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INTEGRATED SERVICES DIGITAL NETWORK (ISDN)

SERVICE CAPABILITIES

TELEACTION STAGE ONE SERVICE DESCRIPTION

ITU-T Recommendation I.241.8

(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.241.8 was prepared by ITU-T Study Group 1 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 3rd of October 1995.

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NOTE

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

CONTENTS

SUMMARY

In accordance with Recommendation I.130 [1], the following three-level structure is used to describe the telecommunication services:

–   Stage 1 is an overall service description, from the user's standpoint;

–   Stage 2 identifies the funcitonal capabilities and information flows needed to support the service described in stage 1;

–   Stage 3 defines the signalling system protocols and switching functions needed to implement the service described in stage 1.

This Recommendation relates to stage 1 (overall service description) for the teleaction service in the ISDN.

Recommendation I.241.8

TELEACTION STAGE ONE SERVICE DESCRIPTION

(Geneva, 1995)

1 Scope

This Recommendation defines the stage 1 of the teleaction service for the Integrated Services Digital Network (ISDN) as provided by the public telecommunication operators or recognized operating agencies. Stage 1 is an overall service description from the user's point of view (see Recommendation I.130 [1]), but does not deal with the details of the human interface itself.

This Recommendation defines the interworking requirements for teleaction services supported by networks other than ISDN with the teleaction services described in this Recommendation.

This Recommendation does not specify the additional requirements where the service is provided to the user via a telecommunications network that is not ISDN but does include interworking requirements of other networks with the public ISDN.

Charging principles are outside the scope of this Recommendation.

This Recommendation is applicable to the stage 2 and stage 3 Recommendations for the ISDN teleaction service. The terms "stage 2" and "stage 3" are defined in Recommendation I.130 [1]. Where the text indicates the status of a requirement (i.e. as strict command or prohibition, as authorization leaving freedom, or as a capability or possibility), this shall be reflected in the text of the relevant stage 2 and stage 3 Recommendations.

Furthermore, conformance to this Recommendation is met by conforming to the stage 3 Recommendation with the field of application appropriate to the equipment being implemented. Therefore, no method of testing is provided in this Recommendation.

2 Normative references

The following 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: all 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.

[1]   CCITT Recommendation I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN.*

[2]   CCITT Recommendation I.112 (1988), *Vocabulary terms for ISDNs.*

[3]   CCITT Recommendation I.210 (1988), *Principles of telecommunication services supported by an ISDN and the means to describe them.*

[4]   CCITT Recommendation Q.9 (1988), *Vocabulary of switching and signalling terms.*

[5]   CCITT Recommendation X.2 (1988), *International data transmission services and optional non facilities in public data networks and ISDNs.*

[6]   CCITT Recommendation X.25 (1988), *Interface between Data Terminal Equipment (DTE) and Data circuit-terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit.*

[7]   ITU-T Recommendation I.431 (1993), *Primary rate user-network interface – Layer 1 specification.*

[8]   ITU-T Recommendation I.430 (1993), *Basic user-network interface – Layer 1 Specification.*

[9]   ITU-T Recommendations Q.920/I.440 (1993), *Digital Subscriber Signalling System No. 1 (DSS 1) – ISDN user-network interface data link layer – General aspects* and Q.921/I.441 (1993), *ISDN user-network interface – data link layer specification.*

[10]   CCITT Recommendation I.450 (1988), *ISDN user-network interface layer 3 – General aspects.*

3   Definitions and abbreviations

3.1   Definitions

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

3.1.1   integrated services digital network (ISDN): See 2.3/I.112 [2], definition 308.

3.1.2   service; telecommunication service: See 2.2/I.112 [2], definition 201.

3.1.3   supplementary service: See 2.4/I.210 [3].

3.2   Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

BNP	Basic Network Provider
CSPDN	Circuit Switched Public Data Network
DTN	Dedicated Teleaction Network
EU	End User
EUT	End User Terminal
PSPDN	Packet Switched Public Data Network
PSTN	Public Switched Telephone Network
ROA	Recognized Operating Agency
SP	Service Provider
SPT	Service Provider Terminal
TMF	Teleaction Management Function
TMFP	Teleaction Management Function Provider
USBS	User Signalling Bearer Service

4   Description and terminology

4.1   General description

Teleaction is a teleservice providing for reliable low volume data communication and allied processing service to the users. The teleaction service may be used for applications such as:

–   monitoring;

–   indicating;

–   controlling;

–   verifying,

of remote events, operations and measurements.

