



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.1001

PUBLIC LAND MOBILE NETWORKS

GENERAL ASPECTS OF PUBLIC LAND MOBILE NETWORKS

ITU-T Recommendation Q.1001

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.1001 was published in Fascicle VI.12 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

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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GENERAL ASPECTS OF PUBLIC LAND MOBILE NETWORKS

1 General

This Recommendation covers definitions, architectures and services in Public Land Mobile Networks.

The definition section is subdivided into basic, roaming and handover subheadings.

The architecture section covers examples of Public Land Mobile Network architecture in roaming and handover situations.

The services section covers introductory descriptions of basic and supplementary services that can be provided to the user.

2 Definitions

2.1 Basic definitions

2.1.1 Public Land Mobile Services

Telecommunications services provided to moving subscribers (terrestrial applications).

2.1.2 Public Land Mobile Network

A Public Land Mobile Network (PLMN) is established and operated by an administration or RPOA for the specific purpose of providing land mobile telecommunication services to the public. A PLMN may be regarded as an extension of a fixed network (e.g. PSTN) or as an integral part of the PSTN. In the first case, it can be considered as a collection of mobile services switching centre (MSC) areas within a common numbering plan (e.g. service access codes) and a common routing plan (e.g. definition of crossover point); in this case the MSCs are the functional interfaces between the fixed network and a PLMN for call set-up. In the second case, it can be considered as an assemblage of special logic in existing or future PSTN/ISDN stored program controlled digital local exchanges, conceptually integrated within a common numbering and routing plan.

Functionally the PLMNs may be regarded as independent telecommunications entities even though different PLMNs may be interconnected through the PSTN and PDNs for forwarding of calls or network information. A similar type of interconnection may exist for the interaction between the MSCs of one PLMN.

The location register system of a PLMN may be centralized, distributed or segmented. So long as we are concerned with functions of a PLMN, such as routing and interworking, the configuration and operation of the location register system have no influence on external networks.

The use of the concept PLMN is illustrated in Figure 1/Q.1001 where various PLMNs are shown with their interfaces to the fixed networks. It should be noted that a PLMN may have several interfaces with the fixed network (e.g. one for each MSC). Interworking between two PLMNs may be performed via an international gateway.

Figure 1/Q.1001 also shows the information paths between a PSTN and a PLMN and between two different PLMNs. The solid lines indicate a possible physical path between the PLMNs through the PSTN. The dotted line indicates that, for some interactions, an end-to-end information path (established through the physical path) may exist between the two PLMNs.

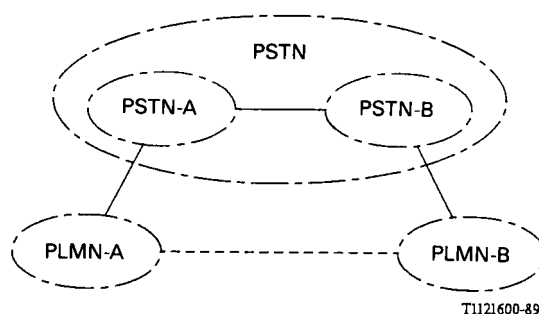


FIGURE 1/Q.1001

The use of the concept PLMN for country A and country B

2.1.3 Mobile Services Switching Centre

In an automatic system the Mobile Services Switching Centre (MSC) constitutes the interface between the radio system and the public switched telephone network. The MSC performs all necessary signalling functions in order to establish calls to and from mobile stations.

In order to obtain radio coverage of a given geographical area a number of base stations (radio transmitters/receivers) are normally required; i.e. each MSC would thus have to interface several base stations. In addition several MSCs may be required in order to cover a country. The definition of the MSC may be prefixed by the terms "land" or "maritime" if that is more suitable in a specific application.

2.1.4 base station

The base station (BS) is the common name for all the radio equipment located at one and the same place used for serving one or several cells.

2.1.5 mobile station

The mobile station (MS) is the interface equipment used to terminate the radio path at the user side. It includes terminal functions required to provide services to the user, e.g. terminal equipment and terminal adaptors.

