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Wireless Sensor Network - Routing

Routing

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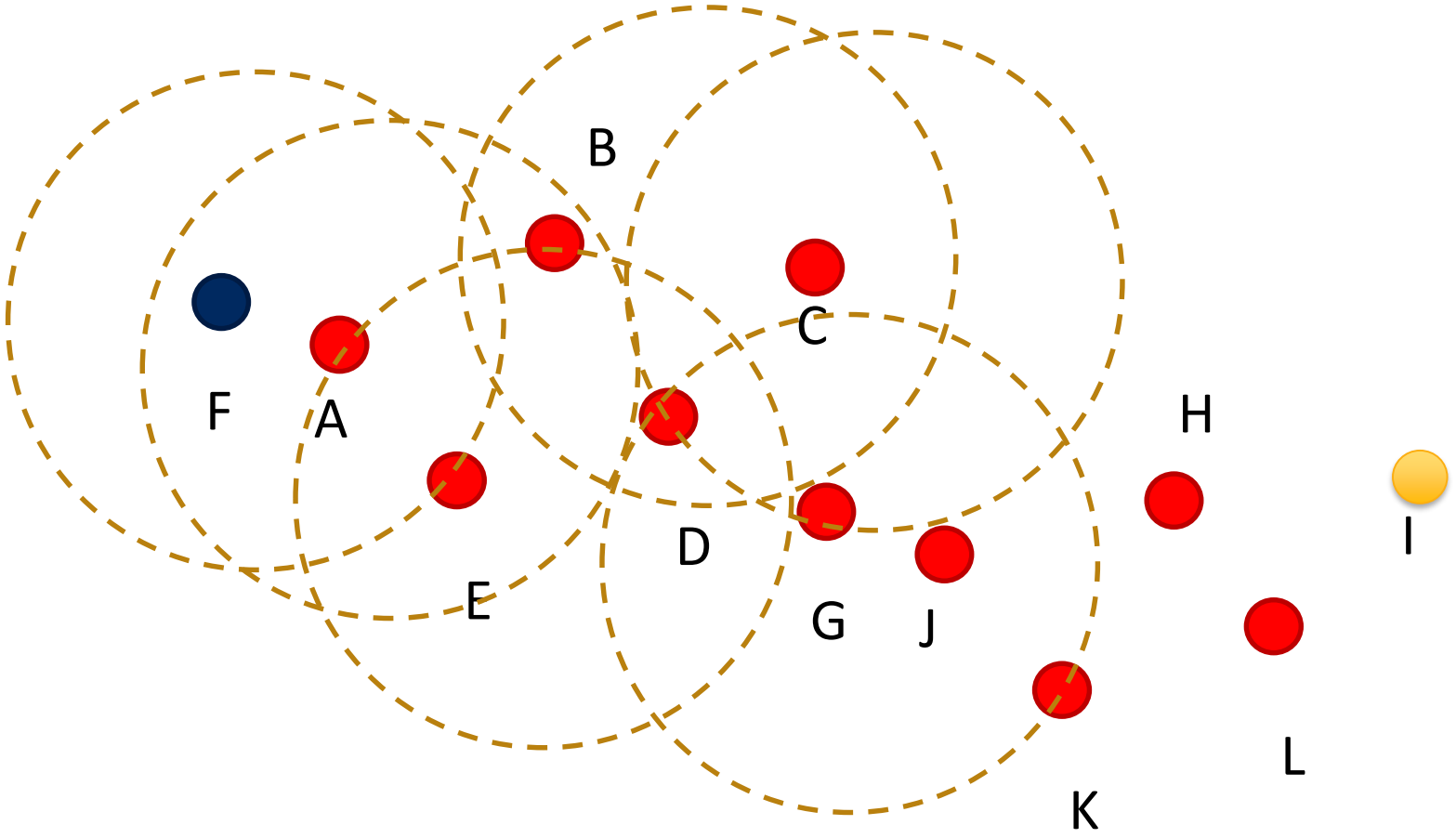
- Flooding
- Gossiping