The teleaction teleservice allows the users to be provided with teleaction applications. The resulting communication can take place either between an EU and a SP, between EUs, or between SPs (see 4.2). A two-way simultaneous information transfer shall be continuously available during the information transfer phase. This shall apply also in such cases where only one-way information transfer is required by the application. The teleaction teleservice specified hereafter is based on the existence of a TMF in the network. Teleaction services using other telecommunication means are outside the scope of this Recommendation.

EUs and SPs shall access the network via ISDN S/T reference point using standardiized protocols defined for teleaction[1].

The applications of the teleaction teleservice can be divided into two basic 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, i.e. *non-sensitive* applications.

2) Applications with additional security and reliability requirements, i.e. *sensitive* applications.

Hence, several levels of reliability and security shall be offered with the teleaction service in order to ensure reliable communications paths between communicating parties and to prevent unauthorized data traffic or unauthorized access to user data. To achieve this goal, TMFs shall be either added to the basic ISDN network or shall be assigned to a separate entity. The level of reliability and security shall be application dependent (see 8.4.3). Transmission delay shall conform to the delay categories defined in 8.4.1 as appropriate for the service application.

4.2 Specific terminology

The context used for the definition of these items shall be as outlined in Annex A.

4.2.1 basic network provider (BNP): The one responsible for the installation and the maintenance of the network supporting the teleaction service.

4.2.2 teleaction management function provider (TMFP): The one responsible for the installation and maintenance of one or more of the TMFs. A TMFP may be the same as the BNP.

4.2.3 teleaction management function (TMF): Set of network functions added to either the basic ISDN or assigned to a separate entity. The tasks of the TMF are:

–   ensure reliable communication paths between the EUTs and the SPT, i.e. to ensure available and secure access for the EUTs to the network and communication paths for the SPT in the ISDN, respectively;

–   authorization of connected EUTs;

–   EUT functionality check;

–   address the appropriate EUT/SPT for transfer of information generated by SPT/EUT.

The TMF executes these functions by polling the EUTs and the SPTs[2,3,4]. The TMF stores status information obtained through the polling procedures. Depending on the application, EUT status information may be sent to the SPT either on request or immediately after a change of status has occurred.

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, therefore, required to perform adequate protocol translation/conversation.

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[1] SPs may be connected to networks other than ISDN. Interworking with these networks will then be necessary.

[2] In this description it is expected that all information transfer between an EUT and an SPT is routed via a TMF. This will allow the TMF to verify that an EUT – SPT communication path is available. However, paths directly between EUT and SPT may also be used if the TMF can verify that such a path is available. This is outside the scope of this Recommendation (see also Footnote 3).

[3] It is expected that the basic ISDN at a later phase will include maintenance functions which may be used to ensure reliable communications paths between EUTs and SPTs (e.g. maintenance of subscriber access). The TMF may take advantage by using these functions after they will have become available. The ISDN maintenance functions are outside the scope of this Recommendation.

[4] The possibility of performing TMFs by means other than polling, e.g. reporting procedures is outside the scope of this Recommendation.

Authorization and functionality check of the SPT are outside the scope of this Recommendation.

4.2.4   end user (EU): The one to whom a teleaction application service is provided or who is affected by that application service.

4.2.5   service provider (SP): The one who, by using one or more TMFs, provides a teleaction application service to one or more EUs.

> NOTE – The SP may be the BNP, the TMFP, or another organization responsible for one or more SPT.

4.2.6   end user terminal (EUT): A device (or location of a device) that, depending on the application (e.g. by monitoring of subdevices):

–   on the basis of local conditions or by interrogation, generates information and presents this information for transmission by the network to an SP;

–   receives information from an SP in order to affect local conditions;

–   upon polling requests received from a TMF executes the requested local actions (e.g. authorization, functionality checks, etc.) and sends appropriate responses to the TMF.

