Evaluating the Potential of Bandwidth Estimators

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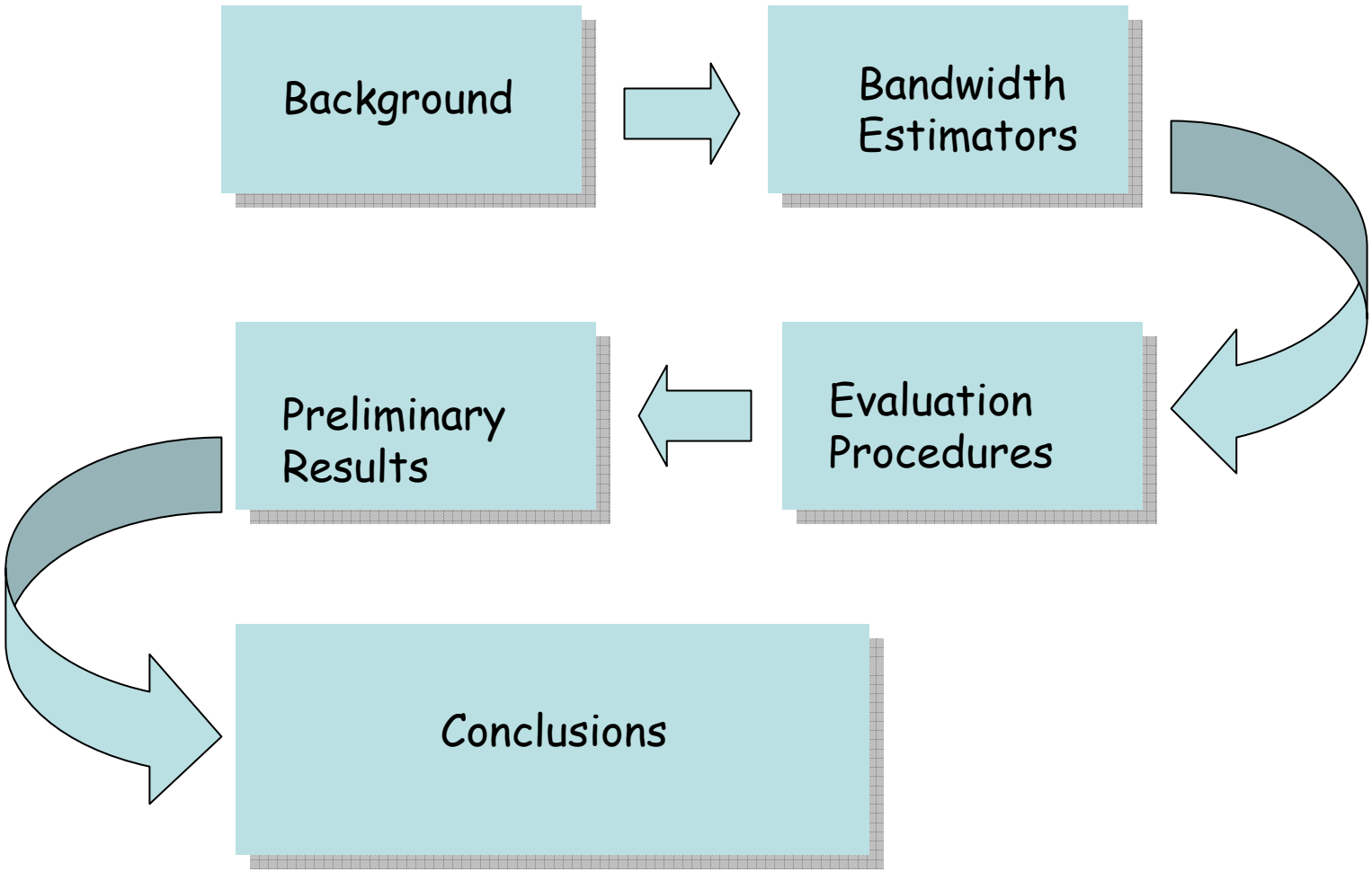
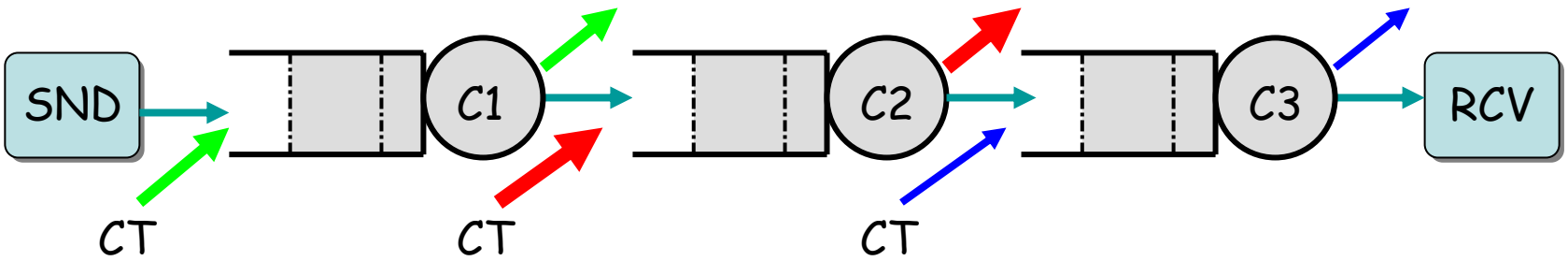
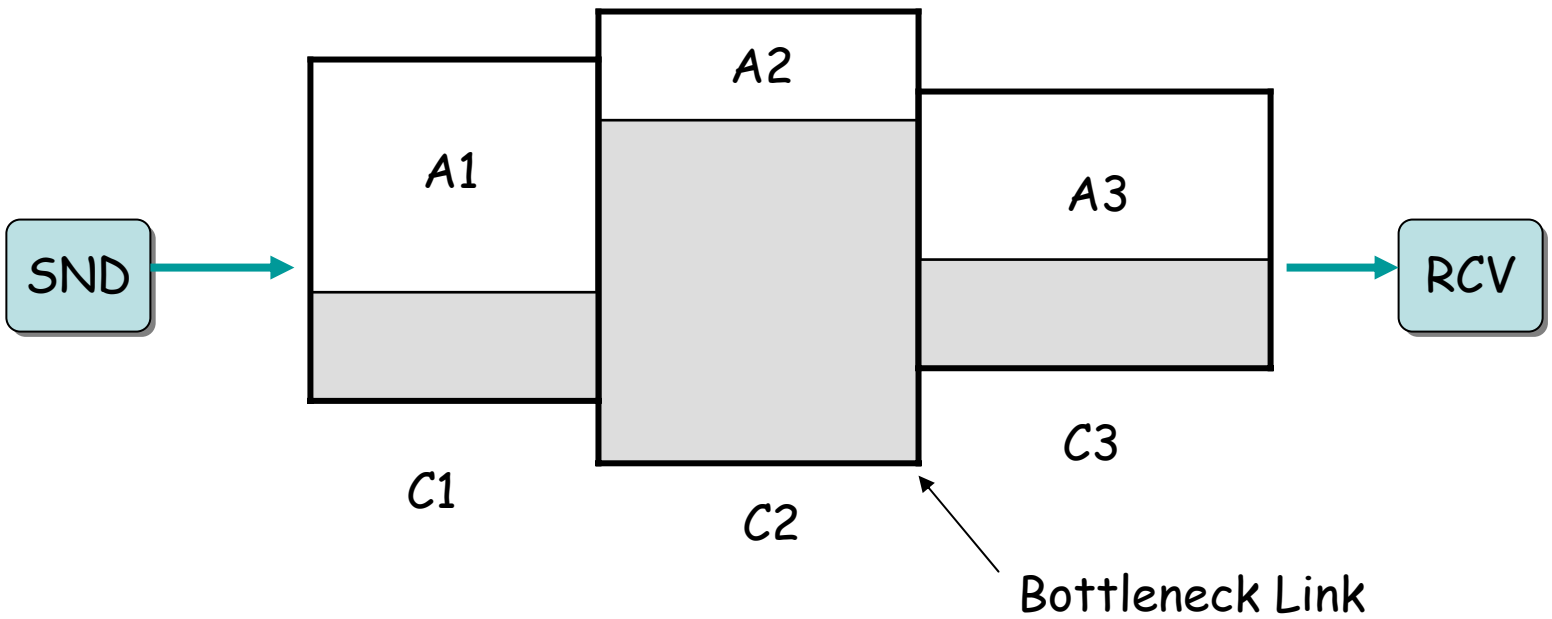
Overview


