progress report

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Outline

Papers

- Retransmission-based Access Class Barring for RAN overload control in Machine Type Communications[1]
- Efficient LTE Access with Collision Resolution for Massive M2M Communications [2]
- Adaptive RACH Congestion Management to Support M2M Communication in 4G LTE Networks [3]

for RAN overload control in Machine Typ Communications

- Classify into several groups by the number of retransmission. Each group were assigned a weight which means the proportion of RACH resource they get.
- The way to control the proportion of RACH resource is dynamic change their ACB factor

Resolution for Massive M2M Communications

- Proposed a collision resolution algorithm. The algorithm use q-ary tree spliting to split the set of avaliable preable
- Revise MSG4 to make UE next contention attempt use the sub-set of available preamble on dedicate RAO(random access opportunity)

Support M2M Communication in 4G LTE Networks

- With several known algorithm for congestion control, and seperate congestion situation in three level.
- Propose an algorithm “ARC”, to apply the best congestion control algo to correspond congestion level.

what this paper modify [1]

- MSG3- include number of preamble transmission
- SIB2- dynamic ACB factor

what this paper modify [2]

- MSG4- propose MSG4b to notify the UE about collision and specifying detail of next contention.

what this paper modify [3]

- eNB- about congestion control strategy

similarity

- restrict RAP
- get higher success probability

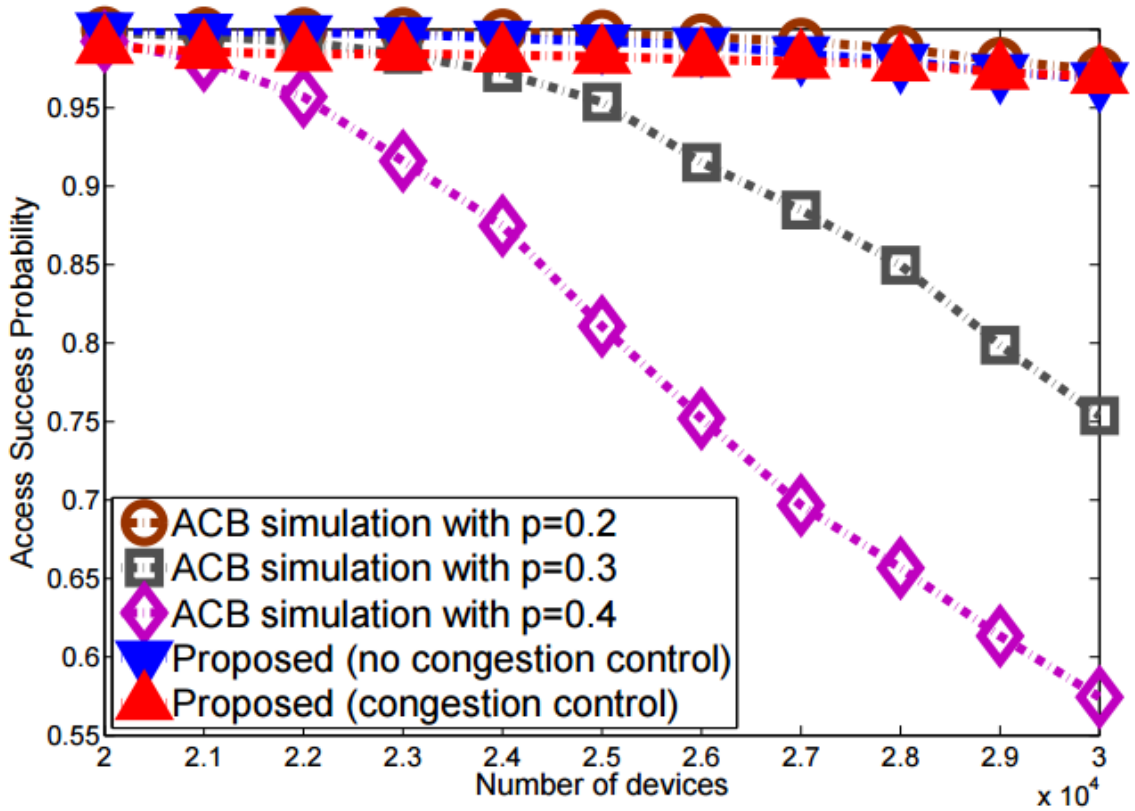
difference

- [1]- use feedback from MSG3
- [2]- deal with all collision, get higher delay
- [3]- use multiple algo to handle different situation