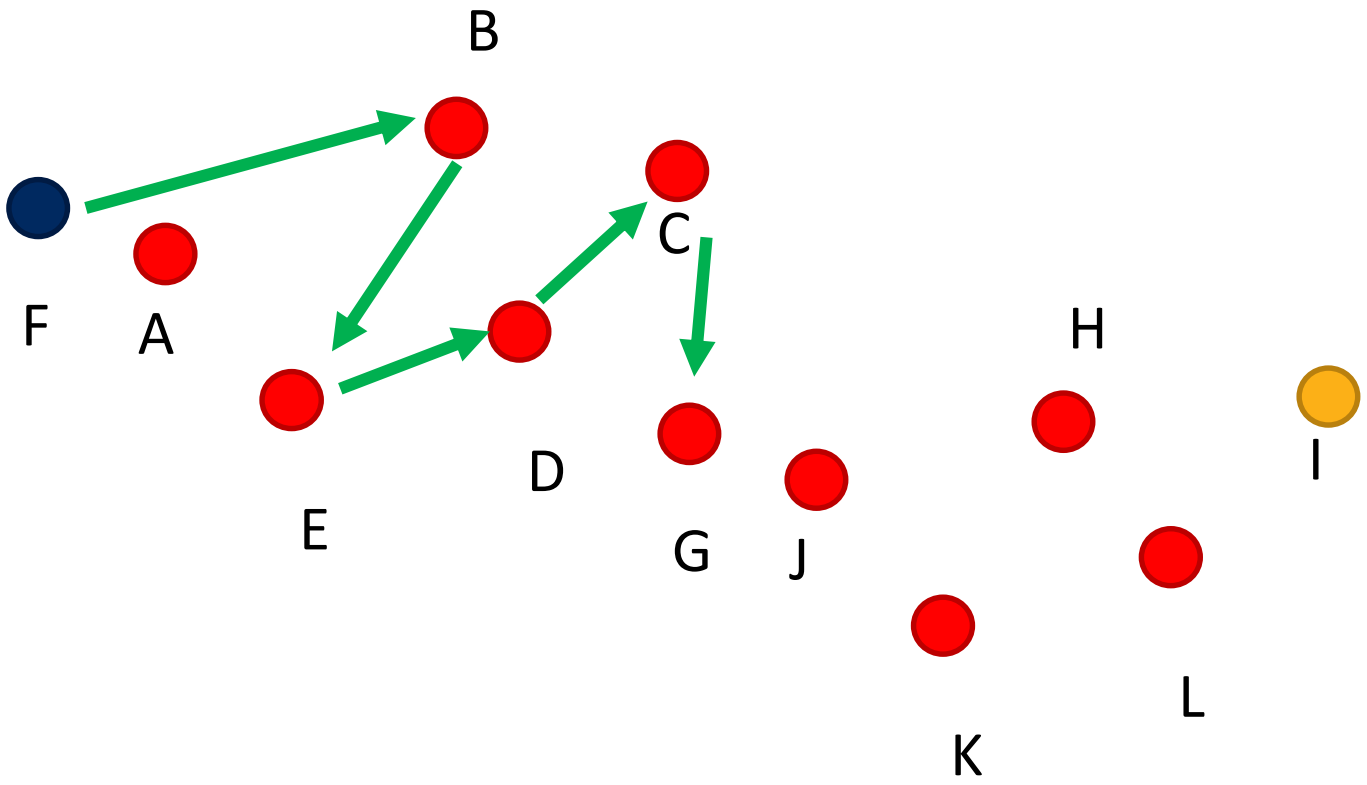
Flooding



Flooding - Issues

- Broadcast Storms

Gossiping



Gossiping - Issues

- No Control over Route Length

Routing - Types

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- Proactive
- Reactive
- Multi-hop
- Direct
- Push
- Pull

Routing – Performance Criteria

- Hit-Miss Ratio
- Average Energy Consumption
- Network Life Time

Routing Algorithms

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- Optimization-based
- Data-centric
- Cluster-based
- Location-based
- QoS Enabled

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Wireless Sensor Network - Clustering

Routing - Clustering

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- Low Energy Adaptive Cluster Hierarchy protocol (LEACH)

