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SERIES Q: SWITCHING AND SIGNALLING

**Broadband ISDN – B-ISDN application protocols for the
network signalling**

**B-ISDN User Part – Look-ahead without state
change for the Network Node Interface (NNI)**

ITU-T Recommendation Q.2724.1

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION Q.2724.1

B-ISDN USER PART – LOOK-AHEAD WITHOUT STATE CHANGE FOR THE NETWORK NODE INTERFACE (NNI)

Summary

This Recommendation specifies the extensions to the Broadband ISDN User Part for the support of look-ahead without state change.

Source

ITU-T Recommendation Q.2724.1 was prepared by ITU-T Study Group 11 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 9th of July 1996.

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FOREWORD

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NOTE

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Recommendation Q.2724.1**B-ISDN USER PART – LOOK-AHEAD WITHOUT STATE CHANGE
FOR THE NETWORK NODE INTERFACE (NNI)***(Geneva, 1996)***1 Overview****1.1 Scope**

This Recommendation specifies the procedures for Look-Ahead without state change at the B-ISDN Network Node Interface. This Recommendation specifies the essential features, procedures and operations required for Look-Ahead. The Look-Ahead facility allows a network to perform called-terminal availability and compatibility checking without any commitment of network resources.

The points-in-call at which this procedure may be invoked will be identified in the appropriate Basic Call, Additional Capability, or Supplementary Service Recommendations, i.e. in their Application Process procedures. However, guidelines for the selection of such points and how the procedure may be used are contained in Appendix II.

Procedures and additional parameters for Look-Ahead on non-basic call will be identified in the appropriate service Recommendations.

The action to be taken at six exchange types are described as:

- initiating exchange;
- intermediate national exchange;
- outgoing screening point and/or gateway exchange;
- intermediate international exchange;
- incoming screening point and/or gateway exchange;
- destination local exchange.

Actions common for all exchange types are described only once. Different, or additional actions required in specific types are described in separate subclauses applicable to this type of exchange.

Note that the incoming and outgoing screening points may be coincident with gateway exchanges, transit exchanges, local exchanges, or as free-standing functions according to the specific national network architecture.

1.2 References

The following ITU-T Recommendations, and other references contain provisions which, through reference in this text, constitute provision 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] ITU-T Recommendation Q.2763 (1995), *Signalling System No. 7 B-ISDN User Part (B-ISUP) – Formats and codes*.

- [2] ITU-T Recommendation Q.2764 (1995), *Signalling System No. 7 B-ISDN User Part (B-ISUP) – Basic call procedures.*
- [3] ITU-T Recommendation Q.2610 (1995), *Usage of cause and location in B-ISDN User Part and DSS 2.*
- [4] ITU-T Recommendation Q.2964.1 (1996), *Digital Subscriber Signalling System No. 2 – Basic Look-Ahead.*
- [5] ITU-T Recommendation Q.2725.1 (1996), *B-ISDN user part – Support of negotiation during connection setup.*
- [6] ITU-T Recommendation Q.771 (1993), *Functional description of transaction capabilities.*
- [7] ITU-T Recommendation Q.772 (1993), *Transaction capabilities information element definitions.*
- [8] ITU-T Recommendation Q.711 (1996), *Functional description of the signalling connection control part.*
- [9] ITU-T Recommendation Q.712 (1996), *Definition and function of signalling connection control part messages.*
- [10] ITU-T Recommendation Q.713 (1996), *Signalling connection control part formats and codes.*
- [11] ITU-T Recommendation Q.714 (1996), *Signalling connection control part procedures.*
- [12] ITU-T Recommendation Q.715 (1996), *Signalling connection control part user guide.*
- [13] ITU-T Recommendation Q.2931 (1995), *Digital Subscriber Signalling System No. 2 – User-Network Interface (UNI) layer 3 specification for basic call connection control.*
- [14] ITU-T Recommendation Q.931 (1993), *ISDN user-network interface layer 3 specification for basic call control.*
- [15] CCITT Recommendation X.209 (1988), *Specification of basic encoding rules for Abstract Syntax Notation One (ASN.1).*
- [16] ITU-T Recommendation Q.773 (1993), *Transaction capabilities formats and encoding.*
- [17] ITU-T Recommendation Q.774 (1993), *Transaction capabilities procedures.*
- [18] ITU-T Recommendation Q.775 (1993), *Guidelines for using transaction capabilities.*

1.3 Definitions

This Recommendation defines the following terms.

1.3.1 screening function: This function is optionally provided within a network to support network-specific screening of Look-Ahead operations and parameters within the LA application. This screening may, for example, include checking of specific parameter values and field contents against bilateral agreements between originating and terminating network operators.

1.3.2 screening point: The location at which the screening function is deployed within a given network. This may be an exchange of any type, or it may be a free-standing node.

1.4 Abbreviations

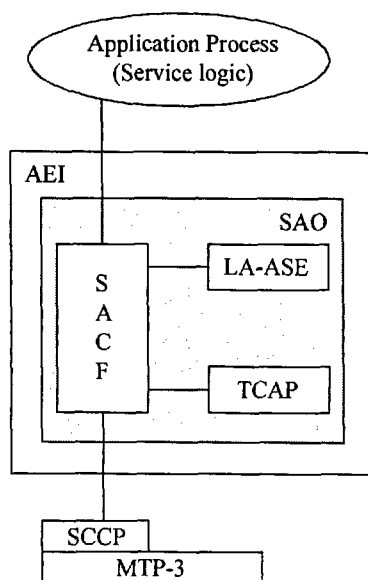
This Recommendation uses the following abbreviations.

