal. The TMF also authenticates both the user terminals and the service provider terminal. ISDN does not offer today any dedicated mechanism guaranteeing that the terminal (EUT or SPT) has not been replaced by a fake. In addition, network status information may be offered by the TMF to the SPT.

If the service provider operates through the Packet Switched Data Network or a dedicated network, the TMF is considered to be the interworking unit, and is required to perform adequate protocol translation. This clause outlines the functional requirements considered to be important to Teleaction applications, independently of where these functions are allocated. The following basic functions have been identified:

- 1) application-independent secure teleaction message delivery service from a terminal to a service provider and vice versa;
- 2) protection against active attacks such as terminal replacement, terminal emulation, message modification or deletion, or spurious connection initiation;
- 3) message broadcasting from a service provider to a predefined number of destinations, e.g. for energy consumption monitoring and control;
- 4) notification to the service provider of any loss, modification or deletion of messages;
- 5) secure and permanent terminal monitoring, for example the detection of any deliberate disconnection by an intruder of the line between terminal and the TMF, with immediate notification to the service provider of a terminal being considered inactive;
- 6) fast message delivery according to predefined priority levels, ensuring for example the overriding of any alarm message over funds transactions or low priority alarm messages;
- 7) protection against disclosure of message content to a third party according to a predefined message sensitivity level;