Measurement method of network congestion used for adjusting the radio resources in a MR cell

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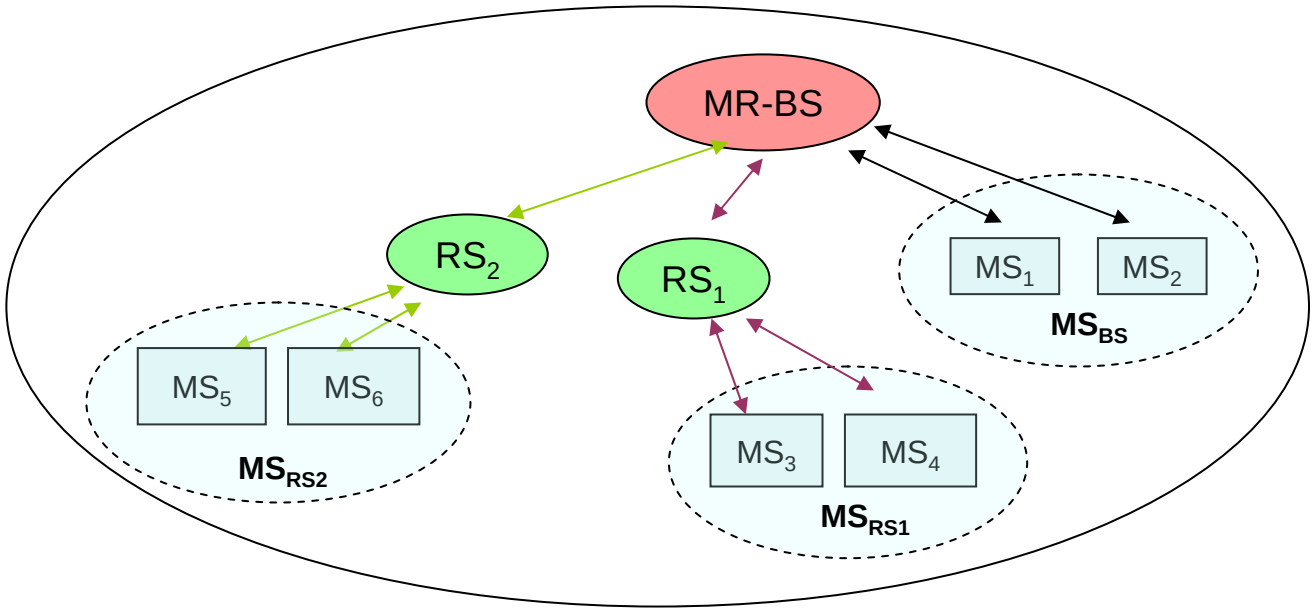
IEEE C802.16j-06/145 and URL <http://ieee802.org/16/… C80216j-06_145.pdf>.

Purpose:

For discussion and approval of inclusion of the proposed text into the P802.16j baseline document.

Two-layered radio resources management in a 16j cell



- Two layered radio resource management:
  - Top layer: MR-BS partitions the BW and assigns to access links and relay links
  - Bottom layer: MR-BS and RSs schedules the transmission of their associated links.
- MR-BS does not have all the detailed information (BW request, channel quality, ARQ, etc) on the access links and some distant relay links.
- MR-BS needs a network congestion measurement for network load monitoring and load balancing.

Transmission queue length as universal congestion measure

- Service flow QoS depends on
  - Traffic characteristics: mean arrival rate, burstyness;
  - Channel quality;
  - Radio resource used;
  - Scheduling algorithm;
- Transmission queue length reflects the combined effect of service request and service delivered. Applicable to different kinds of flows.
- Average channel quality is also useful information.

Proposed congestion measurement mechanism

- A RS collects the following entities:
  - Average transmission queue lengths and standard deviation;
  - Number of MSs with certain QoS traffics;
  - Number of service flows with certain QoS types;
  - Channel qualities of the serviced MSs: RSSI, CINR (mean, standard deviation).
- For relay links, a RS only reports its outgoing direction.
- MR-BS Request, RS Respond.
- New MAC message:
  - Congestion Measurement Report Request (CGT_MEA_REQ)
  - Congestion Measurement Report Respond (CGT_MEA_REP)

Proposed text change

- 6.3.6.7: Network congestion measurement and radio resource management in multi-hop relay networks.
- 6.3.2.3.62: Multi-hop relay network congestion measurement
  - 2 new MAC messages
- 11.20: MR congestion measurement encoding
  - Related TLV