AEI Application Entity Invocation

ASE	Application Service Element
ASN.1	Abstract Syntax Notation No. 1
B-ISDN	Broadband Integrated Services Digital Network
B-ISUP	Broadband ISDN User Part
ISDN	Integrated Services Digital Network
LA	Look-Ahead
MTP-3	Message Transfer Part 3
SACF	Single Association Control Function
SAO	Single Association Object
SCCP	Signalling Connection Control Part
TCAP	Transaction Capabilities Application Part

2 Specification model

The description of the Look-Ahead procedures are structured according to the model described in Figure 1.



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Figure 1/Q.2724.1 – Look-Ahead protocol architecture

3 Look-Ahead, application process functions

3.1 Primitive interface AP/SACF

The Look-Ahead functions in the application process use the services provided by the SACF primitive interface. These are listed in Table 1.

Table 1/Q.2724.1 – LA primitives between AP and SACF

Primitive name	Types
LA_Invoke	Req./Ind./Resp./Conf.
LA_Error	Ind.

Table 2 contains the list of parameters in the LA_Invoke Req./Ind./Resp./Conf. primitives that may be used for the Look-Ahead.

Table 2/Q.2724.1 – Contents of the LA_Invoke Req./Ind./Resp./Conf. primitive

LA_Invoke Req./Ind./Resp./Conf.	
Parameter	Mandatory/Optional
AAL_Parameters	O
AdditionalATMCellRate	O
ATM_CellRate	O
BroadbandBearerCapability	O
BroadbandHighLayerInformation	O
BroadbandLowLayerInformation (Note 1)	O
AESAforCalledParty	O
CalledPartyNumber	(Note 2)
CalledPartySubaddress	O
CauseIndicators	O
LookResult	O
NarrowbandBearerCapability (Note 1)	O
NarrowbandHighLayerCompatibility (Note 1)	O
NarrowbandLowLayerCompatibility (Note 1)	O
OAMTrafficDescriptor	O
NOTE 1 – The information elements contained into this parameter may be repeated in accordance with Recommendation Q.2931.	
NOTE 2 – This parameter will be mandatory in the forward direction (i.e. in the req. and ind. primitives), whilst it is not required in the backward direction (i.e. in the resp. and conf. primitives).	

Table 3 contains the list of parameters, used for the Look-Ahead, in the LA_Error Indication primitive.

Table 3/Q.2724.1 – Contents of the LA_Error Indication primitive

LA_Error Ind.	
Parameter	Mandatory/Optional
Error_Type	O

3.2 Procedures at initiating exchange

Initiating exchange is the exchange initiating the LA procedure and it could be any of the types, originating, transit, gateway or destination (not a free-standing screening point). Actions where the initiating exchange is also the destination exchange are specified by DSS 2 protocol [4].

3.2.1 Normal procedures

The LA-initiating exchange shall perform Look-Ahead based on service requirements, as indicated in Basic Call (Recommendation Q.2764) or other procedures (e.g. Point-to-multipoint, multiconnection, modification etc.). The criteria for this decision are outside the scope of this Recommendation, but some guidelines and suggestions are included in Appendix II.

The LA procedure is requested by the AP creating an instance of Look-Ahead AEI and sending an LA_Invoke.req primitive to the SACF.

If the LA-initiating exchange receives an LA_Invoke.conf primitive:

- which includes a satisfactory LookResult parameter, it shall start the normal setup procedure towards the addressed user, using the received alternatives;
- which includes an unsatisfactory LookResult parameter, or a Cause Indicators parameter, based on the received parameter values and possibly on the diagnostics field, it shall decide whether to clear the connection towards the calling party or to proceed with normal call setup. If the connection is to be cleared, the clearing message shall include the received cause value.

3.2.2 Exceptional procedures

If timer T-la expires, an LA_Invoke.resp primitive will be received by the AP. The LA-initiating exchange shall decide, based on service requirements, whether to continue the call setup or to clear the call towards the calling party.

An LA_Error.ind primitive will be received by the AP also when an error occurs at LA-ASE level.

3.3 Procedure at an intermediate national exchange

The AP of an intermediate national exchange takes part in the LA operation only when it is the LA initiating exchange (see 3.2).

3.4 Procedure at the outgoing screening point

The Look-Ahead AEI has to be instantiated to allow bridging of Look-Ahead requests from the incoming to outgoing network with any required screening.

When a Look-Ahead AEI is instantiated on the incoming side, an LA_Invoke.ind is received from the AEI. The exchange examines the called party number and determines the appropriate destination.

If the destination network is known not to support Look-Ahead, and the screening point is not the originating local exchange, an LA_Invoke.resp primitive shall be generated with the cause value #79 "Service or option not implemented" to inform the originating local exchange. If this occurs in the originating local exchange, the LA procedures will not be initiated.

Otherwise, the received parameters are screened in accordance with network agreements. An outgoing LA-AEI is instantiated, and the agreed parameters are sent to it in an LA_Invoke.req primitive.