Background
Bandwidth Estimators
Evaluation Procedures
Preliminary Results
Conclusions

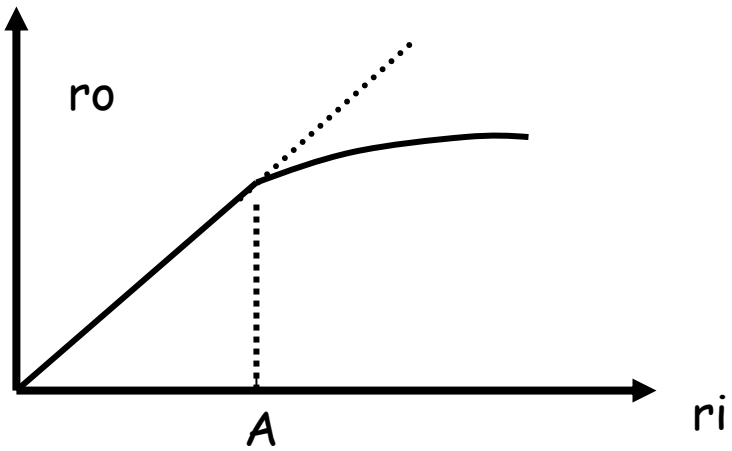
Network Model in Bandwidth Estimation





Existing Techniques

- Design justification
  - Use single-hop path with constant rate fluid CT to identify measurement rationale



