FIGURE 3/Q.1061

Relationship between functional entities

3Signalling reference point characteristics

The PLMN signalling reference points are specified by a comprehensive set of characteristics, including:

1) channel structures and access capabilities;

2) signalling protocols; and

3) performance characteristics.

The definition of the digital PLMN interfaces at the signalling reference points follows the ISDN layered approach to the S and T interfaces according to the OSI reference model.

4Signalling reference point capabilities

In addition to the multi-service capability, a digital PLMN signalling reference point may allow for capabilities such as the following:

1) multidrop and other multiple terminal arrangements;

2) choice of information bit rate, switching mode, coding method, etc., on a call-by-call or other basis (e.g. semi-permanent or subscription time option); and

3) capability for compatibility checking in order to check whether calling or called terminals can communicate with each other.

5Relation of signalling reference points to the user network interface(s)

5.1Signalling reference points are functional interfaces where the user-network interface(s) may be specified.

5.2The choice of the user-network interface is based on service definitions in the relevant digital PLMN Recommendations.

FIGURE 1/Q.1061

Digital PLMN interfaces

FIGURE 2/Q.1061

Signalling reference points in a digital PLMN

informing the network of its present location, and managing user terminals during handover. In addition, because of the "open" connection via radio, some functions such as user authentication are included in this functional entity.

2.3RF transmission management includes those functions associated with providing a radio connection to the BS based on cellular technology, such as selecting the channel coding, controlling transmitter power, seizing a channel, changing a channel, etc.

2.4The relationship of these four functional entities is envisaged as of a nested nature and can be illustrated in Figure 3.Q.1061.

and

d) operation and maintenance capabilities.

1.6 Interface applications

Figure 1/Q.1061 shows some examples of digital PLMN interfaces. The following cases are identified:

1) access of individual digital PLMN terminals (i.e., hand-portable or vehicle-mounted terminals);

2) access of multiple digital PLMN terminal installation;

3) access of a mobile PABX or LAN;

4) dedicated service networks; and

5) land-line ISDN networks.

1.7A number of digital PLMN signalling reference points are specified and any one of these reference points may be used as the user to network interface point. Figure 2/Q.1061 illustrates the major signalling reference points in a digital PLMN.

a) Xm - TEm to mobility management reference point;

b) Sm - mobility management to RF transmission management reference point; and

c) Um - mobile station (MS) to base station (BS) reference point.

The description of the functional entities is given in § 2.

1.8The MS-BS interface for the digital PLMN mobile station includes both the logical part of the communication between the MS and the BS, and the control and physical requirements of the radio channel.

It should be noted that the Um reference point is the traditional radio-based network interface and is very much RF technology dependent.

The detailed Um reference point will be specified in separate Recommendations.

2Functional entities between signalling reference points

2.1PLMN call control adaptation functions are those functions necessary to convert standard CCITT call control signalling into call control signalling appropriate in the digital PLMN environment. For example, some parameters of standard CCITT call control signalling messages need to be translated or some new parameters need to be added, such as IMSI, mobile serial number.

DIGITAL PLMN USER-NETWORK INTERFACES

Recommendation Q.1061

GENERAL ASPECTS AND PRINCIPLES RELATING TO DIGITAL PLMN ACCESS SIGNALLING REFERENCE POINTS

1General

1.1Recommendation I.120 provides the conceptual principles on which an ISDN is based. The main feature of an ISDN is the support of a wide range of service capabilities, including voice and non- voice applications, in the same network by offering end-to-end digital connectivity.

1.2The ISDN concept supports a wide range of service capabilities within the same network such as: packet-switched and circuit-switched connections up to and including 64 kbits/sec on a bearer (B) channel. A digital PLMN network supports the same wide range of service capabilities, including reliable end-to-end digital connectivity and contains specialized supporting functions, e.g. speech bit rate reduction processing. However, due to the limited resources associated with radio channels nominal circuit-switched connections may have to be limited to rates lower than 64 kbit/s (e.g. connections up to and including 16 kbits/sec).

1.3The key element of service integration for a digital PLMN is the provision of a set of standard, multipurpose user network interfaces. These interfaces present a focal point for the development of digital PLMN components and configurations that result in PLMN ISDN-like terminal equipment and applications.

1.4A digital PLMN is recognized by the service characteristics available through the user-network interfaces, rather than by its internal architecture, configuration and technology. This concept plays a key role in permitting user and network technologies and configurations to evolve separately.
The service definitions are provided in separate Recommendations.

1.5The digital PLMN user-network interface point should provide:

a) flexibility of user terminals with respect to digital PLMN network interconnection;

b) flexibility of separate user terminal evolution and PLMN technology evolution;