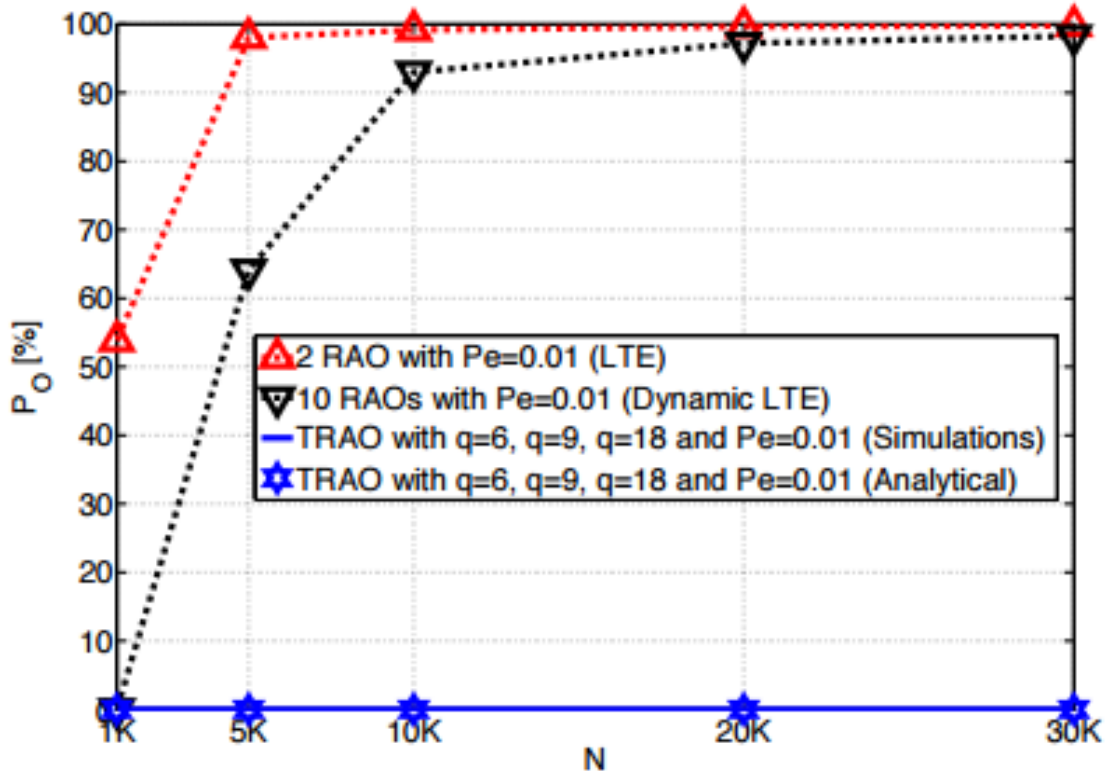
Access success probability and delay

	[1]	[2]	[3]
Access success probility	2	3	1
Access delay	1	3	2