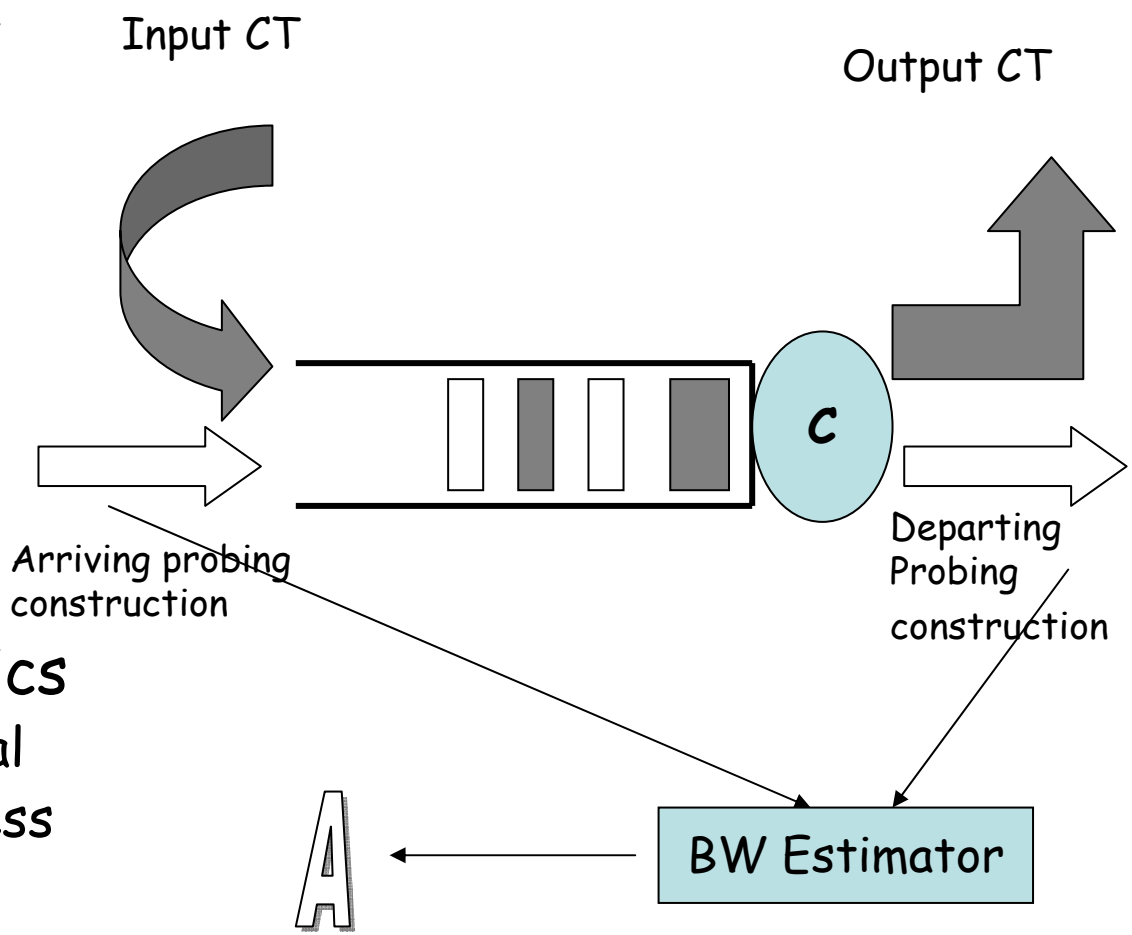
- Performance evaluation
  - Compare to Router MRTG report

Problems

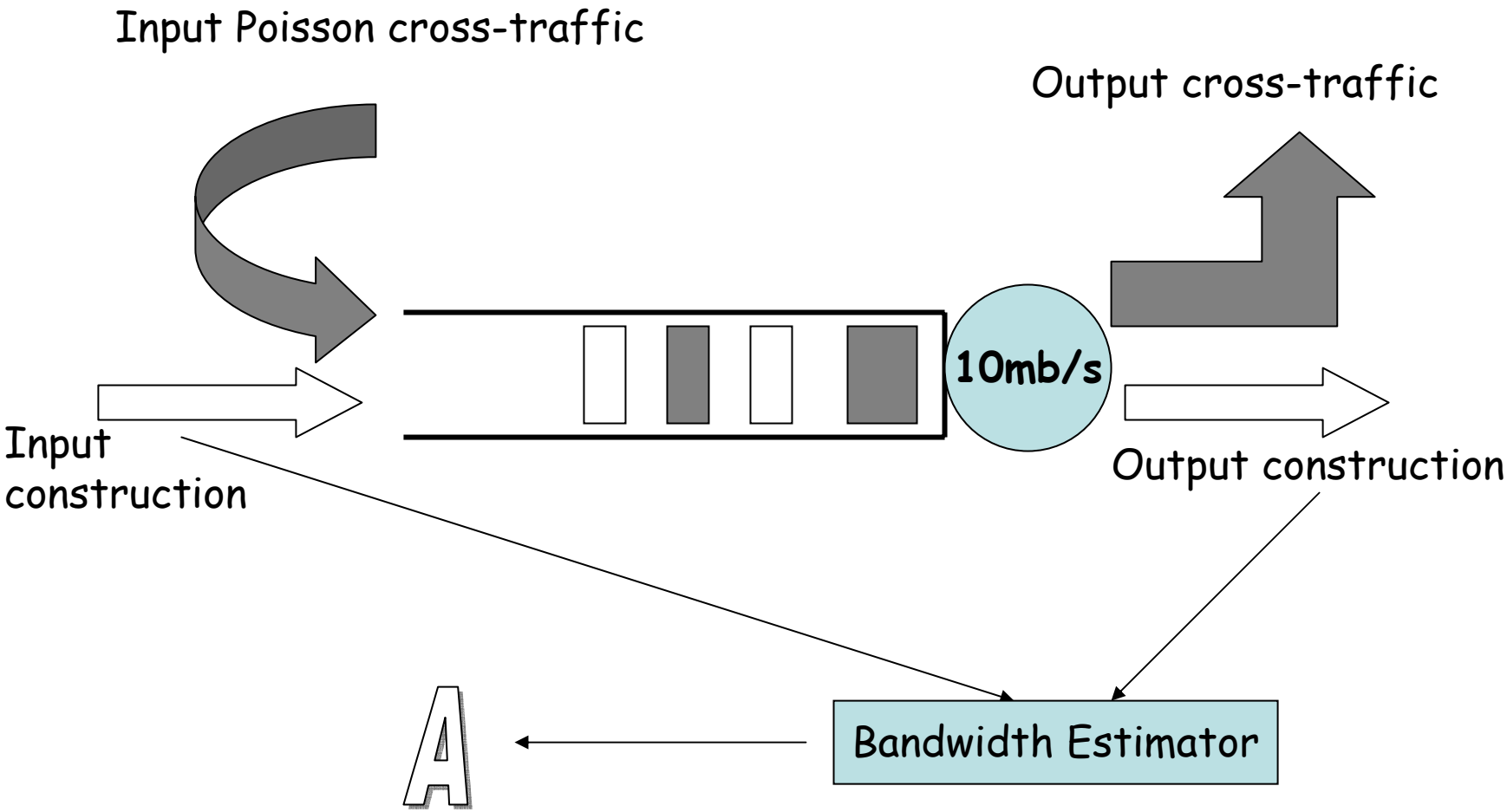
- A lot of factors can affect the measurement accuracy
  - Practical issues
  - Algorithmic problems
- Current performance evaluation is monolithic
  - Can not identify the source of measurement errors
  - Less reproducible and even can be conflicting

