

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

IEEE 802.16 Presentation Submission Template (Rev. 8.3)

Document Number:

IEEE S802.16j-06/145

Date Submitted:

2006-11-14

Source:

Chenxi Zhu

Wei-Peng Chen

Jonathan Agre

Voice: +1 301 486 0671

Fax:

E-mail: chenxi.zhu@us.fujitsu.com

Fujitsu Laboratories of America

Venue:

IEEE 802.16 Session #46, Dallas, USA

Base Document:

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.

Notice:

This document has been prepared to assist IEEE 802.16. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

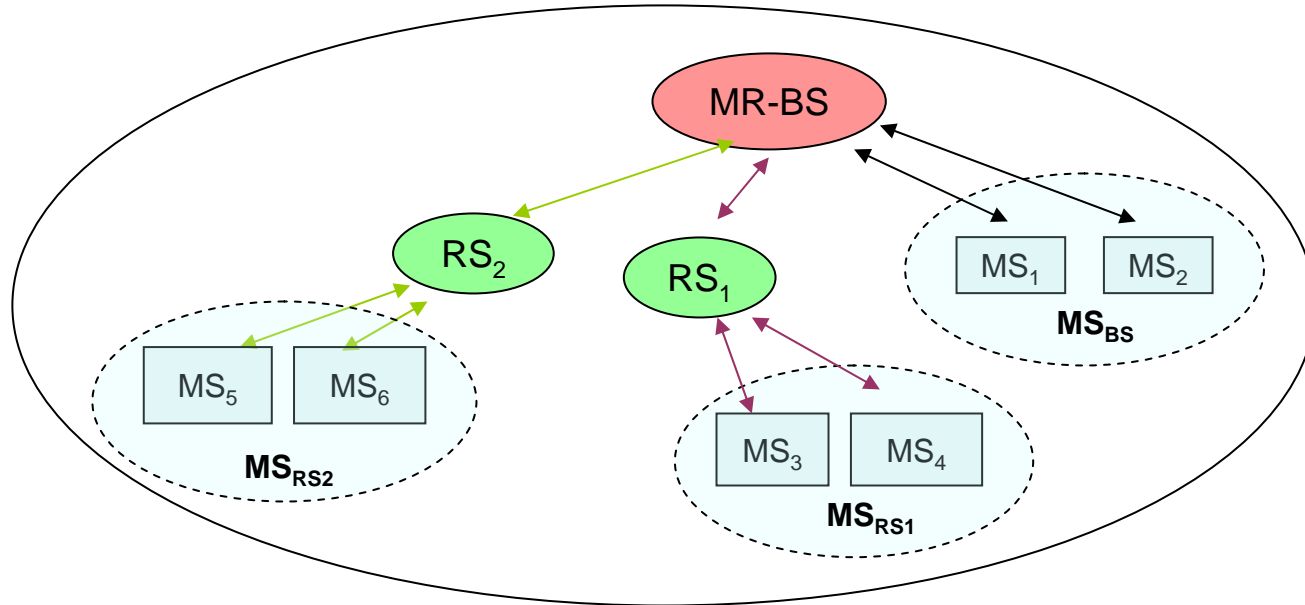
Release:

The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.

IEEE 802.16 Patent Policy:

The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures <<http://ieee802.org/16/ipr/patents/policy.html>>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of the standard." Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <<mailto:chair@wirelessman.org>> as early as possible, in written or electronic form, if patented technology (or technology under patent application) might be incorporated into a draft standard being developed within the IEEE 802.16 Working Group. The Chair will disclose this notification via the IEEE 802.16 web site <<http://ieee802.org/16/ipr/patents/notices>>.

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