# AMF structures

DD Owned by David Cherney DISH •••
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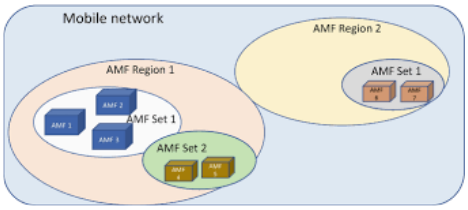
## AMF Name

An AMF instance is identified with an AMF name, which is a globally unique fully qualified domain name (FDQN). (e.g. in Open5GS the default AMF name is `open5gs-amf`.)

### AMF Regions and AMF Sets

According to 3GPP 23.501 (5G architecture) section 3.1 (Definitions)

- an AMF region consists of one or multiple AMF sets
- an AMF set consists of AMF instances that all serve the same geographic area and the same set of network slices.




All of the AMF instances in a single AMF set share UE context data and any one can handle UE requests. Thus, AMF sets serve as load balancers; increasing a AMF set size distributes UE requests across a larger set of AMF instances that share awareness of the UE's context. 5G specifications support adding and removing AMF instances from an AMF set.

The increasing the number of AMF sets in a AMF region is horizontal scaling.

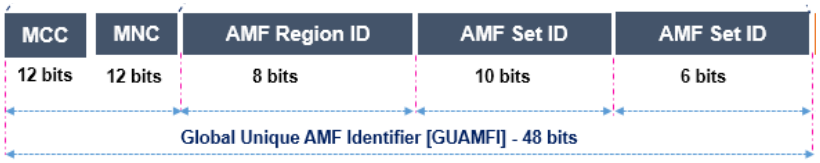
Different AMF regions are meant to serve different geographical regions. The regions served are up to the network operator. The region served by a AMF set is specified with a list of tracking area identifiers, a TAI list. Each TAI is the concatenation of a PLMN and tracking area code (TAC). So, equivalently the region served by an AMF set is specified by a PLMN and a list of TACs. How does this specify a region? Each gNB will carry a TAC, and any gNB whose TAC is in an AMF sets list can establish a connection to that AMF set. Thus, it is possible for two AMF sets in the same service region to serve different sets of gNBs, forming what we might unofficially call subregions.

### GUAMIs

AMF instances are uniquely identified by a globally unique AMF identifier, GUAMI (rarely referred to as GUAMFI). This identifier is a concatenation of

- mobile country code, e.g. 999, or in 12 bit binary 0011 1110 0111
- mobile network code, e.g. 70, or in 12 bit binary 0000 0100 0110
- region ID, e.g. 2, or in 8 bit binary 0000 0010
- set ID, e.g. 1, or in 10 bit binary 0000000001
- a pointer for the individual AMF instance in the AMF set, e.g. 0, or in 6 bit 000000

The GUAMI formed by the concatenation of the examples (from Openverso defaults for an AMF) above is the 48 bit string 0011 1110 0111 0000 0100 0110 0000 0010 0000000001.




At any given time, GUAMIs with distinct AMF pointer values are associated to distinct AMF names.

## Recap

AMF instances within an AMF set are distinguished by their by GUAMIs, carry a common list of TACs, and serve gNBs that carry a TAC in that list.