Trunking and Grade of Service

Trunking:

- A means for providing access to users on demand from available pool of channels.
- With trunking, a small number of channels can accommodate large number of random users.
  - Telephone companies use trunking theory to determine number of circuits required.
  - Trunking theory is about how a population can be handled by a limited number of servers.

Trunking and Grade of Service

Grade of Service (GOS):

Grade of service is a measure of the ability of a user to access a trunked system during the busiest hour.

Setup Time:

The time required to allocate a trunked radio channel to a requesting user.

Holding Time:

Average duration of typical call. Denoted by H (in seconds).

Trunking and Grade of Service

Blocked call:

Call which cannot be completed at a time of request, due to congestion.

Also referred to as a lost call.

Request rate:

The average number of call requests per unit time. Denoted by λ $second^{-1}$

Load:

Traffic Intensity across the entire trunked radio system, measured in Erlangs.

Traffic Intensity

Traffic Intensity is measure of channel time utilization, which is the average channel occupancy measured in Erlangs.

Traffic Intensity offered by each user is equal to the call request rate multiplied by the holding time.

$$A_u = \lambda H$$

where, H = average duration of call

λ = average no. of call request per unit time

Traffic Intensity

For a system containing U users and an unspecified number of channels, the total offered traffic Intensity A, is given as

$$A = U A_u$$

In a C channel trunked system, if the traffic is equally distributed among the channels, then traffic Intensity per channel Ac, is given as

$$A_c = U A_u / C$$