4.2.7   service provider terminal (SPT): A device (or location of such a device) which, depending on the application:

–   receives information from one or more EUTs for handling and processing in accordance with the application service offered by the SP;

–   generates control messages and information requests and presents that information for transmission to one or more EUTs;

–   monitors EUTs on the network, either by retrieving EUT status information stored in TMFs, and/or by receiving status information automatically from TMFs (e.g. alarms);

–   receives polling requests from TMFs and sends appropriate responses to the TMF. Execution of local procedures such as authorization and functionality check are outside the scope of this Recommendation.

4.2.8   end user (EU) access capability: The telecommunication means used between an EUT and a TMF (e.g. ISDN bearer service, dedicated connection, etc.).

4.2.9   service provider terminal (SPT) access capability: The telecommunication means used between an SPT and a TMF, (e.g. ISDN bearer service, dedicated connection, etc.).

4.2.10   teleaction application: The teleaction application is one specific application offered by a service provider using the teleaction service.

5   Procedures

The context used when defining these procedures is outlined in Annex A.

5.1   Provision and withdrawal

> NOTE – BNP and TMFP can be different organizations.

The teleaction teleservice shall be provided by the BNP on demand of one of the two linked parties with the assent of the other party.

The teleaction teleservice shall be withdrawn, if requested by one party, by the BNP or for administrative reasons.

5.2   Normal procedures

5.2.1   Activation, deactivation and registration

a)   *Activation*

Activation of the teleaction teleservice shall be performed by the BNP.

Activation of the teleaction teleservice shall make the necessary access capabilities available to both the EU and the SP (bearer service, dedicated connections, etc.) and shall also include activation of the TMF (starts EUT polling, etc.)[5]. The operation of the TMF shall be as described in 5.2.2.

NOTE – As seen from the EU, activation of the teleaction teleservice makes the teleaction application supported by the SP available to the user (ready for invocations, e.g. send an alarm).

As seen from the SP, the teleaction application shall be made available through the network. Thereafter teleaction application supported by the SP can be made available (activated) for each specific EU subscribing to the teleaction teleservice.

b) *Deactivation*

Deactivation of the teleaction teleservice shall be performed by the BNP.

As a service provider option, the EU can have the possibility to dynamically deactivate/activate the teleaction service.

c) *Registration*

As a TMFP option registration procedures may exist to enable the EU to choose the level of reliability, security and/or transmission delay as well as the EUT polling intervals used by the TMF. For some applications one or more of these levels may be fixed at provision time and may not be individually set (or reset) by the EU.

Registration procedures for SPs are outside the scope of this Recommendation.

5.2.2 Invocation and operation

a) *Originating the service (call establishment)*

The establishment of communication between an EUT and an SPT happens in two phases[6]:

–   Phase 1: Establishment of a communication path between EUT and TMF and a communication path between SPT and TMF[7].

–   Phase 2: Establishment of a communication path between EUT and SPT using the two communication paths established in phase 1.

The originating party can be the EUT or the SPT (application and situation dependent). EUT, SPT, or TMF may initiate phase 1 establishment. EUT or SPT may initiate phase 2 establishment.

The two phase 1 communications paths can have different modes, and shall be independent from the mode used for the phase 2 path.

Phase 1 establishment, EUT-TMF and SPT-TMF:

–   Permanent connection: Establishment shall take place at activation time (at the latest).

–   Establishment on demand: Establishment shall take place at call request time if not already established[8], [9].

Phase 2 establishment, EUT-SPT:

–   Permanent connection: This is outside the scope of this Recommendation;

–   Establishment on demand: Establishment takes place at call request time.

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[5]   If a permanent connection shall be used to/from the TMF, this connection shall (at the latest) be established at activation time.

[6]   All information transfer between an EUT and an SPT is routed via a TMF (TMF), see Footnote 2 in 4.2.

[7]   A phase 1 communication path between an SPT and a TMF may be used for several phase 2 communication paths.

[8]   The phase 1 communication paths are also used for "local" traffic between TMF and EUT/SPT (i.e. polling) and may therefore be established even if no EUT-SPT communication is currently going on.