LEACH - Model

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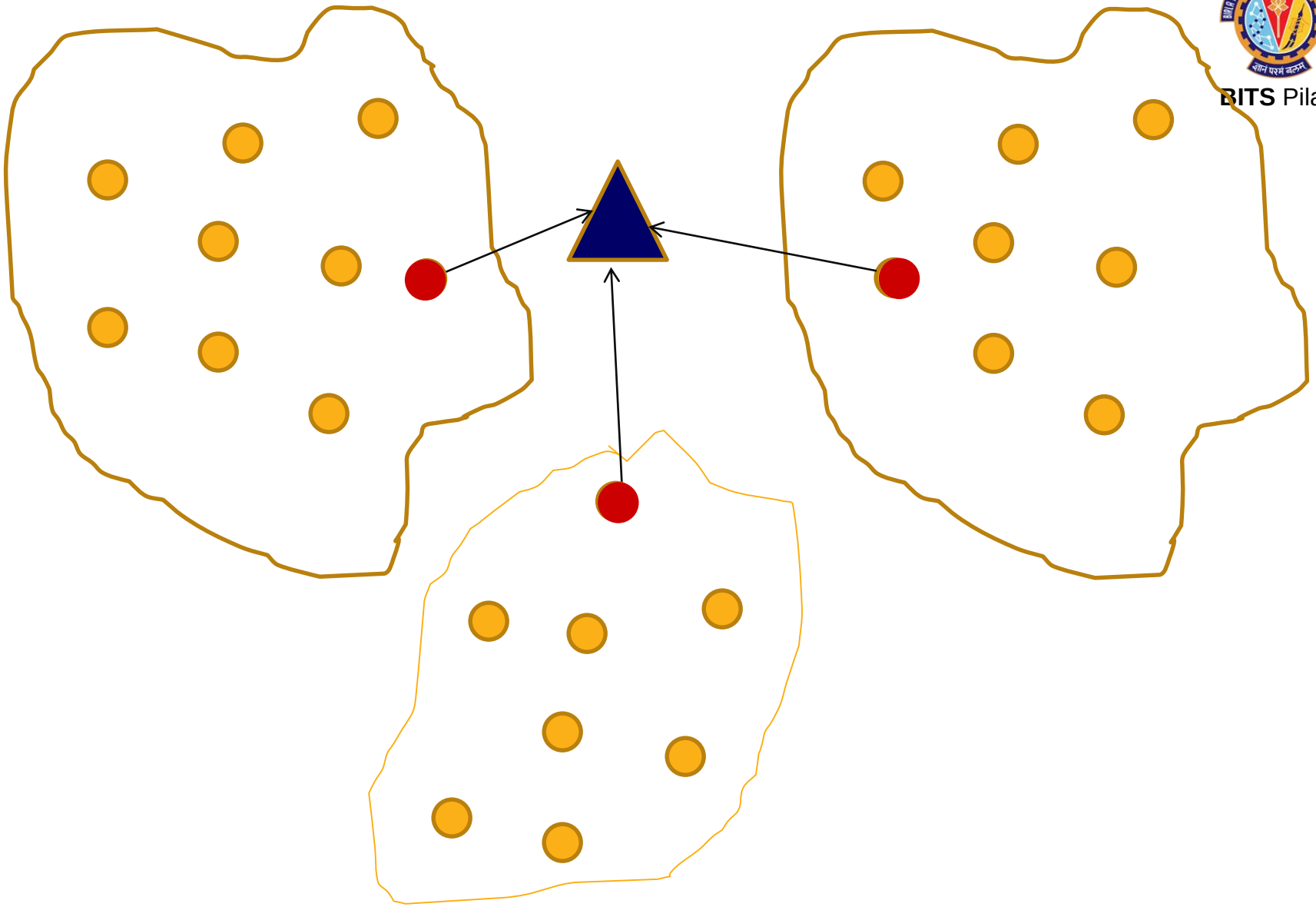
- Base Station is fixed and far away from all sensor nodes
- All nodes - energy constrained & homogeneous
- Localized Clustering
- Local Data fusion
- Rotation of Cluster Heads
- Adaptive and Rotating Clustering Algorithm



LEACH - Advertisement Phase

- P = Desired % of cluster heads
- r = current round
- G – Nodes not yet cluster head in n rounds

LEACH - Cluster Selection Phase

Each node informs the cluster-head node that it will be a member

Each node transmits this information back to the cluster-head again using a CSMA MAC protocol

All cluster-head nodes must keep their receivers on

Schedule Creation Phase

LEACH

Energy Consumption evenly distributed

Data Aggregation – done at CH

In-built MAC