Fairness in Collision-Free WLANs

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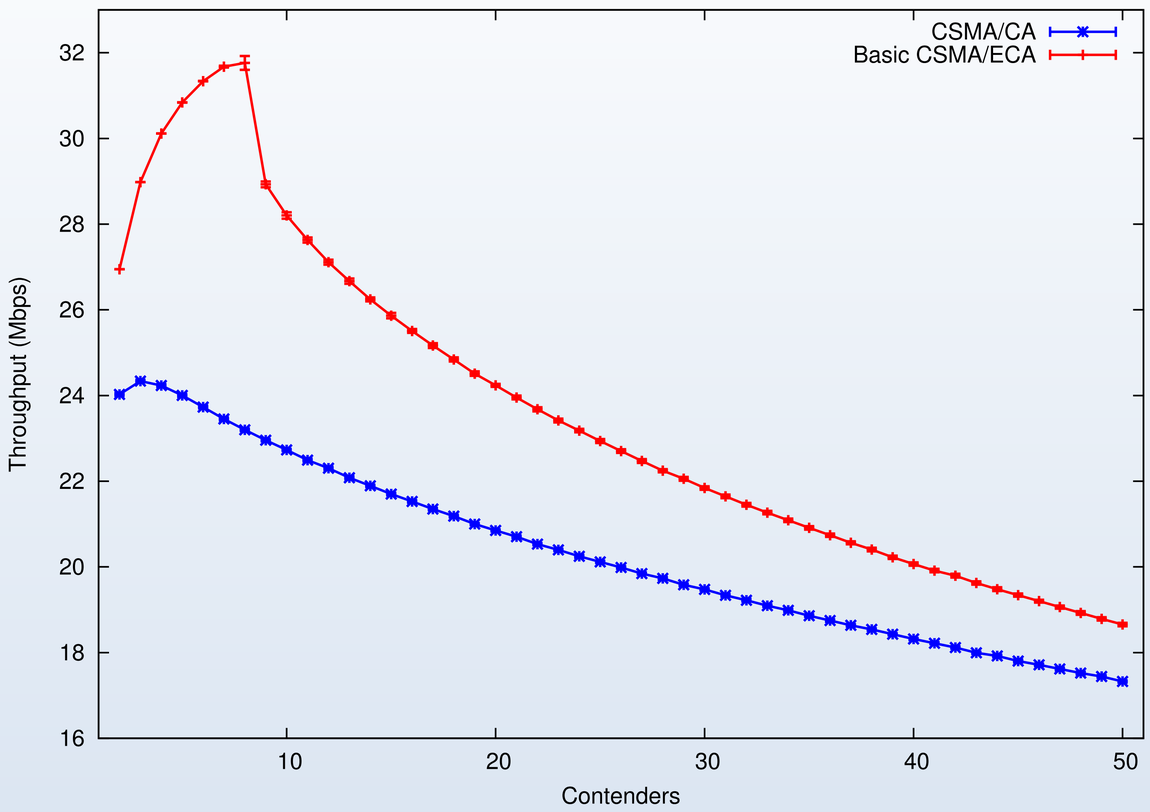
Contending for the medium

This section states the general problem: coordinate access to a shared medium, in a distributed manner avoiding collisions.

- What is a contention protocol for?: explain that the medium is shared.
- Highlight that it is widely used by current WiFi devices.
- What are the repercussions of a collision?

Throughput

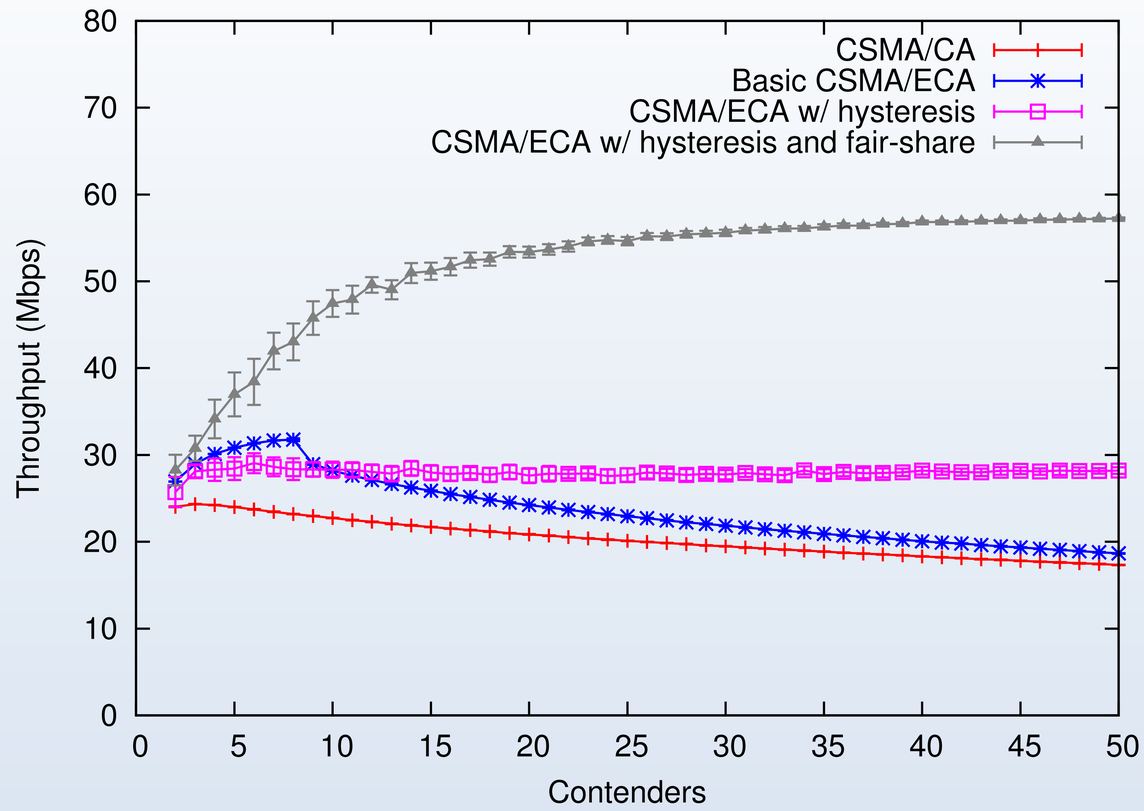
It might be appropriate to detail the behavior of CSMA/CA alongside with the throughput plot. A balls and bins figure?



