Experiences from a protocol-design contest

Anirudh Sivaraman, Keith Winstein, Pauline Varley
(includes joint work with many others)

MIT CSAIL

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Contest setting

1. MIT’s Graduate Computer Networks class
2. Spring 2013
3. Goal: Design a transport protocol to achieve high throughput and low delay on cellular links
4. Baseline protocol: Sprout (NSDI 2013)
Contest specifics

1. Students provided with an Amazon VM running Mininet
2. Teams of two
3. Two weeks in total
4. Evaluated on a replayed Verizon network trace
Evaluation procedure

1. Average throughput
2. 95th-percentile delay
3. Throughput / Delay
4. ... on 3 minutes of Verizon data
But: final evaluation will be on fresh data collected over spring break.
Interface skeleton

- `ack received( sequence number, send timestamp, recv timestamp )`
- `window size()`
Prizes

- 2nd prize: $40
- 3rd prize: $30
- 4th prize: $20
Co-authorship on a future research paper about results of the contest
A crowdsourced throughput-delay tradeoff region

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MIT Computer Science and Artificial Intelligence Laboratory
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Experiences from a protocol-design contest
Performance on training vs testing traces
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Significant “overfitting” among protocols
Two student protocols were comparable with Sprout

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- Jonathan Perry
- The students of 6.829
Takeaways

Reproducing research results lets us improve upon existing research

Lets us simplify problems to their essentials

Tools like Mininet are critical

Can we make reproducible research even easier?

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- Lets us simplify problems to their essentials
- Tools like Mininet are critical
- Can we make reproducible research even easier?