

UNMANNED AERIAL VEHICLE UAV

- Useful for assist in rescue and recovery operations
- Used in Dangerous situations
- Used in common applications (traffic monitoring)

UAVNET or DRONET

- In general, used to search, identify and monitor events over massive/inaccessible areas
- deployed in an area
- coordinate actions autonomously

DRONET

- Drones as flying base stations or relay nodes
- Support connectivity of existing terrestrial communication net

UAVNET issues and challenges

- Mid to high mobility

- Fluid Topology
- Node failure
- Energy constraints

MAC in UAVNET

- Several radio modules on drones
- Wifi, cellular
- LPWAN - Low power wide area network

ROUTING

- When is necessary to stream high definition video



Demands wideband communication technologies

Video monitoring on wide areas

↳ require multi-hop data connections

- DRONETs have much higher mobility

- Proactive Routing Protocol:

- use tables in their nodes to store routing info
- tables updated when topology changes
- bandwidth constraints
- slow reaction to topology changes \Rightarrow DELAYS

- Reactive Protocol:

- route founded when is needed communication between nodes
- on demand

- Hybrid Protocol:

- reduce overhead mixing proactive and reactive
- scale well on large network
- hard to implement

- Geographic Protocol:

- routing scheme based on geo-position of the nodes

$F_{total} = F_{local} + F_{remote}$

- Entire network info not necessary
- Use local info to forward data packets
- Reduced overhead, bandwidth and energy consumption

DEAD END PROBLEM

- Packet can arrive to a DEAD END



node does not have
any neighbor closest
to the destination

- Several techniques defined to recover from a DEAD END

GEOGRAPHIC APPROACH IN DRONETS

- UAVs know its own location using the GPS device

Geo routing based on 3 main approaches

Store-carry
and forward

Greedy
forwarding

Prediction

- When the network is intermittently connected
- Not possible to forward any data packet to a predefined node
- The current node carry the packet until meeting another node or the target destination
- Select the geo. closest node to the target destination
- Local optimum problem
- Prediction on geo.location, speed, direction to predict the future position of the nodes
- Most efficient