

# 32-bit AS-Numbers in AMPRNet

**At the end of 2015 in the Net-44 mailinglist there was a discussion about the usage of private 32-bit as-numbers in the whole AMPRNet™. That diskussion led to a final proposal:**

## Proposal

32-bit-numbers for private usage in AMPRNet™ have to be in the range of 4200000000 to 4294967294 ([RFC 6996](#)). This range has to be split for all participating countries in some wise way. There is an agreement to handle this with the help of 3 digits out of the „[International Mobile Country Codes](#)“ (MCC). The MCC-code is a country identifier that was defined by the ITU in standard E.212. It is used together with the „Mobile Network Code“ for identifying mobile phone networks worldwide.

Orientating at the „international numbering plan for public data networks“ ([X.121 Document](#)) in addition to the „list of mobile country codes“ ([E.212 Document](#)) of the [ITU](#) brings a remarkable expansion of available 32-bit as-number-range to AMPRNet™.

When using 32-bit-as-numbers in AMPRNet™ the first two digits (42) get added with the 3 digits for the MCC-code of the country in question. The remaining 5 digits is the amount of as-range from 00000 to 99999 for each country. It is up to the countries policy how to deploy and use the 32-bit as-range internally. To make it clear: Every mcc prefix brings round about 100000 32-bit as-numbers for the country. That is why big countries with several mcc-codes automagically get more as-range than smaller ones with only one mcc-code. Minimum is 100000 as-numbers per country (which already is a lot).

```
42<mcc>xxxxx
|| ||| |||||
|| ||| +++++-- Suffix available to everey country
|| +++----- 3 digit countryprefix (MCC)
++----- Start of private Adressrange AMPRNet<sup>tm</sup>
```

This structure has the big advantage that it is **usable throughout the whole world without any collisions**. It also respects the different policy-interests in different countries how to deploy their range internally. See what arguments lead to this proposal:

FEATURE	EXISTS	REMARKS
unique prefix for every country	yes	<b>42&lt;mcc&gt;xxxxx</b>
ASN Range dependend on size of country on the go	yes	multi mcc for big ones
already used by some countries	yes	YO PA LX* (* proposal)
mapable on internet-ASNs at edge routers	yes	see HamWan group USA
compatible to existing 16bit-ASNs	yes	-> European HAMNET
total unique management in own ASNs	yes	within own 42<mcc>-Range
allows different policies/registries	yes	every country decides
allows automatic IP-dependend ASNs	yes	every country decides
allows other methods for „generating“	yes	e.g. „klick a free ASN“

FEATURE	EXISTS	REMARKS
allows integration of „old“ 16bit	yes	-> see European HAMNET
allows integration of other 16bit	yes	no doubles due to mcc prefix
transfer 32bit through 16bit	yes	verified for European HAMNET
transfer 16bit through 32bit	yes	verified for European HAMNET
mixed use within single AS	yes	verified for European HAMNET

## 32-bit-range for German HAMNET

According to the proposal the as-range for Germany compiles as follows:

```
42<MCC>xxxxxx e.g. for Germany 42262xxxxx -> 4226200000 to 4226299999
```

The MCC corresponding to E.212 is a subset of the „international numbering plan for public data networks“ which was announced in X.121 document of the ITU. In X.121 document the different size of countries and their network requirements, based on the number of inhabitants, has been taken into account. Bigger countries (e.g US, GB, JA, DL) get more MCCs than smaller ones (e.g ON, LX, HB9). The gaps between the single MCCs in document E.212 are getting filled up and these additional MCCs are assigned to the countries. This principle has been transferred 1:1 to the number of licenced Radioamateurs in those countries. That is why Germany has been assigned the codes 262 to 265. That means Germany, according to number of radioamateurs and size, has an 32-bit as-range of 400.000 as-numbers:

```
4226200000 bis 4226299999 <-- in use with special policy
4226300000 bis 4226399999 <-- future use
4226400000 bis 4226499999 <-- future use
4226500000 bis 4226599999 <-- future use
```

The 3 digit MCC also is being used for assigning IDs in the DMR-system. There the extension to the country-prefixes according to X.121 is accepted too.

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