Bandwidth Estimators and performance metric

- Avail-bw inference algorithm
  - Input: the probing input and output
  - Output: Avail-bw estimation result
- Performance metrics
  - Single-hop potential
  - Multi-hop robustness



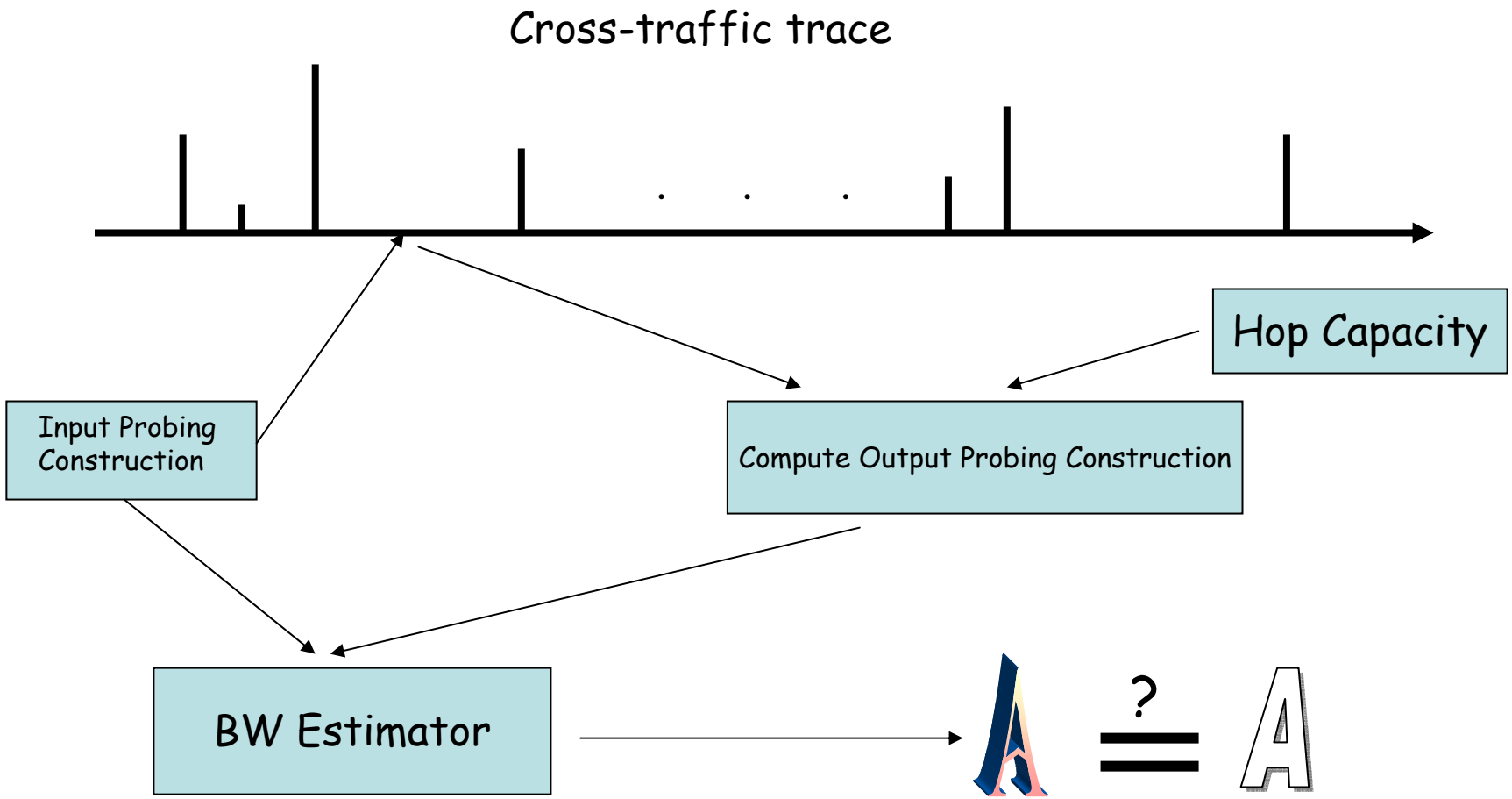
Measurement targets of Bandwidth Estimators



