



ECC Recommendation (17)02

Harmonised European Management and Assignment
Principles for E.212 Mobile Network Codes (MNCs)

approved 31 May 2017

amended 28 November 2023

INTRODUCTION

ITU-T Recommendation E.212 [1] defines a unique international identification plan for public fixed and mobile networks providing users with access to public telecommunication services. The Recommendation describes an identification plan for subscriptions and the format of the International Mobile Subscription Identity¹ (IMSI). It also sets out the principles, criteria and procedures for the assignment and reclamation of E.212 Mobile Country Codes (MCC) and their respective Mobile Network Codes (MNCs). ITU-T Recommendation E.212 also comprises various Annexes, Appendices as well as Amendments, in particular, Annex B of E.212 covers principles for the assignment of MNCs within geographic MCCs and Annex A covers MNCs under shared MCC 901. Amendment 1 (07/2018) of E.212, Appendix III defines shared MCC 999 for internal use within a private network.

Initially, the assignment of MNCs under geographic MCCs was limited to public networks offering public mobile telecommunications services as they were regarded as the only stakeholders in the value chain with a justifiable need for MNCs to facilitate authentication, roaming, billing and routing of their customers. As a result of this legacy view on the assignment of geographic MNCs, some CEPT administrations currently assign geographic MNCs according to strict criteria, whereby the applicant must either operate its own Radio Access Network (RAN) on radio frequencies that are suitable for the different generations of mobile technologies, or have its own infrastructure (Home Location Register (HLR)² and other network elements) and a contractual agreement that allows access to a RAN operated by an Mobile Network Operator (MNO). The latest ITU-T Recommendation E.212 (09/2016) introduces flexibility regarding the assignment of MNCs to entities other than public networks offering public telecommunications services. Such assignments are to be made according to procedures and criteria established by the national numbering plan administrator.

As business models have evolved as demonstrated in ECC Report 212 “Evolution in the Use of E.212 Mobile Network Codes” [2] and ECC Report 337 “Public numbering resources for mobile non-public networks” [3], there is an increasing demand for MNCs from entities other than public networks offering public telecommunications services. Informational Annex 1 contains a non-exhaustive list of potential applicants for geographic MNCs. One of the reasons for assigning an MNC to these entities is that it can create flexibility and less disruption if a change to the underlying network operator is required as there is no need to change the SIM profile for connected devices.

The purpose of this Recommendation is to harmonise the management and assignment principles for MNCs to ensure regulatory certainty for entities providing services for which there exists a justifiable requirement for the assignment of these resources. In particular a harmonised approach is also needed to minimise the risk of regulatory shopping for geographic MNCs. Regulatory shopping is one issue that can arise where prospective applicants for numbering resources choose the regulator and regulatory regime which suits them best. If management and assignment principles diverge in the different countries prospective applicants may seek resources in the countries with a more flexible regulatory regime. While the management and assignment principles for MNCs under the shared MCC 90x series are a matter for the ITU Telecommunications Standardisation Bureau (TSB) and are outside of the scope of this Recommendation, the usage of these resources may be subject to national legislation/rules or guidelines.

This Recommendation is cognisant that appropriate solutions for managing demand for geographic MNCs can be found so that competition and service innovation can continue to be facilitated while avoiding exhaustion of MNCs.

¹ The IMSI is a string of decimal digits, up to a maximum length of 15 digits, which identifies a unique subscription. The IMSI consists of three fields: the Mobile Country Code (MCC), the Mobile Network Code (MNC), and the mobile subscription identification number (MSIN).

² Or equivalent functionality in other mobile system generations e.g. 4G and 5G.

ECC RECOMMENDATION 17(02) OF 31 MAY 2017 ON HARMONISED EUROPEAN MANAGEMENT AND ASSIGNMENT PRINCIPLES FOR E.212 MOBILE NETWORK CODES (MNCs), AMENDED 28 NOVEMBER 2023

“The European Conference of Postal and Telecommunications Administrations,

considering

- a) the September 2016 revisions to Recommendation ITU-T E.212 “The international identification plan for public networks and subscriptions” introduce flexibility in the assignment of geographic MNCs to entities other than public networks offering public telecommunications services;
- b) that Amendment 1 (07/2018) of Recommendation E.212 (09/2016) introduces a new Appendix III on shared ITU-T E.212 mobile country code (MCC) 999 for internal use within a private network and that any MNC value under MCC 999 used in a network has significance only within that network. The MNCs under MCC 999 are not routable between networks. The MNCs under MCC 999 shall not be used for roaming;
- c) the ECC Report 337 [2] on “Public numbering resources for mobile non-public networks” (06/2022);
- d) that, as a result of technology and service innovation, the value chain now contains different entities than those who operate their own networks with or without access to spectrum. Informational Annex 1 contains a non-exhaustive list of potential applicants for geographic MNCs;
- e) that geographic MNCs and MNCs under shared MCC 90x series are required to enable interconnection with mobile networks for certain services;
- f) that broadening the circle of market entities which are eligible for an assignment of geographic MNCs may lead to a scarcity of the resource and may also lead to new demand for other numbering resources. This is particularly relevant when broadening the circle to entities not providing publicly available electronic communications networks and/or services;
- g) that Over-the-Air (OTA) provisioning enables operator switching without the need to physically change SIM cards;
- h) the shared use of geographic MNCs, via allocating different mobile subscription identification number (MSIN) blocks to multiple entities under a single assigned MNC, although technically feasible and a viable option in some cases, is seen as more demanding from operational and administrative point of view;
- i) that harmonised management and assignment principles are required in order to maximise effective and efficient use of this resource in CEPT countries;
- j) that MNCs under the shared MCC 90x series are assigned by the TSB of the ITU for global services;
- k) that while Recommendation ITU-T E.212 allows the MNC to be either two or three digits in length, the migration from two to three digits under the same MCC seems to have a large operational impact and to be costly.
- l) that 3-digit MNCs offer more possible MCC+MNC combinations when compared to 2-digit MNCs, this would therefore reduce the risk of interference between networks using MCC 999 and subsequent network attachment issues.