[1] access success probability



[2] outage probability



[3] access success probability

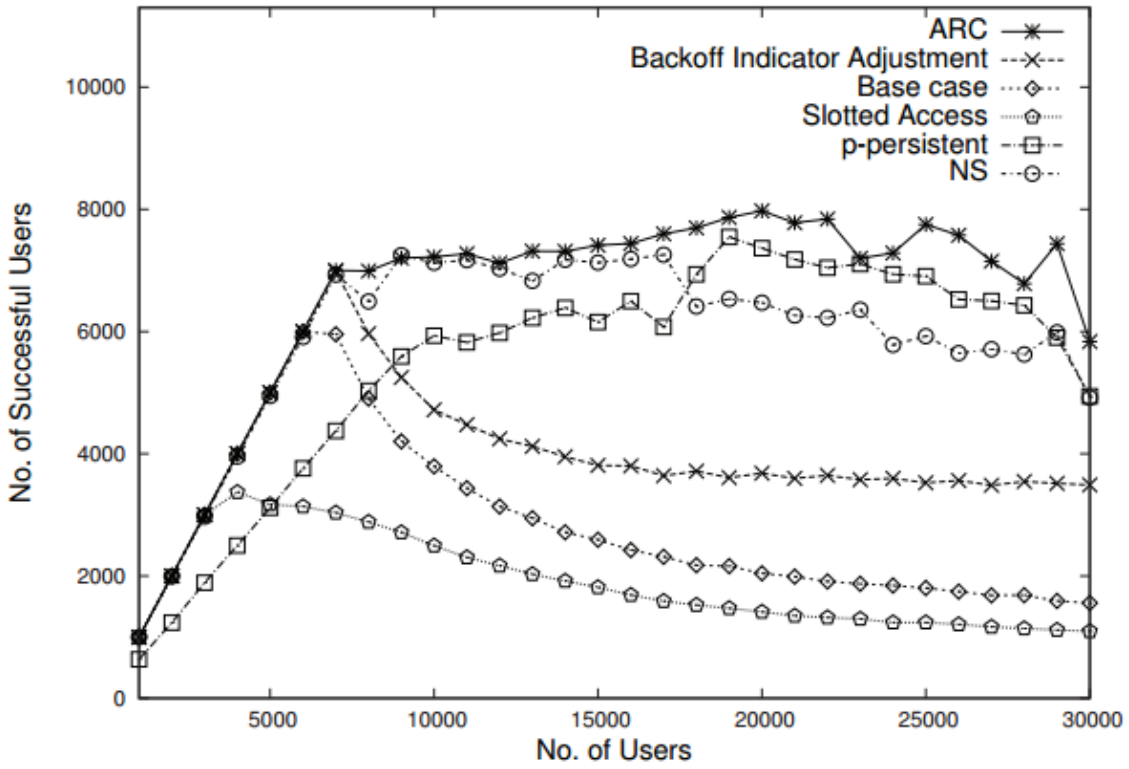
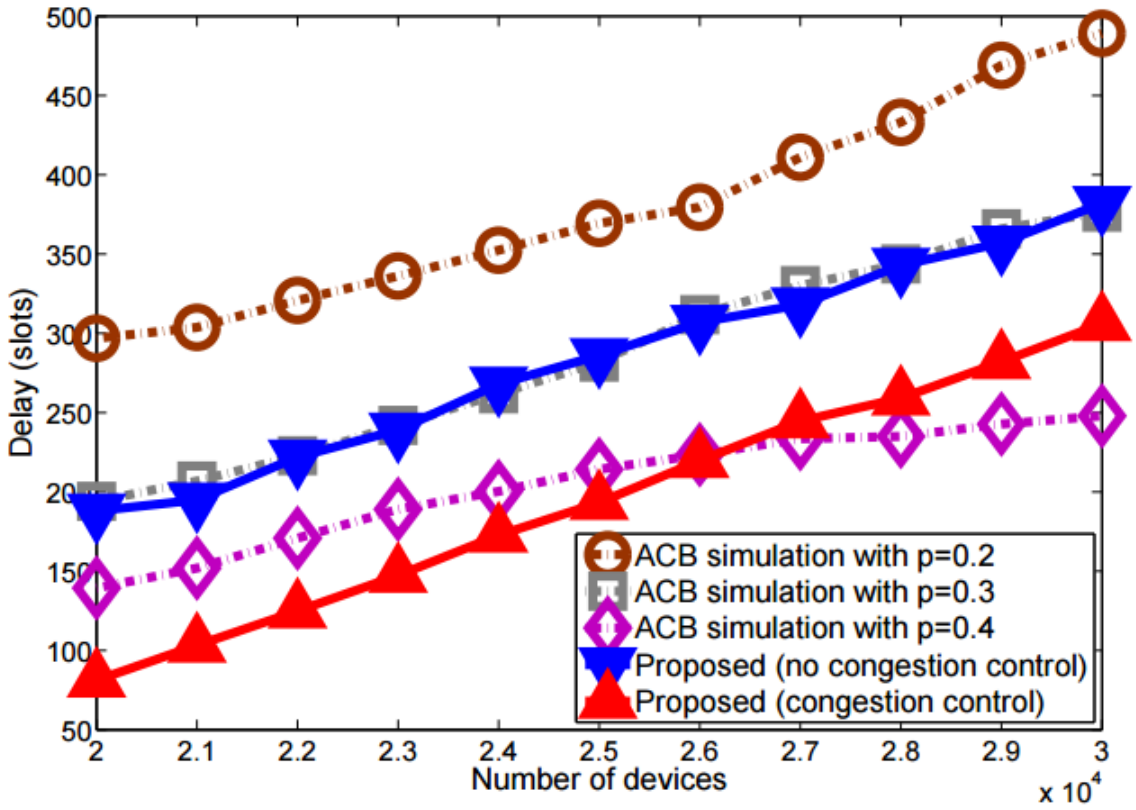