2.1.6 cell

The area covered by a base station, or by a sub-system (sector antenna) of that base station corresponding to a specific logical identification on the radio path, whichever is smaller.

Every mobile station in a cell may be reached by the corresponding radio equipment of the base station.

2.1.7 base station area

The area covered by all the cells served by a base station.

2.1.8 location area

The location area is defined as an area in which a mobile station may move freely without updating the location register. A location area may comprise several cells.

2.1.9 MSC area

The part of the network covered by an MSC. An MSC area may consist of several location areas.

2.1.10 service area

The service area is defined as an area in which a mobile station is obtainable by another PLMN, PSTN or ISDN subscriber without the subscriber's knowledge of the actual location of the mobile station within the area. A service area may consist of several PLMNs. One service area may consist of one country, be a part of a country or comprise several countries. The location registration system associated with each service area must thus contain a list of all mobile stations located within that service area.

Figure 2/Q.1001 shows an example of the composition of a service area.

Note - This definition does not take into account any constraints on routing imposed by the international telephone network.

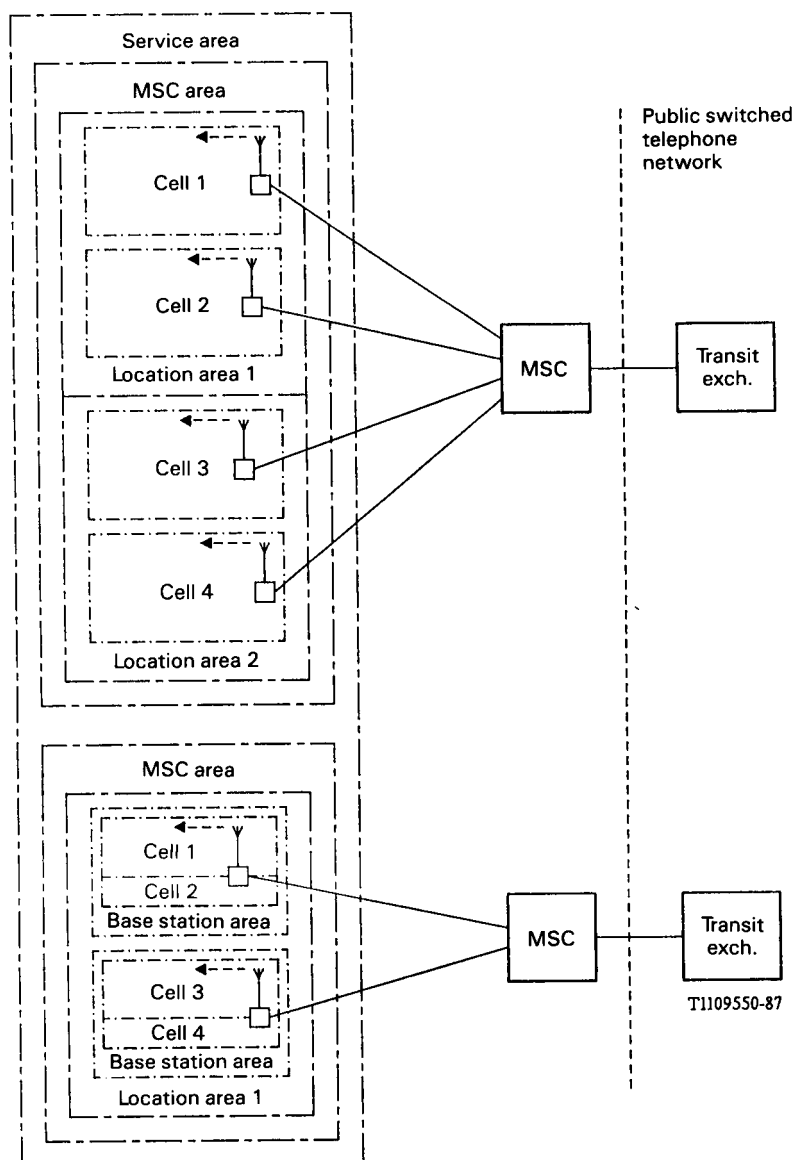


FIGURE 2/Q.1001

Use of the definitions.
In this example the service area consists of one PLMN