

CYCLE 2

Exp 1: Measurement of Call Blocking Probability in Cellular Network

AIM: To design and simulate a GSM cellular network using NetSim, and to measure the Call Blocking Probability in order to assess network performance, resource utilization, and overall efficiency under varying traffic conditions.

SOFTWARE: NetSim 12.2.26

PROCEDURE:

A. Topology Setup

1. Open NetSim 12.2.26.
2. Choose the GSM technology/workspace.
3. Build the network with:
 - 4 Mobile Stations (MS)
 - 1 Base Station (BS)
 - 1 Mobile Switching Center (MSC)
4. Connect nodes:
 - Each MS → BS via wireless link. (i.e, a dotted line -----)
 - BS → MSC via a wired link. (i.e, a continuous line)

B. Node/Interface Settings

5. On the MSC:
 - Right-click MSC → Properties.
 - Select Interface-1 (GSM) → DataLink_Layer.
 - Set Uplink_BW_Max (MHz) = 890.2 (or as prescribed by your lab sheet for GSM-900).
 - Click OK.

C. Traffic/Application Configuration

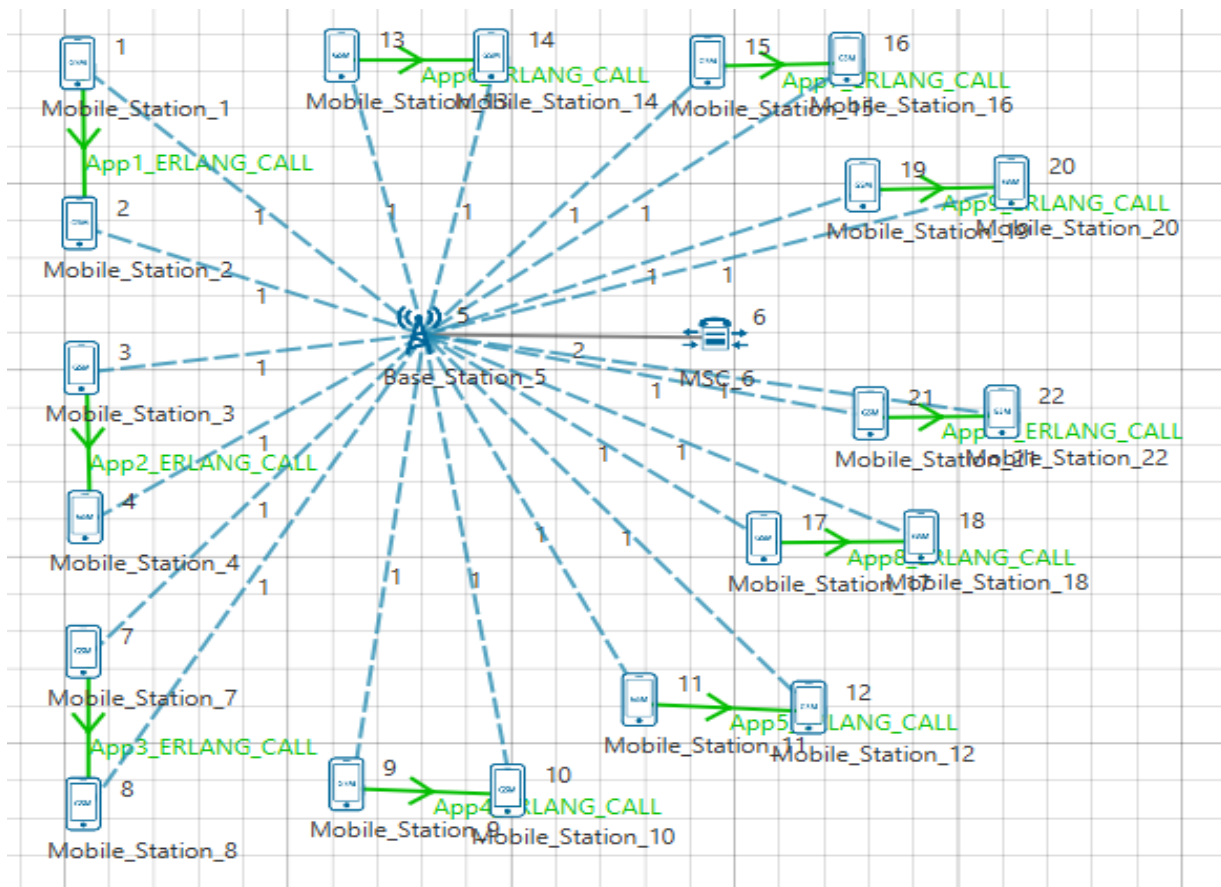
6. Click on Application and select these:
 - Source_ID = 1