Fig. 2: Number of Successful Users

[1] access delay



[2] access delay

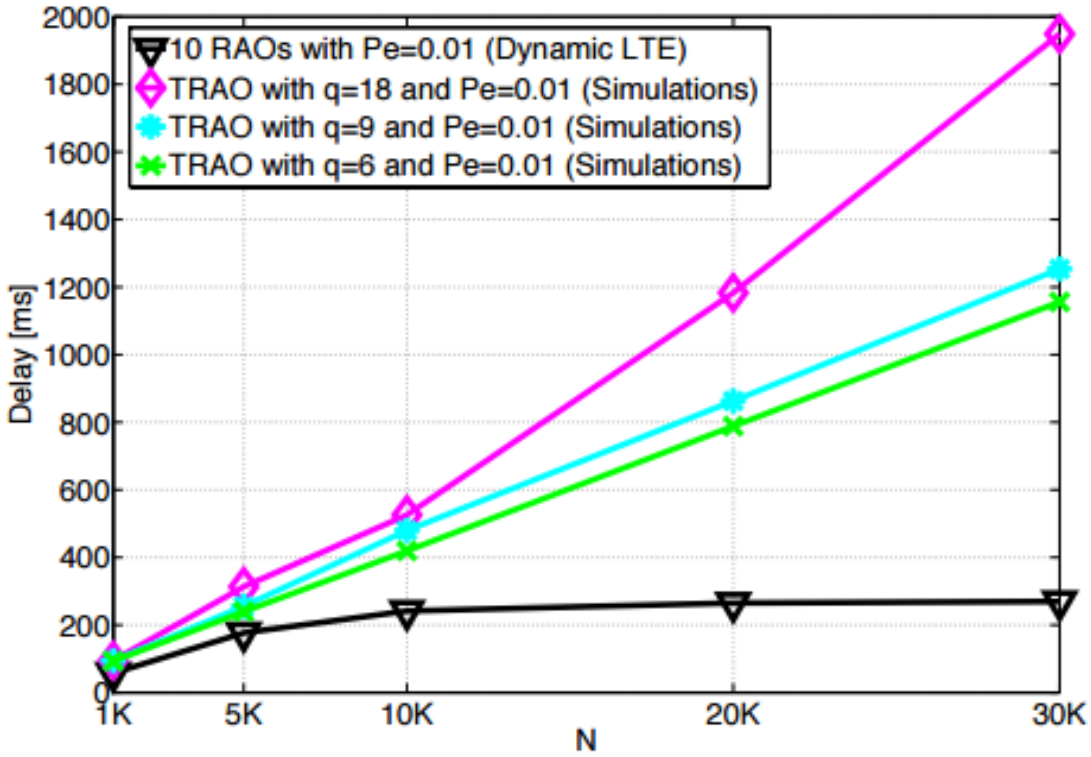


Fig. 7. Average delay experienced by resolved devices.