Classification of Bandwidth Estimators

- Non-iterative estimators
  - Fixed probing input
  - Every probing produces an estimation
  - Delphi, Spruce, Pathchirp
- Iterative estimators
  - Adapt probing input to find the construction that bring out AW.
  - Pathload, IGI/PTR, TOPP

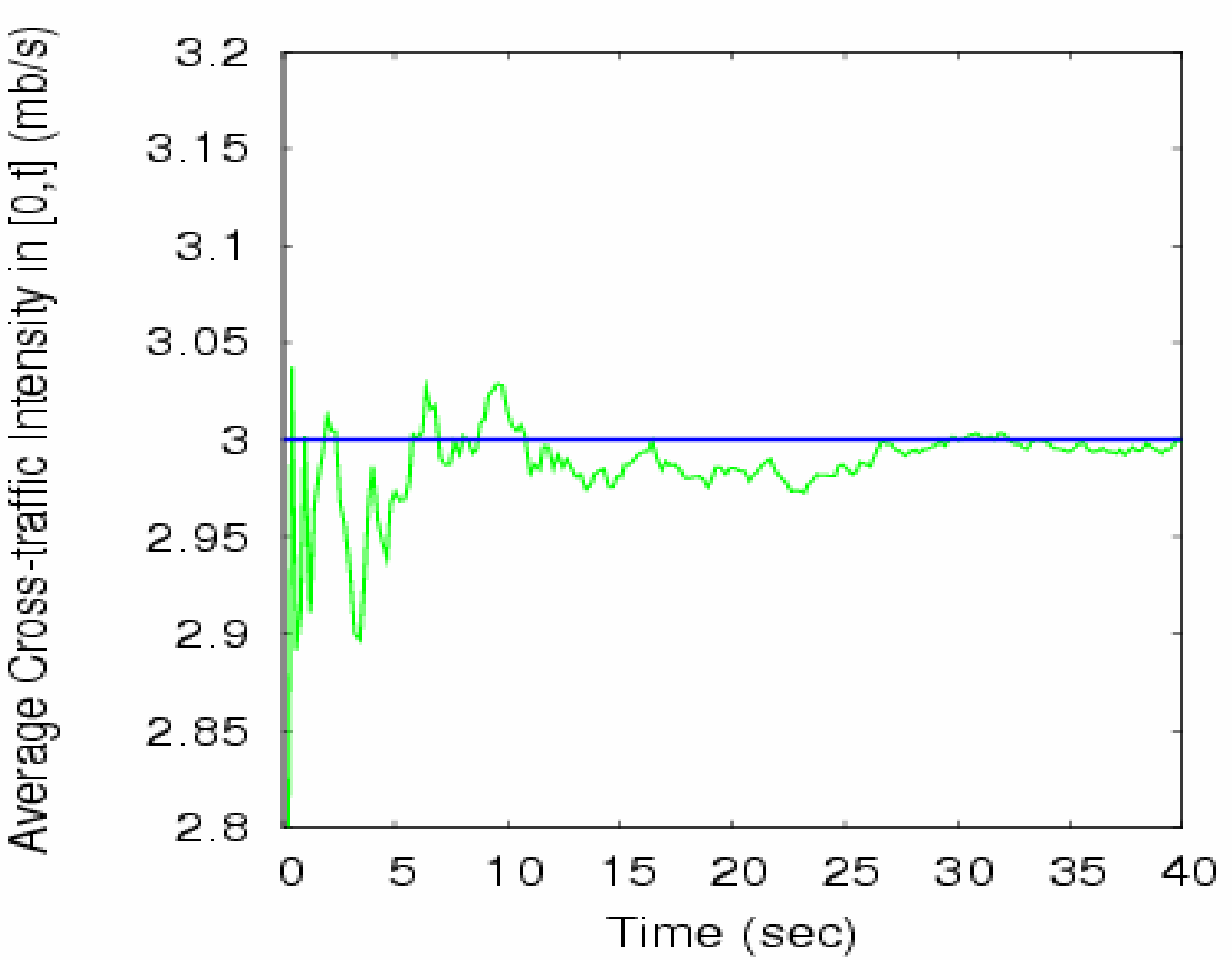
Trace-driven testing



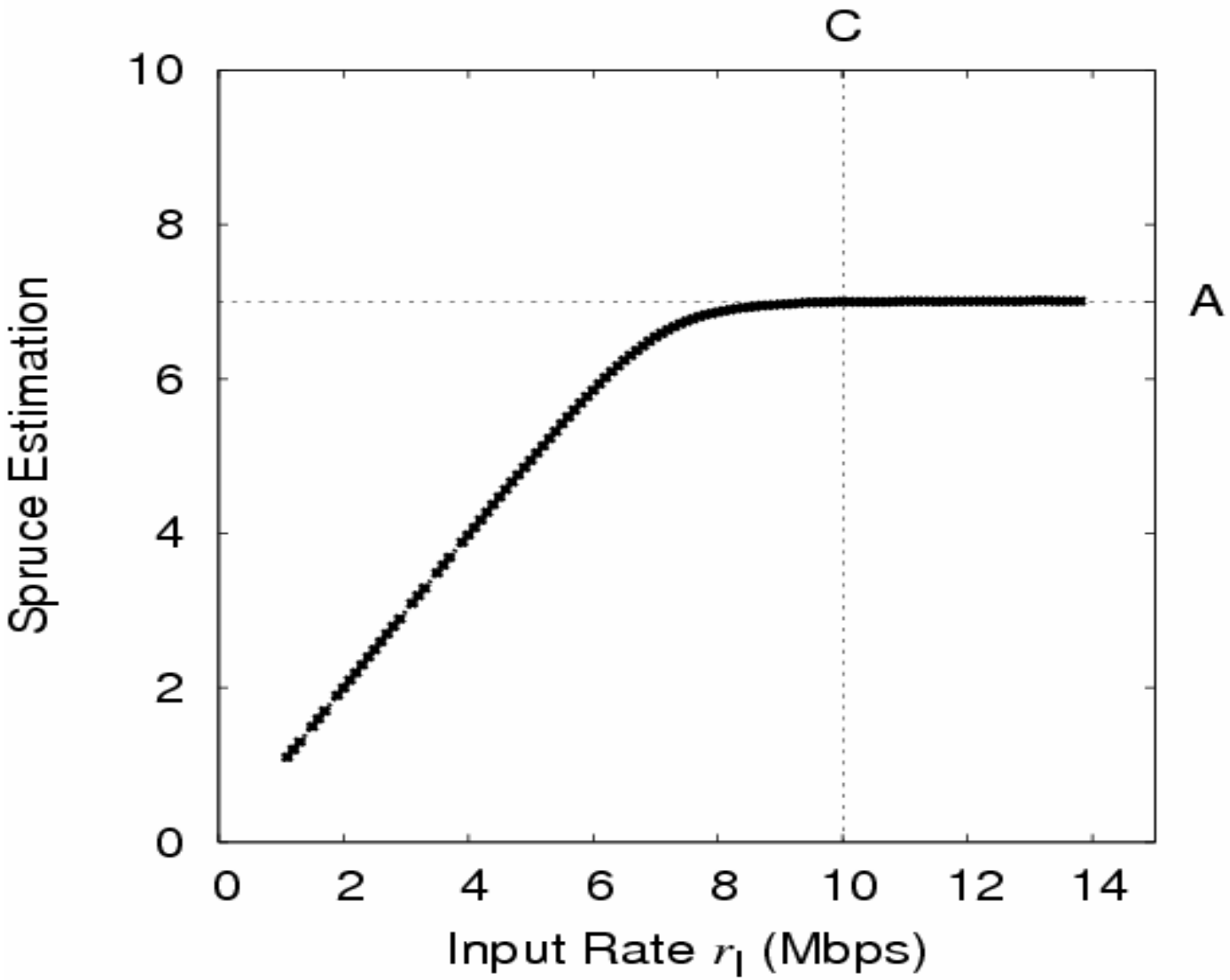
Why not just do NS2 simulation.

