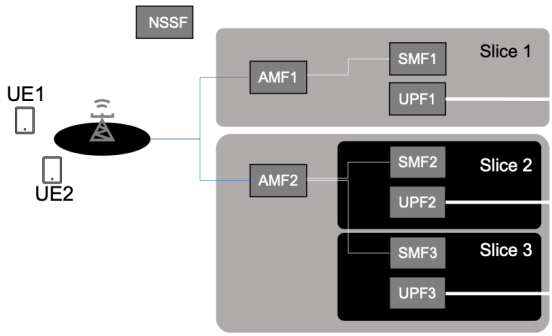
Slicing

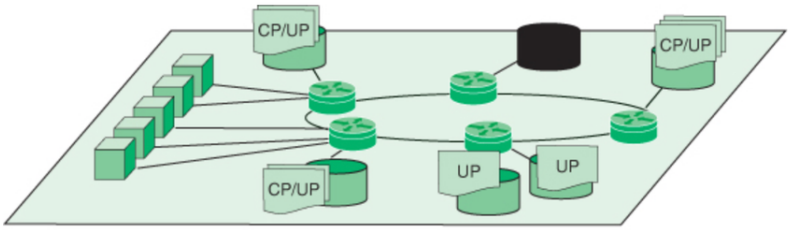
DD Owned by David Cherney DISH •••
Last updated: Jul 03, 2023 • Add Workflow

Contents

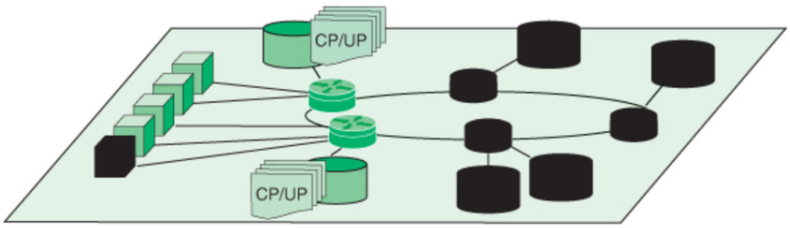
A single mobile operator will want to have multiple networks while maintaining its identity as a single PLMN. This is enabled by slicing. A slice is a logical network; a network operator can use a subset of its resources in each of its slices.



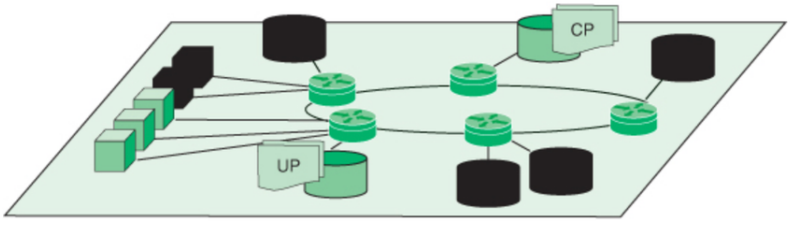
The idea is to use different network resources for different purposes.



(a) Smartphones



(b) Automotive devices



(c) Massive IoT devices

SST

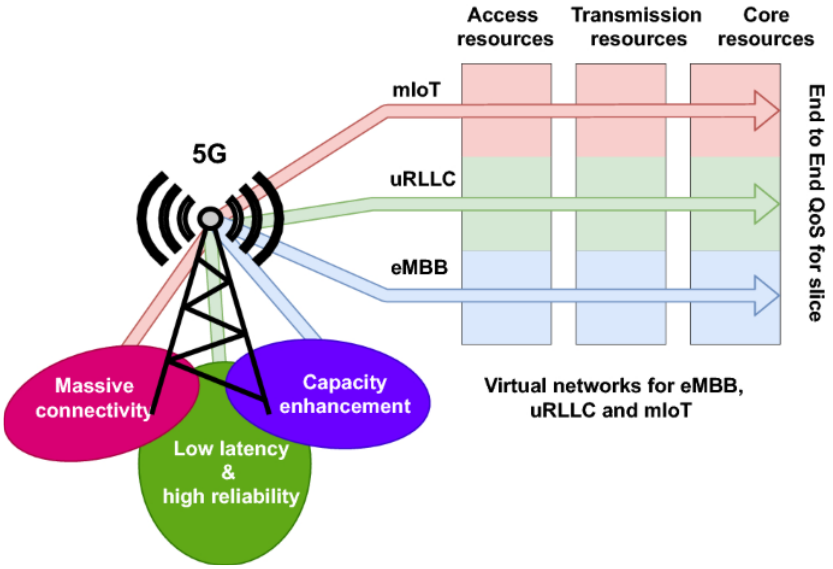
In particular, 3GPP envisions a single network operator providing 3 different core infrastructures to 3 specific different kinds of 5G system uses; for this reason slices are indexed in a way specified by 3GPP using the slice service type (SST) field.

SST 1 is for enhanced mobile broadband (eMBB)

SST 2 is ultra-reliable low latency communication (URLLC)

SST 3 is massive IoT (mIoT)

SST 4 is for vehicle to anything communication (V2X)



Further, 3GPP has reserved all SST values up to 127 for purposes that 3GPP might identify in the future. A network operator may use larger SST values between 128 and 255 with custom meaning.

Slice Differentiator

A network operator may also use a slice differentiator (SD) value to differentiate two slices that have the same SST. For example, two different smart factories might want to have slices, both the the mIoT SST.

NSSAI

These two fields comprise the single network slice selection information (S-NSSAI). Network function instances s are given a list of these values to indicate the slices they are allowed to serve. Such a list is called an NSSAI. Requests for PDU sessions include an S-NSSAI. The AMF that receives the request looks for SMF instances that cover the requested S-NSSAI. The UE chooses an SMF from that list, and then the chosen SMF looks for a UPF instance that covers the S-NSSAI to serve as the PSA.