- Destination_ID = 2
- Codec = Custom
- Packet Size (Bytes) = 33
- Call Duration Distribution = Exponential
- Inter-Arrival Time = 10
- IAT Distribution = Exponential
- Service Type = CBR
- Click OK.

D. Run & Replicate

- Click RUN to simulate.
- Repeat the same application setup and run for 9 samples and tabulate the call blocking probability for the respective samples and plot the graph.

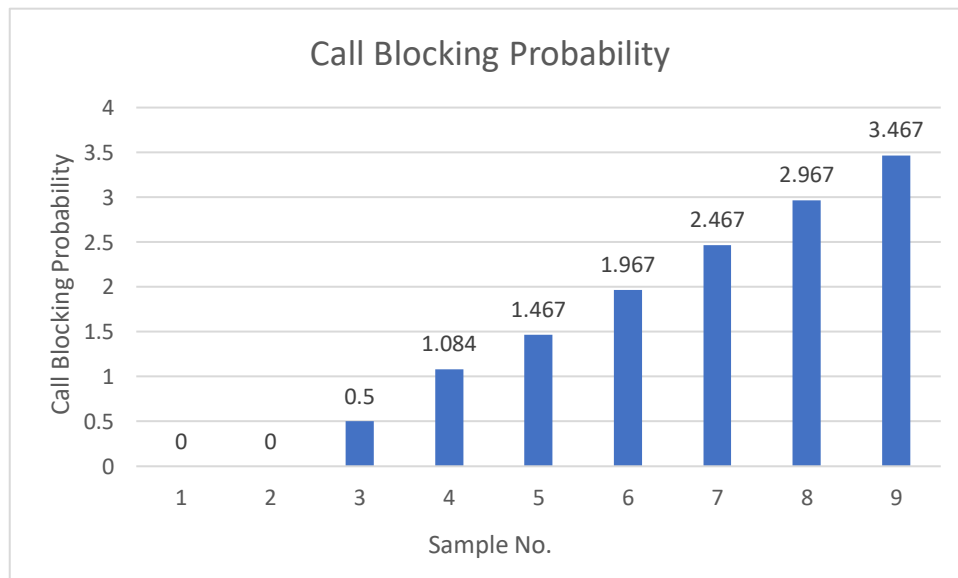
Celluar Network Diagram:



OUTPUT:

- 1) Call Blocking Probability was measured across 9 samples.
- 2) The observed values are tabulated below and shown in the bar chart.

Sample No.	Sum of Call Blocking Probability
1	0
2	0
3	0.5
4	1.084
5	1.467
6	1.967
7	2.467
8	2.967
9	3.467



RESULT:

The Call Blocking Probability increases gradually with the number of call requests (samples). Initially, there is no blocking when traffic load is low, but as more calls are generated, the probability of blocking rises due to limited available channels.

INFERENCE:

From the experiment, it is observed that:

- Call Blocking Probability is directly proportional to the traffic intensity in the cellular network.
- At low traffic, all calls are successfully connected with negligible blocking.
- As the number of users (traffic load) increases, blocking probability increases significantly, indicating limited channel resources.
- Hence, the efficiency and performance of a GSM network depend on optimal resource allocation to balance between carried traffic and blocking probability.