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**INTEGRATED SERVICES DIGITAL
NETWORK (ISDN)**

OVERALL NETWORK ASPECTS AND FUNCTIONS

B-ISDN FUNCTIONAL ARCHITECTURE

ITU-T Recommendation I.327

(Previously "CCITT Recommendation")

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. 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, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation I.327 was revised by the ITU-T Study Group XVIII (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

2 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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Recommendation I.327**B-ISDN FUNCTIONAL ARCHITECTURE***(Geneva, 1991; revised Helsinki, 1993)***1 Introduction**

The general functional architecture model for the ISDN is described in Recommendation I.324. The concepts and associated definitions adopted in Recommendation I.324 also apply to the B-ISDN, i.e. reference configurations, functional group, reference points.

The objective of this Recommendation is to provide a basic functional architecture of the B-ISDN to complement Recommendation I.324. The model is not intended to require or exclude any specific implementation of the B-ISDN but to provide a guide for the specification of B-ISDN capabilities.

Recommendation I.310 describes the functions of an ISDN. These functions are by their nature static (i.e. time-independent). The relative distribution and allocation of these functions is the subject of the architecture of the ISDN and is described in this Recommendation. The dynamic aspects of these functions are modelled in Recommendation I.310 as executive processes.

Therefore, the key components in this architecture model are: the functions which are contained in the B-ISDN, where they are located and the relative topology for their distribution in the B-ISDN.

2 General architecture of the B-ISDN

In B-ISDN implementations some of the B-ISDN functions will be implemented within the same network elements, whereas other specific B-ISDN functions will be dedicated to specialized network elements. Various different B-ISDN implementations are likely to be realized depending on national conditions.

A basic component of the B-ISDN is a network for asynchronous transfer mode (ATM) switching of both constant bit rate (CBR) and variable bit rate (VBR) end-to-end connections. These connections will support 64 kbit/s based ISDN services.

3 Architectural aspects of the B-ISDN

The basic architectural model defined in Recommendation I.324 is complemented as shown in Figure 1. This shows the main information transfer and signalling capabilities of the B-ISDN.

The architecture of the B-ISDN includes low Layer capabilities and high Layer capabilities. These capabilities support services within the B-ISDN and within other networks by means of interworking B-ISDN with those other networks.

3.1 Low Layer capabilities

From the functional capabilities of the B-ISDN, as shown in Figure 1, the information transfer capabilities require further description.

Broadband information transfer is provided by ATM at the B-ISDN user-network interface (UNI) and at switching entities inside the network.

ATM is a specific packet oriented transfer mode using an asynchronous time division multiplexing technique. The multiplexed information flow is organized in fixed size blocks, called cells. A cell consists of an information field and a header: the primary role of the header is to identify cells belonging to the same virtual channel connection. Cells are assigned on demand, depending on the source activity and the available resources. Cell sequence integrity on a virtual channel connection is preserved by the ATM layer.

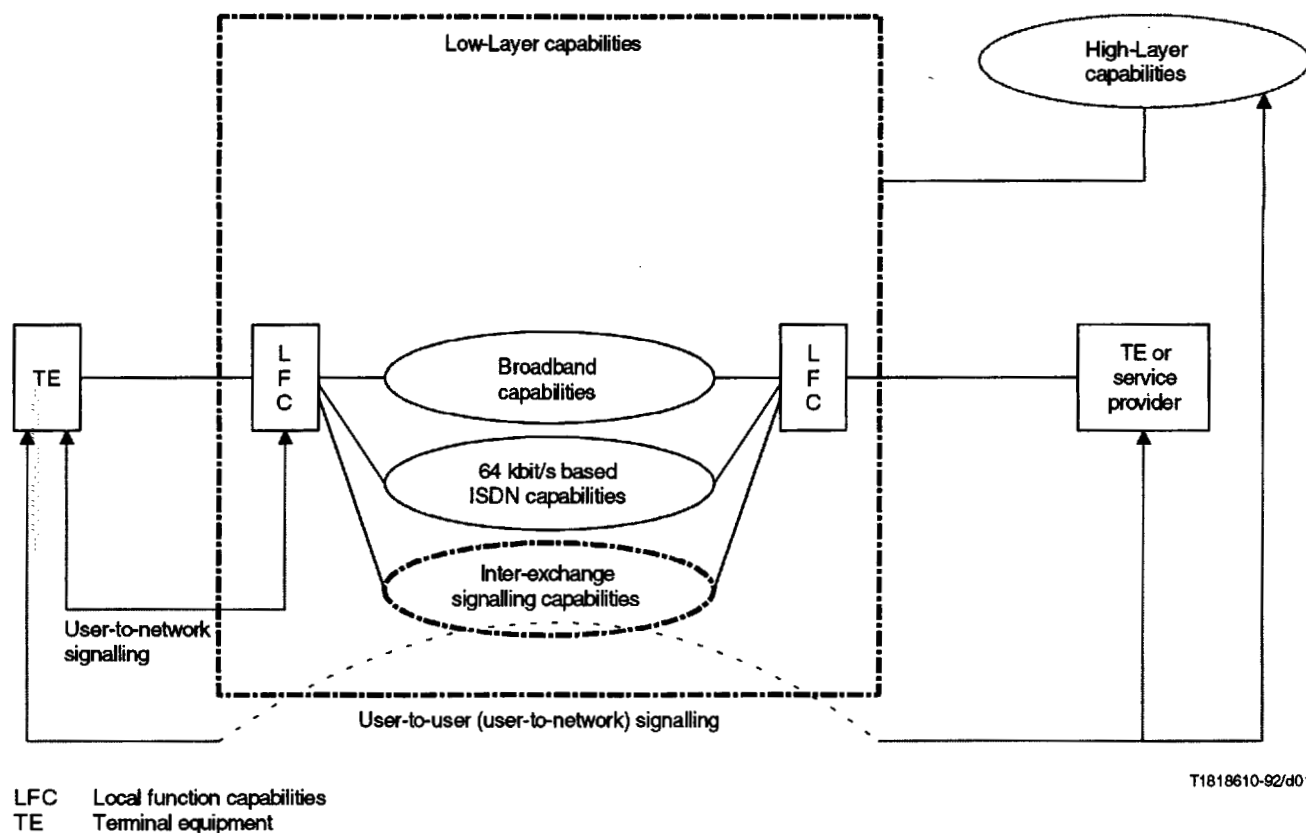


FIGURE 1/I.327

Basic architecture model of the B-ISDN

ATM is a connection oriented technique. A connection within the ATM layer consists of one or more links, each of which is assigned an identifier. These identifiers remain unchanged for the duration of the connection. It should be noted that signalling information for a given connection is conveyed using a separate identifier.

Although ATM is a connection oriented technique, it does offer a flexible transfer capability common to all services, including connectionless services. Examples of mechanisms supporting connectionless data services are illustrated in Annex A.

The switching and transmission capabilities, as described in Recommendation I.324, are also applicable in B-ISDN. The support of 64 kbit/s based ISDN services by a network based on ATM needs further study.

3.2 High layer capabilities

Normally, the high layer functional capabilities are involved only in the terminal equipment. However, for the support of some services, provision of high layer functions could be made via special nodes in the B-ISDN belonging to the public network or to centres operated by other organizations and accessed via B-ISDN user-network or network-node interfaces (NNIs).

4 Location of functions in the B-ISDN

4.1 Overall

In considering a B-ISDN call (i.e. an instance of a telecommunication service) two major functional areas are involved:

- i) the customer equipment (TE and optional customer network),
- ii) the public B-ISDN.