[9]   EUT and SPT may initiate local alternative procedures. However, these local procedures are outside the scope of this Recommendation.

b) *Call acceptance*

This subclause shall only apply to the situation where non-permanent connection oriented communication paths are used. Under normal conditions an EUT, an SPT, or a TMF shall not reject a call request. This shall depend on the actual application and the subscribed/chosen level of service availability.

c) *Information transfer phase*

Information shall be transmitted between EUT and SPT by using specific service data units named teleaction messages. The format of teleaction messages shall be independent of the application and the type of communication paths used [see point a)].

> NOTE – Application dependent protocols are used between the EUT and the SPT to provide/"execute" the teleaction application.

d) *Call release*

This subclause shall only apply to the situation where non-permanent connection oriented communication paths are used. Both phase 1 and phase 2 communication paths shall be released [see point a)], and the release shall be initiated by the EUT and/or SPT. The TMF may also release a phase 1 communication path as long as this path is currently not used by any phase 2 communication path.

Normally, the phase 2 communication path shall be released before one or both of the phase 1 communication paths are released[10].

e) *TMF operation*

The main purpose of the TMF shall be to add reliability/security to the teleaction service. Procedures between EUT and TMF:

– after activation TMF will start polling the EUT (see also Footnote 4 of 4.2);

– depending on the application various polling intervals may be offered;

– the polling is used for:

   • testing the availability of the communication path between TMF and EUT, including the user-network access used by the EUT;

   • authorization of EUT (to prevent any kind of misuse);

   • functionality check of EUT (detect malfunction). The TMF stores the status information obtained by the polling procedure.

Procedures between SPT and TMF:

– after its activation the TMF will start polling the SPT;

– depending on the application various polling intervals may be offered;

– polling is used for:

   • testing the availability of the communication path(s) between TMF and SPT, including the user-network access used by the SPT;

   • authorization and functionality check of the SPT are for further study;

– on request from the SPT, the TMF sends EUT status information to the SPT.

As described in 5.2.1, the TMF shall activate these procedures when the teleaction service is activated. The phase 1 communication paths [as described in point a)] shall be used for transmitting the polling messages.

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[10] It may also be possible to keep a phase 2 communication path, i.e. a logical relation between an EUT and an SPT without currently having the supporting phase 1 communication paths. However, in these cases the needed phase 1 communication paths have to be established before information can be transported between EUT and SPT.

The procedures shall run independently of the availability of a teleaction application service [i.e. communication between the EUTs and the SPT. See also point a)]. The TMF will serve as a routing function when information is sent between EUTs and SPT.

As a service provider option, polling can be done end-to-end where the SPT polls the EUTs connected to the SPT. In this case the pollings and reponses to the polling shall be transported transparently through the TMF.

5.2.3 Interrogation

As a teleaction management function interrogation procedures shall exist as a service provider option to enable an EU or an SP to determine the current level of reliability, security, delay, or other types of service status information.

5.3 Exceptional procedures

5.3.1 Activation, deactivation and registration

a) *Activation*

Depending on the application, a failure of an activation attempt shall be indicated to the relevant parties (i.e. EU and/or SP).

b) *Deactivation*

If, at anytime, the service becomes deactivated or unavailable a fault alarm situation has occurred which shall be handled as described in 5.3.4.

As described in 5.2.1, deactivation can optionally be provided as normal procedure.

c) *Registration*

Failure of a registration attempt shall be treated as a system alarm situation as described in 5.3.4.

5.3.2 Invocation and operation

a) *Call establishment*

This subclause shall only apply to the situation where non-permanent connection oriented communication paths are used. Unsuccessful call establishment shall be indicated to the calling party (EU or SP). The calling party (or the TMF for phase 1 communication paths) can then repeat the call request once or more times, depending on the actual application. If no communication path between the EUT and the SPT can be established, a fault alarm situation shall occur which is handled as described in 5.3.4.

b) *Information transfer phase*

During the information transfer phase a fault alarm situation shall occur when:

–   the communication path used between EUT and SPT becomes unavailable (unexpected disconnection, blocking, etc.);

–   information becomes corrupted or lost during transmission;

–   abnormal signalling occurs;

–   or any other fault occurs which prevents correct operation of the teleaction service.

