In the name of God

System model

Each service is mapped to a slice so if we have S services, we have also S slices.

Due to the concept of slice isolation, we assume the orthogonality of slices.

In our problem the number of VNFs and the mapping of PRBs to slices and PRBs to UEs and the power allocation of UEs are obtained.

We assume we have two-time scale, in the large time scale, the problem of obtaining optimal number of VNFs and the mapping of PRBs to slices is achieved and other parameters achieved in the small-time scale (Assume there is an outer and inner loop, in the outer loop we have large-time scale and inner loop is for the small-time scale)

The achievable rate

SNR is shown with \rho (ρ) and power is shown with (p).

I added the interference.

Also ϵ is the transmission error probability.

The mean delay

Total delay is the sum of transmission delay, propagation delay and the processing delay. We have the transmission delay and the propagation delay both in the fronthaul link, the midhaul link and the backhaul link. So, it is not repetitive.

The reliability

Since I was not sure about the formula, I removed this section in the last draft, but I need to add it after I studied it.

Problem Statement

We have the problem of VNF placement here in the large-time scale. z_d is depicted whether any VNF (that are mapped to VM) is used from the server “d” or not. We want to used minimum number of servers.

I converted the problem statement from two different problem for each time-scale to one main problem. But in the proposed method the main problem will be broken into the two parts.