- Need much longer trace and time
- Inter Probing pattern introduces ASTA bias

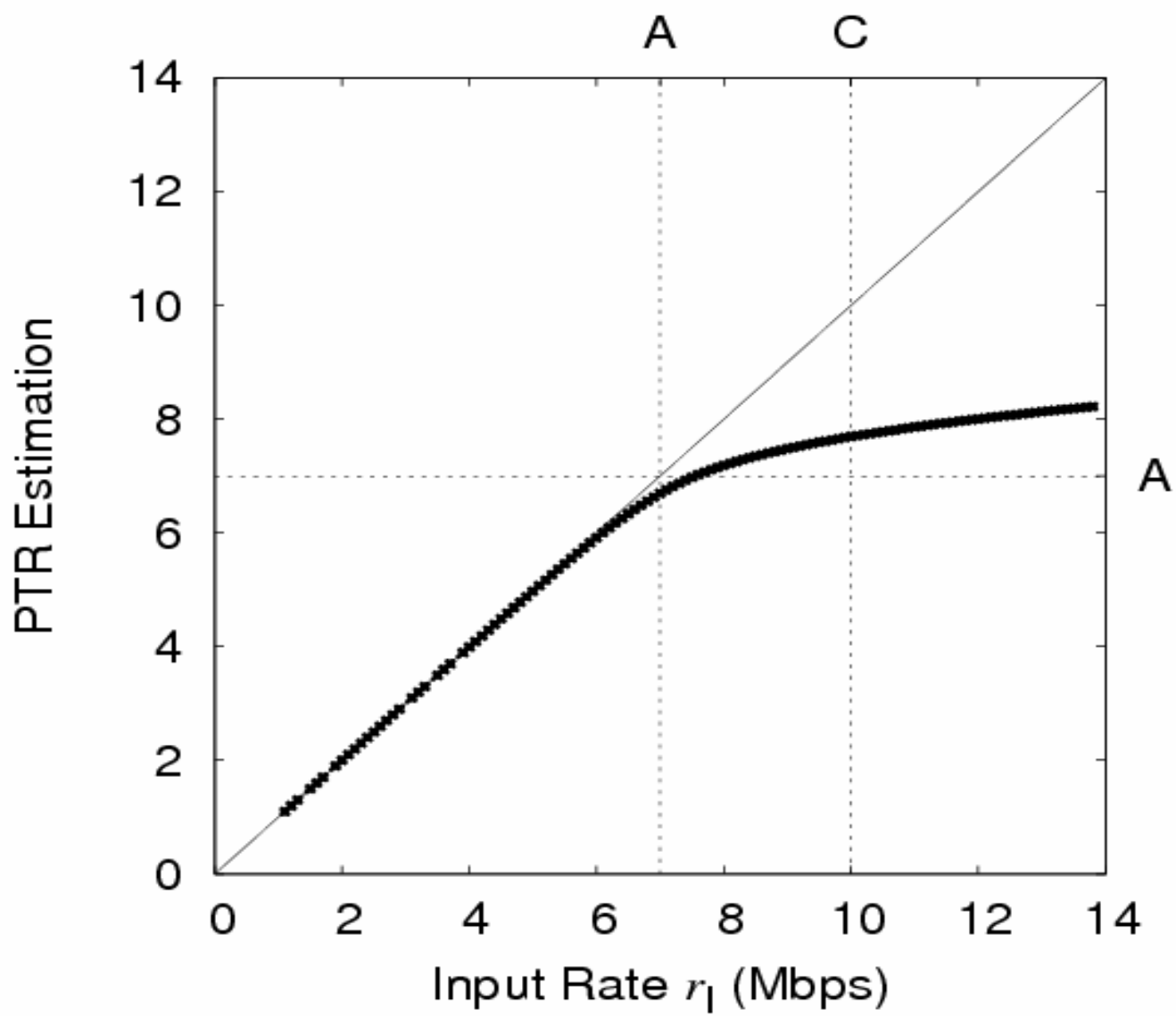
Results: Cross-traffic trace



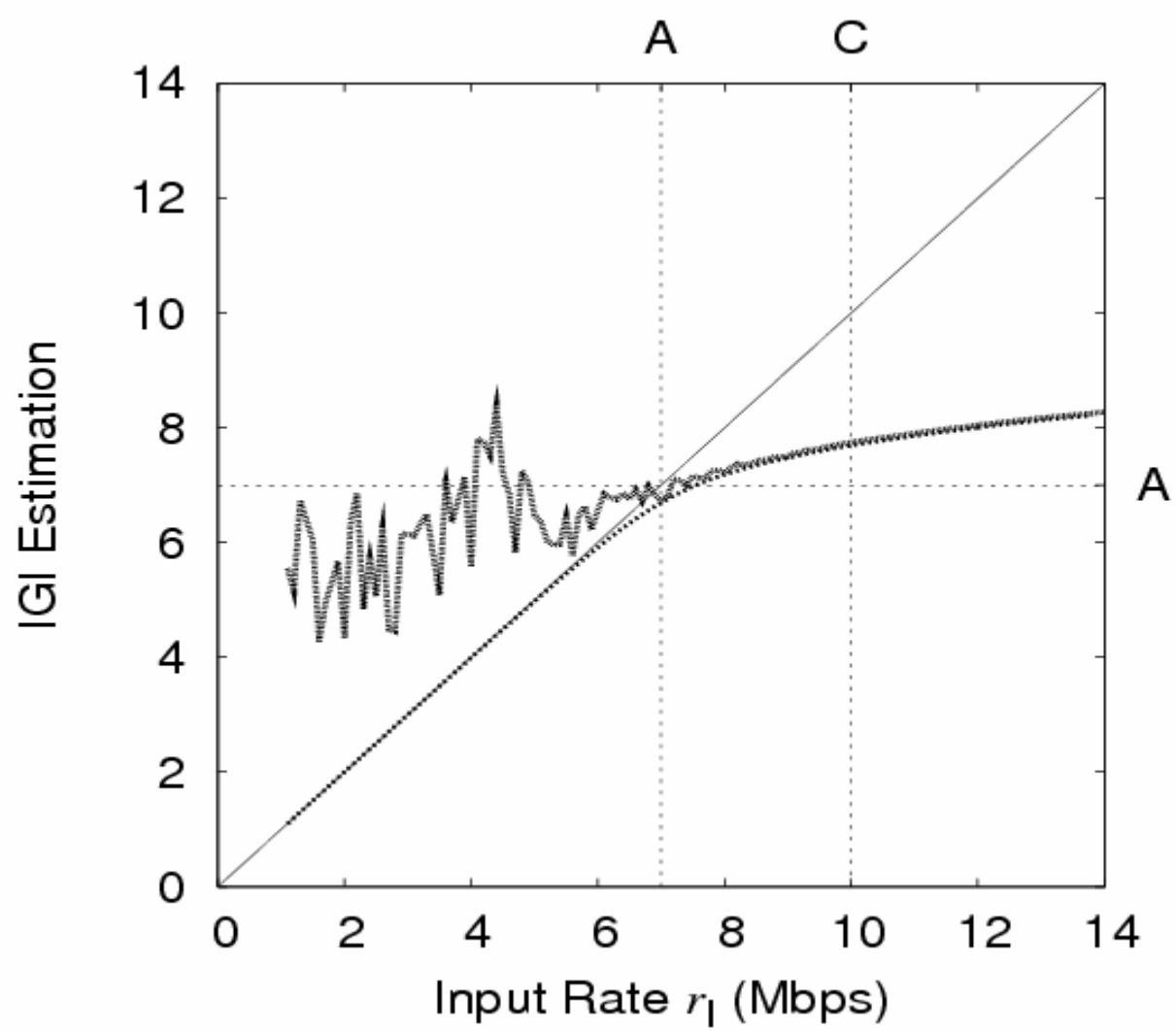
Results for Spruce Estimator



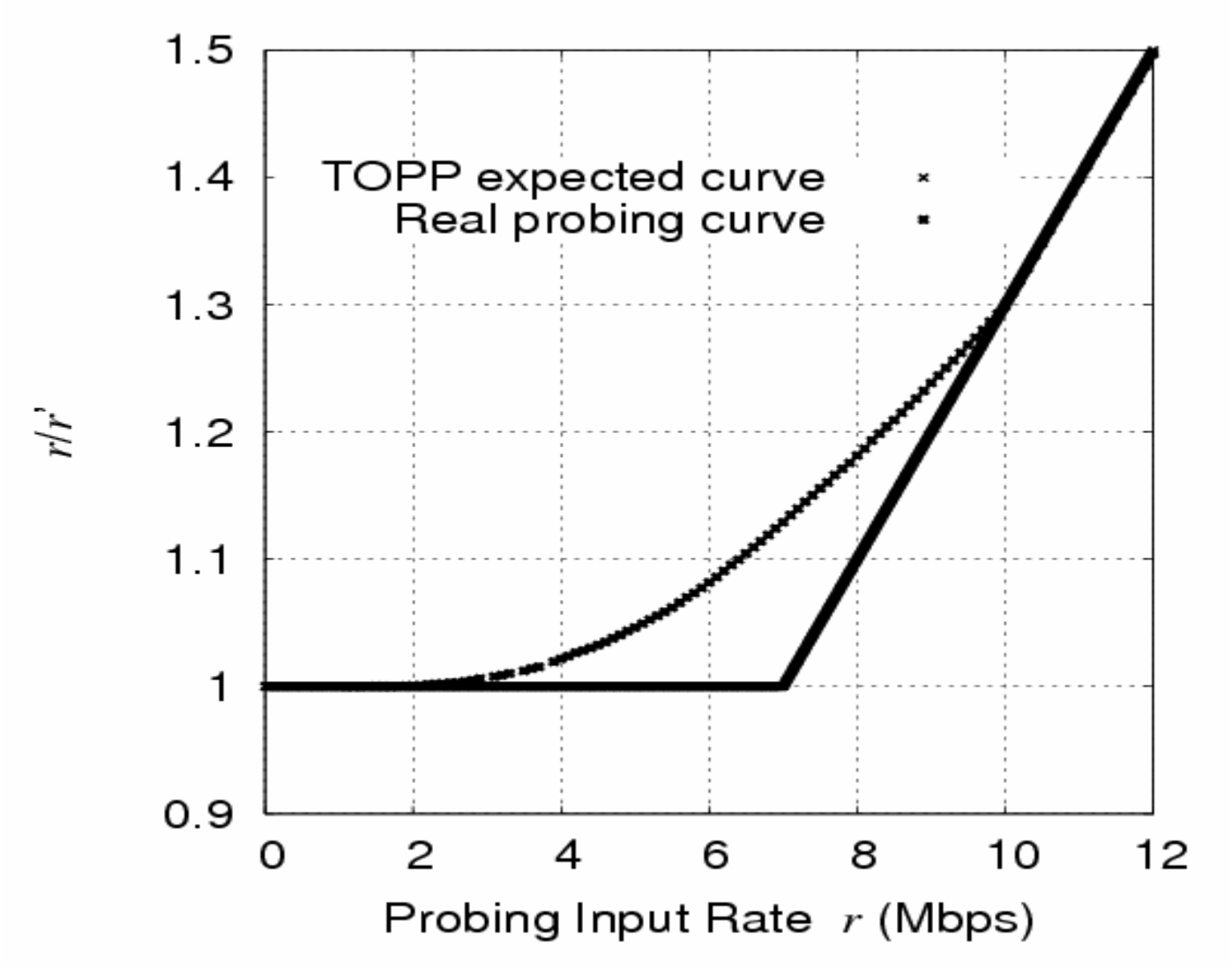
Results for PTR Estimator



Results for IGI Estimator



Results for TOPP Estimator



Conclusion and Future Work

- Our testing procedure
  - Quickly and easily evaluate one performance aspect of BW estimators
  - Provide guidance to choose better tunable parameters.
- Ongoing work
  - Evaluating pathload and pathChirp
  - Understanding the phenomenon observed

Thank You!