[3] access delay

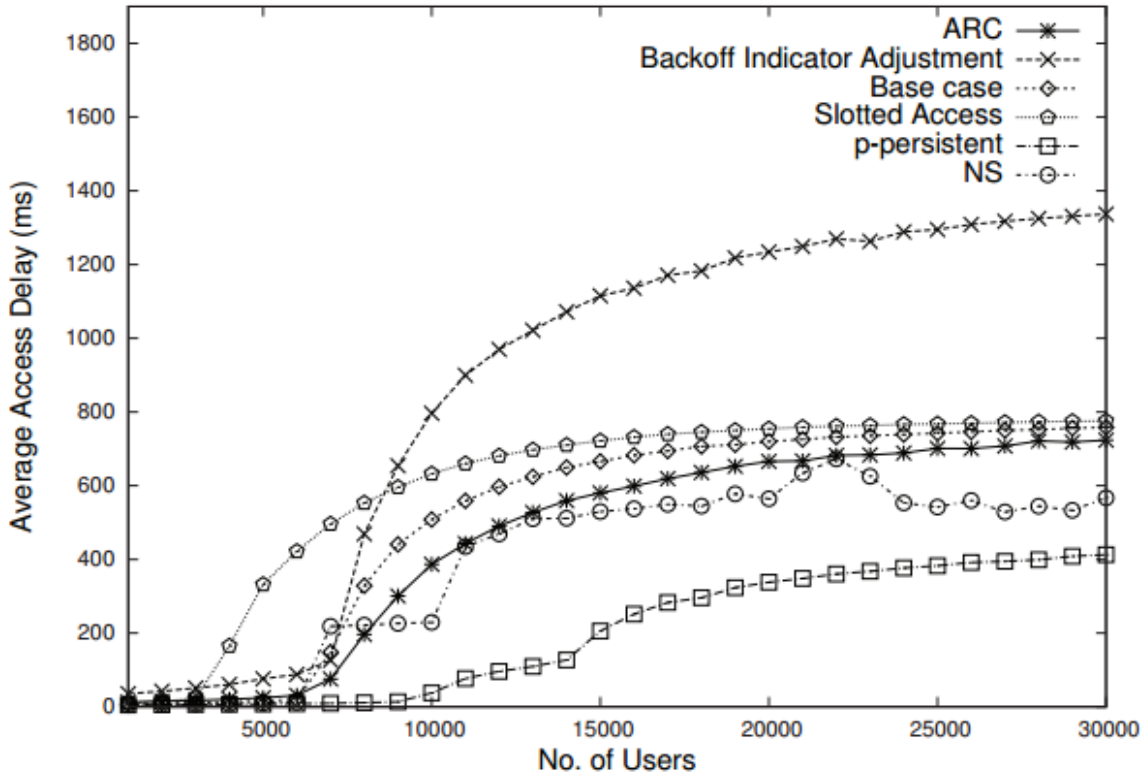


Fig. 3: Average Access Delay

References

[1] J. W. Chiou and S. Cheng, “Retransmission-based access class barring for ran overload control in machine type communications.”

[2] G. C. Madueo, . Stefanovi, and P. Popovski, “Efficient lte access with collision resolution for massive m2m communications,” in *2014 IEEE Globecom Workshops (GC Wkshps)*, Dec 2014, pp. 1433–1438.

[3] M. K. Giluka, A. Prasannakumar, N. Rajoria, and B. R. Tamma, “Adaptive rach congestion management to support m2m communication in 4g lte networks,” in *2013 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS)*, Dec 2013, pp. 1–6.

Thanks for Your Attentions