Fault alarm situations shall be handled as described in 5.3.4. Recovery procedures which may be invoked to restart the communication between EUT and SPT are outside the scope of this Recommendation.

c) *Call release*

No exceptional procedures are identified in this phase.

d)   *TMF operation*

Exceptional procedures between EUT and TMF:

–   A fault alarm situation shall occur when the TMF detects through polling of the EUT that:

- the communication path between EUT and TMF is not available;

- no EUT is present (or not responding);

- a non-authorized EUT has replaced the authorized EUT;

- EUT functionality check fails.

Exceptional procedures between SPT and TMF:

–   A fault alarm situation shall occur when the TMF detects through polling of the SPT that:

- the communication path(s) between SPT and TMF is not available;

- no SPT is present (or the SPT is not responding).

SPT authorization and SPT functionality check are outside the scope of this Recommendation.

Fault alarm situations are handled as described in 5.3.4.

5.3.3   Interrogation and editing

No exceptional procedures identified.

5.3.4   Handling of system fault situations

System faults described here are situations where the teleaction service becomes unavailable or does not operate correctly.

A system fault situation shall be detected by either:

–   the TMF;

–   the SPT; or

–   the EUT.

A system fault situation can be the result of a report or indication from the basic ISDN network (e.g. disconnection of communication paths used).

As a general rule, the one who detects the fault situation should send an alarm signal to the communicating parties. This shall make all parties aware of the fault situation, and each party may initiate predefined fault handling procedures (see Footnote 9 of 5.2.2). Fault report delay classes are defined in 8.4.3.

However, situations may occur where it is not possible for the one who detects the fault situation to send an alarm signal to the other parties (e.g. no communication path available). In these cases, as a service provider option, the alarm information can be stored locally and sent when possible. For the TMF-SPT communication path alternative routing is possible as a service provider option.

As another service provider option procedures may be used where fault alarm situations are detected but the alarm information is only sent on request from the communicating party. This applies for TMF which may be requested by SPT to send all stored EUT status information.

6   Interworking and intercommunication requirements

The EUT, TMF and SPT shall also be considered valid for networks different from ISDN[11]. Hence, the following interworking scenario as shown in Figure 1 can be identified, where interworking with the ISDN shall be mandatory and the other possibilities shall be TMFP options.

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[11]   Data over voice connections and dedicated lines are considered part of dedicated teleaction networks.
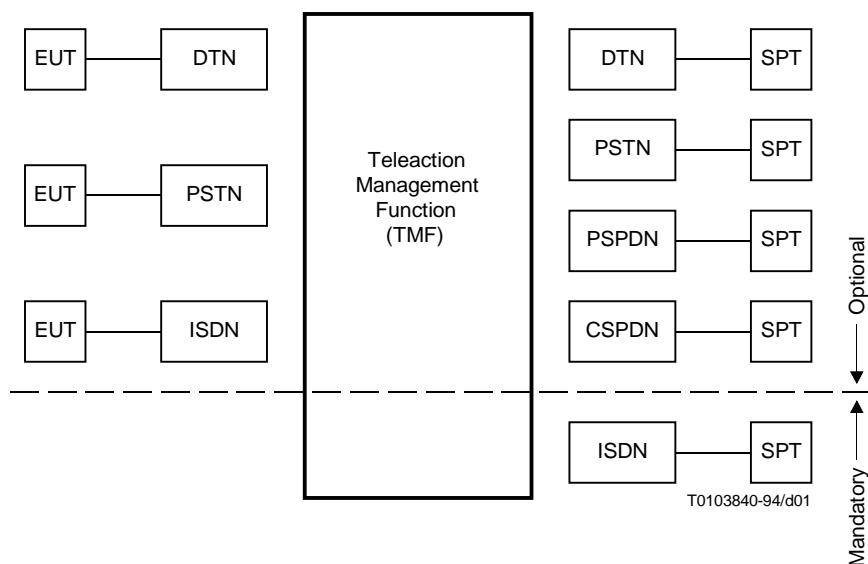
FIGURE 1/I.241.8

Teleaction interworking scenario

7 Applicability of supplementary services

Not applicable. Attributes of supplementary services are given in 8.3.