This should actually be just a CSMA/CA plot (to be removed).

CSMA/ECA: hysteresis and fair share

Explanation on how the hysteresis and fair share achieve this increase in throughput. Also to mention the resiliency to slot drift.

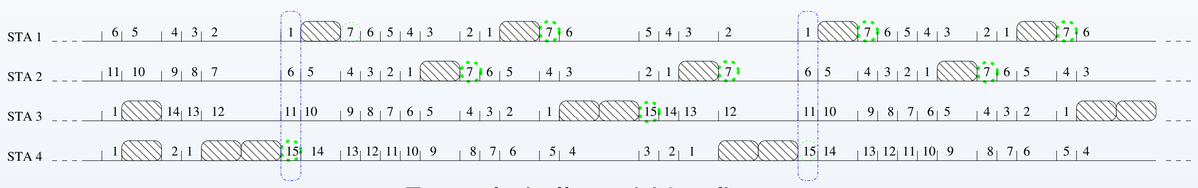


An STB establishes active (used) and inactive (unused) SIP sessions.

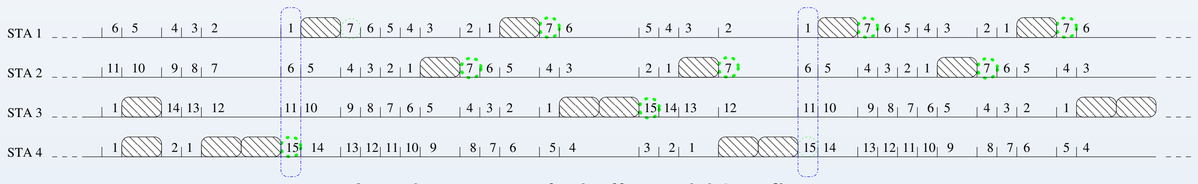
Using a deterministic backoff

This section introduces the deterministic backoff after successful transmissions. It should cover:

- When is this deterministic backoff selected?
- Why that value? ($B_d = CW_{\min}/2$)
- Is the problem solved?: No. Highlight the limitations of Basic ECA.



Example balls and bins figure.

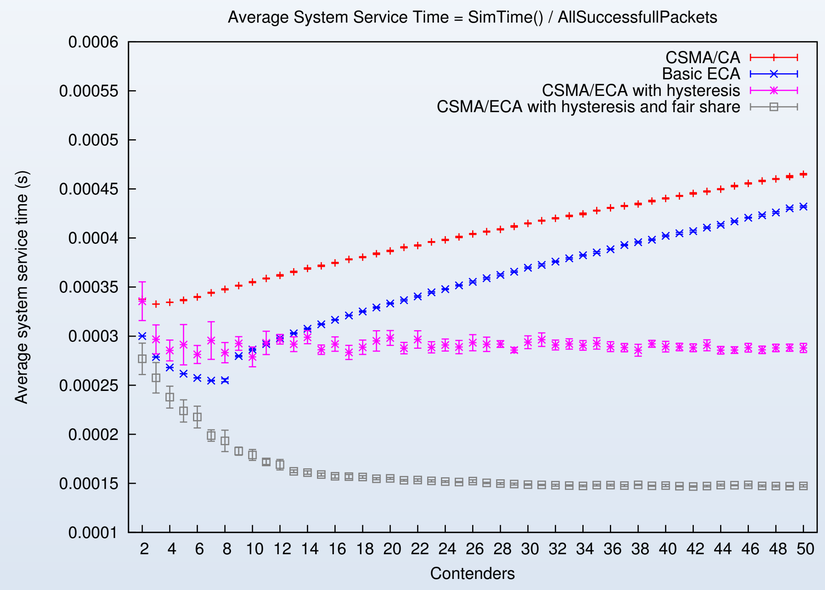


Another example balls and bins figure.

Future plans

Some of the future directions of the project:

- Unsaturated scenarios.
- To implement IEEE 802.11e EDCA.
- Wireless MAC Processors.
- Implementation in RFID networks.



Average system service time.

References

[1] Alex Bikfalvi, Jaime García-Reinoso, Iván Vidal, and Francisco Valera. A peer-to-peer iptv service architecture for the ip multimedia subsystem. *International Journal of Communication Systems*, 23(6–7):780–801, June–July 2009.

[2] T. Qiu, Z. Ge, S. Lee, J. Wang, J. Xu, and Q. Zhao. Modeling user activities in a large iptv system. In *Proceedings of the 9th ACM SIGCOMM conference on Internet measurement conference*, pages 430–441. ACM, 2009.

[3] T. Qiu, Z. Ge, S. Lee, J. Wang, Q. Zhao, and J. Xu. Modeling channel popularity dynamics in a large iptv system. In *Proceedings of the eleventh international joint conference on Measurement and modeling of computer systems*, pages 275–286. ACM, 2009.