

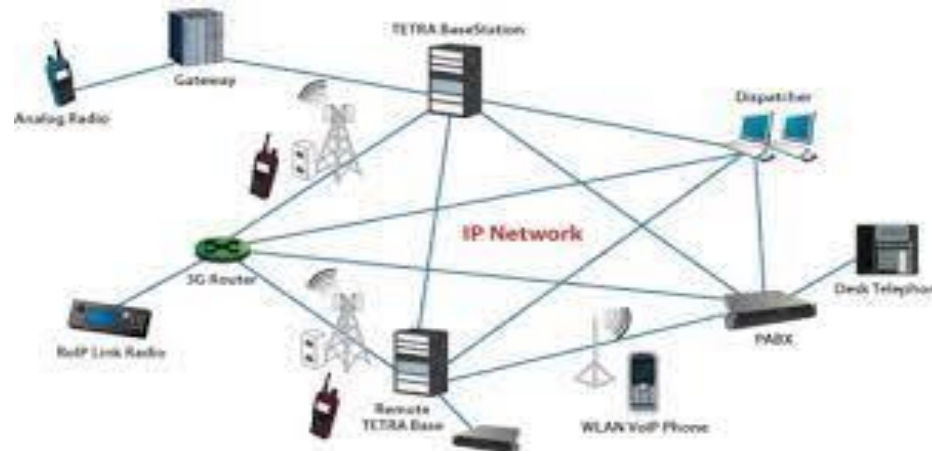


## 19EC601 – Wireless Communication

### Unit -1

#### Fundamentals of Wireless Communication

# Trunking , GOS, Challenges of WC





# Trunking and Grade of Service

- Erlangs: One Erlangs represents the amount of traffic density carried by a channel that is completely occupied.
- –Ex: A radio channel that is occupied for 30 minutes during an hour carries
  - 0.5 Erlangs of traffic.
- Grade of Service (GOS): The likelihood that a call is blocked.  
Each user generates a traffic intensity of  $A_u$  Erlangs given by
  - $A_u = \lambda H$
  - H: average duration of a call.
  - $\lambda$ : average number of call requests per unit time
  - For a system containing  $U$  users and an unspecified number of channels, the total offered traffic intensity  $A$ , is given by
    - $A = UA_u$
  - For  $C$  channel trunking system, the traffic intensity,  $A_c$  is given as
    - $A_c = UA_u / C$



# Improving Capacity in Cellular Systems

## Methods for improving capacity in cellular systems

- **Cell Splitting:** subdividing a congested cell into smaller cells.
- **Sectoring:** directional antennas to control the interference and frequency reuse.
- **Coverage zone :** Distributing the coverage of a cell and extends the cell boundary to hard-to-reach place



- **Cell Splitting**

- Split congested cell into smaller cells
- Preserve frequency reuse plan. Reduce transmission power.

- **Sectoring**

- Decrease the *co-channel interference* and keep the cell radius  $R$  unchanged
- Replacing single omni-directional antenna by several directional antennas
- Radiating within a specified sector



# Microcell Zone Concept

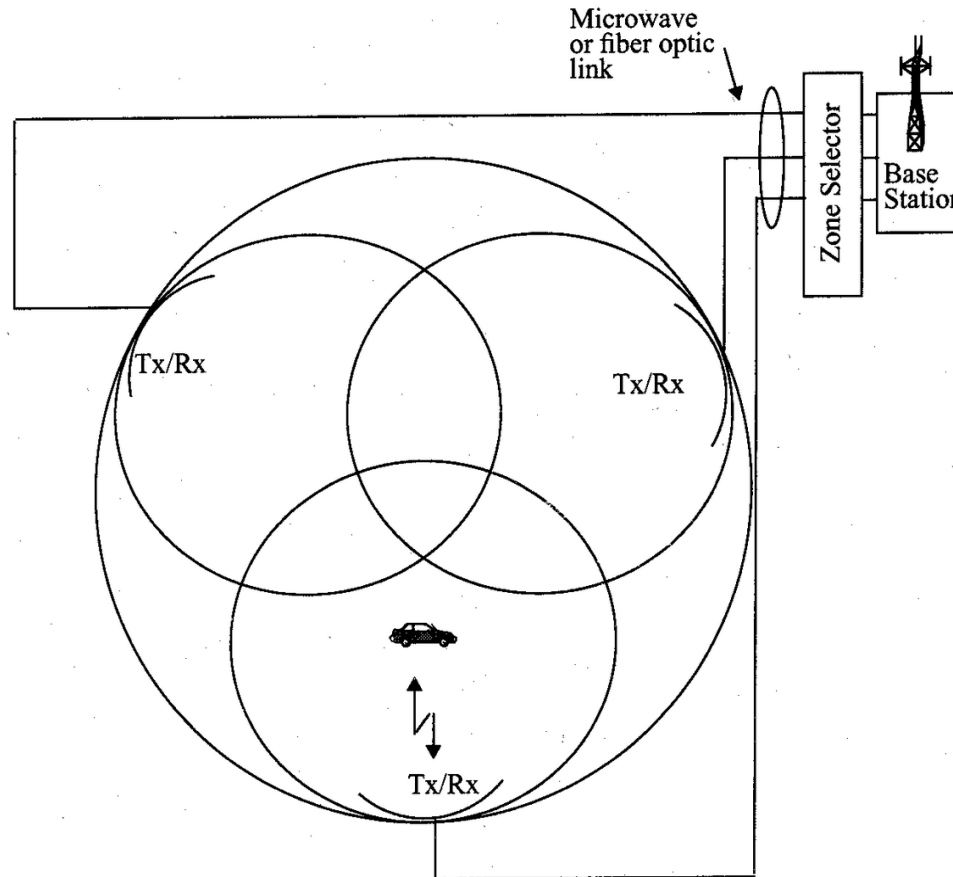
- Antennas are placed at the outer edges of the cell
- Any channel may be assigned to any zone by the base station
- Mobile is served by the zone with the strongest signal.

## Handoff within a cell

- No channel re- assignment
- Switch the channel to a different zone site

## Reduce interference

- Low power transmitters are employed





Thank  
you