recommends

that CEPT administrations, when setting management and assignment principles for MNCs take account of the following high level principles:

1. geographic MNCs are to be managed and assigned to permit the most effective and efficient use of a finite resource in order to defer, as long as is practicable, the need to request an additional MCC from the ITU TSB;
2. assignments of geographic MNCs are to be made according to procedures and criteria established by the national numbering plan administrator (NPA);
3. applicants for geographic MNCs should be required to:
 - provide substantiating documentation justifying their need for the resource which also describes the network, services and/or functions that the resource will be used for;
 - affirm that the network, services and/or functions comply with applicable standards (ITU-T, ETSI, 3GPP etc.);
 - provide justification that other numbering solutions fail to meet requirements for specific services.
4. the shared use of MNCs should be considered as a viable option;
5. for mobile non-public networks:
 - in order to reduce the risk of interferences, encourage the use of MCC 999 with 3-digit MNCs (and not 2-digit MNCs) for standalone non-public networks (SNPNs)³;
 - in order to manage potential network attachment issues⁴, NPAs may consider encouraging industry stakeholders to lead on a national coordination regarding the use of MNCs under MCC 999;
 - considering the allocation of one or more MNCs from the geographic MCC for shared use without direct assignment for SNPN;
 - considering the assignment of a single MNC for the simultaneous use by multiple networks for shared usage.
6. for services to be provided in more than one country, excluding mobile roaming services, an applicant for a geographic MNC should, as an alternative, be encouraged to consider applying to the ITU TSB for the assignment of an MNC under a shared MCC in the 90x series to avoid the need for multiple assignments of MNCs under different geographic MCCs;
7. geographic MNCs may be allocated for testing purposes or assigned on a temporary basis for testing purposes⁵;
8. where a CEPT administration requires a new MCC assignment from the ITU according to procedures in Recommendation ITU-T E.212, annex C, this administration should consider using 3-digit MNCs under this new MCC, thus providing 1000 rather than 100 MNCs.”

Note:

Please check the Office documentation database <https://docdb.cept.org/> for the up to date position on the implementation of this and other ECC Recommendations.

³ Which includes also SNPNs with shared RAN (see ECC Report 337 [3])

⁴ Network attachment issues occur when a mobile device can attach to different networks that use the same combination of MCC and MNC

⁵ See also Amendment 2 (from 2020) of Recommendation ITU-T E.212 which introduce Annex G with assignments of MNCs under shared MCC 991 for conducting international non-commercial trials.

ANNEX 1: EXAMPLES OF POTENTIAL APPLICANTS FOR GEOGRAPHIC MNCs (INFORMATIVE)

Assignments of geographic MNCs are to be made according to procedures and criteria established by the national numbering plan administrator⁶. The following non-exhaustive list provides examples of use cases where there could be an interest in a geographic MNC assignment:

- Mobile Network Operators (MNO);
- Full or light Mobile Virtual Network Operators/Enablers/Aggregators including Network/infrastructure Sharing Provider (MVNO/MVNE/MVNA/NSP);
- Entities with identification or authentication requirements in public networks, comprising providers of services with a public interest and connectivity providers of M2M/IoT services (e.g. eCall, smart metering, connected cars);
- Public electronic communication service providers with interoperability requirements (e.g. SMS provider);
- OTT provider/App provider/Application provider/Cloud provider;
- Entities with non-public networks or other private/closed networks (e.g. GSM-R, SNPN and Public Network Integrated Non-Public Network (PNI-NPN), Ministry of Defence);
- Entities for testing purposes.

⁶ Recommendation ITU-T E.212 Annex F further illustrates some uses of E.212 resources

ANNEX 2: LIST OF REFERENCES

- [1] Recommendation ITU-T E.212: “The international identification plan for public networks and subscriptions”
- [2] [ECC Report 212](#): “Evolution in the Use of E.212 Mobile Network Codes”, approved April 2014
- [3] [ECC Report 337](#): “Public numbering resources for mobile non-public networks”, approved June 2022