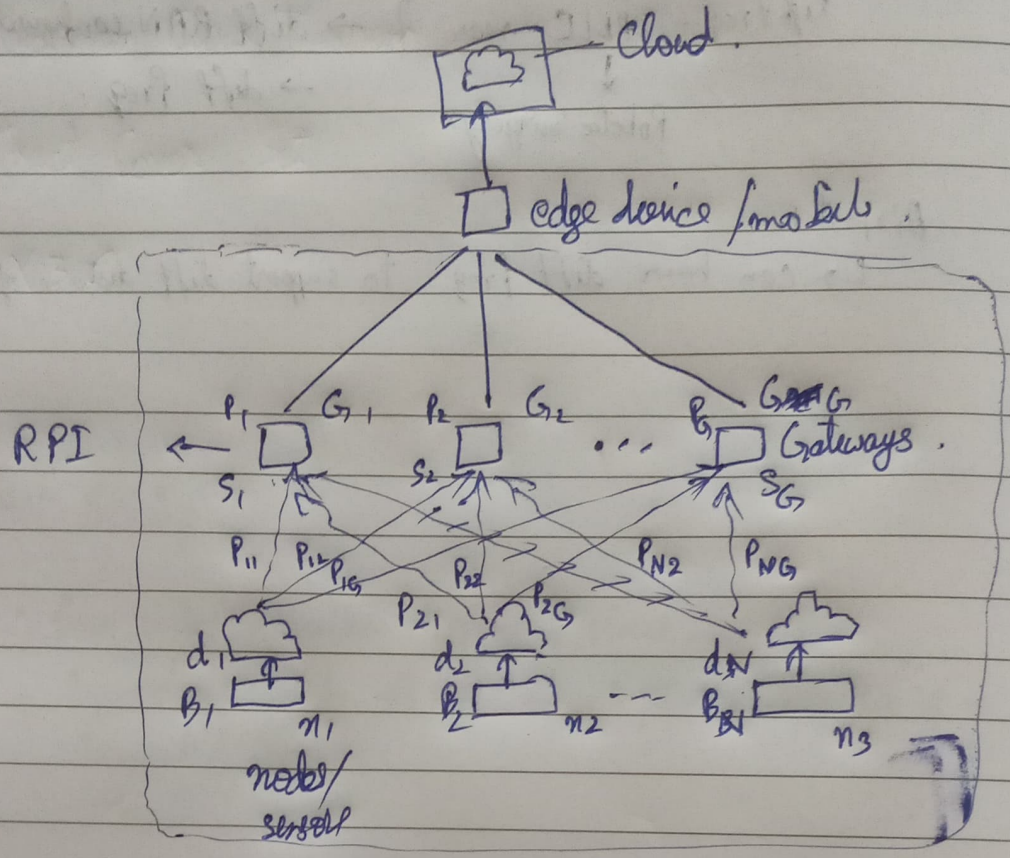
Problem Scenario.

→ 1 - eMMB. (5G - prone)



a node can send data to one Gateway or multiple Gateway (need physical channel)

say 60% - G_1

10% - G_2

30% - G_m

this has capacity to aggregate the data & send to edge device.

① Problem: storage by each of these gateways ($S_1, S_2, \ldots S_m$)

Gateway should have capability to accept the data in the storage.

(2) - A Gateway can be connected to all nodes or few nodes.

Total data received from all nodes $\leq S_i$ of Gateway i.

- $B_1, B_2, \ldots$ ⇒ Battery power required to send the data

P_{11} = Battery power required to send data from n_1 to G_1.

$P_{11} + P_{12} + \ldots P_{1x} \leq B_1$

Till B_1 becomes 0, it can transmit..

(3) $P_1, P_2, \ldots$ power required to turn on the Gateway (say Raspberry Pi or desktop computer).

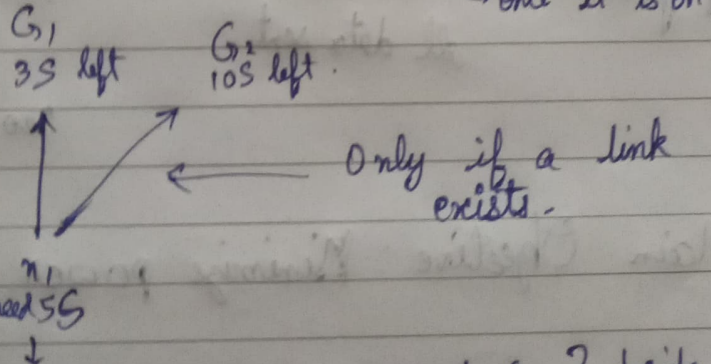
- always turning on all Gateway is not required!.

Objective: Minimize power :- (Total Power)

$P_{11} + P_{12} + P_{13} + \ldots P_{1G_1} + P_1 + P_2 + P_3 + \ldots P_{G_1}$

$P_{Transmission} + P_{operate\ of\ gateway}$

↳ once it is on, it is on.



* Facility location Problem → variants → Capacitated, Un-Capacitated
Capacitated

* Maximum Flow Theorem

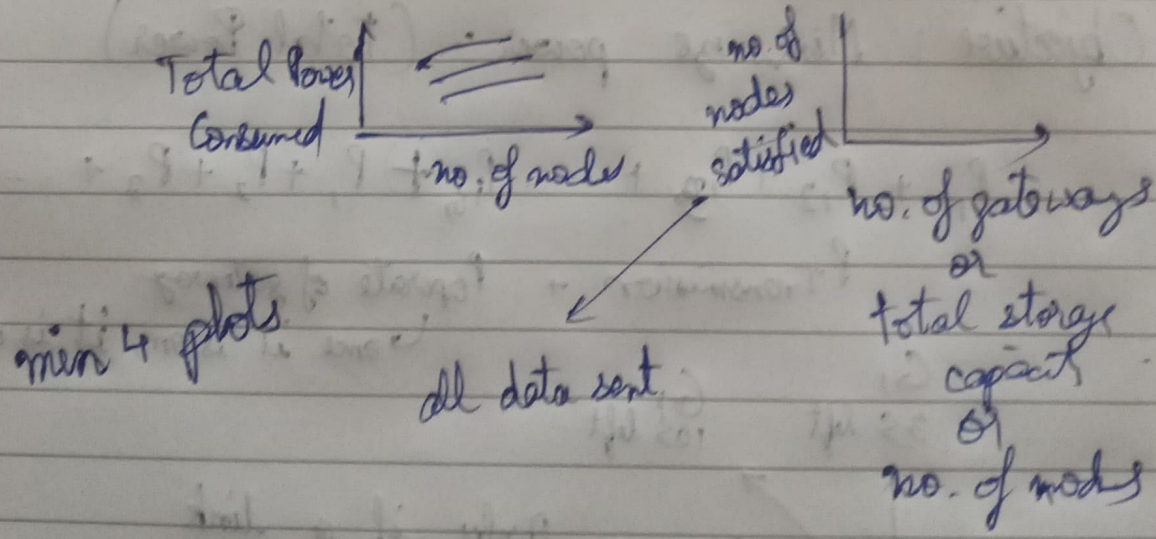
* Exact Cover Set → Graph problem.

* X3C

Greedy Set-Cover Algorithm. } download
- Neal E. Young, University of California

70 - 80 - ~~no~~ gateway

vary - no of nodes - graph



Main Objective: Minimize power.