8 Teleaction service attributes and values

A synopsis of the teleaction service attributes and values is contained in Table 4.

8.1 Low layer attributes

8.1.1 Information transfer attributes

8.1.1.1 Information transfer mode

Circuit switched mode, frame mode, or packet mode.

8.1.1.2 Information transfer rate

Depending on the supporting network and complying with Recommendation X.2 [5].

8.1.1.3 Information transfer capability

Unrestricted.

8.1.1.4 Structure

Service data unit integrity.

8.1.1.5 Establishment of communication

Asynchronous on demand.

8.1.1.6 Symmetry

Bidirectional symmetric.

8.1.1.7 Communication configuration

Point-to-point between the SPT and the TMF and between EUT and TMF. Broadcasting of information may optionally be offered by the TMFP.

8.1.2 Access attributes

8.1.2.1 Access channel and rate

B-channel 64 kbit/s, D-channel 16 kbit/s, D-channel 64 kbit/s.

8.1.2.2 Signalling access protocol layer 1

As per Recommendations I.431 [7] and I.430 [8].

> NOTE – Depending on the application, the layer 1 at the user-network interface may need permanent activation.

8.1.2.3 Signalling access protocol layer 2

For the purpose of teleaction services, the layer 2 protocol in the D-channel shall have the following properties:

–   semi-permanent layer 2 link (method 1) or on demand layer 2 protocol (method 2);

–   continuous monitoring of the layer 1 readiness and availability.

8.1.2.4 Signalling access protocol layer 3

None.

8.1.2.5 Information access protocol layer 1

As per Recommendations I.431 [7] and I.430 [8].

8.1.2.6 Information access protocol layer 2

As per Recommendations Q.920/I.440 and Q.921/I.441 [9].

8.1.2.7 Information access protocol layer 3

As per Recommendation X.25, layer 3, PVC [6].

8.2 Higher layer attributes

8.2.1 Type of user information

System dependent.

8.2.2 Layer 4 protocol functions

System dependent.

8.2.3 Layer 5 protocol functions

System dependent.

8.2.4 Layer 6 protocol functions

System dependent.

8.2.5 Layer 7 protocol functions

System dependent.

8.3 General attributes

Supplementary services provided are not described in this Recommendation.

8.4 Quality of Service

The teleaction service shall provide a secure and reliable telecommunication and processing service to the users. The service shall include facilities to:

–   ensure available communication paths between EUTs and SPTs;

–   prevent corruption, blocking, loss, or tapping of information during its transfer;

–   prevent unauthorized data traffic and data sources;

–   ensure that the time delay for information transfer does not exceed a specific limit.

The availability of the teleaction service shall not only include the availability of communication paths but also shall include the availability support granted by the SP.

TMFs are added to the basic ISDN network in order to get the required quality of the teleaction service.

As a matter of arrangement between the teleaction management function provider and the basic ISDN operator, the basic ISDN shall provide reliable and secure communications paths (bearer services, connections) between the EUT and TMF and between the SPT and TMF.

8.4.1   Transmission delay

The transmission system response delay shall not exceed the limits given in Table 1.

TABLE 1/I.241.8

Transmission system response delay

Delay category	Transmission delay (seconds)				
	D0	D1	D2	D3	D4
Arithmetic means of all transmissions		120	60		10
Upper 95 percentile for all transmissions	240	240	80	30	15
Maximum acceptable delay		480	120	50	20

8.4.2   Availability

See Table 2.

TABLE 2/I.241.8

Availability

Class	A1	A2	A3	A4
Availability of the total teleaction network during a period of 12 months	97%	99.3%	99.5%	99.8%
Monthly availability	75%	91%	95%	98.5%

The availability shall be equal or better than the values shown in Table 2.

8.4.3   Fault report delay

The maximum period from the instant the fault develops in the teleaction system until the fault information is reported to the alarm receiving centre shall not exceed the limits shown in Table 3.

