

IMPACT OF MOBILITY ON MULTICAST CAPACITY OF WIRELESS NETWORKS

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System Model

- We have n node in a unit area disk, n_s sources and n^{e-1} destination per source.
- We consider hybrid system with n^γ mobile nodes and the rest are *static*.

A) Geographically Unrestricted Mobility (GUM)

- We consider both *protocol* and *physical* model for interference.
- The total multicast throughput in case $\gamma=1$ is

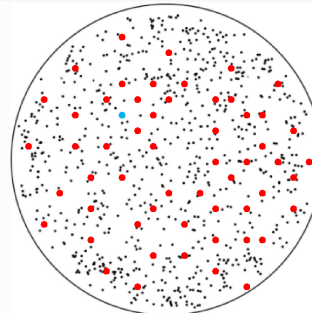
$$\Theta(\min\{n_s, n^\varepsilon\})$$

- The total multicast throughput in case $\gamma \neq 1$ is

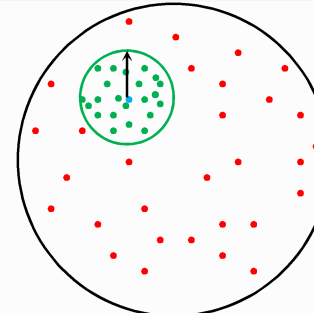
$$\Omega\left(\min\left\{n_s, \max\left\{\frac{n^{\gamma+\varepsilon-1}}{\log n}, \frac{\sqrt{n^\varepsilon}}{\sqrt{\log n}}\right\}\right\}\right)$$

B) Geographically Restricted Mobility (GRM)

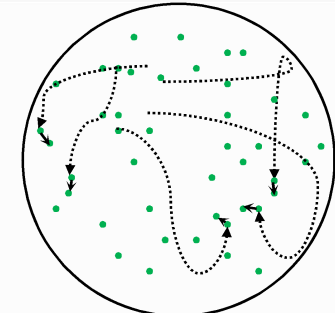
- Mobile nodes are restricted to move within $\Theta(n^\alpha)$ clusters.
- We consider two cases Equal Area Clusters (EAC) and Distinct Area Cluster (DAC).



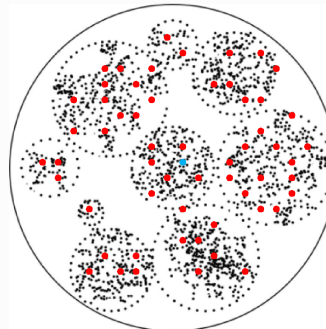
Source and destinations locations



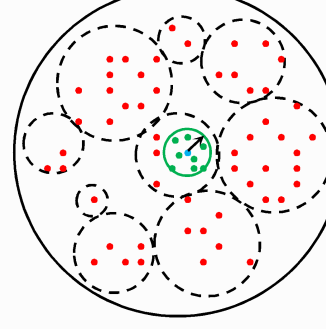
Packet sent to the nearest nodes



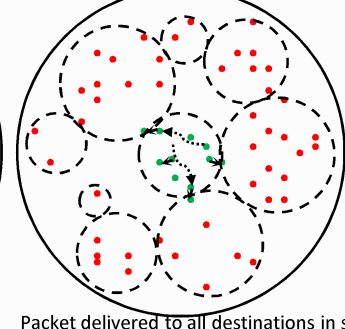
Packet delivered to all destinations



Source and destinations locations



Packet sent to the nearest nodes



Packet delivered to all destinations in source cluster

- The total multicast throughput in case $\gamma=1$ is

$$\Theta(\min\{n_s, n^\varepsilon\}) n^{-\alpha} \quad \text{in case of EAC}$$

$$\text{and } \Theta(\min\{n_s, n^\varepsilon\}) n^{\max\{i\}-1} \quad \text{in case of DAC}$$

where $\Theta(n^{e(i)})$ is the number of nodes in cluster i .

Repeat the steps for each cluster

