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P2PRG: Peer-to-peer simulation survey
draft-gurbani-p2prg-simulation-survey-00

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Motivation

- Peer-to-peer protocols are complex.

- Even minor changes introduced in the wild may have unintended consequences.

- However ...

- Research community needs tools and simulators to study p2p protocols in a controlled environment.

- Many simulators ... many assumptions!

- Results sometimes not reproducible.

Aim of document

- Provide state-of-art survey on p2p simulation frameworks available today.

    - Existing surveys [naicken,p2prg-core] are outdated.

    - New simulation frameworks are becoming prevalent (ns-3, ProtoPeer [protopeer])

- Allow researchers to choose the right simulation framework according to their level of abstraction.

- Provide guidance to researchers who want to develop their own simulators.

Criteria for evaluating simulators

- draft-gurbani-p2prg-simulation-survey lists > 15 criteria for evaluating simulators:

  - Type of simulator (flow-level, message-level, packet-level).

  - Statistics collection primitives.

  - Modeling link-level and host-level attributes.

  - Visualization components.

  - Turning simulated models into production code.

  - Distributed simulation models.

  - Scalability.

  - Parametrized p2p simulators (or how to specify same scenario in different simulators)

  - ...

(Very rough) work plan

1. Taxonomize these criteria (major work!)

2. Determine which p2p simulators are used widely (questionnaire by Fleming et al. [questionnaire] may help).

3. Evaluate the chosen simulation frameworks according to the taxonomization.

4. Other miscellaneous items (to be decided).

List discussion

- Very positive.

- Received private emails as well as list emails on volunteers.

  - New co-authors in next release of the draft: Mario Kolberg, Matthias Waehlisch, Thomas C. Schmidt, Anirban Basu, Simon Fleming, and James Stanier.

  - Anirban Basu, Simon Fleming and James Stanier are compiling the p2p-hackers questionnaire [questionnaire] for an ACM survey paper.

- Riccardo Bernardini: consider p2p streaming as a use case?

Next steps

- Synchronize with authors of [questionnaire] (agreement to move p2prg and ACM survey work jointly).

- Adopt this as a RG deliverable?

References

[naicken] Naicken, S., Basu, A., Livingston, B., and S. Rodhetbhai, "A Survey of Peer-to-Peer Network Simulators", Proceedings of the Seventh Annual Postgraduate Symposium, Liverpool, UK, 2006.

[p2prg-core] A. Brown and M. Kolberg, "Tools for Peer-to-Peer Network Simulation", IETF Internet-Draft, Work in Progress, January 27, 2006 (draft-irtf-p2prg-core-simulators-00).

[protopeer] Galuba, W., Aberer, K., Despotovic, Z., and W. Kellerer, "ProtoPeer: A p2p toolkit bridging the gap between simulation and live deployment", Proceedings of SIMUTools, Rome, Italy, 2009.

[questionnaire] S. Fleming, "ACM CSUR on peer-to-peer simulators", p2p-hackers list, March 11, 2011. http://lists.zooko.com/pipermail/p2p-hackers/2011-March/002912.html