All drawings appearing in this Recommendation have been done in Autocad.

Recommendation E.720

ISDN GRADE OF SERVICE CONCEPT

1 Introduction

This Recommendation outlines the general considerations for the ISDN Grade of Service (GOS) concept and provides guidelines for selecting GOS parameters. In this Series of Recommendations, the term GOS always refers to traffic Grade of Service parameters as defined in Recommendation E.600.

ISDN GOS parameters are given in subsequent Recommendations in the E.720 Series.

2 GOS concept

GOS uses a number of traffic engineering parameters to provide a measure of adequacy of plant under specified conditions; these GOS parameters may be expressed as probability of blocking, probability of delay, etc. Blocking and delay are caused by the fact that the traffic handling capacity of a network/network component is finite and that the demand traffic is stochastic by nature.

The users of telecommunication services can experience the effects of GOS parameters depending on their perception of events such as:

1) failure of a call demand or excessive delay to satisfy a call demand;

2) failure of call attempts or excessive delay to satisfy call attempts;

3) failure of automatic re—attempts or excessive delay to satisfy automatic re—attempts.

Events of the first class are always perceived by the user. Events of the other two classes may be perceived by the user depending on the capability of the terminal equipment to transmit signalling information to the calling user.

In all three classes the ability to distinguish GOS depends on having distinct indications of called user conditions and network conditions.

GOS may be distinguished as the user GOS, network GOS and network component GOS as shown in Figure 1/E.720. User GOS relates to user call demands. Network GOS relates to any call attempts including both user generated call attempts and terminal generated automatic reattempts. Network component GOS relates to bids for the utilization of a specific network component including both bids generated by call attempts and bids generated by call attempts and bids generated by internal retrials in the network. Parameters related to user GOS and network component GOS are for further study.

Recommendation E.721 defines network GOS parameters based on any call attempt. Subsequent Recommendations in the E.720 Series will define other GOS parameters. Recommendations in the E.740 series will define traffic measurement and performance monitoring requirements.

User GOS performance effects and other traffic—independent, user—perceived effects such as availability and service integrity contribute to Quality of Service (QOS). Network GOS parameters and their values provide information on the traffic aspects of the QOS.

3 Principles to select ISDN GOS parameters

3.1 *ISDN traffic characteristics*

ISDN has many characteristics different from the existing dedicated networks such as Public Switched Telephone Network (PSTN), Circuit Switched Public Data Network (CSPDN), Packet Switched Public Data Network (PSPDN), etc. The following characteristics are taken into account when defining GOS parameters for ISDN:

— ISDN provides integrated access to a wide variety of telecommunication services through a small set of standardized user—network interfaces.

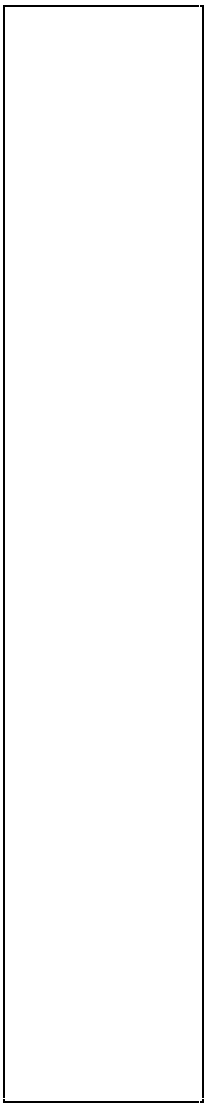
— Services have heterogeneous traffic demand profiles and diverse performance requirements.

— The traffic streams generated by user demands for bearer services and teleservices utilize layer 1, 2 and 3 resources.

— The configuration and implementation of a user's terminal and its man—machine interface may vary from one service to another service and one user to another user.

— Out—of—band signalling and call control capability, based on D—channel and Signalling System No. 7 (S.S. No. 7) are provided.

Figure 1/E.720 - T0201181-88



3.2 *Parameter selection principles*

The GOS parameters defined in the E.720 series of Recommendations applies to the first phase of ISDN. The definitions of these parameters may be expanded or additional GOS parameters defined to accomodate future evolution of ISDN architecture and services. Considering the above characteristics in ISDN, the following principles are recommended for selecting GOS parameters in ISDN:

i) A minimum common set of GOS parameters is defined for attempts on layers 1, 2 and 3 — such attempts belonging to different services may or may not share the same out—of—band call set—up and release procedures. (See Note.)

ii) The GOS parameters are defined and specified in such a way that the GOS can be derived at well—defined reference points (traffic significant points).

iii) The GOS parameters should be specified with reference to traffic load conditions in the sense of Recommendation E.500.

iv) Blocking GOS parameters may in the future need to take account of repetitions due to network status, but are presently based on lost—call—cleared assumptions.

v) GOS parameters related to the user plane information transfer phase are for further study.

Note — To assess the performance directly perceived by a user, other additional parameters which are specific to the user's terminal equipment may also be necessary.

3.3 *GOS standard setting principles*

GOS standard setting principles will take into account the current standards for voice and data services so that when the user migrates from a dedicated network to the ISDN, the user does not encounter a marked undesirable contrast.