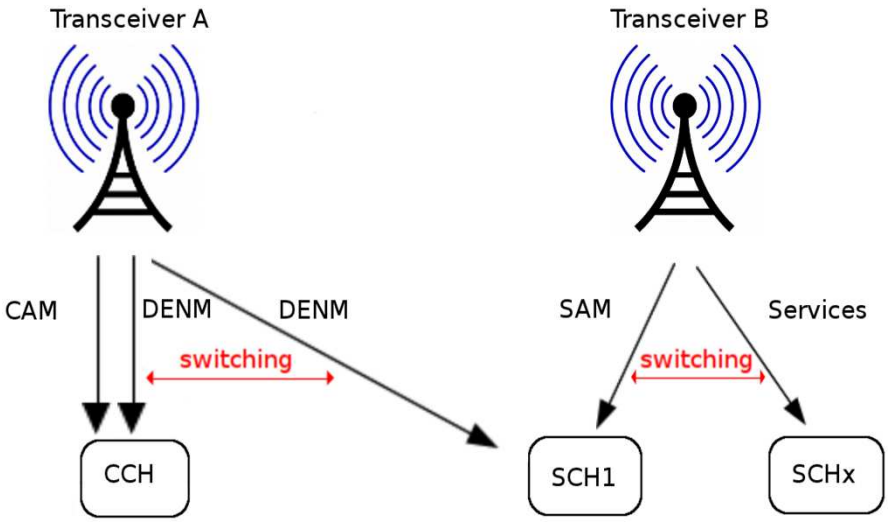
Multi-Channel Congestion Control for ETSI ITS G5 A/B

De Martini Laura - Master student at Politecnico di Torino

ETSI ITS G5 Channel And Message Specification



CAM
Cooperative Awareness Message

Periodically transmitted on CCH with position and speed information of the vehicle

DENM
Decentralized Environmental Notification Message

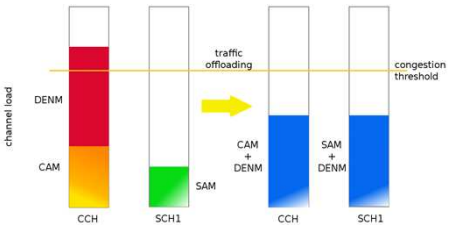
Event driven
Announces dangers

SAM
Service Announcement Message

ETSI ITS G5 Multichannel operations

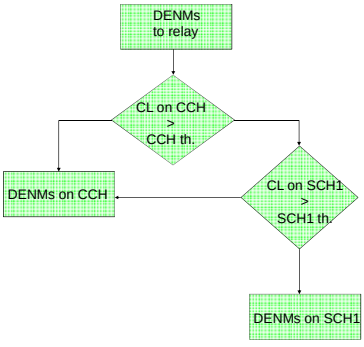
Traffic offloading

DCC states: restricted active relaxed

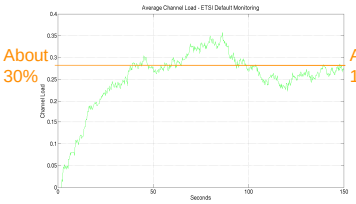


- Channel load on CCH can easily reach very high level due to CAMs transmission.
- Some messages can be off-loaded on SCH1 in order to obtain more efficient usage of the resources
- DENM messages can be relayed on SCH1 instead of CCH
- CAM messages could be transmitted as well on SCH1 if the CCH load is high
- CL stands for Channel Load
- CCH threshold is given by DCC active + hysteresis
- SCH1 threshold is given by DCC active - hysteresis

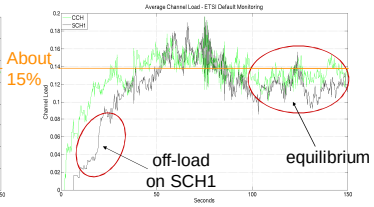
Channel switching algorithm



Channel load without traffic off-loading

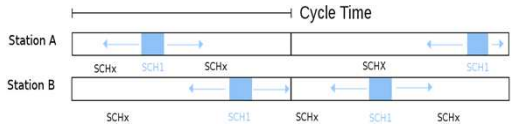


Channel load with traffic off-loading



Multichannel services

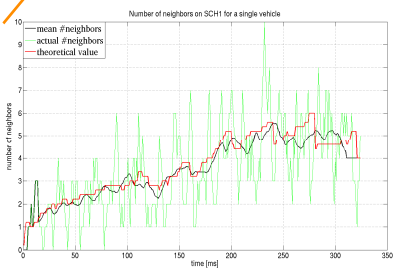
- Service provider (SP): transmits SAM on SCH1 and offers services on SCHx
- Service consumer (SC): after SAM reception on SCH1 it switches on SCHx in order to get the related services
- Each ITS node can act both roles
- The channel switching proposal define a cycle time of 1s in which at least one slot of 200 ms is dedicated to SCH1



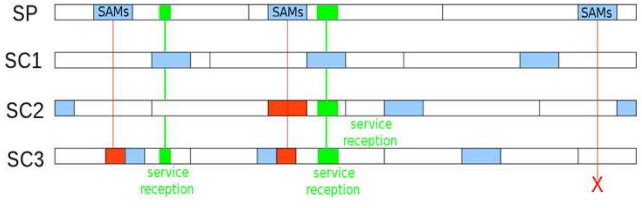
Consequent issues :

- Asynchronous periodic return to SCH1
- Heterogeneous duty cycle on SCH1
- On SCH1 DENMs are relayed and SAM transmitted

How many neighbors on SCH1?



Multichannel services protocol



EURECOM – CAMPUS SOPHIATECH
450 route des Chappes F-06410 BIOT Sophia Antipolis
www.eurecom.fr

In cooperation with ETSI ITS Standards on the move