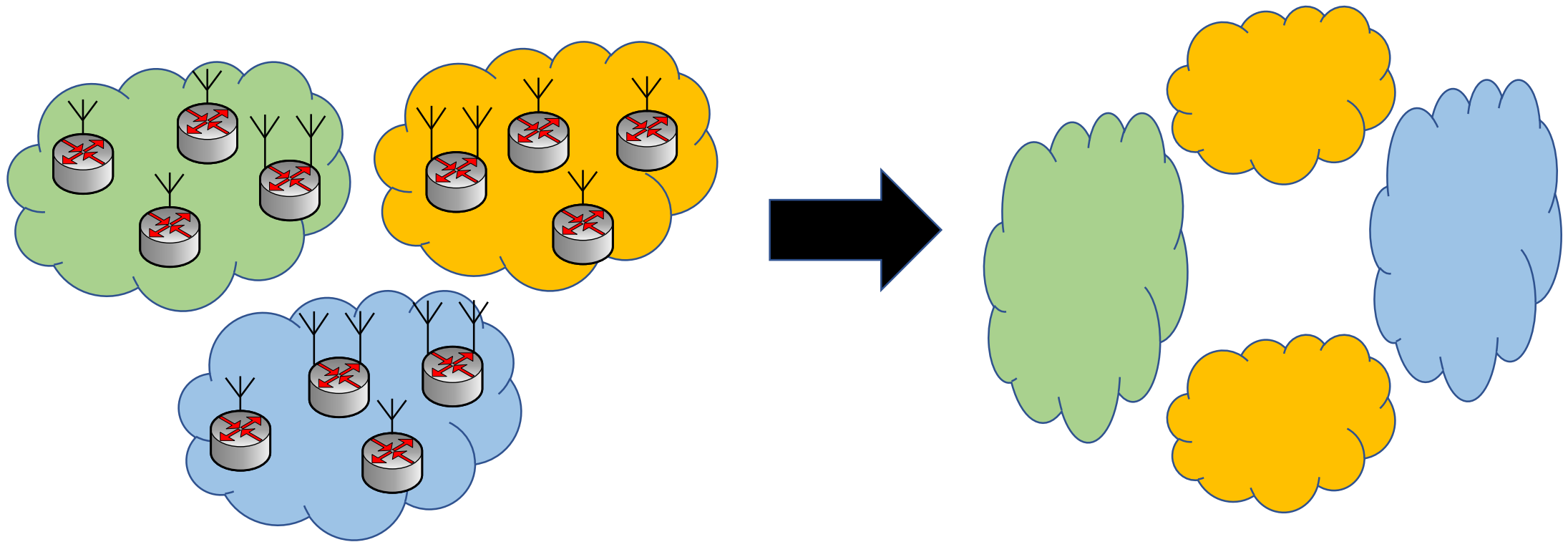# Inter-MANET Routing

IETF-105, Ronald in 't Velt, TNO

How to connect (heterogeneous) MANETs?

- Multiple MANETs
  - Potentially running different MANET routing protocols
  - Potentially using different radios (L1/L2) for internal communication
    - but within each MANET a subset of the nodes is equipped with an additional 'common' radio / waveform type for Inter-MANET communication
  - Forming a 'coalition' or 'federation'
- Think large scale multi-party disaster recovery operation
  - The usual euphemism ☺

Everything moves

- Individual MANETs may split and merge

Gateway nodes

- Nodes with both an internal and a 'common' radio are potential gateways

- Gateways can be pre-configured or dynamically selected

- Gateways run two (or more) different MANET routing protocols
  - How to convey routing information from one MANET routing protocol to another?
    - 'Flat' route redistribution is one possible solution, but is hard to configure and loop-prone
    - A specific Inter-MANET protocol may be the way to go
      - Analogy: Autonomous Systems connected by an Exterior Gateway Protocol; hence ….

'EGP for MANETs'

- BGP is not suited for the job
  - Cannot handle frequent splits and merges of 'Autonomous Systems' (MANETs)
    - There is no address aggregation in MANETs
  - Runs over TCP; in MANETs, TCP connections are often unstable
- The need for a MANET 'EGP' has been argued in a number of scientific papers, along with some solutions
  - But 'implementations' were largely done in simulation frameworks (ns-2, OPNET) and are unavailable

Literature

- C.-K Chau *et al.*, Inter-domain routing for mobile ad hoc networks, in 3rd International workshop on Mobility in the evolving internet architecture, 2008

- S.H. Lee *et al.*, InterMR: Inter-MANET Routing for Heterogeneous MANETs, in The 7th IEEE International Conference on Mobile Ad-hoc and Sensor Systems, 2010

- Joy Na Wang *et al.*, Inter-domain Routing for Military Mobile Networks , Milcom 2015

- …..

Question to the WG

- Is there interest to work on an Inter-MANET Routing Protocol?
    - Write a Problem Statement
    - Study existing proposals and establish what is missing (if anything)
    - Write a protocol specification
        - Probably aiming at 'Experimental' initially
    - Work on an implementation(?)
- If yes:
    - Do we need to re-charter to accommodate this work?