TABLE 3/I.241.8

Fault report delay

Class	T1	T2	T3	T4
Maximum period	32 d	25 h	65 m	20 s

TABLE 4/I.241.8

Teleaction service attribute

Information transfer attributes	Circuit	Frame mode	Packet mode
1 Information transfer mode			
2 Information transfer rate throughput	64 [kbit/s] Other values for further study	For further study	According to Recommendation X.2
3 Information transfer capability	Unrestricted digital information		
4 Structure	Service Data Unit (SDU) integrity	SDU integrity	SDU integrity
5 Etablishment of communication	Asynchronous on demand		
6 Symmetry	Bidirectional symmetric		
7 Communication configuration	Point-to-point	Point-to-multipoint	Broadcast
8 Access channel and rate	B (64 kbit/s)	D (16 or 64 kbit/s)	Outside the scope of this Recommendation
9.1 Signalling access protocol layer 1	Recommendation I.430/I.431 (may use permanent activation)		Outside the scope of this Recommendation
9.2 Signalling access protocol layer 2	Recommendation I.440/I.441		Outside the scope of this Recommendation
9.3 Signalling access protocol layer 3	Recommendation I.450 [10]		Outside the scope of this Recommendation
9.4 Information access protocol layer 1	Recommendation I.430/I.431		Outside the scope of this Recommendation
9.5 Information access protocol layer 2	Recommendation I.440/I.441		Outside the scope of this Recommendation
9.6 Information access protocol layer 3	Recommendation X.25, layer 3, PVC		Outside the scope of this Recommendation
High layer attributes			
10 Type of user information	System dependent		
11 Layer 4 protocol	System dependent		
12 Layer 5 protocol	System dependent		
13 Layer 6 protocol	System dependent		
14 Layer 7 protocol	System dependent		
General attributes			
15 Supplementary services	Outside the scope of this Recommendation		
16 Quality of service	See 8.4		
NOTE – The requirements for the pure integrated ISDN solution are for further study.			

Annex A

Context used for teleaction service description

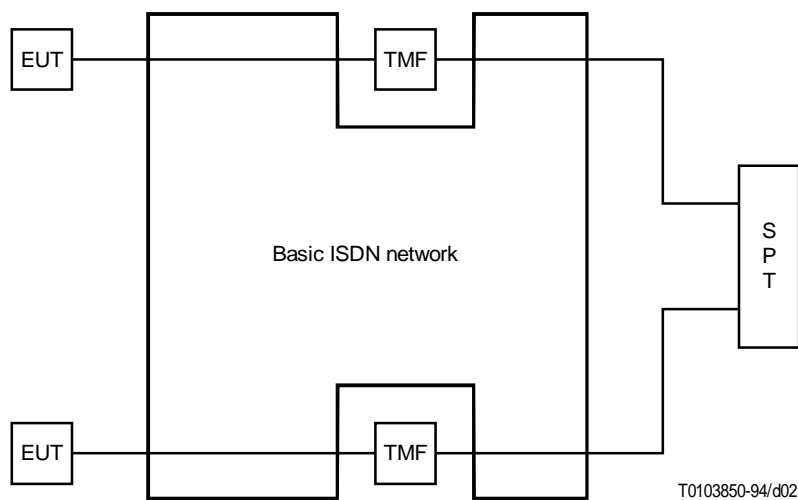(This annex forms an integral part of this Recommendation)

FIGURE A.1/I.241.8

Figure A.1 shows the context used when one teleaction application service is offered to the users:

– SPT provides the application to the EUTs by using one or more TMFs;

– one EUT communicates with one or more SPTs via one TMF;

– one TMF may support one or more EUTs;

– one TMF communicates with one or more SPTs.

One should especially note the following:

– If the EU wants to communicate with more than one SPT and/or more than one TMF, the user must use separate EUTs from the service point of view (the separate EUTs will be handled as logically independent devices, but may be implemented in the same physical terminal equipment).

– Several TMFs may be implemented in the same physical device and thereby be able to communicate with more than one SPT (and hence different types of EUTs). However, from the service point of view, each TMF is still handled independently.

The context where one EUT communicates with several SPTs is outside the scope of this Recommendation.

Some TMF functions are of a kind that they may be used as functions for several teleaction application services, e.g. testing of EU's subscriber access does not necessarily need to be executed separately for each application. However, this kind of harmonization between different applications is outside the scope of this Recommendation.